University of Alberta

Nakasaleka: Language, Marine Ethnobiology, and Life on a Fijian Island

by

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Abstract

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This thesis examines the process of assembling an encyclopaedia of local knowledge of marine life in three Fijian coastal villages. Many of the details of the methods used were developed in the field through trial and error. This process allowed continuous improvements in eliciting information in appropriate cultural contexts. Much of the thesis follows these paths of methodological development, which are presented as ethnography to provide meaning. This investigation of methods and approaches raises significant questions about approaches and assumptions made by NGOs and government agencies in crafting programs for conservation and sustainable development for small rural communities. I interrogate assumptions about the appropriateness of the use of biocultural diversity as a blended ideology for revitalization of biological, cultural, and linguistic diversity. I then explore the issues around recycling indigenous taboos and totems in conservation programs. Naïve assumptions about the cross-cultural translatability of concepts, such as stewardship, may blind program developers to what really happens in the village before and after the workshop. By using an ethnographic approach in this thesis, I attempt to determine better methods for conservation and sustainable development to allow developers to anticipate the context of their plans, and for residents to understand and evaluate the propositions.

Keywords: biocultural diversity, traditional ecological knowledge, stewardship, metaculture of loss, ethnographic methods.

Preface

The foundation of this thesis is the knowledge, goodwill, and hospitality of the many people in Nakasaleka who have given me permission to tell their stories. In Kadavu fashion, I will begin by thanking you for taking your time to read these stories; and express the hope that the stories and subsequent analysis might inform and improve the lives of others. If some passages in this thesis appear at times to be critical, the intent is not to diminish the works or lives of anyone, but to clarify what may prove to be misconceptions and stumbling blocks to supporting healthy lives for people in healthy biological, cultural, and linguistic environments.

Acknowledgements

A thesis of this sort bears the name of a single author, but is a compilation of the diverse contributions of many people and organizations. Funding from the Province of Alberta and University of Alberta in the form of Queen Elizabeth II Graduate Scolarships supported the project. The guidance of Professor Gregory Forth, my doctoral supervisor, was invaluable, as were the insights of the other committee members. In general, I have benefited much from the training and support I have received from the faculty and staff of the Department of Anthropology at the University of Alberta. The University of Alberta Research Ethics and Management approvals were met and followed as per file: PRO-00020381.

The fieldwork project was awarded the 2013 'Grant to Return Indigenous Knowledge to Pacific Island Communities' (GRIKPIC) from the Association for Social Anthropology in Oceania. In Fiji, this research project was supported by the Office of The Commissioner Eastern Division; The Ministry of Education, National Heritage, Culture and Arts; and the Ministry of Fisheries and Forests. In Kadavu, I greatly appreciate the support for the project by Ratu Josaia Veibataki, assistant Roko Tui Kadavu, and the chiefs and leaders of Nakasaleka Tikina. Many thanks to the chiefs, leaders, and residents of Lagalevu, Matasawalevu, Tiliva, and Waisalima who hosted me for more than four months during this research project and contributed to both the project and my well-being in a great many ways. I am honoured to have experienced your thoughtful hospitality. I also appreciate the support and patience of my family throughout this period of travel and intense work.

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Introduction

The contents of this thesis describe and analyze a research project undertaken to gather and assemble local knowledge of marine life into an encyclopaedia to be used as a resource for several small Fijian communities. Non-governmental organizations (NGOs) focused on environmental conservation, which integrate education of local people in their projects, may also find the encyclopaedia (Gordon 2012) and this analysis useful when designing and evaluating projects. This thesis explores methods and protocols to guide such efforts to incorporate local perspectives and meaning in a respectful fashion. The study was carried out in three small neighbouring communities on the island of Kadavu, Fiji. The small geographic scale allowed opportunities to establish the relationships and cultural insights necessary to provide results of ethnographic substance. Some of the results may prove to be specific to this Fijian district, while other results and observations may have wider applications for gathering traditional ecological knowledge (abbreviated as TEK) in other socio-cultural settings; in particular, when project design prioritizes potential benefits for local people.

This thesis offers a critical analysis of the methods used and results achieved in order to question the veracity of the information that I gathered. This is an essential approach when undertaking reflexive methodological analysis. The project was designed to give local people vital roles in shaping the project, and to deliver results to participating communities immediately upon the conclusion of the fieldwork. At that time, a preliminary draft was presented to the participants and supporting Fijian government bodies in the form of a 100 page encyclopaedia of local marine biology in the vernacular (Gordon 2012). This draft forms Appendix I of this thesis. I will reference it within the thesis as 'Gordon 2012', as it is now in limited circulation. These laminated loose-leaf versions, left in the villages and village schools, demonstrate a commitment to giving the communities tangible results of their contributions in a timely manner. People need to see their contributions crystalized into material and accessible forms for them in order to respect the research.

The value of this approach became apparent when people saw information from their culture respected and assembled in a binder that enabled transmission within their communities. This encyclopaedia project has also received recognition from the Association for Social Anthropology in Oceania in the form of their 2013 'Grant to Return Indigenous Knowledge to Pacific Island Communities' (GRIKPIC). This grant provides seed funding for the next project phase of printing durable copies of the encyclopaedia for use in local schools, and the anticipated provision of a copy to each home in the Nakasaleka district of Kadavu. The encyclopaedia received particular interest from participants who were intrigued by reading in their local dialect for the first time. The choice of marine life as a topic for this project enriches the depth of vernacular language used; but also demonstrates ongoing changes in practices, education models, and language use, as will often be shown in the thesis.

In this thesis introduction, I will provide some basic keys to the Fijian language used in the thesis, including pronounciation tips, before providing a guide to the thesis contents and the approaches used.

Language use in the thesis

The transcription of the Fijian alphabet is almost perfectly phonetic. Vowels are pronounced either short or long, with a long vowel having a much longer sound.

Linguists show the long vowels with a macron over them as in the word '***sā***'. However, few Fijians use these macrons in reading and writing, and thus they have not been used in this thesis or in the encyclopaedia (Gordon 2012). Most consonants are pronounced as they are in English, with the key differences shown in Table 1.

Table 1 Standard Fijian pronunciation (Calamia et al. 2008:10-11, Gordon 2010)

Vowel sounds	**Consonant Sounds**
a as in 'father' or 'lark'	**b** as 'mb' as in 'thumb' or 'timber'
e as in 'bed'	**c** as 'th' as in 'this'
i as in 'machine'	**d** as 'nd' as in 'candy'
o as in 'core'	**g** as 'ng' as in 'wing' or 'singer'
u as in 'true'	**j** as 'ch' without the following puff of breath
	k as 'k' without the following puff of breath
	p as 'p' without the following puff of breath
	q as 'ngg' as in 'anger'
	r is rolled
	t as 't' without a following puff of breath , and often as 'ch before 'i'
	v with lower lip against upper lip, somewhere between a 'v' and a 'b'

Consonant variation is common in Fijian dialects, in particular with the sounds represented by the letters 'k','t', 'd', 'q', and 's' showing regional variation (Shütz 1972: 97). Key variations in the Eastern Fijian Nakasaleka communalect are the use of 'j' for 't' when followed by 'i', as in ***bajilumi***; and the use of a prenasalized alveolar affricate 'z' for 'di', according to Geraghty (2007: 136-137), as in ***zina*** (SF: ***dina***). However, the use of the symbol 'z' for this sound was not a familiar concept for the Nakasaleka people with whom I worked. At their request, I used the letter 'j' in writing words such as the Standard Fijian ***dina*** in the draft of the encyclopaedia that was completed in the field and presented to the villagers. Further discussions of language use will be provided in Chapters 1 through 7 in the project overview, and at the beginning of each discussion of a survey question used. Language use in Nakasaleka is further analyzed from a social linguistic perspective in Chapter 8 of this thesis.

Fijian words in the corpus of the text appear in bold italicized type to distinguish them from the many italicized Latin names used for the genera and species taxa. Terms for the higher levels of Linnaean categorization, such as Family, Class, and Order are not italicized, as per accepted conventions in international science. English common names for organisms are provided for the convenience of the reader, but should not be considered to be definitive. Most of the English common names used are drawn from several key sources (Allen et al. 2003, Randall 2005, Froese and Pauly 2013).

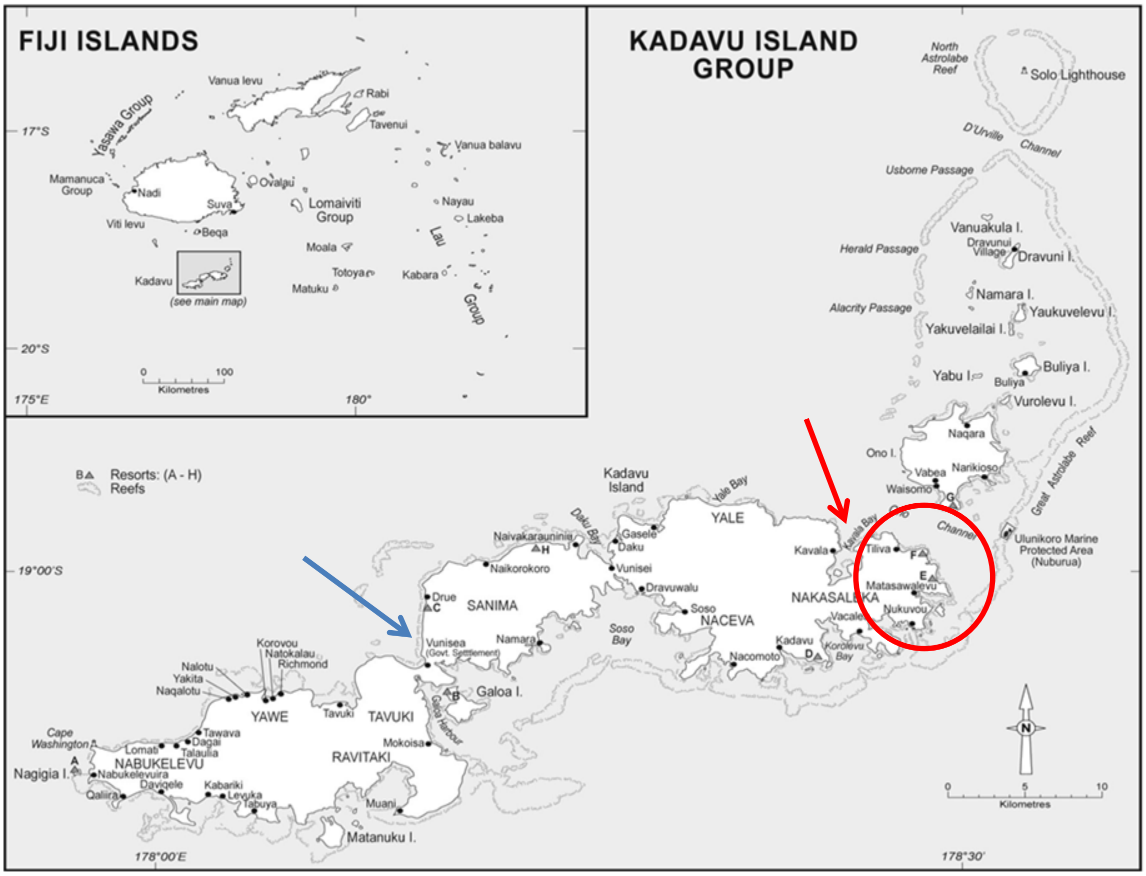
The Island of Kadavu

Kadavu is the fourth largest island in Fiji, with a relatively stable population of about 10,000 people who live in 75 villages along the coastline of this mountainous 408 square kilometre island. I provide details of population trends and political districts in Chapter 8. Most residents are engaged in some combination of subsistence agriculture and fishing, as there is little wage employment. The island is under-developed by Fijian standards, but some improvements in transportation and communication are being made. There are few Indo-Fijian residents, in contrast with the larger Fijian islands with urban centres, industry, and larger scale agriculture. Most of the land in Kadavu is controlled by villages and their chiefs, who designate small parcels of agricultural land to village households. Many residents spend periods of time living and working in Suva, Fiji's capital; but send regular contributions and retain their identity and land rights within their villages as part of a revolving urban-rural population cycle.

A number of small tourist resorts have attracted SCUBA divers here over recent decades and have provided casual employment for some villagers. However, the number of tourists visiting Fiji dropped dramatically following the 2006 political coup. After a modest recovery, anecdotal evidence suggests that tourism in Kadavu is in a significant decline. Kadavu is far away from Fiji's main tourist destinations, but an extensive fringe reef bordering the southern coast supports a rich biodiversity of marine life. In Map 1, the reef can be seen outlined along the south coast, where it faces the prevailing winds. The outer wall of the reef drops below 200 metres, in contrast with the lagoon soundings of 25 to 40 metres in the Ono Channel (United States Government 1996). These variations in marine topography create a wide range of marine life habitat, which is particularly rich near the Ono Channel between Kadavu and Ono Islands. Here plankton-laden currents surge through the Naiqoro Passage supporting this biological diversity of the reef and lagoon. The passage is marked in Map 1 by the red circle, as are the villages of Lagalevu, Matasawalevu, and Tiliva, whose residents supported this research by contributing their time and knowledge.

In Map 1, the red arrow points to the Kavala Bay wharf where the weekly ferry calls to move people between islands and bring supplies from Suva. This trip takes about 15 hours from Suva including a stop in Vunisea. People will be waiting to load their shipments of produce, fish, and kava for city markets or for relatives living in the city on the six hour return trip back to Suva. Kavala Bay is the administrative centre of Nakasaleka. The health centre, the post office, the secondary school, a primary school, the fisheries sub-station, and two stores are located in this protected waterway along with several villages.

Map 1 Kadavu Province.



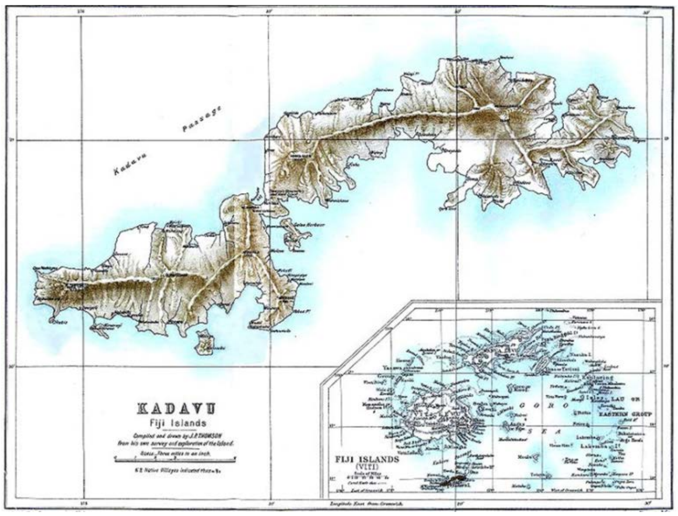
The circle shows the locations of the participating villages in Kadavu Island's Nakasaleka district. Tiliva and Matasawalevu are identified. Lagalevu is marked 'E' just north of Matasawlevu. Map source (Calamia et al. 2008:9)

The blue arrow in Map 1 points to Vunisea, which is the administrative centre for the Province. The weekly ferry from Suva docks here first, before going on to Kavala. A small airstrip allows daily service to Suva, weather permitting, for tourists, government employees, and a few well -off Kadavu residents who can afford the expense. There is a small hospital in Vunisea along with government offices and several stores connected by roads in this relatively flat part of Kadavu. Nearby is Tavuki village, the chiefly village of Kadavu.

Nakasaleka

Kadavu is a mountainous island with sharp ridges dividing the land into sections that often form boundaries between village lands. This topography can be seen in Map 2 to be particularly pronounced in Nakasaleka at the eastern end of the island, where plans to build roads beyond some short stretches in Kavala Bay have not been realized (Daurewa 2007). Existing roads around Vunisea and Kavala Bay require significant ongoing maintenance, given the seasonal torrential rains. The three villages that participated in this survey are connected only by rough trails, which can become very muddy at times. In some places the seashore can be followed at low tide. A few people in each village own 23 foot fibreglass outboard motorboats that are used for transport and fishing trips, with non-boat owners contributing fuel or cash to pay for their trip. Tiliva and Lagalevu are situated near the seashore on wide bays where the weather can be very pleasant at times, but also very windy for many days and nights at a time. Matasawalevu, set deep in a protected harbour bordered by mangroves, can be very warm at times, but is much less windy in poor weather conditions. Access to this village by boat at low tide requires a walk through the deep mud in the harbour. The photograph in Plate 1 was taken from the steep hill behind the village of Matasawalevu, which is just visible near the bottom of the picture. The reef is defined by the horizontal

Map 2 Map of Kadavu with topography (J.P. Thompson 1889)



row of white breakers visible out to sea and the red arrow shows the location of the Naiqoro Passage through the reef.

Plate 1 Matasawalevu village and Naiqoro Passage in the main fringe reef.

This brief introduction to the Nakasaleka region of Kadavu is meant to provide the reader with context for the information and images to follow in the thesis, which will elaborate on the rich cultural, linguistic, and biological diversity evident in this area. Given that the analysis of methodologies used is a key objective of this thesis, the methods will be examined over the course of the first seven chapters and contextualized within ethnographic data. The value of using the vernacular language in the encyclopaedia (Gordon 2012) was recognized as very important by participants, government administrators, and an external funder. In Chapter 8, I explore the challenges in determining just what the local vernacular might be from different people's perspectives. Socio-economic and political context for Kadavu is also addressed in Chapter 8. Chapter 9 is an interrogation of the conceptual underpinnings and usefulness of the notion of biocultural diversity that was inspirational to this research. In Chapter 10, I examine how both classic anthropological and popular notions of tenure, taboo, and totem often cloud perceptions of traditional ecological knowledge and modern research approaches in this domain. In what follows, I will provide a brief summary of each chapter.

Chapter 1 provides an overview of the interview process used and how it was developed. I discuss the challenges of encouraging people to use the local dialect for answering questions to an outsider. Different interpreters had dissimilar linguistic practices that influenced interviewee responses and the data recorded. Further challenges are discussed regarding interpreters' variable knowledge levels of marine life, and their perspectives on their roles. The topic of developing a productive interview format is reviewed by discussing failed methods that led to more successful approaches. This analysis includes recognition of external social factors which potentially conflict with research agendas. I address justifications for accepting and building upon variations in interview formats and approaches, a practice which might be criticized as 'poor science', but reflects the realities of village life and thus is 'real ethnographic science'. I open a discussion of the data coding methods chosen and their retroactive effect on the interview format and the information collected. This topic arises again throughout the methodological analysis. Chapter 1 concludes with an introduction to the survey questions used, and how they were developed and chosen.

Chapter 2 covers three survey questions that address relationships between creatures and estimates of their size. Under the first two questions, I describe and evaluate springboard listing, a method of cultural domain analysis that I used to determine perceptions of relationships between different kinds of organisms. This process leads to a discussion of perspectives of kinship in the village, and how exogamous marriage practices influence language use variation and ongoing change. This knowledge informs decisions to modify survey questions using language with more appropriate meaning, a procedure which improves the richness of the responses. I provide specific examples of perceptions of relationships between different kinds of fishes in order to compare people's observations of interspecies relationships that would be defined in international biology as parasitic, commensal, or symbiotic. A comparison of the responses to the first two questions leads to a positive evaluation of the springboard method as a tool to elicit people's knowledge of marine life forms when the interviewer does not name or present them in photographs. I then address the challenges of using the broad range of data collected to appropriately group the various creatures into the categories used in the encyclopaedia (Gordon 2012).

Under the fourth question, I describe how people's estimate of the maximum size of a creature helps to qualify an accurate identification from a photograph, and how people perceive and measure the size of fish. I compare average estimates for maximum sizes of different sets of fish between villager interview responses and sizes listed in published field guides in order to determine that villagers do not exaggerate the size of fish in their responses. This is an important test in a research setting in which spear fishers often tell stories about the large fish that they caught. In fact, the results show that people tend to under estimate the measurement size of some very large creatures.

This test augments the validity of the data collected for this question and likely elsewhere in the survey.

Chapter 3 covers four survey questions focused on marine life behaviour with regard to where organisms live, how they move about, the size or densities of their populations, and any recent changes. I provide an example of forming survey questions around Fijian pronouns used with specific numerical categories, and discuss people's perceptions of variations in group sizes involving different kinds of creatures. These perceptions create challenges in gathering and assessing survey responses. Under question 6, I address the difficulties of translating the ecological concept of 'habitat' as it is used in international science into Fijian folkbiology terminology. I review the various terms used in Nakasaleka that equate to ecological zones. This procedure facilitates a discussion of: the challenges of eliciting detailed responses; the data coding methods that streamlined the interview process; and how coded data was sorted to determine what information to use in the encyclopaedia (Gordon 2012), along with suggestions for improved efficiencies. The etymology of the terms used for ecological zones suggests cosmological and territorial perspectives embedded in some terms. This analysis introduces Kadavu conceptions of reef ownership, as will be explored further in Chapters 9 and 10. The discussion of question 7 results also illustrates translation challenges in asking people to differentiate between common and rare kinds of creatures. The results of question 7 are compared with the question 8 results in order to try to understand what experiences and knowledge people draw upon when they express their opinions on changes in marine life populations. A common discourse among villagers about declining fish stocks is not well supported by the overall trend gathered in the creature-by-creature survey results.

Chapter 4 covers questions that explore perceptions of marine life behaviour related to reproduction and diet. I interrogate the ineffectiveness of asking people the general question used about how a kind of creature reproduces. I link this issue to educational efforts used by conservation-focused NGOs on the topic. The reproduction of a few kinds of creatures, such as turtles, was well known; and I review these responses. However, my data show that most of the responses on reproduction focus only on where the reproduction is thought to take place, and many of these responses are vague references to 'on the reef' or 'in the sea'. These inquiries were refined during the fieldwork by introducing detailed questions about the months in which fish were seen to carry eggs, and when eggs have been shed. In this chapter, I analyze these responses and the terminology used to demonstrate how this more fine grained approach led to a better understanding of how people think about marine life reproduction. Responses about seasonal changes, aggregations, and sequential spawning cycles of different kinds of fish showed the usefulness of this sort of inductive approach, which may then better inform efforts to teach marine conservation. Under question 10, I compared the responses about where 'little ones' live with question 6 responses about the general habitats of similar kinds of creatures. This contrast determined that people did have reasonable knowledge levels specific to the habitats of the 'little ones'. These results are drawn upon to show how this response data can demonstrate people's attitudes towards certain kinds of fish which are the focus of conservation efforts, using the example of the humphead wrasse (*Cheilinus undulatus*).

Question 11 was an inquiry into people's knowledge of the diet of different marine creatures. I analyze these data by comparing traditional ecological knowledge (abbreviated as TEK) with international science knowledge (abbreviated as ISK) across 25 categories of marine organisms. This approach requires an examination of different ways of naming and conceptualizing food, such as sand; an inorganic substance at one classificatory perspective that is an organic substance in a different classificatory perspective. A brief analysis of each comparative category of marine life that measures agreement levels between TEK and ISK allows variable perspectives to be put in context. The results of the analysis show a relatively strong agreement level between TEK and ISK in this domain of knowledge. I then review factors affecting the results, stressing the importance of letting TEK shape the categories that define the food sources discussed to enrich the comparison.

Chapter 5 opens the inquiry into the practical and social aspects of marine life in Nakasaleka by analyzing the thousands of responses to questions about fishing methods. Suggestions are made to address the methodological problem of sorting response terms for 'actions of fishing' from those used for fishing tools. I describe a wide range of fishing methods used by people, and relate these to historic Fijian methods from other literature and accounts that I recorded in the field. This review facilitates a discussion of the use of new technologies in popularizing underwater spear fishing as a sport for village men, a practice which I contrast with notions of 'traditional' indigenous stewardship of marine life; a topic examined further in Chapter 9.

Chapter 6 investigates cooking methods, and how marine life is used in Nakasaleka. I provide an ethnographic review and photographs of common cooking technologies and methods, which provides insights into how, why, and when people are likely to use a given cooking method. Using field notes kept of my own diet in the village, I demonstrate the significant diversity of kinds of marine life consumed by villagers. This observation is substantiated by published records from other rural coastal Fijian villages that show corresponding diversity in consumption and catches. These findings should have implications for marine life conservation education programmers. I go on to establish an indistinct relationship between the diversity of types consumed and methods of cooking, given that personal tastes create the considerable variations shown in an in-depth analysis of responses on cooking methods used for 33 categories of marine life. This analysis is followed by a review of sophisticated cooking methods used for poisonous creatures, and people's techniques for determining when creatures have poisonous content. These responses demonstrate a very complex use of TEK by some villagers.

The second section of Chapter 6 addresses what people identified as their various uses of marine life forms. I identify ways that this topic could be better addressed during interviews to elicit more detailed responses than often were given. To analyze how people use different life forms, I again use 33 categories of types of marine life to determine primary and secondary uses of different kinds. The results facilitate several discussions including the use of baitfish, and the possibilities of expanding this topic to encourage different sorts of discussions on fishing practices. Attention is also given here to how and where people sell some of their catch; and the economics of fishing from motorboats, which may burn more money in fuel than the value of the fish caught. The current economics of sea cucumber fishing practices are also addressed. I review some uses of marine life types for medicinal and handicraft purposes, as well as the use of some kinds of invertebrates with decorative and symbolic importance to villagers.

In Chapter 7, I summarize 844 comments, anecdotes, and stories provided during interviews by grouping them into 16 categories for closer attention; and then illustrate the information by using examples not mentioned in detail elsewhere in the thesis. In this chapter, I pay particular attention to observations of marine life behaviour, and knowledge of dangerous and poisonous creatures, topics which yielded a significant number of detailed stories and practical remedies. A comparison between stories about sharks and various poisonous creatures supports the notion of sharks being perceived as social actors in Fijian society, a concept with deep roots in Fijian mythology. I suggest ways that this relationship should be understood by marine life conservation-focused educators working with fishing communities. A number of other unique topics are addressed here, such as the types of parrotfish whose livers are considered a culinary delicacy and are often immediately eaten raw as soon as the fish are caught. Throughout the chapter, the analysis of the stories is framed within a meta-discourse of evaluating the methods used to elicit and record the stories, and consider how the methods might be improved.

The language revitalization aspect of this project demands the close examination made in Chapter 8 of the indexical web of language use in Nakasaleka, which defies simplistic hierarchical definitions. Language change is a constant; I explore the relevance of sociolinguistic concepts of polycentric indexicality, valuative authority, and prestige languages to the directions of change for what I describe as a 'community of practicers' using a 'language of place'. The argument moves from a broader view of language diversity in Fiji through a socio-political evaluation of language use in Kadavu and on to language socialization in Nakasaleka, in order to demonstrate a relational representation of language use. The goal of this chapter is to establish an understanding of how the encyclopaedia (Gordon 2012) might be contextualized within the Nakasaleka and broader Fijian sociolinguistic settings.

Chapter 9 interrogates the conceptual underpinnings of the modern notion of biocultural diversity used to frame traditional ecological knowledge. Biocultural diversity conservation has become a well-established research paradigm in the last decade, to be applied in gathering biological, cultural, and linguistic knowledge in high diversity regions, in which these domains are all threatened by similar forces. The focus of the model is revitalization through intergenerational knowledge transmission, an approach which supports diversity conservation. I agree that the three domains face common threats; but my research leads me to question the wisdom of prioritizing the biological conservation aspects in concert with cultural and linguistic matters in revitalization program development. In particular, biological conservation policies may be associated with harsh punishments for some people in cases in which only the penalties are respected, rather than the policies. In this case, bundling language and culture diversity efforts with biology may lead to negative outcomes. This situation may in fact encourage people to have less interest in their local culture and language. Treating biocultural diversity as a natural or universal ideology may lead to reducing complex cultural factors to simplistic academic models.

In Chapter 10, I address the role of marine tenure and taboos in modern marine life conservation programs in Melanesian societies, a topic which has been under debate for many years. Simon Foale et al. (2011) argue that most Melanesian tenure systems arise from negotiations among and within social groups which compete to control resources in order to maximize their prestige and status. This view negates the notion of marine tenure systems as adaptive and functionalist mechanisms which can be transposed into a modern conservation ethic of managing scarcity, as understood today in international science. Foale et al. (2011) call for a better understanding of the cognitive underpinnings of these tenure and taboos systems. I pursue this quest by examining the ways that the terms tenure, taboo, and totem have been understood or misunderstood in cross-cultural use, with specific attention to Fiji. I propose that a broad concept of taboo has become so tightly linked with concepts of totems that using any one of tenure, taboo, and totem invokes the others in a trinity replete with much conceptual and theoretical baggage. I provide a detailed example of a so-called 'totem fish' from a small Fijian village to demonstrate the inconsistencies in these theories, and question the usefulness of these concepts in relation to presuming the presence of a 'conservation ethic'.

Chapter 1: Overview of the Research Project

The first seven chapters provide a review of the methods used to gather the information included in the report, ***Na vu ni era rai kila me baleta na ika vata na sasalu iso na koro va Nakasaleka*** (The knowledge of Kadavu marine life of some Nakasaleka people.) The report or encyclopaedia was produced to provide a useful cultural record for Nakasaleka people, local educators, and the Fijian Ministry of Education. The primary data used to build this resource were gathered in interviews with 59 of the residents of the neighbouring villages of Lagalevu, Matasawalevu, and Tiliva in the Nakasaleka ***tikina*** (district) of Kadavu Island, Fiji, as shown in Map 1. Lagalevu is not technically a village, but rather a settlement on freehold land; however, its leaders encourage residents to cooperate in group projects and activities as if it is a village. For simplicity, I will refer to Lagalevu as a village in what follows.

A priority in this research was to make every effort to perform this work in a fashion that was respectful of people's time, knowledge levels, and interest in the project, in addition to meeting the standards of the University of Alberta ethics guidelines and those of the applicable Ministries of the Government of the Fiji Islands.

This research work was done in late 2011, with further interviews in early 2012 to check data accuracy, and additional fieldwork to produce effective translations. As the sole researcher on the project, I participated in all interviews, most often as an observer to monitor questions given and answers recorded, but also as the primary recorder of data during the last two weeks of interviewing in 2011. Over the course of the first seven chapters, I will review key factors of the interview process including settings, language use, interpreter issues, interview formats, things that did not work well, the usefulness and results of each question used, and the various stages of development of the methods.

Interview settings

Interviews were conducted in the daytime or on occasion in the evening by lamplight to suit people's schedules. Interviews were often arranged a short time in advance by the interpreters or myself; but schedules can change quickly when people's activities are weather dependent, so flexibility was required. Interviews were conducted in three different villages while I resided in each respective village. At times, I may refer to Lagalevu as 'village L', Matasawalevu as 'village M', and Tiliva as 'village T' for brevity.

Interview settings included homes, outside of homes, and in community halls. The interpreters and I could be with individuals, couples, families, groups of men drinking kava together; or at community work events such as women's mat weaving or net mending, in which people could work with their hands as they answered questions. In Nakasaleka villages, most homes consist of one large rectangular room. When at home, people sit cross-legged upon the floor of wood planks or cement slab covered by a thin woven mat. Most often the interviewee, interpreter, and I were seated on the floor in a rough circle, enriched with children and onlookers who would come and go. The frequent distractions range from toddlers having tantrums or chewing on the photographs being used, to having to shout above the noise of men cutting grass nearby with brush-cutters, or over thunderous rainfall pounding on metal roofs. However, there are often inspirational surprises, such as the day an eight year old boy produced his school notebook and avidly wrote things down in imitation of us, as we interviewed his grandparents. Some homes have a chair or two of some sort, which would be offered to me and almost always refused; in Fijian custom to sit above other people on a vertical plane is an assumption of superior status and I suspect, arrogance. People do pay close attention to where everyone sits on a horizontal plane in Fijian homes, as has been well documented (Sahlins 1962: 107, Ravuvu 1983: 17, Toren 1990: 37). This manifestation of status varies by who is present and the nature of the setting. People also pay close attention to who sits where in relation to others. I soon learned that when joining a group of people it was best to hesitate until someone directed me to an appropriate seating position, as some direction was always forthcoming. The elderly man shown in Plate 3 had serious health problems which forced him to sit on a chair. We visited this home every day for several weeks, and this man often apologized to me for not sitting on the floor with us as he would like to. Plate 2 shows the sheets used for interviewing, as will be described, and an untrained but helpful research assistant.

Plate 2 Question and answer interview sheets

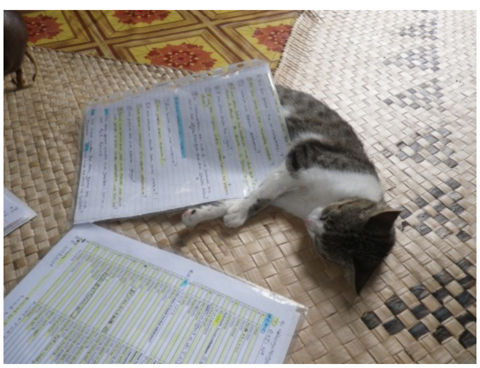


Plate 3 An interview setting in a home

Language use

Language issues are dealt with in detail in Chapter 8, and a key to basic pronounciation in Fijian is found above in the Introduction to the thesis. I will cover a few key points here that relate to the interview models. A methodological goal was to have the questions asked and answered in the local Nakasaleka dialect, although I will describe how this choice was often not the case. Villager language skills range widely from speakers whose main dialect is Nakasaleka, to multi-lingual speakers who speak some combination of Nakasaleka, Bau, and English, other Kadavu dialects, and a little Hindu-Fijian. Bau is the term that Nakasaleka people use to refer to the Standard Fijian (SF) language taught in school and used in the Wesleyan Methodist translation of the bible and hymn book. Standard Fijian is the Fijian language of government along with English. Here, I will use the term Standard Fijian abbreviated at times to SF in following the method of Paul Geraghty (1979, 1983), noted expert on Fijian language matters. Given the political dominance of Standard Fijian, the concept of having an outsider interested in using the Nakasaleka speech took some time to catch on. Some of the terms used in the responses and many of the stories taken down had to be rewritten by key interpreters into the Nakasaleka dialect. Often, a second interpreter was asked to review each rewritten story to establish consensus on Nakasaleka speech use.

My language skills in Fijian are in many ways inadequate for this project. I was unable to find a good language teacher to offer me instruction. The school teachers were away on holidays, or very busy starting a new term during the month that I spent in village T where the primary school is located. In any case, the teachers in the community-run primary school did not have any texts designed to teach Standard Fijian to the children, although it is a key subject. They also had no written examples of the Nakasaleka dialect. In 2012, I found 20 reprinted copies of Churchward's (1941) standard Fijian Grammar text, and donated these to the primary school, a source which will help the teachers. Early on, I worked on my language skills using the text, 'Spoken Fijian', an oral method to learn Standard Fijian (Schütz and Komaitai 1971). However, in trying to put this learning to use with my hosts and interpreters, I inadvertently encouraged them to speak SF to me and use SF in interviews, rather than emphasizing the Nakasaleka speech as used in the village. However, I did make good progress on the language in the last few weeks of the project as I worked with interpreters on editing and sorting out consistent use of Nakasaleka speech with the written records from this research.

It should be noted that my references to language or dialects as ‘Bau’ and ‘Nakasaleka’ reflect how people in the villages refer to the languages. This procedure is in contrast with the common academic reference use of the term, Bauan. I have never heard or seen a written reference to the Nakasaleka dialect; hence I will not formalize here the use of the term, Nakasalekan. I will follow the speech pattern of the users by calling their dialect ‘Nakasaleka’, and refer to Bauan as Bau to be consistent.

Interpreters

The linguistic backgrounds of each of the interpreters contributing to this research are shown in Table 2. Four of the five female interpreters came from other Kadavu linguistic districts; and most of these women, ranging in age from 16 years to early 30s, had also lived off-island at some point. Interpreter one, who made significant contributions to the project, made ongoing efforts to check many dialect terms with other reliable people; and became quite expert on determining Nakasaleka speech, as did interpreter three. The male interpreters ranged in age from 21 to about 60 years, and lived in their natal villages; but all three had spent several years off-island on Viti Levu, in or near Suva, Fiji’s capital city.

Table 2 Interpreter background

#	Village	Nakasaleka as natal dialect?	Command of English	Degree of input to interview data	Degree of input to final editing and translation
1	M	no - other Kadavu dialect (OKD)	strong	high	high
2	M	yes	working	high	moderate
3	M	yes	strong	high	high
4	L	yes	strong	moderate	little
5	T	no – (OKD)	light	light	none
6	T	no – (OKD)	working	light	none
7	T	no – (OKD)	working	moderate	none
8	T	yes	strong	light	none

Interpreters lived in the village where the given interviews or translation work was done; and were engaged at an hourly rate, in excess of what I understood to be the average hourly wage paid at local lodges for most sorts of work. Weekly payments included generous estimations of actual hours worked, and took into account the time interpreters spent visiting with people to schedule future interviews. Interpreters played a significant role in establishing interview sessions with people in the village. Some interviewees were interested in being part of the project, and wanted their knowledge to be made available to younger generations. Others saw participation as a responsibility to the community, or as a courtesy to the interpreter or me. Over time, I built my own relationships with people, an effort which led to interviews; but clearly interpreters with broad kinship or strong social networks facilitated the most interviews and often very productive ones.

The prior knowledge of Kadavu marine biology of the interpreters varied significantly. Interpreters 1-4, who provided the most input to the project, were all experienced fishers, while interpreters 5-8 were young women with relatively little knowledge of marine life. Interpreters needed to understand the importance of recording information from interviewees faithfully without adding their own knowledge or ideas from other interviews. Initially this objective took consistent effort on my part with each interpreter to prevent their well-meaning efforts from shaping the responses into a form where the interpreters defined the data.

This interview protocol was a particular challenge for an interpreter who is a senior elder in village L, now retired from a long career as a dive-master and life-long avid fisherman. It took many examples and much persuasion before this good natured and generous man came around to realize and respect the scope of knowledge that other people in his own village held, in particular that of many of the women. Working with village experts in this context is beneficial in that their knowledge allows them to translate a wider range of ideas than average, and to know what questions to ask to expand the topic. However, in this case it initially compressed what we learned, as the expert adjusted the responses to fit a certain body of 'correct' knowledge. Nevertheless, we sorted things out in time. I know that my friend meant well when starting to translate other people's words to me with the phrase "What he means to say is…" This phrase is quite similar to the phrase "***kena ibalebale***" (its meaning is) that Matt Tomlinson (2009) identifies as a common phrase used in church sermons and other discourse venues in Kadavu. The phrase is used to link "something that is to be explained and its explanation," and it establishes the speaker's authority to help the listener understand something properly (2009: 91). In fact, this man was active in leading Methodist church services in the village; and his approach to shaping knowledge for others may well be a common habit of some benefit to other villagers, but not the best one for anthropologists gathering information. This example demonstrates how necessary it is to learn local styles of discourse in fieldwork.

The problem of ensuring accurate transcription was ongoing, as interpreters gained experience and as their focus and enthusiasm varied from day-to-day. This work was a novel experience for all interpreters except the aforementioned elder from village L, who had recently done some translation work in gathering community perceptions on grouper spawning for marine biologists working in Kadavu. I asked interpreters to focus upon the key points of attention to: recording details; encouraging interviewees to expand one word or short answers; avoidance of leading the interviewee; and consistently communicating the broader concept and purpose of what we were up to.

Interview format

I will describe the interview format that we settled upon over the first few weeks of interviewing after I discuss the development process of the format. During the first few weeks I was over-ambitious in anticipating that I would be able to find 10 people in a village of about 140, who would each agree to repeated interviews to each go through the initial 250 photographs selected. A number of people agreed to participate, but then were not interested in doing a second or third interview. In the early interviews we went through the images quickly, asking only for identification of organisms shown and the names of related kinds. I expected that we would meet again with these people and go through the same images with further sets of questions, such as age, size, habitat, diet; and perhaps a further session to look into topics such as how to catch, cook, and eat or use the creature being discussed.

This method did not work. People’s reactions suggested that the pile of photographs seemed endless. People found answering a repeated sequence of three questions to be boring. Some interviewees just repeated their responses for similar types of fish that they were shown sequentially. Using repetitive short question and answers created a rapid fire format for the interviews, which is contrary to a more narrative style of discourse commonly used in social relations in Fijian villages. Another problem with the original plan was the logistics of relying on the same people for multiple interviews, as this ignored the realities of the rural Fijian use of time, which varies with weather; household demands of gardening, fishing, wood gathering, cooking; and various social events. Scheduling the first two weeks of interviewing during school holidays was a mistake, as returning students and visitors filled houses in the village. This period demands that people spend more time fishing, gardening, and cooking in order to feed everyone. A wedding party was scheduled in the village during this period, an event which meant extra work and a busy social calendar. Neither the associated kava parties nor kava hangovers are conducive to interview participation during holiday periods. Thus the methodological approach was flawed, and the timing of my visit was poor. I subsequently rescheduled my 2012 visit to arrive in another village several days after the school holidays had ended, and had better success.

I soon revised the methods by sorting the images into batches comprised of distinctly different kinds of fish. Showing people similar kinds of fish sequentially had encouraged people to focus too much on similarities and ignore the differences, by just repeating responses. The new interview format consisted of asking one person 15 or more different questions about a given image at one time. This procedure reduced the long term commitment of the individual to the project, and made just one interview with a person productive. Sections of 25 pictures were taken out and separated from the plastic tubs, which held the growing collection of over 300 photographs. This way people could easily see how much there was to do. In general, this method made people more focused and patient, as they could see an end in sight, in contrast with showing pictures in sequence from a large stack until they lost interest, as I did in some early interviews. Early experiments with sections of 25 pictures also saw people grow weary by the 15th or 16th picture shown, but with 20 images people would most often finish the section.

The interview formula that emerged as most productive consisted of a person or couple being shown a section of 20 pictures comprising selections from a variety of different Linnaean families of fish and a few other marine organisms, such as a clam, turtle, plant, or particular coral type. Some people answered questions much faster than others. In contrast, for some interviewees, just going through ten pictures at a sitting took up to an hour and a half, which seemed to be the time period when people's attention would wane. We attempted to keep all interview sessions under two hours.

The 20 pictures making up each section were drawn from a pool of about 300 pictures of marine life which I shot either in local waters near the adjacent Astrolabe Reef; or in Beqa Island Lagoon, about 60 miles across the open sea from the Nakasaleka villages (See Map 1 inset). A few exceptions were photos that I had taken on recreational dives in Hawaii, Thailand, and Zanzibar of common Indo-Pacific creatures or some circumtropical types, such as sharks or turtles. These foreign images were used when I lacked pictures from Kadavu waters, such as was the case for the seldom seen cuttlefish. I keep source records of all of my file pictures. A few foreign photographs were discarded when people pointed them out as inappropriate, and several were replaced in the early stages if I acquired a local image.

People were asked a series of questions in a consistent order. Some people did only one section of 20 pictures to demonstrate their goodwill and participation in what was viewed by many as a community project, while some enthusiastic participants did a number of sections. One older and very knowledgeable couple worked through nine of the first 15 sections. These critical changes in the format of interviews allowed many different people to contribute to the project with just one or two hours of their time. This approach was important to the project's success and local visualization as a community project. People who were enthusiastic could contribute more, and others were included with a small time commitment.

The batch size change to 20 images was also important. Fijians often group things in tens; and have many terms for ten of an item, such as the Standard Fijian term, '***bola***' for ten fish (Hazlewood 1979, Churchward 1941: 66, Capell: 1968). Churchward defines groups of ten as the fundamental counting system in Fiji, and provides 20 examples of specific terms for everything from spears and mats to pigs and puddings. '***E rua na bola***' (two groups of the ten fish) is given by Churchward (1941) as the manner of use of the term in SF to illustrate the importance of the numerical concept. In Kadavu, the 20 picture-per-section model worked well for interviews, as some people gave quicker and shorter answers. This method meant that 20 pictures could be dealt with in about one hour; but for the slower and often more interesting interviews, ten pictures at a time was fine. On average there would be about three pictures per section that people would have little to say about, such as nudibranchs or corals.

The selection, order, and wording of questions was changed a number of times to ensure that the questions were relevant and productive, as the main body of questions was developed through close monitoring of interview processes in the first few weeks. For example, I soon stopped asking people to describe the colour of a given fish, although I had thought this question might highlight which features of a fish attracted attention. Instead people spent enormous amounts of time debating with themselves and others about what colour(s) the fish in a given picture was. This situation was unproductive, given that original light conditions and printing of the photograph and the viewing environment shapes perceptions. These factors may combine to present an unfamiliar image.

In what follows, I will discuss each question used and how each question was developed or modified throughout the interviewing period. I accepted the practical reality of some variation in question use as a productive research approach, given that this method produced more engaged interpreters and interviewees. This topic is discussed further under question 2. Each image was reviewed by at least four or five different people drawn from one of the three villages; hence some variation in question use generated a wider range of information, which was the goal of the multiple interviewees.

Often the speed with which the interpreter could write down answers determined the interview flow and the interviewee's enthusiasm for participation. Over the first couple of weeks, I kept track of the answers given for each question, in order to build lists of all of the common answers; and then assigned a letter code to each answer for interpreters to record. Depending on the question structure, the number of options or common responses varied from two to more than 30. For example, the question 'do you ever see eggs in this fish?' requires a yes (a) or no (b) response, while asking the best way to catch or cook a certain fish might yield multiple answers and terms drawn from many possibilities. Interpreters were encouraged to use the lists to record responses more quickly in order to keep the interview flowing, rather than giving the lists to interviewees to choose answers. The lists were in plain sight, and interviewees did make use of them. They were useful to help people provide more detailed responses. The risk of showing the lists to informants was restricting the possible answers; but we were still adding occasional fresh responses to the lists in the final week of interviewing, a result which indicates that informants were thinking independently.

In practice, the interpreter asked up to 18 questions about an image in a set sequence from a reference sheet, and then wrote down the answers in a notebook. At the same time, I kept further notes and observations of each interview in another notebook. This method allowed me to ask for details or more information. We often interviewed an individual or a couple; but other people might drop in to visit and make contributions, or discuss a question with the interviewees. For clarity in what follows, I will refer to the people participating in a single interview in the singular tense as the interviewee. Answers were written in notebooks; and I then transposed all responses into MS Excel spreadsheets each night or the following day, a procedure which allowed prompt verification of any uncertainties in the written data.

The interviewees

59 people from three villages directly participated in formal interviews, with additional input from some interpreters and various other people contributing items of knowledge. Most homes in Kadavu are close together. It was not uncommon for

neighbours to visit during interviews and offer their contributions. Rainy or very hot days when women were mending nets or weaving could be productive interview days, when an interview with one person might be enhanced by the input of several other members of the work group. Sessions of this sort were often quite useful for learning longer stories and songs, as busy hands seemed to put minds at ease. Many village women take great pride in their work ethic and ability to work hard.

One disappointing method was my attempt to view and photograph fishing catches upon people's return from the sea. Fishing is hard work in Kadavu, whether it is boat-based hand-line fishing, spear fishing on the reef, or wading in the ankle-deep mud of the lagoon with nets. People stay out fishing for many hours in all sorts of challenging weather conditions; and they are often tired, hungry, and either hot or cold when they return, with little interest in standing around for fish photography. I suspect when the catch was poor they were even less interested in sending for me. I know that I would feel the same way. I do appreciate the opportunities that I was given to photograph people's catches. People bringing in poor catches were seldom eager to discuss the fishing. There are also a number of common beliefs about what one should say to people about fishing expeditions. For example, one should never say good luck or something similar to people who are going fishing, as this remark may be thought to bring bad luck. Hence, one must be careful in one's approach.

In general, interviewees who provided the most information understood the purpose of the project, saw it as a community event, and were experienced fishers. As a researcher, I attempted to learn about each participant's background, such as where their natal village was, how much fishing they had done growing up, and what sort of fishing they currently practiced. This enriched perspective lets the researcher know whether it is worth trying to draw out more information at times, and to consider how much of the information is first hand or learned from someone else.

The interview questions and discussion of relevant issues

In what follows, I will review the interview questions used and list the various Fijian versions of these questions that I was given by different people. I will then discuss the use and productivity of each question. Given the broad scope of this topic, I will provide details of the use of each question in subsequent chapters in order to establish context for topical discussions.

The order of the questions given here is the order used in the survey, as shown here in Table 3 as a quick reference for the following overview of the question format and choice of question sequence.

Table 3 Interview questions

	Interview questions
1	What is the name of this fish (or substitute as required)?
2	What is the name of the fish that is its nearest relative?
3	What is the name of another relative or family member?
4	How long is it?
5	How do these fish go about? As A) one, B) two, C) three to nine, 4) ten or more?
6	Where do these fish live? (See list of options)
7	Are there A) many of these or B) few of these?
8	Compared to 5 years ago are there A) more of these fish or B) fewer of them?
9	How do they make babies?
9.1	Do you see eggs inside these fish? A) yes, B) no?
9.2	What month(s) do you see eggs inside?
9.3	What month do you no longer see eggs? - when the eggs are gone?
10	Where do the young ones live? (See list of options)
11	What do they eat? (See list of options)
12	What is the best way to catch them? (See list of options)

	Interview questions
13	What is the best way to cook them? (See list of options)
14	What are they used for? (See list of options)
15	Do you know a story, song, or other things about this fish?

The first question asks for the local name of the creature. This response establishes the person's level of familiarity with the creature in the image, knowledge which is further explored by questions about related creatures. The size question provides useful data; and brings to light any inaccurate perceptions of scale from the photograph, which can then be corrected before other questions go astray; or the interviewer can opt to apply the data to the creature being thought of, rather than the one pictured. Question 5 serves to establish knowledge of any solitary, partnering, or schooling behavior; and at times it generated supplementary stories involving social interactions between creatures of the same kind or with other kinds. This behaviour-focused question flowed nicely into the subsequent one on habitat. Question 6 often required us to encourage people to be specific in their responses, rather than giving a general answer, such as ***cakau levu*** (main reef). Once we established how and where the creatures lived, questions 7 and 8 probed for perceptions of population size and trends of growth or decline. In retrospect, these questions when used back-to-back encouraged some matching of answers between responses indicating increased population in the last five years with responses of the creature being common, or the opposite matching responses of a drop in population and the creature being uncommon. This association may be true sometimes in practice, but not necessarily, as populations of uncommon creatures may increase without them becoming common.

I anticipated that the questions about reproduction would be a natural follow-up to population trends, but I no longer think this was the case, for the simple reason that many people in the villages do not know or think very much about the biology of fish reproduction; and seldom had answers for question 9, except in the case of grouper fish. A conservation organization's local education programs on grouper spawning have had some impact in these villages. We adjusted question 9 in villages M and L by adding questions about observations of the presence of eggs inside fish, a question which improved the response rate on this topic. Question 10 on the habitat of young ones did prompt some knowledgeable responses of some creature's life cycles, but the question often drew the same response as given for question 6 on habitat.

Question 11 on what the fish eat, followed by question 12 about the best way to catch them might seem to overlap; but many people did not connect the creature's diet with the bait used to catch them. However, many fish kinds are caught without bait by using spears or nets. Question 12 generated more enthusiasm, as many people enjoy fishing and talking about how and what they have caught in the past. This theme built nicely into the most popular question, of how to cook and eat the creature. There was seldom a shortage of answers here. Question 14 was a simple and productive one with a short list of usage possibilities.

The final question was used to break out of short answer response patterns and encourage people to think about past events, favourite fishing stories; and allow time for ***talanoa***, as story telling or discussions are referred to in the villages. The number and quality of responses to this question varied widely, and was often correlated to the skills and interest of particular interpreters in drawing these stories out. Some interviewees decided early on that they had no stories and seldom answered this question, while others responded to my encouragements or that of an interpreter and made efforts to come up with something of interest for each picture. Given that most images were reviewed by at least four or five different interviewees, we ended up with some sort of ***talanoa*** to go along with more images than not. In some cases we had to edit and reduce multiple and overlapping ***talanoa*** for inclusion in the encyclopaedia.

In summary, the sequence of the survey questions was successful; but in future I would separate the population level and population trend questions, move the popular cooking and eating question earlier in the sequence, and reverse the seldom answered reproduction question to be an add-on to the questions about the presence of eggs.

Chapter 2: Survey questions and responses about nomenclature and morphology

Question 1) What is the name of this fish?

(Note to interpreter: replace the term ***ika***/fish as needed for other kinds of organisms.)

A) ***Na yava na ila ni ika ke****?*

Literal translation (LT): What is the name of/for this fish here?

B) ***Na cava na yacana****?*

LT: What is the name of this?

A 4 x 6 photograph of a fish or other marine life form was shown or given to the interviewee with a request for a name and at times an alternate name. People were encouraged to be as specific as possible by using a binomial name if they knew one. The response was then written down.

In this thesis, literal translations (LT) of Fijian versions of questions are included with the Fijian questions when significant variations in wording between versions of a question may affect the meaning of the question.

Question 2) What is the name of the fish that is its nearest relative?

A) ***Dua na ika veiwekani***?

LT: The one fish related by family or traditional relationship?

B) ***Na ika yava i ru vivolekaji***?

LT: What is the fish that is close? The term ***vivolekaji*** implies physical closeness.

C) ***Na ika cava e rau viavia tautauvata***?

LT: What fish is very nearly the same?

Discussion:

In retrospect, asking for the nearest relative is presumptive in assuming that people will apply certain culturally specific notions of kinship to marine life. In future, I would spend more time determining more culturally appropriate ways to address this topic.

I consider questions 2 and 3 to be a free listing method modification, which I call springboard listing and describe here with examples of its use. Springboard listing is a form of cultural domain analysis, which allows context-driven variations in question phrasing in order to explore the cultural context of both the questions and the answers. It is a form of what Russell Bernard (2011: 157) defines as a semi-structured interview, using a plan with a defined sequence of questions, enriched with semantic cueing, in this case photographs of fish. Bernard (2011: 337) defines free listing as a qualitative method to turn words into numbers. Springboard listing is a modification in which interviewers have flexibility in their approach, which produces fuzzy data that turns words into concepts, ill-suited for traditional statistical input and analysis. I use the term 'fuzzy data' to describe information which resists categorization due to ambiguities or indistinctness, such as used in Lofti Zadeh's (1965) famous fuzzy set theory example of dividing all men into tall men or short men. There are many men who are neither tall nor short, so more fine grained approaches are required (Lackoff 1987:21-22). Springboard listing gives interpreters flexibility in order to elicit information as people understand it, but it also requires innovative analysis in approaching the data.

In the May 2012 American Anthropology Association newsletter, Thomas Weisner stresses the value of mixed methods frameworks that move beyond the simplistic dichotomy of qualitative and quantitative methods. Examples of this approach are to distinguish between person and experience centered, or context and variable centered methods. Weisner recommends using a mixed methods software program called Dedoose for this technique, using features such as coding and weighting of themes found in narratives, with results then cross-referenced against the demographics of the narrator to represent people's culture, emotion, and values in visual formats. This procedure transforms fuzzy data into fuzzy but discernible and comparable results shown in charts with bubbles of data and word clouds. Despite the fact that Weisner's article is a not too subtle advertisement for a software company which he co-founded, his point is well made. The software looks useful. It is promoted as a tool to analyze other people's behaviour in order to deliver better services or products. However, in evaluating whether to use this software after the data were collected and coded, it became clear that one should input and code original data using the parameters of the software for efficient use of the program. I may use this method in future research. My key point in this discussion section is to illustrate the importance of flexibility of approach.

Given the more than 400 Linnaean species of fish and innumerable kinds of invertebrates found in the local waters, I used underwater images for semantic cueing, but I needed prompts for the names of creatures for which I did not have pictures. I also wanted to know how best to group the different kinds of creatures in the book; so in question 2, I asked for the name of the fish that is the nearest relative to the pictured fish, and then in question 3 for the name of another related family member. Trying to determine just what Fijian terms to use for these questions blended notions from kinship and ethnobiology in an approach that allowed for variations in question delivery.

Free listing is often associated with cognitive anthropology and the early ethnoscience approaches of the 1960s and 1970s. Brent Berlin (1992), a leader of this genre attempted to define a universal system of classification of plants and animals often based upon using free listing. The basic use of free listing concepts in anthropology dates back to the kinship work of Morgan and Rivers in their somewhat unsuccessful search for genealogical methods and universal laws of kinship.

In 2011, Marshall Sahlins wrote about the re-energizing of kinship research. For example, Viveiros de Castro's (2009: 243) notions of cosmological perspectivism examine how in Amerindian societies kinship, gift exchange, and magic interweave to form objective bonds between people in what he calls: "trans-specific kinship relatedness, utterly beyond the grasp of the genealogical method" in contrast with a commodity economy "where things and people assume the form of objects." Sahlins supports this argument by quoting Anne Becker's (1995) observations that in Fiji and other Oceanic societies "self-experience is intimately grounded in its relational context, its kin and relational community."

Thinking about this discussion in the context of my own experience in Fijian villages, any and all research here involves kinship concepts; thus approaches must allow for the fluidity of these interwoven bonds of kinship, gift exchange, and in Kadavu indigenized Christian practices which have absorbed and adapted magic (Williams 1982, Tomlinson 2009: 142). So if one is tracking fluidity in a tapestry of knowledge and practice, does one track it just in the answers or also seek it in the shapes and forms of the questions? Change is a given. For example, in the literature on kinship in Fiji, one can observe ongoing variations and changes in rules of cousin marriage, bride theft, and mother's brother relationships (Capell and Lester 1945: 171, Cook 1975, Ravuvu 1986: 6, Ewins 2009: 194). Hence, giving interpreters the desired meaning to be discerned and the leeway to appropriately adapt the survey questions should yield more contextually accurate information.

In my fieldwork site in the Nakasaleka district of Kadavu, language change is an active process as people code shift between their own oral dialect, any of the other four Kadavu oral dialects, the Standard Fijian language taught in schools as the written version of Fijian, English learned from school lessons and media sources, and some Fiji-Hindi picked up from time spent in the city on another island. When women marry in Kadavu, they move to their husband's village. In village M, more than half of the 24 women had come from another dialect-defined district; three of these women's natal language of Nabukelevu from the far end of Kadavu is almost unintelligible to the Nakasaleka villagers where these women live now. In the village, language skills and use vary with one's experiences to date, and thus it makes sense from a linguistic perspective to allow interpreters to adjust the language in their questions to what they know is appropriate for the person being interviewed.

The preceding arguments for flexibility were not part of my research plan, but were observations made as I worked with the 8 different interpreters, who were often assigned to me by village leaders or my hosts, with their own agendas. Flexibility was required on my part, but was also beneficial as will become evident in the following discussion.

Question 2 was "What is the name of the fish that is its nearest relative?," of which we used one of three versions. As mentioned earlier, I would not begin with the presumptive term of nearest relative in the future. The first translation of the question that was used came from some Fijian friends, the second from improvements by local schoolteachers, and the third from two interpreters who were unhappy with previous versions. We used paper copies of questions for reference during interviews, but interpreters also used their own variations at times. I encouraged interpreters to use the agreed upon questions; but I was also asking them to be creative in drawing out stories and anecdotes, a combination which may have seemed confusing. Interpreters were also asked to try and use the local dialect when asking the questions.

This first translation was "***dua na ika veiwekani***?" Literally this means "the one fish related by family?" Ronald Gatty (2009: 314) defines ***veiwekani*** (verb, noun, adjective) as related by family or traditional relationship among different clans or tribes. This is a term used for human relationships. Breaking it down, ***wekana*** means family, colleague, associate, or anyone recognized as part of a wide social network. The versatile Standard Fijian prefix '***vei***' means 'all of' or 'each and every one' in this collective usage (Gatty 2009: 288, Geraghty 1983: 174).

The second translation of this question that I was given by two schoolteachers as a correction to the first was "***Na ika yava i ru vivolekaji***?" Literally this is "What is the fish that is close by? The word ***vivolekaji*** implies physical closeness; and can apply to place, people, or thing (Gatty 2009: 296). It contains the Kadavu monophthongization of the prefix '***vei'*** to '***vi***' (Geraghty 1983: 174). The third translation of the question was "***na ika cava e rau viavia tautauvata***?" Literally this is "what fish is very nearly the same?" Here then are three very different types of words. The use of ***veiwekani*** is specific to human relationships; ***vivolekaji*** is used for person, place or thing; and the third term ***tautauvata*** means 'same' or 'equivalent' in most contexts.

In contrast, for another purpose, I asked people for Nakasaleka terms which I could use to indicate the life stages of parrotfish, which go through dramatic changes in colour, shape, sex, and quite often size. International scientists identify the stages as the juvenile, intermediate, and terminal phases. A group of 11 village M women with whom I spoke on this topic were adamant that human life stages, such as ***gone*** (children), ***caravou***, (youth), and ***tamata*** or ***yalewa*** (man or woman) could not be applied to fish in this context, as they were terms for humans only. This response shows a distinction between terms for humans and fish contrasting the references to family relationships just discussed.

As far as generating new names for marine creatures, the results of questions 2 and 3 were productive, yielding from 300 images over 100 new names of which about half represented creatures not previously discussed. There are many interesting views of relationships between creatures in the data. I have selected a common one to discuss here as an example.

Plate 5 *Vusevuse* (*Arothron caeruleopunctatus*; blue-spotted puffer)

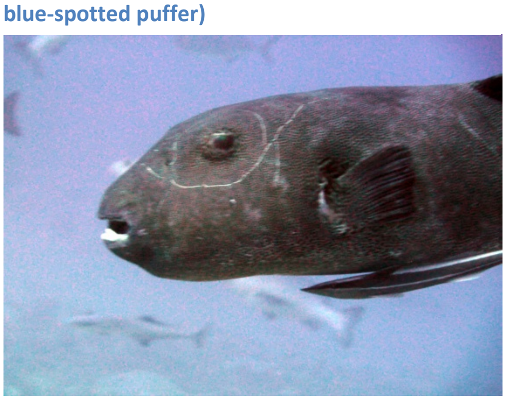


Plate 4 *Qio saqa* (*Carcharhinus amblyrinchos*; grey reef shark)

Plate 6 *Bakewa* (*Echeneis naucrates*; sharksucker)

Plate 5 shows a ***vusevuse*** or (*Arothron caeruleopunctatus*; giant puffer fish) accompanied by a remora fish (*Echeneis naucrates*; sharksucker). The latter is known as ***bakewa*** in Fiji, where it is often seen at about 50 centimetres in length; but it can grow to 90 centimetres (see Plate 6). It is sometimes free swimming; but is most often seen attached to or swimming near to sharks, dolphins, sea turtles, and large trevallies (see Plate 4). ***Bakewa*** have a distinctive modification of the first dorsal ray into a suction disk, which is used to attach to bigger creatures. The ***bakewa*** feed on bits of the transporter's prey, clean ectoparasites, and eat some small fish. Very small ***bakewa*** may establish cleaning stations and clean parasites from the gills and mouth of larger fish like parrotfish.

International biologists define the relationship between ***bakewa*** and their transporters as commensalism, where one party benefits and the other is unaffected. I assume that the parasite cleaning work is too insignificant to qualify the interaction as symbiotic. The Latin root meaning of commensal is *cum mensa*, literally 'with table', meaning share food. Coincidentally this term would be most appropriate in a Kadavu village where they seldom use tables, but food sharing is important. However, my Kadavu friends see the mechanics of the ***bakewa*** relationships quite differently, a view which I will discuss shortly.

In the survey, many people named ***bakewa*** as a relative of the shark. When asked for relatives of ***bakewa***, a few people gave ***qio*** (shark) or ***saqa*** (trevally) as answers, with two people offering the names of other smaller morphologically similar fish with long slender bodies or rough skin that in some way resemble ***bakewa***. Sharks and ***bakewa*** also share the features of grey colour, streamlined shape, and in particular the rough skin that one man said made shark and ***bakewa*** as brothers. However, the notion of brothers can be quite a broad relational concept in Fijian human kinship systems and is defined by age seniority, a detail which I regret not following up on in regards to the man's perception of seniority status between these creatures.

A different survey question was a request for stories about each creature, and ***bakewa*** yielded more stories than the average fish kind. Several people were very clear in their stories that ***bakewa*** follow big fish and stick onto the fish to drink their blood until the big fish dies. Another man reported seeing large ***saqa*** or trevallies (*Caranx ignobilis*) trying to scrape the ***bakewa*** off their sides against mangrove roots. This perception of the relationship as I understand it in international science terms would be a parasitic one, since one party consumes the other until the host's death.

Plate 7 Bluestreak cleaner wrasse (*Labroides dimidiatus)* at work on a parrotfish (*Chlorurus* sp.)

The Kadavu parasite-like perception of this relationship was further reinforced for me when I showed people pictures of cleaner wrasses at work cleaning parasites from larger fish, which is a service critical to reef fish health (see Plate 7). Few people identified the 10 centimetre long slender cleaner wrasse; but people do observe them cleaning fish on the reef and notice how slowly the client-fish that are being cleaned move. People assume that the client-fish move slowly because the cleaner wrasse is biting and hurting the fish. Cleaner wrasses will nip at human skin with a light pinch. Some people associate the cleaner wrasse and remora. The image of the cleaner wrasse at work was identified as ***bakewa*** by several people. Two people, who looked at Plate 5 of the ***vusevuse*** and ***bakewa***, chose to name the ***bakewa*** and not the much larger puffer fish, stressing the salience of the remora.

Given that people do see the ***bakewa*** as a predator or freeloader in the relationship, I asked some of my most helpful informants what they thought about this relationship and if there was a word for this kind of interaction used in Kadavu human society. This was a bridge that no one would cross with me. Maybe they have one, but I did not learn of it[1]. People in my home village are pretty careful about what they say about other people, most of whom are kin and friends. For me one of the most impressive social behaviours in the village was the respect that people maintain and demonstrate for each other, even in very difficult circumstances, such as when a village man committed a serious crime against other villagers. In Kadavu villages, a man is a village member for life and is expected to contribute even when living away; but he can look forward to returning to the village in retirement to fish, farm, and feast with his kin. I may be reading too much into these stories about ***bakewa*** and their hosts, but people's perspective on this relationship may represent the tolerance that people must practice in order to maintain small scale, self-governing societies, when options exist for urban migration, and chiefly authority is not what it once was.

[1] Capell (1968) gives ***tubeisu*** as a translation for parasite. Gatty (2009: 232, 269) gives ***tube isu*** as an idiom meaning "to be an unimportant person, a simple carrier, carrying things to accompany an important person" and various meanings for ***tube***, such as holding a whale tooth in the hand, guiding by holding someone's hand or teaching them, and holding hands in a non-romantic situation such as same-sex youths.

The irony of course is that the ***bakewa*** relationships are not parasitic at all, but border on symbiotic and are at the very least commensal as neither party is harmed significantly.

To summarize the question 2 discussion, I believe that this example demonstrates that the methodological flexibility and fluidity of the questions used within a springboard listing approach create opportunities to better learn and understand people's perceptions of their worlds, while still generating comparable results. Further observations on the use of springboard listing follow under question 3 in the following discussion.

Question 3) What is the name of another relative or family member?

A) ***Na mataqali ika yava ruka tautauvata***?
   Literal translation (LT): What clan or kind of fish is the same?
B) ***Na ika yava i ru vuvale vata****?*
   LT: What fish is of the household together?
C) ***Na mataqali cava tale e ratou via tautauvata***?
   LT: What clan again is almost the same*?*
D) ***Na wekani cava tale e ratou via tautauvata***?
   LT: What family again is almost the same?

Discussion:

The meanings of the versions of question 3 vary in some similar ways to those of question 2. Each question contains a term used for one of the human relationships of clan, extended family, or household coupled with the adjective '***tautauvata***' meaning the same or even, except in Question 3B, where the implication of sharing a household supplies the link of classificatory proximity. Terms used for human relations are being used for marine life in this context. (Versions C and D were versions used early in the research and use '***cava'***, the Standard Fijian term for what, rather than '***yava***', the Nakasaleka term, a Western Fijian language variation also used in the Kadavu communalects of Tavuki and Nabukelevu (Geraghty 1979: 124).)

Question 3 was often less effective than question 2 in drawing responses. Question 2 drew 1,944 responses; while question 3 drew 1252 responses and a further 155 responses when people gave a second answer to question 3 for a total of 1407 question 3 responses. In some cases people answered the question by providing the family name of the creature in the image rather than another family member. Some people who did not respond to a question 3 felt they had already answered question 3 in their question 2 responses, or they could not think of the name of another relative. In this situation a difference may occur between the results from interviewees who were interested in doing multiple batches of pictures and some people who were just doing one session. People who became more familiar and engaged with the interview process were more likely to answer question 3.

Questions 2 and 3 were useful to gather names of marine creatures other than those already photographed. These names were then fed into the full question cycle to further build the encyclopaedia. Questions 2 and 3 generated over 100 new names of which about half were sorted out as creatures yet unknown to me. Most of the other names were duplicate terms for already identified creatures often drawn from another Fijian dialect or language. Applying questions 2 and 3 to the new-to-me creature names yielded even more new creature names, a few of which were followed up on with further rounds of questions. This productive process of name gathering could have been continued to record more data, but this research was not done here for logistical reasons.

A second goal of questions 2 and 3 was to try and establish appropriate categories for grouping the marine life forms in the encyclopaedia. Some classificatory groups seem obvious at first, such as the large number of fish known as ***jivijivi***, which include most kinds of fish known in English as butterflyfish, and as members of the Linnaean family Chaetodontidae . However, the term ***jivijivi*** is also applied to some kinds of angelfish of family Pomacanthidae, and with less consistency to some types or life phases of spadefish, family Ephippidae. For example, the vivid yellow and black three-spot angelfish (*Apolemichthys trimaculatus*) was named ***jivijivi*** by four of six people, but was named as or considered as related to ***lati ni daveta*** by two others. This fish was also said to be related to ***guru***, a broad term used for various damselfish and clownfish, smaller Pomacentridae fishes. However, the three-spot angelfish was also said to be related to members of several other Linnaean families of fish including kinds of pompano (Carangidae), squirrelfish (Holocentridae), tang (Acanthuridae), and wrasse (Labridae). This one example of many, clearly demonstrates the blurring of category borders and the presence of polythetic classification practices, as people pick certain and different reasons to associate one kind of fish with another. Furthermore, differences other than colour between kinds of ***jivijivi*** were noted not in nomenclature responses, but in conversations about cooking the fish, when several people who talked about the preferred taste of a certain type.

The name ***lati ni daveta*** is a term often applied to most types of larger angelfish (Family Pomacanthidae), but with similar overlapping uses and polythetic classification features. The word ***daveta*** means a passage through the reef, where large angelfish are common; and the term ***lati*** means a screen, wall, or barrier (Gatty 2009: 132), which may refer to either or both the vertical compression of the bodies of these fish and the delineated markings on their scales which resemble a woven screen.

My fieldwork methods to determine appropriate local categories to group the creatures in the encyclopaedia were only partially successful. I had hoped to pull the data from the MS Excel sheet I used for data entry into a database program such as MS Access and apply association-based modeling methods. However, after I had collected and entered the data in MS Excel, I was advised by an MS Access expert at my University's technology training centre that the task of building such a database was overly ambitious, given the large scale of data and varieties, and my tight schedule to return to the field in January 2012. I abandoned formulaic use of these data for category building in the encyclopaedia, and instead used the MS Excel records as a manual reference tool to sort out category boundaries, along with some input from a few knowledgeable people in the field. This was still a useful approach. In a future project of this sort, I would spend more time planning a database model that could accept raw data and give category boundaries. These would still not be definitive, but would be a more accurate representation of the results. Given that this encyclopaedia is meant as an educational tool that may shape young people's perceptions of marine life groupings, this approach is worth further investigation. The database planning was not done in advance in this project, because I did not finalize my questions and interview structure until the first few weeks of trying things out in the field.

Springboard listing proved to be a productive research method to prompt people to speak of other kinds of creatures, and to help organize the results in a culturally appropriate manner. This relationship-based approach yielded insights into how people perceive relationships between different creatures. These questions, along with question 4, also provides a mid-interview warning to the researcher that someone might have misidentified a creature, a situation which then allows the researcher to ask the interviewee to have another look at the image before asking further questions.

Question 4) How long is it? / What is its maximum size?

A) ***I vakia na kena balavu***? (often abbreviated as: ***kena balavu***?)
LT: Know how long is it? (know length?)

B) ***Na cava na kena balavu duadua e rawa ni ra yalova***?
LT: What do you know of the longest it can achieve?

Discussion:

This question was answered by using a tape measure for reference by the interviewee. Often the person making the estimate measured a distance on one of their arms, starting from their fingertips to a point marked with their other hand. The interpreter or I would hold the measuring tape up to their arm to quantify the estimate in centimetres. Other times people would pick a distance on the tape measure itself. Interviewees were encouraged to give the length of the biggest ones they had seen recently. For example, one man spoke of olden times when they would catch a kind of ***jivijivi*** at 25-30 centimetres in length, as compared to the 15 centimetre specimens more common today. In this case we recorded the current estimate of 15 centimetres, rather than the historic one. An intangible benefit of this question was that the physical interaction of pulling out the tape and deciding on the measurement broke up the question and answer cycle, and helped keep everyone engaged in the interview process.

This question was useful to confirm that people were identifying the fish kind that is in the picture, as scale is often hard to judge in a 4” x 6” photo of a fish. For example, an adult male anthias (*Pseudanthias* sp.) which grows to only 10 centimetres, too small and slender to be caught or eaten, has a similar colour and body shape to some well-known and tasty 60-70 centimetre groupers (*Plectropomus* sp.) known as ***droudrouwa***, a correspondence also noted by Linnaean taxonomists[2]. So in this example, shown in Plate 8 and Plate 9, the term ***droudrouwa*** was given several times as a naming response for the anthias image; and the misidentification was confirmed with responses for questions 2 and 3 of related fish kinds of other groupers, such as ***kawakawa*** and ***donu***. The interviewer then has the choice of correcting the size estimate and misidentification, or listening to what the person has to say about ***droudrouwa***. In some cases the latter approach is more fruitful than correcting the mis-identification only to have the person say they then know nothing of the fish in the image.

Plate 8 *Pseudoanthias* sp. (10 cm.)

Plate 9 *Plectropomus* sp. (60-70 cm.)

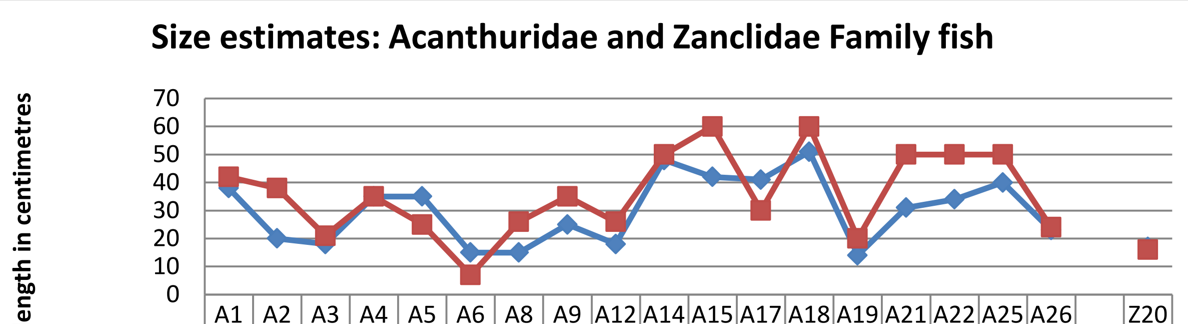
[2] In Linnaean taxonomy the anthias and grouper fishes have long been categorized as Subfamilies Anthiinae and Epinephelinae of what was thought to be the monophyletic lineage or common ancestry of Family Serranidae. Recent molecular systematic research has shown that these two groups of fishes have similar features, but lack recent shared genetic history; hence the grouper fish have now been reclassified as Family Epinephelidae, with the anthias fish remaining in Family Serranidae (Craig et al. 2011: xii).

On occasion we interviewed people who had very little knowledge of marine life. Consistent large errors in size estimates were a quick way to evaluate the quality of the data and consider whether this person's other inputs should be included, given the potential use of the final report as an educational tool. The final measurement included in the encyclopaedia as the maximum size of each creature is an average of all of the responses to question 4 for each creature listed. In most cases the average is based upon four to six responses per creature. One curiosity of this process was that when people were using the measuring tape against their arm or as guide, people often picked odd numbers of centimetres such as 29 or 31 rather than 30. My impression in the field was that most people had a pretty good idea of the size of the kinds of fish found in the area, with some exceptions. These include images of a number of smaller fish kinds, such as the anthias and cleaner wrasse mentioned above, which are seldom caught and eaten; and also some very large creatures such as sharks and rays, which are harder to conceptualize from mental images into centimetres than is a smaller type of fish that one can measure against a hand and forearm.

In Figures 1 to 6 below, I take the maximum size estimates people gave for a range of 73 common fish kinds in Kadavu and compare them with the maximum size given for each kind in a well-respected field guide for tropical Pacific reef fish (Allen et al. 2003). The scale varies from chart to chart with the size ranges of the fish in question. The Kadavu results reflect the local fish population which is exposed to regular fishing, with the exception of some Marine Protected Areas (MPAs). A few survey participants have spent time spear fishing commercially in other parts of Fiji, and may have drawn their estimates from elsewhere. In contrast, the field guide results are drawn from a range of reports from across the Pacific region, which I assume will include some areas with much less fishing pressure than Kadavu waters, where poachers from Suva and elsewhere come at night and put further pressure on stocks beyond local fishing efforts.

A further comparison between Allen et al. (2003) and a more detailed Pacific reef guide (Randall 2005) for 15 of the 18 Acanthuridae fish kinds in Figure 1 found the same measurements in both books for seven of the kinds and somewhat larger sizes in Randall (2005) for the other eight kinds. A second comparison of maximum sizes shown in Allen (2003) and Craig et al. (2011) for 12 of the fish kinds listed in Figure 2 found 10 of these listed as larger in Craig et al. (2011) than in Allen et al. (2003). The point to consider here while reviewing Figures 1 to 6 is that the Allen et al. (2003) size numbers may be on the conservative side. The groups of fishes used for Figures 1 to 6 were chosen for analysis on the basis that they include many fish kinds that are well known in Kadavu, and hence the Kadavu estimates are based upon rich data.

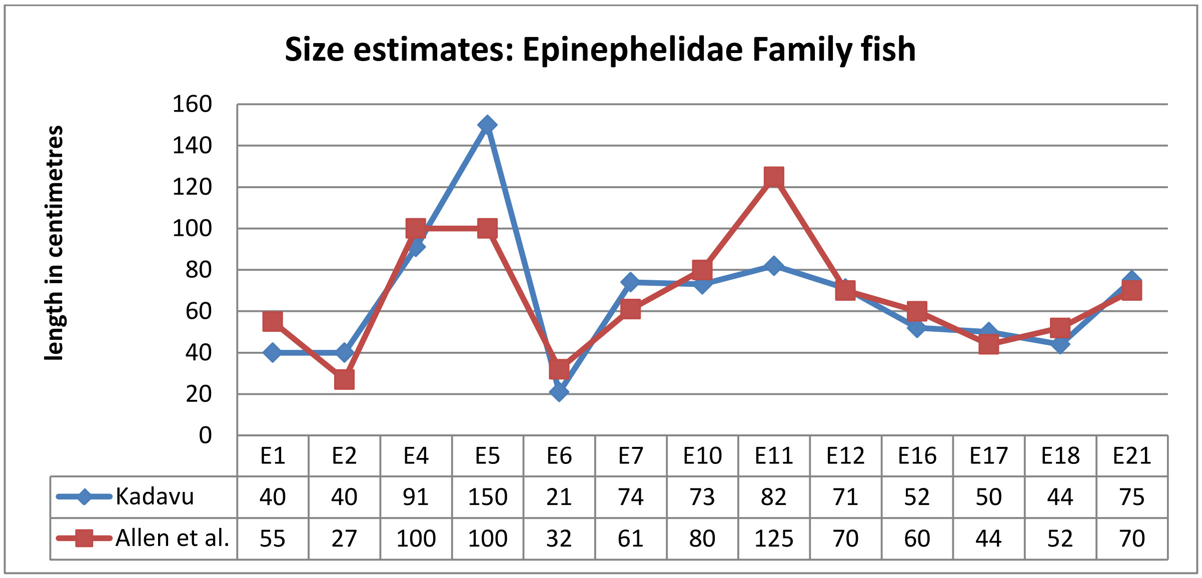
Figure 1 Size estimate comparison A



	A1	A2	A3	A4	A5	A6	A8	A9	A12	A14	A15	A17	A18	A19	A21	A22	A25	A26		Z20
Kadavu	38	20	18	35	35	15	15	25	18	48	42	41	51	14	31	34	40	23		17
Allen et al.	42	38	21	35	25	7	26	35	26	50	60	30	60	20	50	50	50	24		16

Figure 1 shows that 15 of 19 Kadavu estimates are lower than Allen et al. (2003). Of the other four types, I have seen specimens in Kadavu waters of A5, A6, and A17 in the Kadavu estimate ranges, and Z20 is an incremental difference. These results are important because they suggest that most Kadavu estimators do not exaggerate size of fish in this context, a feature which I did have some concerns about, as fisher-folk in Kadavu do like to tell stories of ‘the big one’. Furthermore, given the wider range and sources of data available to Allen et al. (2003), the Kadavu estimates may well be quite accurate for the local fish population.

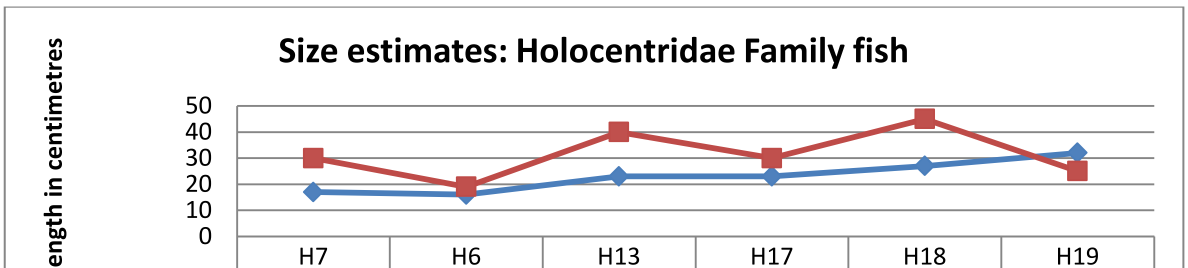
Figure 2 Size estimate comparison B



The Figure 2 comparison results show seven of 13 Kadavu estimates as smaller than Allan et al. (2003), and while not shown here, ten of the 13 Kadavu estimates are smaller than those of Craig et al (2011). Craig’s estimate for E5 is 120 centimetres, still below the Kadavu average of 150. However, E5 is *Epinephelus fuscoguttatus*, which is very similar in appearance to the much larger *Epinephelus malabaricus* that can reach 234 centimetres (Allan et al. 2003). The latter is now quite rare in the local waters, but stories of catching very large groupers are told. My understanding is that both of these Linnaean species are given the name ***seravua*** in Nakasaleka, based upon my 2009 and 2011 fieldwork records. This difference would account for what seems a high size estimate for E5 in Figure 2. I did not have my own image of *E. malabaricus* to show and use in the encyclopaedia.

Many of the fish kinds tracked in Figure 2 are considered delicacies in Kadavu, and catching larger ones is a noteworthy event. In 2011, one fisherman told me that he had caught the most recent large ***seravua*** a couple of years previously with one accurately placed spear-shot, and the village had enjoyed a fine feast. Despite this discourse, I conclude that for the Figure 2 category, the Kadavu estimates seem reasonable and show no signs of exaggeration trends.

Figure 3 Size estimate comparison C



	H7	H6	H13	H17	H18	H19
Kadavu	17	16	23	23	27	32
Allen et al.	30	19	40	30	45	25

The squirrelfish of the Holocentridae Family listed in Figure 3 are common food fish caught with spears and nets around the reefs in Kadavu. They are considered good eating, although bony. Figure 3 shows five of the six Kadavu estimates to be less than the field guide sizes for the same fish kinds.

Figure 4 Size estimate comparison D

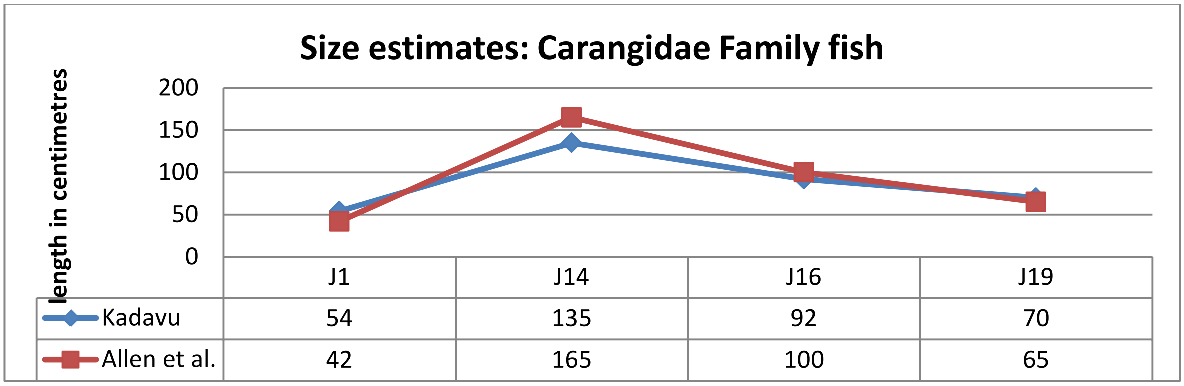


Plate 10 ***Saqa ni takali*** **for dinner**

Saqa (trevally), J14 and J16 in Figure 4, are considered chiefly food in the Nakasaleka district (See Plate 10) Today if a chief is visiting the village where someone catches one, the fisher is expected to present this high status fish to the chief. Both of these Kadavu estimates are less than the field guide sizes. The 23% higher Kadavu average estimate of J1 size is skewed by a single 122 centimetre estimate, which may be one person’s misidentification for a larger kind of ***saqa*** (see Plate 11).

Plate 11 ***Saqa*** **(*****Caranx ignobolis*****; giant trevally)**

The 7% higher Kadavu estimate of J19 is notable, given that this kind of fish, ***roqoroqovatu*** (*Trachinotus blochii*; snubnose pompano), is uncommon today in Kadavu; and sells for extraordinarily high prices in fish markets (see Plate 12).

Plate 12 ***Roqoroqovatu*** **(*****Trachinotus blochii*****; snubnose pompano)**

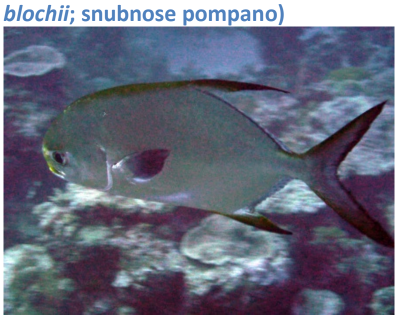
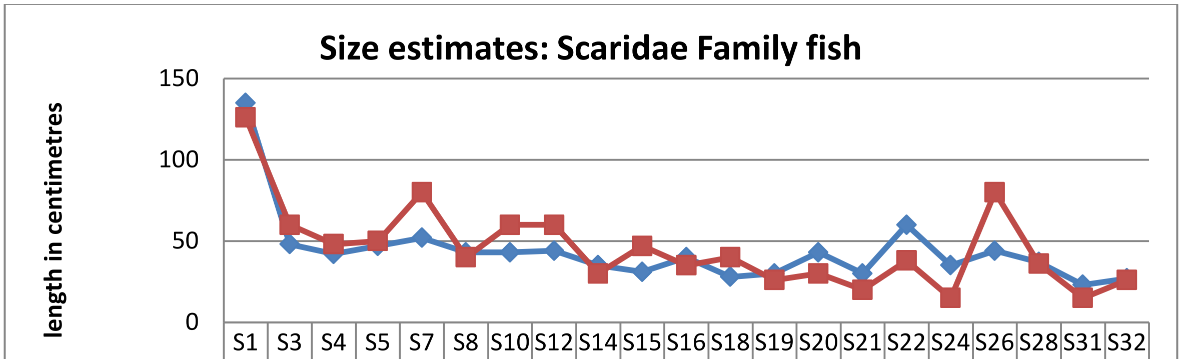


Figure 5 Size estimate comparisons E



	S1	S3	S4	S5	S7	S8	S10	S12	S14	S15	S16	S18	S19	S20	S21	S22	S24	S26	S28	S31	S32
Kadavu	135	48	42	47	52	43	43	44	35	31	40	28	30	43	30	60	35	44	37	23	27
Allen et al.	126	60	48	50	80	40	60	60	30	47	35	40	26	30	20	38	15	80	36	15	26

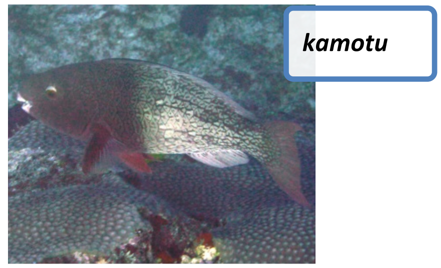
The comparison in

Figure 5 does not show clear trends, but a summary of the differences calculated by percentage shows the average of the Kadavu estimates for these 21 fish kinds is 4.7% smaller than the field guide maximum sizes. The Scaridae or parrotfish is a difficult category of fish to compare here, as the classification systems do not mesh well, given that each of these Linnaean species go through two or three significant colour and body shape changes as the fish matures. For example, Kadavu classification groups similar growth stages of several Linnaean species which vary in size, but have similar body shape and a dominant blue-green colour as ***kakarawa*** (Gordon: In press). Two Linnaean species, *Scarus frenatus* and *Scarus schlegeli,* have significant differences between their terminal phases (TP), as seen in Plates 13.1 and 13.3. This is also the case with the differences between the intermediate phase (IP) of these same Linnaean kinds shown in Images 13.2 and 13.4, but in Fijian terminology they are grouped together as types of ***kamotu***. The Fijian categories cross-cut Linnaean systems, and creates less congruent size estimates in the data. Average sizes given in interviews for nine ***kakarawa*** images of different Linnaean kinds ranged from 28 to 43 centimetres, and for images of five kinds of ***kamotu*** a range of 23 to 44 centimetres. However, size exaggeration by Kadavu fishers is again not evident here.

Plate 13 Series *Kakarawa* and *kamotu* of *Scarus frenatus* and *S. schlegeli.*

13.1 *Scarus frenatus* TP

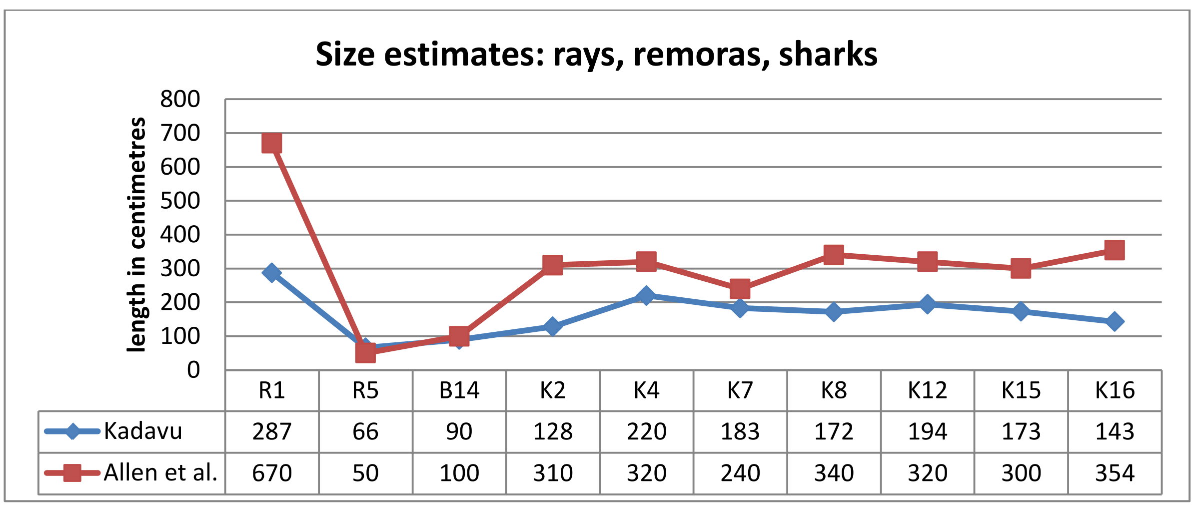
13.2 *Scarus frenatus* IP



13.3 *Scarus schlegeli* TP

13.4 *Scarus schlegeli* IP

Figure 6 Size estimate comparison F



	R1	R5	B14	K2	K4	K7	K8	K12	K15	K16
Kadavu	287	66	90	128	220	183	172	194	173	143
Allen et al.	670	50	100	310	320	240	340	320	300	354

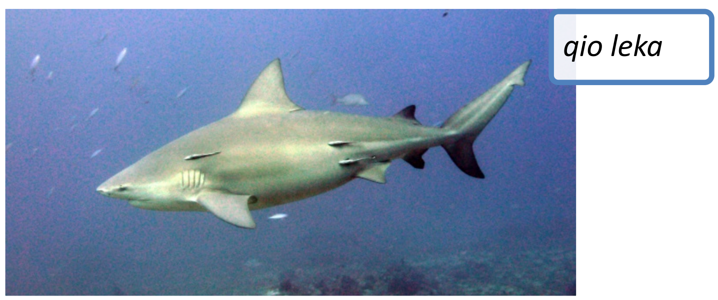
The comparison of size estimates in Figure 6 shows bigger differences between Kadavu estimates and field guides with larger creatures. I have grouped rays (R1, R5) and sharks (K) together here as Linnaean taxonomists do; this is not necessarily a Kadavu practice, although some people do remark on the shared distinction that they carry live young in contrast with the eggs of other fish. Sharks and rays are considered to be ***ika***, things that swim; and the remora or ***bakewa*** (B14) is grouped with sharks as discussed in the previous chapter. Referenced in Figure 8, the ***bakewa*** (B15) and small rays (R5) are caught with some frequency; and are small enough to be measured against an arm. They have a small ratio of difference relative to the rest of the category.

Figure 6 shows that the Kadavu estimates for the larger kinds of sharks and rays are significantly less than the maximum sizes of Allen et al. (2003). There are several possible reasons for this difference, but clearly the interviewees are not telling exaggerated stories about the size of sharks and rays, although they did tell me many stories about human interactions with them, as can be found in the encyclopaedia. Most of the people I interviewed did their fishing inside the barrier reef, where one would expect to see smaller sizes of sharks than in the open sea. I might accept this reasoning for the discrepancy in K8, ***qio leka*** (*Carcharhinus leucas*; bull shark*)*, which do not seem very common inside the reef in Nakasaleka waters (See Plate 14.1). However, K2 in Figure 6, ***qio balavu*** (*Negraprion acutidens*; sicklefin lemon shark) is a common visitor inside the reef, and I have seen specimens well in excess of two metres in length, as can be seen in Plate 14.2. In fact their local name, ***qio balavu***, means long shark, despite the estimate average of 1.28 metres. This kind of shark can be seen sleeping in caves on the main reef, and some men claim to hunt this kind of shark at rest by sneaking up on it to put a rope around its tail and pull it up to the boat.

The point to be made from Figure 6 is that people had trouble estimating the size of large creatures and consistently understated their size in contrast to the relative accuracy of fish of less than one metre in length. This observation is further supported by the discrepancy in R1, between local estimates of 2.87 metres and 6.7 metres by Allen et al. (2003), for ***vai roqo*** (*manta birostris*; manta rays), which are not uncommon in the general area and well known. Notice the large size of the ***vai roqo*** in relation to the diver's flippers in Plate 14.3. As a measurement standard for rays, interviewees were asked to estimate the wing span of rays. Allen et al. (2003: 457) qualifies their measurements of rays as disc size, which I take to be roughly the same parameter as mine.

Plate 14 Series *Qio* and *Vai*

14.1 *Carcharhinus leucas*



14.2 *Negraprion acutidens*

14.3 *Manta birostris*

In summary, the data gathered from question 4 seem to be valid in most cases, but understated in the case of large creatures of 2 or more metres in length. The exaggeration in size estimates which I thought might distort these data did not occur, and I would recommend this method as a useful tool to gather local knowledge, qualify observations, and encourage storytelling in interview settings.

Chapter 3: Survey questions and responses about the behaviour of marine life (a) movement and population

Question 5) How do these fish go about? (Group size) a) one, b) two, c) three to nine, d) ten or more?

(More than one answer for a given image of a creature was accepted for this question.)

A) ***I ra dau lako yavica tu na ika***? a) ***dua***, b) ***rua***, c) ***tolu***, d) ***yavuni***.
   LT: The fish go in a number of how many?
B) ***Era dau lako tu vakia na ika ke***? ***Ra dau*** a) ***dua***, b) ***rua***, c) ***tolu***, d) ***yavuni***.
   LT: ?
C) ***E ra dau lako yadua rua se ra dau yavuni***? ***Ra dau*** a) ***dua***, b) ***rua***, c) ***tolu***, d) ***yavuni***.
   LT: They go in ones, or twos, or groups?

Discussion:

Question version 'A' is the best use of Nakasaleka pronunciation, as shown by the use of '***i ra***' over '***e ra***'. The categories of one, two, three to nine, and ten or more were chosen to reflect the Fijian grammatical forms for number in the use of pronouns, which in English are termed singular, dual, paucal or trial, and plural (Churchward 1941: 26). The paucal form is the confusing one for English speakers, but it is also found in some other Austronesian languages (Greenhill et al. 2008). David Hazlewood notes that since it is indefinite, one might not consider it a number; but logically one would next have to exclude plural as a number (1979: 26). The paucal form is often used to refer to a group of people, such as a family (Geraghty 2008: 21). My interpreters consistently told me that it was used for any number from three to nine; but in asking people question 5, they would just use the number ***tolu*** (three). I conclude that Nakasaleka people well understand this association between reference and category, based upon their answers and my knowledge of the habits of the creatures being described by interviewees. Maxwell Churchward, who uses the term trial rather than paucal, suggests that the trial number reference originally denoted three; but provides no reasons for this assertion (1941: 26). In any case, the use of these four numerical categories made logical sense to interviewees and interpreters alike; and helped make question 5 a productive one.

Multiple responses from an interviewee were recorded when provided for this question. These responses may reflect changes in a creature’s behaviour at different sizes, places, or times of year; and multiple answers allowed opportunities for inquiry into these variations.

Question 5 was added in the first few weeks of interviewing, when I noticed that people often tried to contribute information on grouping behaviour in their responses to other questions, such as question 6 about habitat and question 15 on stories or things people knew about a creature. Once question 5 was put to use, it yielded at least one response in most cases. When used for some invertebrates, this question had less relevance if the creature was sessile or not perceived to have much intra-kind social life as a type of fish might. Although, of the 14 kinds of ***dri*** (sea cucumbers) described by people and presented in the encyclopaedia, two kinds drew some consensus that they could be found both in pairs and on their own, while the other kinds were considered to be solitary creatures. One person also mentioned that when you see one ***loli*** (*Holothuria atra*), you should look around as you will soon see another one. Sea cucumbers are gathered by hand from the lagoon bottom and from the reef, to be sold to brokers for sale to Asian markets, so people are always keeping an eye out for them when they wade or dive in the sea. Clams and other shellfish were invertebrates that women, in particular, were quite knowledgeable about which types could be found on their own or in groups, as these are coveted culinary delicacies. People do have economic or gastronomic incentives for keeping track of whether many creatures are found in pairs or groups. Large group sizes were discussed as opportunities for plentiful regular or seasonal catches of fish.

Two Fijian names for calendar months make reference to abundances of fish. ***Vula i Nuqa Lailai*** (moon of rabbitfish) and ***Vula I Nuqa Levu*** (moon of many rabbitfish) apply roughly to the Gregorian months of December and January. ***Vula*** means 'moon'. ***Lailai*** means 'little' or 'few', and ***levu*** means 'large' or 'many'. ***Nuqa*** are very popular food in Fiji; even small children can identify pictures of ***nuqa***. In discussions of ***nuqa*** group size, people spoke enthusiastically of when the ***nuqa*** abandon their solitary or small group habits to form spawning aggregations in the lagoon near the shore, where they are easily caught in nets and on hooks. The term ***nuqa*** generally seems to refer primarily to the vermiculate rabbitfish (*Siganus vermiculatus*); but also to some other locally found *Siganus* species, except those with yellow tails, which are known as *nuqa tabanica (S.uspi* and *S. doliatus*). Not only are ***nuqa*** tasty, as I can attest, but they are plentiful at Christmas, a time for visiting and feasting. This phenomena occurs in many places in Fiji, and it is no coincidence that the Fiji Christmas tree (*Descaspermum fructicosum*) is also called ***nuqa*** (Gunderman et al. 1983 from Randall 2005, Gatty 2009: 180). I use these examples to demonstrate the sorts of knowledge that questions about group size can lead the researcher to, and in the process reveal people's perceptions of the social behaviour of various kinds of creatures.

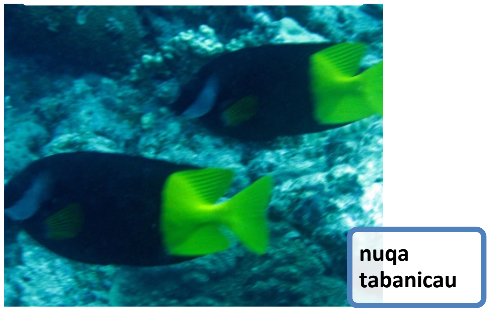
A number of kinds of creatures were identified as often living in pairs. For example, ***nuqa tabanicau***, the reef dwelling bicolour rabbitfish (*Siganus uspi*) which is unique to Fiji, except for a possible presence in New Caledonia (Randall 2005: 602), were almost always seen in pairs or occasional trios in my observations in Kadavu waters, in contrast with small groups or aggregations of ***nuqa*** and the related ***sarika*** (*Siganus spinus*). ***Nuqa tabanicau*** were often described to me by interviewees as always living in partners, or as husband and wife. This awareness of creatures living as partners came up a number of times, and might also have personal safety benefits for spear-divers. I often heard a story of a local man who had lost some earlobe to a ***qau***, the titan triggerfish (*Balistoides viridescens*). This kind of ***qau*** digs a pit in a sandy bottom to lay its eggs; one parent defends the nest while the eggs hatch, and the other parent defends the larger territory. The diver swam too close to the nest, and the ***qau*** territory defender came at the man from behind to bite a considerable chunck of flesh from his ear. Another common story told about partners describes attacks on divers by a second ***sulua*** (octopus) from behind as the diver threatened what they thought was a single ***salua*** on the reef.

Question 5 was a productive one for gathering knowledge of the habits and behaviour of marine creatures. The basic answers were useful on their own to build the encyclopaedia. Some responses led into more detailed discussions of the creatures by providing context for stories to be told, as the above examples demonstrate. The family Siganidae fish, known in Nakasaleka as ***nuqa***, ***nuqa tabanicau***, ***sarika***, ***tabava***, and ***tavai***, provide productive examples of the usefulness of these sorts of questions. In a detailed study of Siganidae behaviour and reproduction, Gunderman et al. divide the group into species which “live in pairs, are site tenacious, and are brightly coloured,” and associated with coral reefs, in contrast with the other species in the family which at times form large schools and are more environmentally adaptable, allowing exploitation of a range of marine environments (1983: 177-8). Given that ***nuqa tabanicau*** (*Siganus uspi*) are common only in Fiji, recording observations of this kind of fish by local people is not only valuable to build local knowledge bases, but these records can inform international scientists of behaviour and habitat use.

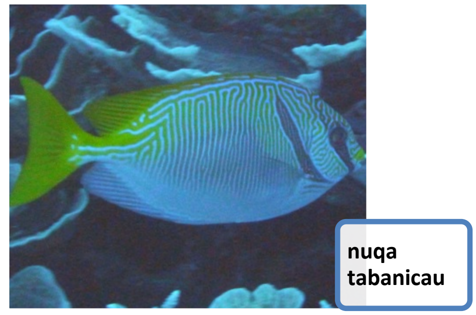
The case of the term ***nuqa tabanicau***, however, does show the importance of using images to verify name use before drawing on local knowledge, as *Siganus doliatus* is also given this same name. Both *S. doliatus* and *S. uspi* have bright yellow tails giving rise to the term ***tabanicau***, meaning branch of the ***cau*** (*Casuarina equisetifolia*) tree (Plantnet Flora Online), thus named for the resemblance of the fish tails to the yellowish whorls of needles near the branch tips of this evergreen-like tree found near Fijian shores (See Plate 15.3). The body colour of these two kinds of fish is quite different, but the Kadavu name focuses on the prominent tail colour as shown in Plates 15.1 and 15.2. This example points out the usefulness of the type of illustrated local knowledge encyclopaedia assembled during this research project. A marine biology researcher could use the encyclopaedia pictures, descriptions, and anecdotes to have informed conversations with local residents about the kinds of marine life of interest with more assurance of common understanding by linking local names to images. A previous non-illustrated record of Kadavu marine life terminology links only *Siganus doliatus* to ***nuqa tabanicau***, without any mention of *Siganus uspi* (Calamia et al. 2008), a distinctive kind of fish seen quite often when diving on the local reef, as shown in Plate 15.1.

Plate 15 Series *Nuqa tabanicau* (rabbitfish)

15.1 *Siganus uspi*



15.2 *Siganus doliatus*



15.3 *Casuarina equisetifolia*

Question 6) Where do these fish live? (habitat) See list of options (Figure 9).

A) ***I ra dau bula tu i ya***? (***bula i na***)

LT: This one is living? (it lives in?)

B) ***E dau bula e vei***?

LT: This one lives where?

Discussion:

Bula i na is the abbreviated version used in the text of the encyclopaedia, but this expression is expanded to the above version A in the Key to Descriptions (Appendix 1: 6). The literal translation 'it lives in' applies to '***bula i na***', which was often used by interpreters in interviews when the interviewee already understood the question. Question 6, version A, represents the better Nakasaleka wording of this question, with the use of '***i***' rather than '***e***' in two places. The term '***tu***' in the context of version A of this question means a state of being or to exist (Gatty 2009, Hazlewood 1979). The use of the term '***ya***' may translate here as '**at**' in the form of a "locative and directional preposition with human referents" much like the term ***vei*** in Standard Fijian (Geraghty 1979: 310). Version B is an SF phrase that was used early in the research.

The responses to Question 6 made a valuable contribution to the encyclopaedia. The 24 responses listed in Table 4 were part of a longer list that emerged from interviews, as we later deleted some duplicated terms for habitat zones in Standard Fijian. On the advice of several Nakasaleka speakers, these were edited out in the final stages of assembling the encyclopaedia. The habitat terms that remain are considered Nakasaleka terms by the speakers consulted on this matter, who included three generations of Nakasaleka-born men and two older generations of Nakasaleka-born women. This same review and editing process was followed for the terms used to answer questions 10-14 in order to determine the most suitable Nakasaleka dialect use.

Table 4 Habitat responses

	Bula i na	**Habitat**
A	***baji kai lili***	outer edge of reef
B	***baji ni vi jirijiri***	edge of mangrove
C	***bajina***	edge of a reef
D	***cakau levu***	main reef
E	***cakau vanua***	inshore reef
F	***daku ni tuba***	deep - inside reef
G	***daveta***	passage in reef
H	***dela ni cakau***	top of main reef
I	***jiro***	tidal zone of freshwater stream
J	***jiro lailai***	small river
K	***jiro levu***	big river
L	***laselase***	branch coral
M	***loma ni vi jirijiri***	inside of mangrove
N	***lomaloma***	lagoon area between ***cakau vanua*** and ***cakau levu***
O	***maqamaqa***	tidal flat
P	***nukanuka***	sandy bottom

	Bula i na	**Habitat**
Q	***ruku ni cakau***	inner edge of reef
R	***takali***	open sea beyond the reef
S	***vi vujia***	seagrass
T	***vi togo i gusunijiro***	estuarine (river mouth) mangrove
U	***vi vatuvatu***	rocky shore
V	***vitogotogo***	a mangrove area
W	***yalava***	***qoliqoli***: fishing territory
X	***yamotu***	coral patch / brain coral

Many of the creatures that were being discussed are found in more than one habitat area. We recorded up to four different responses to question 6 for each organism. People provided at least one response in almost every case. This was a question in which many interviewees had to be encouraged to be more specific, in particular if it was their first interview. The default response for many people was often '***cakau levu'*** (main reef); but with my encouragement, most interpreters were persistent in requesting more specific answers. Our quest for details with this question benefited from the use of the written chart, similar to Table 4 with the use of a letter code to record each possible response. By viewing the list of possibilities, interviewees were encouraged to provide specific responses. Interpreters had only to write down a single letter code for each response, a feature which kept the interview moving along. I observed that people were more likely to provide detailed and multiple responses when they did not have to wait while the recorder wrote the words out. Once we gathered a good number of terms and set up the letter codes, there was a marked improvement in response quality with the use of the codes. We continued to accept and add new unique habitat responses to the list throughout the research as they arose. The letter codes also facilitated rapid data entry for me each night.

I used several coding systems to track and sort the data in MS Excel spreadsheets. First, each photograph was labelled on the back face with an alpha-numeric code such as A1, B6, or I15. The letter codes were applied to groups of similar types of creatures such as ‘A’ for Acanthuridae fish, ‘B’ for Holothuridae (sea cucumbers), and ‘I’ for marine plants. Based upon my 2009 fieldwork in Kadavu, I was able to pre-group many organisms into locally recognized categories. However, I also used several catch-all categories of organisms for some sections, a method which later required re-sorting based upon people’s responses on relationships between organisms before assembling the encyclopaedia. The use of alpha-numeric codes allowed me to establish each 20 picture section as a diverse group of organisms, a method which was an important factor to keep people interested during interviews; a topic discussed in the Chapter 1 under the heading of interview format. These alpha-numeric codes were written down by the interpreter and myself in our respective notebooks to identify each record. I also used these codes in the first column of the data-entry MS Excel spread-sheet, a procedure which later allowed automated grouping of various people’s responses to questions about a single image.

The interviewees were each identified in notebooks and spreadsheets with a second alpha-numeric code using a unique letter for each village and a number for each contributor, such as Mat-5, a procedure which allowed fact checking and sorting to highlight any responses specific to a given village. This method also allows for quick removal of data if requested by an interviewee, as required to meet ethics guidelines.

The responses of organism names or letter codes to the various survey questions were then entered beside the question number in notebooks during interviews and under appropriate columns in the data spreadsheet. To prepare for data extraction, responses pertaining to each image were sorted together in the MS Excel sheet as is shown in Table 5. Using question 6 as an example, I might then have 5 or 6 different people's responses of the habitat(s) of a given kind of fish tracked in the form of one to four letter codes representing different habitats. I used a manual method to add up the number of times each letter code came up for a given image of an organism kind. I then selected the three most frequent responses overall to describe the organism in the encyclopaedia, beginning with the most common response, as is shown on the bottom row of Table 5. For use in the encyclopaedia, the responses were converted from letter codes back into the verified Nakasaleka terms. The manual aspects of the data management for questions such as this one are challenging; sorting out hundreds of multiple-answer responses accurately takes many hours of valuable fieldwork time.

Table 5 Sample segment of MS Excel data entry spread-sheet with habitat responses highlighted

		1	2	3	4	5	6	Question #
Code	**ID**	**Name**	***Veiwekani* 1 (relative)**	***Veiwekani* 2 (relative)**	**size: cms**	**group size**	**Where it lives**	**Linnaean name**
A1	LL.5	***balagi***	***jila***		33	d	b	*Acanthurus blochii*
A1	LL.18	***balagi dina***	***jila***	***balagi nawa***	42	d	v,b,f	*Acanthurus blochii*
A1	Mat.5	***balagi***	***ika loa***	***ta***	44	d	h,b	*Acanthurus blochii*
A1	Mat.7	***balagi***	***jila***	***ikaloa***	33	d	h,c,t	*Acanthurus blochii*
A1	Mat.4	***ikaloa***	***balagi***	***jila***	30	d	b,h,t	*Acanthurus blochii*
A1	**organism summary**	***balagi***	***jila***		**36.4**	**d**	**b,h,t**	*Acanthurus blochii*

Given that the project needed to be completed on site to ensure ongoing access to local Nakasaleka experts on both marine life and language use, the coding methods worked fairly well; but computer use was limited at times without a reliable electricity supply; efficiency refinements would be beneficial. My fieldwork computer is a 14 inch Panasonic Toughbook laptop with low power settings to minimize the challenges of recharging batteries from solar and generator sources in the field. Striving for more efficient use of technology allows the researcher to produce more robust results from more data; and to spend more time with villagers with less time on the computer, reducing the demand for electricity. In hindsight, I might have used a database program such as MS Access with pre-set letter codes for data entry and more efficient extraction. Automating the counting and sorting of letter codes would have saved days of data sorting in the field, time better spent learning more about how people live and conceptualize their life in the village.

Explanation of habitat zones

The terms used in Table 4 all describe physical or biological features of the Kadavu seascape, seashore, or riverine zones to varying degrees except for the term '***yalava***', which will be discussed later. I will review several of the more common terms and demonstrate ambiguities which arise in the translation of the concept of habitat, a common notion drawn from international ecological science to mean "the place where an animal or plant naturally lives or grows" (Collins 2006). The prefix ***baji*** is used in three of the habitat terms to mean the edge; but for Nakasaleka people ***baji*** also refers to a tooth or something sharp, and ***Baji*** can be a proper name for a man. Gatty (2009) supplies ***bagi*** as the Kadavu and Lau term for tooth, said to be a synonym for the more widely and diversely used Fijian term ***bati***, which can mean a warrior caste and also finds use as a prefix for many eating-associated references, or as ***bati-na*** to mean the edge of an object, much as ***baji-na*** (***bajina, baji ni vi jirijiri***) is used in Figure 9 to describe edges of reef or mangrove. The use of a 'j' sound in Nakasaleka is a regional linguistic marker in contrast with the 'ch' sound without aspiration that is written as 't' in standard Fijian. The use of 'j' sound rather than 't' is a well-known Tongan influence found in Lau, which shares some of these influences with Kadavu speech (Gatty 2009: 3). However, Gatty's use of ***bagi*** for this same meaning in Kadavu seems odd, given the very different 'ng' sound indicated by the letter 'g' in Fijian.

Cakau, ***laselase***, and ***yamotu*** are the three primary terms that people used to name hard corals in the survey, despite being shown pictures of more than 20 distinct shapes, sizes, and colours of stony corals. Although people's familiarity with the different kinds of coral varied, their use of names was general. ***Laselase*** describes branching corals; and may also be used without duplication as ***lase***, as ***lase kata*** (fire coral), as ***lase piqi*** (pink coral), or with another colour term. ***Cakau*** describes any large inshore or offshore barrier reef. The word ***yamotu*** is widely used for any sort of patch reef or coral outcrop inside the main reef.

The methods of this study investigated people's knowledge of coral from the perspective of what people know about various types of coral, and from the perspective of types of coral as habitats for other organisms. According to the Australian Institute of Marine Science, there are 25 living Scleractinia families worldwide. These are commonly known as the hard, stony, or reef building corals. At least 16 of these 25 coral families grouped within subcategories of 52 genera and 148 species are found in Kadavu waters offshore from the villages surveyed in this research (Obura and Mangubhai 2003: 81). The very limited folk taxonomy for corals recorded in my research is consistent with the recent comments on The Association of Social Anthropology in Oceania (ASAO) listserv by the noted Australian coral reef biologist and anthropologist Simon Foale. To the best of Foale's knowledge, most Melanesian folk taxonomies use few categories for corals, with no more than 12 categories in total (ASAO listserv July 30, 2012). The limited information that I gathered on corals in Nakasaleka with these methods was clustered around corals that can hurt people through contact, such as ***lase kata*** (fire coral), corals that can be ground and boiled to make white paint to decorate rocks and houses; and a few colour adjectives such as ***lase piqi***, which I suspect were supplied more out of courtesy than reflective of any common use by interviewees. Names and categories supplied for soft corals were even sparser in response to identification questions, and absent from habitat terms despite the significant and colourful patches of soft corals, which attract scuba divers to the Astrolabe Reef.

Takali is a common Fijian word for ocean or deep sea (Gatty 2009), with more detailed use in Kadavu for the sea beyond the barrier reef, given the importance of the barrier reef to protect Nakasaleka shores from heavy seas and the reef's role in providing the people with a protein source. ***Lomaloma*** is a very common geographic term used for lagoon areas inside the reef, which may include more specific ecological designations such as ***yamotu*** or ***vi vujia*** (sea grass). In this sense, the ocean is viewed as ***ni takali*** (outside the reef), ***dela ni cakau*** (top of the reef), and ***lomaloma*** (inside the reef). Most fishing is done inside or on top of the reef. Deep sea fishing requires more costly equipment than most people have, and uses more fuel. ***Ni takali*** is sometimes used as a secondary lexeme in fish names, such as ***saqa ni takali*** (*Caranx melampygus*) or ***mayawa ni takali*** (*Carangoides plagiotaenia*), to indicate where these fish are found; but I have no record of anyone using ***lomaloma*** or ***dela ni cakau*** in this manner.

Alternate meanings for ***takali*** include ‘permanently lost’, or a polite term for ‘died’ in reference to a person (Gatty 2009). Hazlewood (1979) confirms the meaning of lost, and in this sense associates the term ***takali*** with the verb ***kali-a*** ‘to separate a thing from what it adheres to’ or ‘to wean’). ***Loma***, the root term of ***lomaloma***, is exclusive to eastern Fijian (Geraghty 1983: 313); and is a common prefix to indicate inside, in the middle, within, or the spirit of a person or animal. The related term, ***lomalagi***, indicates heaven; and is used often in Christian prayers, sermons, and discourse in Nakasaleka (Methodist Church of Fiji 1988: Hymn #8). The key point I make here is that ***takali*** and ***lomaloma*** are provided as habitat terms, but they both have much wider cosmological significance to Fijians than more ecologically specific terms such as ***vi vujia*** (sea grass area) or ***vitogotogo*** (mangrove area), or terms which describe specific landscape features such as ***maqamaqa*** (tidal mud flat), ***nukunuku*** (sandy bottom or shore), and ***daveta*** (passage in reef). However a clear distinction between cosmologically and ecological significant terms cannot be made. For example, ***vitogotogo*** (the mangrove area) plays a significant role in local beliefs about the passage of spirits of the deceased on their way to the after-world (Appendix 1: ***talanoa***). Consideration of the broader cultural contexts of these terms is important in the development of any educational materials on marine life in Fijian languages. This observation is further justification for the methodology used here of gathering the key terms for habitats on an ongoing basis throughout the research process.

The final habitat term to be discussed here is ***yalava*** (fishing territory), a synonym for ***qoliqoli*** according to some interviewees and Gatty (2009). Hazlewood defines the singular term ***qoli*** as a verb meaning ‘to fish’ or ‘to go a-fishing’ (1979: 94). Paul Geraghty translates ‘***qoli***’ as a common noun with use in Eastern Fijian communalects in Vanua Levu Island (Map 1) to refer to fishing with nets (1983: 336). The ***yalava*** of a given village in this part of Kadavu stretches from the shoreline to the seaward face of the fringe reef. This proprietary area contains many of the different habitat zones named in Table 4, and is therefore a not an ecological zone term in the same way that the terms ***vitogotogo*** and ***maqamaqa*** describe mangroves and mudflats. I questioned people a few times on the appropriateness of using the term '***yalava***', as it seemed broad and out of context with the question; but they insisted upon its relativity, and we added it to the list of terms.

Territorial fishing rights are of the utmost significance to Kadavu people; and as elsewhere in Fiji, ownership of the reefs and inshore waters has been a significant political issue for many years, as is discussed in Chapters 9 and 10. I found it interesting that five people from two villages used ***yalava***, a term of 'practical ownership', to describe where six types of fish and a kind of lobster live. All of the creatures concerned were desirable food items, although the two types of '***vusevuse***' (puffer fish) found in the ***yalava*** are deadly poisonous if not prepared and cooked properly by experts. Given the context of question 6, one might expect the users of the term '***yalava***' to be older men of rank in their villages who were making political statements, given the history of political discord in Fiji around ***qoliqoli*** ownership, boundaries, and use. Political leadership of Kadavu villages and districts is dominated by male chiefs, with rare exceptions. However, four of the respondents using '***yalava***' were women in their late 50s or early 60s, who are expert fishers and are wives to or widows of men of high village rank with expert fishing backgrounds. The fifth person to use this term is a man in his early thirties who is an expert and frequent fisher. The term '***yalava***' was added to the habitat list more than halfway through the 10 weeks of primary interviewing, and it may have found more use if other people had seen it on the list sooner. In retrospect, I would pay more attention to whether the people who used this term thought of it themselves, or used it because it was on the list. Use of the term '***yalava***' is of analytical interest, as it is a crosscutting way of conceptualizing the marine environment, which stresses ownership and resource extraction rights by humans instead of the physical and ecological features of the organism's habitat. The anthropological interest in this sort of use is reinforced by the fact that all users of the term in question 6 responses were quite active extractors of marine-life resources from their ***yalava.***

In 1998-2000 anthropologist Mark Calamia (2003: 507-514) conducted research in Kadavu focused on marine tenure issues, which included a 12 page bilingual survey about sea cucumber harvesting and marketing. The term ***yalava*** was used in several interview questions to do with areas in which people collect sea cucumbers as shown in Figure 11; but ***yalava*** is not used elsewhere in the 561 page thesis in favour of ***iqoliqoli*** (customary fishing grounds or fishing rights area) and ***ikanakana*** (clan's traditional fishing ground; subdivision of ***iqoliqoli)*** (2003: 560). The use of the prefix 'i' will be addressed later under language issues in Chapter 8.

Table 6 Use of the term *yalava* in a marine tenure survey by Mark Calamia (2003: 507-514)

Context of term	**Calamia translation**
yalava qo	this area
na kena yalava **(*dina*)**	natural habitat
nomudou yalava	your customary fishing ground
nomudou yalava	your collecting areas

The uses and translations shown in Table 6 show variations in meanings, and this example again demonstrates the potential ambiguity of effective translation of the notion of habitat steeped in international ecological science. Each possible translation must be considered in the planning of methods and phrasing of questions in anticipation of variations in perceptions by people of their local environment, and their consequent responses. Although I tried to present the question as ‘where does it live?’, I was still imposing my own perspective of an ecological zone or habitat on the query. A question for further research is whether there is a better way to do this inquiry. Should one try and use local terms applied to human behaviour? Marshall Sahlins’ advice for determining where people lived in Moala villages, on a neighbouring Fijian island to Kadavu, was to identify the common cook houses and hearths, which form the hub of social and economic life for both nuclear and extended families (1962: 97). Perhaps, question 6 should ask where the creatures eat, although question 11 does ask what the organism eats, the results of which will be discussed later on. A test of the effectiveness of this change might be whether people would often be more specific in their answers than ***cakau levu*** (main reef) in response to a good translation of the question ‘where does it eat?’, rather than ‘where does it live?’.

Question 7) Are there many or few of these? a) many, b) some, c) few.

A) ***I ra dau vigaci va levu tei va vudua***? a) ***wadu***, b) ***iso***, c) ***vica***.

LT: The ones found now, a lot or occasionally? a) many, b) some, c) few.

B) ***E dau laurai vakalevu se vakavudua***? a) ***wadu***, b) ***vica***.

LT: The ones visible / within view a lot or occasionally? a) many, b) few.

C) ***E ra se vigaci jiko*** *a)* ***vakalevu se*** *b)* ***vakavu dua***.

LT: They found existing? a) a lot, b) ___?_ one.

Discussion:

Version A of question 7 is a better Nakasaleka version, with the use of ‘I’ rather than ‘E’ to begin the phrase, and the use of the shorter ‘***va***’ rather than the Standard Fijian ‘***vaka***’ each time it occurs. The term ‘***vigaci***’ used in version A and version C means ‘found’, and is not listed in any of the Fijian-English dictionaries that I have consulted. The use of ‘***vi***’ in Nakasaleka is often an abbreviation of ***vei***, which can be used before some nouns to imply plural or collective number (Hazlewood 1979), or as a locative or directional preposition similar to ‘at’ or ‘to’ (Geraghty 1983: 331). Either of these options might fit this context. ***Gaca*** is the Kadavu synonym for the SF term ***rai*** or ***raica*** (to see or view) (Gatty 2009: 201).I suspect the term ‘***gaci***’ is a variation of ***gaca***, and hence ***vigaci*** translated as ‘see there’ or ‘see how many there’ approximates the meaning of ‘found’. Question C may be an example of mixing dialects, with the use of SF markers of ‘***E ra***’, and ‘***vaka***’, assuming that ***vigaci*** is not used in SF. Version B is a more consistent Standard Fijian phrase, but it is interesting how these translations of a more abstract English phrase of ‘how many are out there?’ to position the question in Fijian within the interviewees’ personal experience as ‘the ones you observe’ in a transition from the objective to the subjective perspective.

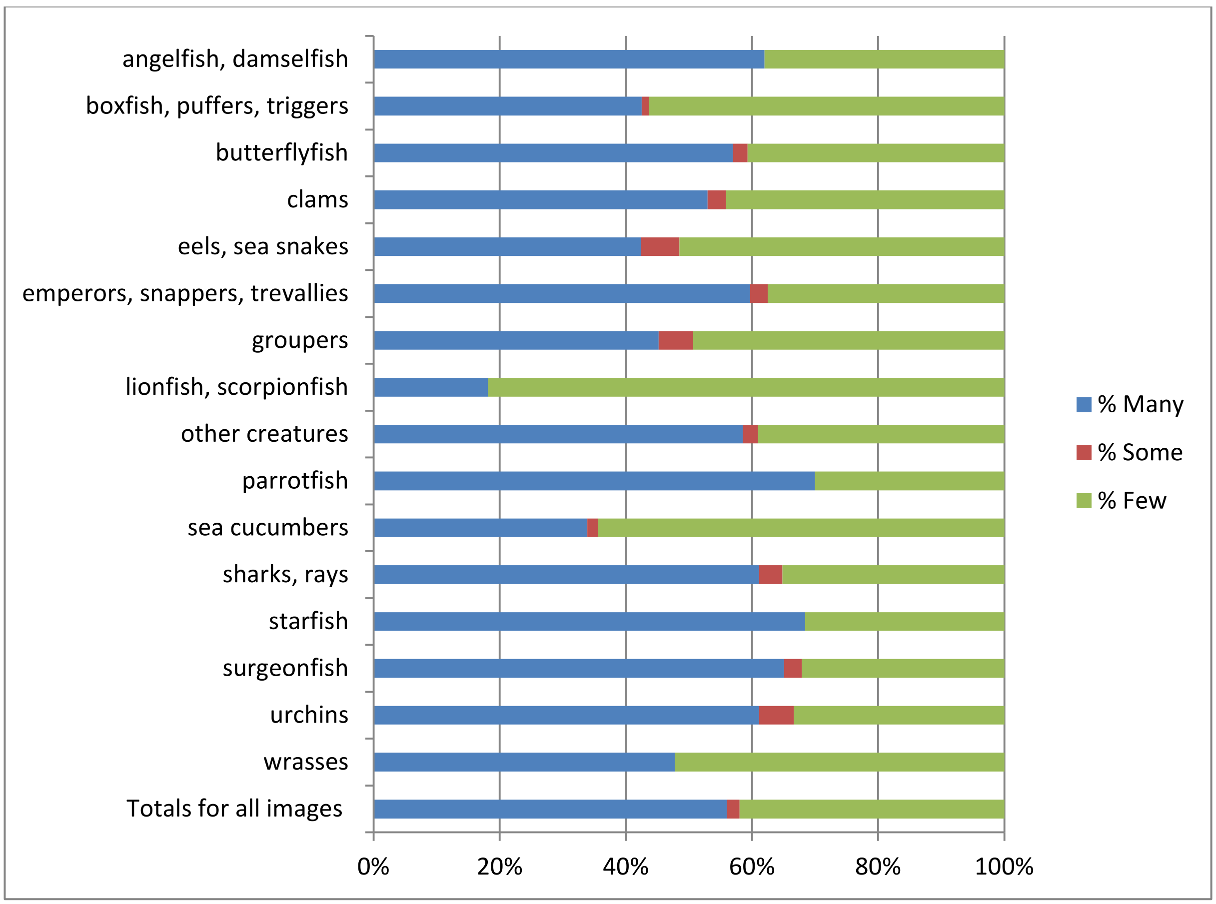
Question 7 was an interesting one to develop. I began by trying to have interpreters translate the concepts of ‘common’ and ‘rare’ into comparable Fijian terms without success. The terms ‘***levu***’ (large, many) and ‘***lailai***’ (small) were suggested, as these words dominate discourse related to size or number in most contexts. However, these terms imply a different meaning than common and rare. I compromised in the construction of the questions to use ***levu***, but avoided using ***lailai***. Initially, the optional answers for interviewees, shown in version C, which were suggested by interpreters also included the term ***levu*** for many, and ***dua***, the cardinal number one, which in this context may mean something like the English word unique. I was unhappy with the responses shown in version C; with better advice I was able to narrow the parameters of these broad terms by defining three optional answers in order to translate meaning effectively in this question. The use of version B was a short intermediate stage in developing this question before adding the option of '***iso***' (some) to accommodate this third response option.

I obtained good consensus from Nakasaleka speakers that '***wadu***' means many, but I lack any dictionary references on this term. Hazlewood's (1979) dictionary, of 1872, provides ***vuqa levu*** (many things) and ***lewe levu*** (many people) in the Standard Fijian dialect and ***seta*** (many) from another Fijian dialect. I found good consensus among speakers for the use of '***eso***' to translate some and '***vica***' to mean a few of something. These two translations are supported in Gatty (2009). ***Eso*** is the SF pronunciation. The Nakasaleka spelling as shown here is ***iso***, which was used later in the survey and in the encyclopaedia. There was an ongoing debate among interviewees as to whether the word should be written as ***iso*** or ***i so*** to properly reflect a slight pause between the syllables. The use of ***iso*** here is based upon the advice of some knowledgeable interpreters on language matters.

The case of question 7 provides an example of working with somewhat unsatisfactory question phrasing, but improving issues of meaning by using predetermined answers. This method is suitable for this type of question with a small range of possible answers; but it limits more creative responses that might lead to other stories, and opportunities to learn of more detailed knowledge from interviewees.

1178 responses to question 7 were recorded, of which 56% were ***wadu*** (many) and 42% ***vica*** (few) with the remaining 2% as ***iso*** (some). Responses for some groups of organism kinds are broken out in Figure 7, as there are considerable variations between groups. The categories also vary significantly in membership size, but represent some of the more easily defined categories of creatures in both Kadavu and international science. 24% of total responses are grouped as other creatures. I have used only common English terms for organism kinds in Figure 7 for brevity.

Figure 7 Question 7: Are there many or few of these? Overview of responses.



In Figure 7, the percentage range of many / few responses is between 30% and 70% for all groups except the 82% level of ‘few’ responses for lionfish and scorpionfish, an unexplained variation. For the most part, these results do not show any bias in clear correspondences between a high percentage of the responses of ‘many’ with schooling creatures, or of a high percentage of ‘few’ with organisms of high commercial or household demand as one might expect. However, the ***dri*** (sea cucumber) results show only 34% of responses as many, a result which may reflect the current ebb stage of the historical fluctuation of the economically important sea cucumber or bêche-de-mer fishery in Fiji, which I have described elsewhere (Gordon 2010: 87-91).

The cycles of the 19th century bêche-de-mer trade that dominated early 19th century Western contact with Fijians, after the sandalwood ran out, are detailed by R. Ward (1972: 108). China, the key international market for ***dri***, was reopened to many Pacific nations in the early 1980s after a 50 year hiatus. Exports from Fiji peaked in 1988 at more than 717 tons per year (Kinch et al. 2008: 20), primarily to Asia. Demand and prices have continued to rise for many kinds, which provide ready cash when sold to Chinese traders in Kadavu or Suva. Today, this trade and market demand may be further fueled by recent increased economic ties with China, ease of immigration for Chinese business people into Fiji, and anecdotally more Chinese restaurants opening in Suva. Local fishers pick up ***dri*** whenever they see them on the seabed, but many people told me that the valuable kinds are getting scarce. I have been on reefs in Australia on which sea cucumbers are not harvested; in some shallow places it is hard to wade in the shallows without stepping on them.

Only a few kinds of ***dri*** are eaten in the three villages that informed this research. Just one person gave personal consumption as a primary use for a ***dri***, with 42 responses of ‘sell’ to question 14 about the uses of ***dri***, and 9 responses of either ‘sell’ or ‘eat’ depending on a person’s circumstances. It is unlikely that ***dri*** have ever been a high demand food source in Kadavu. Hence, the low responses in Question 7 of ‘many’ regarding sea cucumbers may reflect perceptions of change related to heavy exploitation of ***dri*** resources.

Question 8) Compared to 5 years ago are there more of these fish or fewer of them? a) more, b) same, c) fewer.

A) ***Ni vaka tautau vata taki na lima na tabaki sa kora i ra se levu tei sa lailai***? a) ***levu***: **Δ↑**, b) ***tautauvata***: **Δ→**, c) ***lailai***: **Δ↓**.
   LT: Compared with five years completed are there more or less? a) more, b) same, c) less.

B) ***Ni vakatauvatani kei na lima na yabaki sa oti, se levu tikoga se sa lailai sobu***?
   LT: Compared with five years completed are there continuing to be more or are they getting to be less? a) more, b) same, c) less.

Discussion:

The terms ‘***vaka tautau vata’*** and ‘***vakatauvatani***’ are synonyms that translate as the verb ‘to compare’ (Gatty 2009: 254). Gatty shows the first term as one word, and uses reduplication in the second as ‘***vakatautauvatana***’. In place of the common Standard Fijian term ‘***kei***’ (with) in version B, version A uses the term ‘***taki na’***. Nakasaleka speakers told me that ‘***taki na’*** means ‘as part of the body, or a social or family relationship’. Version A uses the Kadavu term ‘***sa kora***’ to mean completed, in place of the SF term, ‘***sa oti***’ (Gatty 2009: 120); and also the Nakasaleka word ‘***tabaki***’ for year, rather than the SF word ‘***yabaki***’ used in version B. Version B uses the terms ‘***tikoga***’ to indicate continuing; and ‘***sobu***’, which means ‘going down’ (Gatty 2009). These actions seem to be implied in version A, in which only the verb modifier ‘***tei***’ (just now; Gatty 2009) is used between ***levu*** (more) and ***lailai*** (less). The symbols of delta and an arrow shown here in version A are the symbols used in the encyclopaedia to indicate people's perceptions of population change. This format was adopted for brevity, as I was unable to learn of any other concise way to write this question over 300 times in the encyclopaedia. The symbols are explained in the Key to Descriptions of the encyclopaedia (Gordon 2012; Appendix 1: 7).

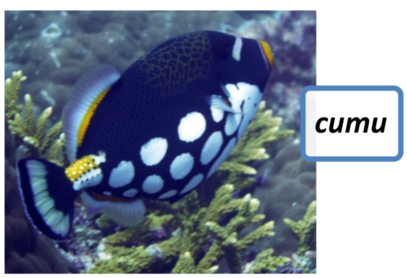
The intent of question 8 was to understand people's perceptions of recent changes in the population levels of the organism in question. As mentioned previously, it was a logistical error to position this question beside question 7, which seeks a very different meaning. Many people just matched their answers of the Fijian equivalents of many and more, some and the same, and few and less. The structures of questions 7 and 8 are also very similar, an arrangement which drew interpreters and interviewees to meld the different ideas sought by these questions. Separating these questions in the survey sequence will not eliminate this problem; but it may increase the accuracy and variations between the sets of responses, which are illustrated in Figure 9 and discussed below.

A key problem in seeking knowledge of marine life population changes from fishers is determining what experiences and knowledge people might draw upon in their responses. Fishing success on any given day in Kadavu is determined by a wide range of factors such as water and air temperature, winds, currents, cloud cover, lunar cycles, time of day, spawning cycles, fishing methods used, when and where people decide to go fishing, and a range of beliefs about the adequacy of one's current religious practices and spiritual state. I was told by a Wesleyan Methodist preacher that poor fishing results are attributed to something bad in the village, and should be associated with a lack of belief in God by villagers. I heard stories that when women are out hand-line fishing in a boat and having little success, they may make a ***kudrokudro*** noise to indicate that they think someone back in the village is talking about them or making fun of them, a situation which is causing the poor fishing results. This ***kudrokudro*** noise imitates the sound made by a type of fish called ***cumu***, the clown triggerfish (*Balastoides conspicullum*; Plate 16.1), when it is removed from the water.

Nevertheless, some people did take question 8 quite seriously; and talked about other environmental changes associated with the population change of the organism being discussed. For example, the common sea grass in Nakasaleka shallows is known as ***vujia***, which is shown in Plate 16.2.

Plate 16 Series: *Cumu*; changes in marine foliage and deforestation

16.1 *Ballistoides conspicullum*



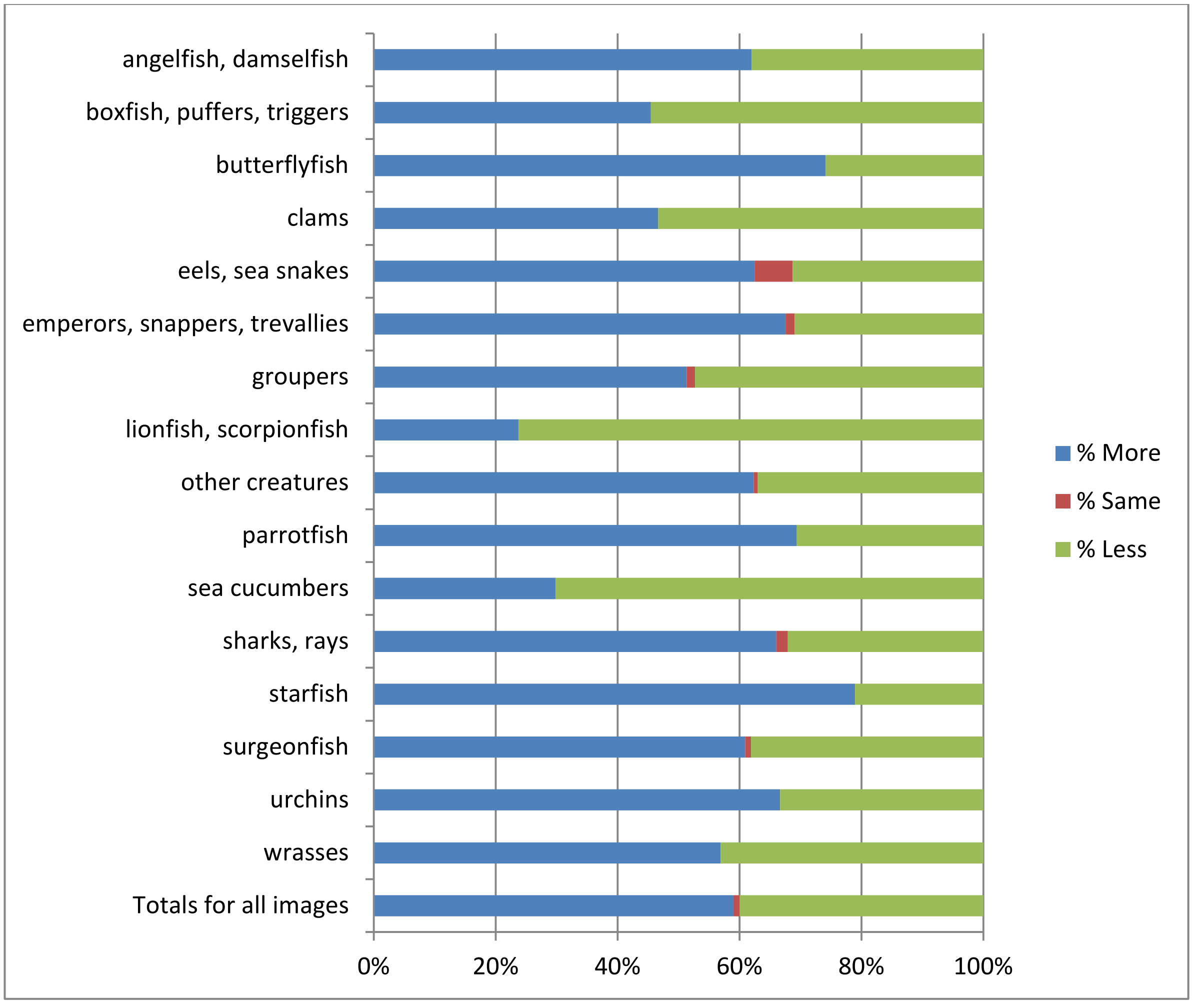
16.2 vuiji; newer variety

16.3 deforested hillside

One older couple described how the current variety of ***vujia*** shown here reaches 26 centimetres; it became established in about 1980 to replace a much thinner and shorter leaf ***vujia*** type that reached only 16 centimetres. This era was a time when people apparently deforested many of the hillsides for firewood, a lasting legacy as can be seen on the hilltop in Plate 16.3. The deforestation increased soil erosion into the sea, and these observant people speculated on an association between the erosion and the marine vegetation change. A number of creatures graze on ***vujia***, including turtles; any significant changes in a primary food source like sea grass will impact other aspects of the local ecology. While this change is a historical event, recording observations of ongoing ecological changes and possible contributing factors is of great value to communities such as these, in which leaders are concerned with maintaining sustainable marine resources, and work hard to build consensus for their decisions. The example of the ***vujia*** demonstrates the practical value of question 8, which is underscored by the fact that this couple are quite advanced in years, and stated their wish to have their knowledge recorded to benefit future generations.

The 1162 responses to question 8 are displayed in Figure 8. 59% of the total responses to question 8 reported increases in population stocks. 40% of responses indicated a decrease, and only 1% observed no change. This trend is at odds with the discourse that I often heard about fish stocks declining due to factors like overfishing by other village members, poachers from Suva fishing at night, and the fish getting smarter and hard to catch. Many times people spoke of the old days when they used to catch more or bigger fish in one place or another.

Figure 8 Question 8: Population change in last five years? Overview of responses.



59% of people answered 1162 questions indicating that population levels of a range of certain marine creatures have increased in the last five years, in contrast with an overarching discourse that the fishing success is going down. This difference demonstrates the value of using detailed questions such as these to understand this contrast. However, it is important to note that the general discourse largely addresses marine life used for consumption or resale, while the questions were asked about a wider range of types, including nuisance or dangerous organisms like ***bula***, the crown-of-thorns starfish (*Acanthaster planci*). Four of the five responses for ***bula*** reported an increase. As discussed under question 7, people's responses to these questions may be situational; and their perceptions of change may reflect a shorter or longer window than the five years stated in the question. To start with, Fijians state their age by the anniversary date to come, rather than the year completed (Gatty 2009: 316), a practice that I was not aware of when asking people this question. In this sense, a Canadian conception of five to six years may equal a Fijian conception of anywhere from four to five years. The choice of a five year period for this question was an arbitrary decision, based on my assumptions that this was a significant period of time, but one that was easily recalled.

However, given the size of the survey in relation to the human population of the villages, the fact that 59% of the responses indicated increases in stocks is significant. The more negative general discourse may be associated with a broader Kadavu and Fijian metacultural discourse of a sense of loss discussed by Matt Tomlinson (2009), or it may just reflect the daily hard work and common frustrations of trying catch the desired amount of marine life to meet one’s daily needs. In Figure 9 I blend the results from Figure 7 and Figure 8 for comparison.

Figure 9 Question 7 (many/few) and question 8 (more/less) comparison of responses.

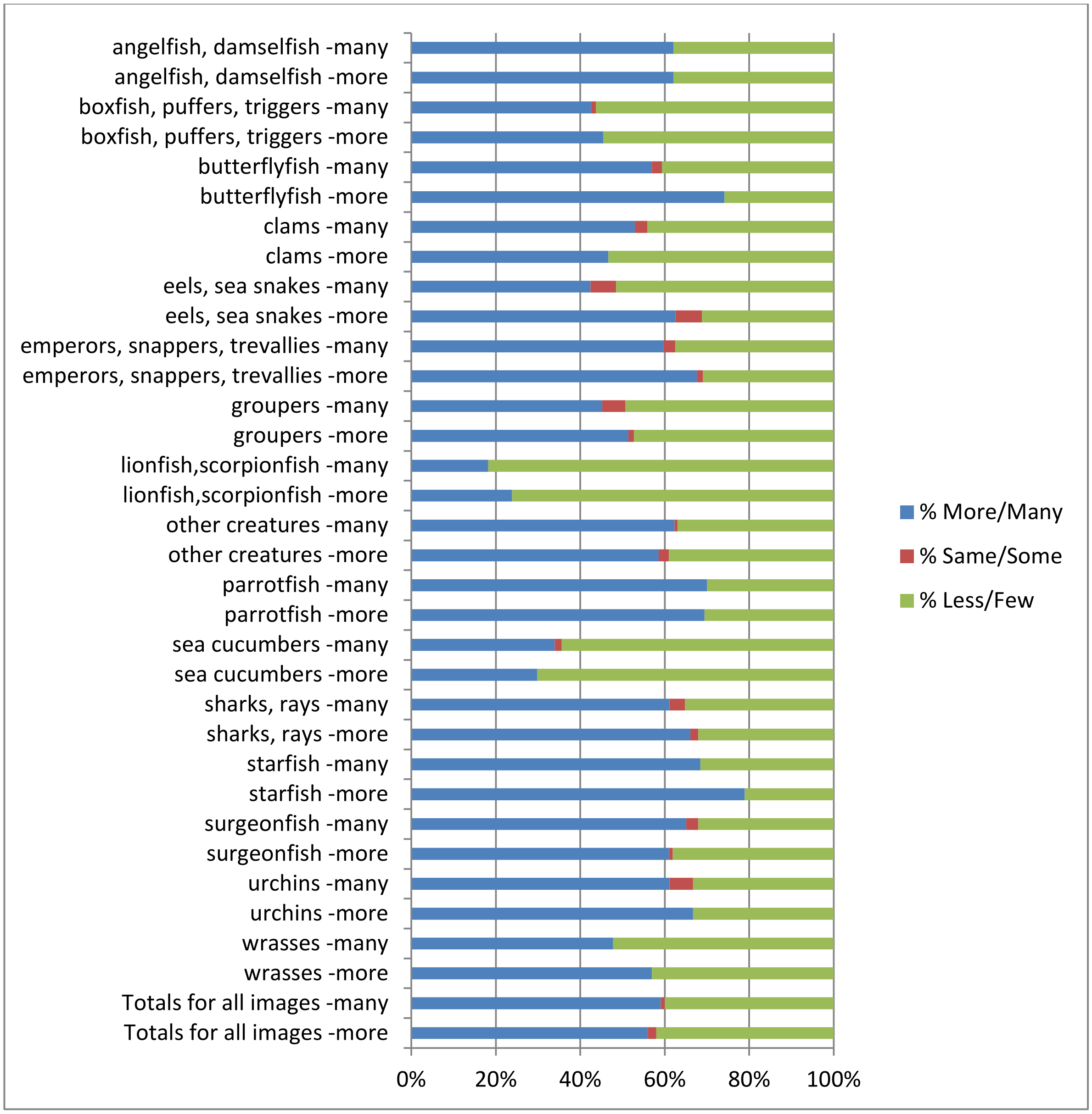


Figure 9 provides a comparison of the category breakdown of the responses to questions 7 and 8. Notable cross-question variations are that butterflyfish are perceived to be plentiful and increasing more rapidly than the average group, and sea cucumbers are few and decreasing. Most thin-bodied butterflyfish have no commercial value, and limited consumption appeal. Sea cucumbers have important commercial value, as was discussed under question 7. For question 7 the standard deviation of answers of 'many' from the average of 56% is 0.14, compared to the wider range in the question 8 responses that produce a standard deviation of 0.16 from the 59% average.

The responses of ‘many’ to question 7 and ‘more’ to question 8 do indicate similar percentages of the answers for many and more, as they do for the alternate answers ‘few’ and ‘less’, with a range of variation between the results of 7 and 8 below 10% in most categories. Overall, 75% of the time the responses to question 7 and 8 of a given person viewing a given image are a match between either many with more or few with less. Further methodological research might determine if this result is shaped by the methods or people’s perceptions. These are important questions for marine resource sustainability managers in Kadavu, where official enforcement of fishing regulations by the island’s two fisheries officers is of limited effectiveness, given the difficult logistics of time and transportation to monitor the many people who go fishing.

In recent years community leaders and NGOs have made much progress in establishing marine protected areas (MPAs) in Kadavu waters (Tawake 2007). The use of MPAs is a proven model for replenishment of marine life into adjoining marine areas, and their use is a key element of developing sustainable fishing practices in coral reef environments. However, people do not always respect these conservation efforts; and sometimes choose to fish in or very near the MPAs, a situation which leads to a ‘tragedy of the commons’ scenario, and undermines sustainable fishing models. Thus, it is important for resource managers to have a clear understanding of the perceptions of marine life stock levels and trends by the people going fishing, such as can be gained by broad survey questions from an impartial observer. If people perceive conservation methods that lead to growth in marine resource populations are an investment in their future, they are more likely to respect the programs.

For example, 51 % of responses to question 8 about all types of grouper fish state that grouper populations are growing. Grouper conservation in the Nakasaleka district has been a focus project of the Conservation of Fish Aggregations (SCRFA) organization for six or seven weeks in each of the three years preceding my research. Their efforts include frequent regular fish counts; and coordinating educational visits with villagers around the district to explain how the spawning cycles work, with an emphasis placed upon the importance of insuring that fishing practices do not disrupt the spawning process. The efforts of SCRFA local education programs are making an impact here (SCRFA 2, 3, and 4). Villagers today have a much higher awareness of grouper spawning habits and behaviours than they do of any other groups of fish, and people state this education program as the source of their knowledge. This is a significant step, given the quite limited knowledge village people have of marine life reproduction in general, as will be discussed under question 9. Of the many Linnaean species of grouper found in the district, the SCRFA team's primary focus is on three species of fish, which are also very desirable catches in Kadavu for consumption or resale. 50% of the responses to question 8 for each of these three types in my survey indicated beliefs that stocks were growing, and 37% of responses classed these types in Question 7 as common or many. Anecdotally, SCRFA team members told me that they believed that stocks of these kinds of fish had been under pressure but were now stabilizing, an observation which is broadly consistent with the perceptions of the villagers.

In the discussions of questions 7 and 8, I have shown that a categorical breakdown as used in Figures 7 to 9 illustrates general trends that can be put to use in evaluating local perceptions. The use of categories in the Figures also highlights consistency levels of the data. Items of interest can then be accessed in the organism-specific responses published in the encyclopaedia (Appendix 1). Thus marine resource managers and educators can compare the results with their own surveys over time and with their own perceptions of population levels. I conclude that these two questions need further adjustments in grammar, context, and survey placement; but are still of value, as the responses are based on the year round observations of men and women of various ages and knowledge levels. The 'unofficial' nature of the type of survey conducted here may also add credence to the results, as people may be more open in their responses in a more casual setting than one involving official government programs.

Chapter 4: Survey questions and responses about the behaviour of marine life (b) reproduction and diet

Question 9) How do they reproduce?

A) ***I ra vakaluveni vakia***?

LT: They have offspring how?

B) ***Era vakaluveni vakacava***?

LT: They have offspring how?

Discussion:

In question 9, the Kadavu pronoun '***I ra***' (they) is followed by the term '***vakaluveni***', which Gatty defines as an adjective (having borne offspring), as distinct from the verb form, written as ***vaka-luveni*** (to have children) (2009). In everyday Nakasaleka speech, I suspect any difference between uses as a verb or adjective is made within the context of the sentence. In question 4, ***vakaluveni*** is used as a verb, as it is in the Standard Fijian usage in question 9, version B. The word ***vakaluveni*** can be broken down into the three parts of ***vaka-luve-ni***. ***Luve*** (offspring) is made into a verb or adjective by using the prefix ***vaka***, and made possessive with the suffix ***ni*** (of).

The related term ***luvena***, a contraction of ***luve-na*** (the child or the offspring), is used to describe the offspring of animals in question 10; and its use is distinct from that of the common term '***gone***' (human children), in that ***luve*** can apply to humans or animals, but the term ***gone***, in Nakasaleka, is not applied to animals, a differentiation discussed under question 2. My interpreters and interviewees were consistent in this distinction, and I have no records of offspring of animals being referred to as '***gone***'. In stories and other contexts, the term ***vakaluveni*** was often abbreviated to '***valuveni***', by using a common Nakasaleka contraction of '***vaka***'. In the Standard Fijian dictionary, Hazlewood supplies ***luve-a*** and ***vaka-luve-a*** as verbs that mean 'to breed, or yield offspring' (1979: 73). The article '***na***' is abbrieviated to '***a***', a common alternate form, quite often used to begin sentences (Hazlewood 1979: G4-6, Gatty 2009: 174). My interpreters always wrote down ***luvena***, with no records of '***luve-a'***; but this term provides a good example of the stress on vowels in Fijian speech, as the strength of the '*n*' sound used between the vowels may vary among speakers.

Question 9 was the least productive question used in this survey in terms of number of responses gathered; as most people have very limited knowledge of how marine life forms reproduce. However, people have gained significant information from marine conservation education initiatives focused on certain kinds, such as grouper spawning aggregation protection by SCRFA and giant clam (*Tridacna* sp.) seeding projects by the Fiji Fisheries Department. Current fisheries management education initiatives for village fishers in Fiji place significant emphasis upon explaining the reproduction and life cycles of marine life. These cycles are featured in a recent collaboration between the Secretariat of the Pacific Community (SPC) and the Fiji Locally-Managed Marine Area Network (FLMMA), in a project which produced a series of information sheets made available online in 2011. These organizations view marine life reproduction education as vital steps in sustainable fisheries programs. To support this initiative, I provided several laminated sets of these sheets for educational use in the Matasawalevu community hall and at the Tiliva primary school. Each of these double sided sheets describes a distinct group of similar fish kinds or invertebrate types, with emphasis on an explanation of reproduction and life cycles, stressing the invisible drifting larval stages as a necessary precursor to understanding recommended fisheries management practices (FLMMA 2011).

The 16 marine life categories profiled in this FLMMA education project cover creatures which disperse eggs that develop as a larval form. This phase lasts one to three months in the case of most fishes, or a few days to a month for many invertebrates, such as crabs, molluscs, and octopus, before the survivors assume a juvenile form. In the early juvenile stages of marine fish and invertebrates, the fry are often still quite tiny; and likely to seek a safe environment in corals or sea-grass beds. Factors which mean that they may not be visible for some time to the human eye and various predators. This reproductive strategy is a key method for marine life to disperse their young, and cross-populate non-contiguous reefs. Given the small size and lengthy development time of the larval and juvenile stages, it is not surprising that fishers have little knowledge of this process.

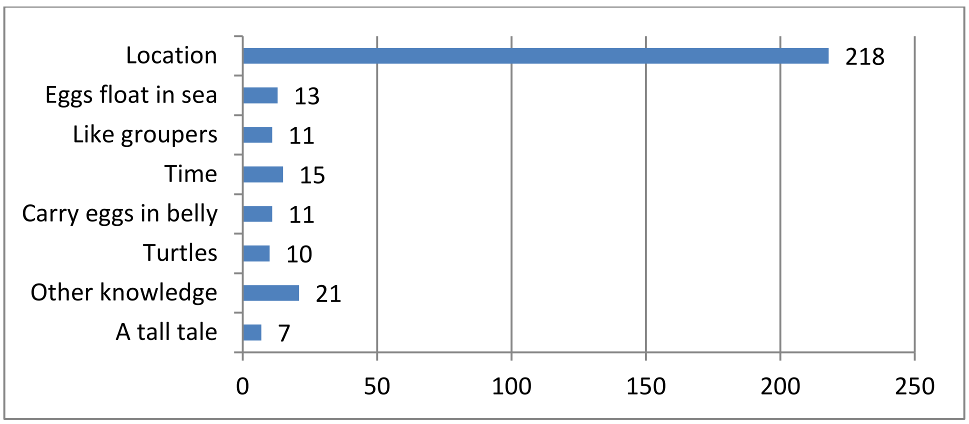
Thus, this issue is significant to planners of marine life conservation initiatives. Simon Foale (2006) argues that, based upon self-interest, animals such as *trochus*, a high commercial value mollusc whose larvae settle to the ocean bottom in three to five days, are more suitable for localized management efforts than are reef lobsters (*Panulirus* sp.). Lobsters are also high demand creatures, but they release larvae to drift in plankton for many months before settling far from their origin (Foale 2006: 134). In short, lobsters breeding in one group's fishing grounds are likely to be populating another group's grounds, while larval *trochus* may stay closer to home and benefit the owners of the host fishing grounds. The obvious question is whether people are motivated to show restraint in fishing from spawning aggregations if they know that the young may end up as mature fish living far away.

NGOs concerned with encouraging marine life conservation and sustainable fishing practices attempt to educate local fishers about the lifecycles of marine creatures as part of developing a conservation ethic. This topic has been approached in Oceania from a range of perspectives, such as ideas championed by R.E. Johannes (1977, 2003) that conservation ethics were embedded within local knowledge, fishing taboos, and marine tenure systems in many Pacific societies. Johannes proposed that this traditional ecological knowledge (TEK), when used in tandem with international scientific knowledge, held the promise of managing sustainable inshore fisheries in Pacific Islands. These ideas of Johannes inspired considerable research into indigenous knowledge and practice in Melanesia (Hviding 1996, Aswani 1997, Calamia 2003), and to some degree has influenced this research project. In contrast, Foale et al. (2011) criticize the notion that Melanesian fishing practices, taboos, and tenure systems contain functional adaptations to manage fisheries, arguing instead that these systems are ways of converting marine resource production surpluses into social prestige and status through food sharing .Thus Foale et al. argue that a “conservation ethic” similar to the Western notion of the term does not underlie historic Melanesian marine tenure systems, and that this is a misconception which leads to unproductive strategies and program development for sustainable fisheries (2011: 362-363). This important debate is explored in detail in chapter 10.

Regardless of the theoretical approach taken, the broader goals of supporting sustainable fishing practices remain the same. Developers and deliverers of such programs need to know what people know about marine life reproduction, and how they come to know about it. Second, these programs require effective follow-up methods to determine what changes in people’s knowledge have occurred as a result of the program. Thus question 9 attempts to address an important topic, but in an awkward fashion.

A total of 306 responses were recorded for question 9; these include other related anecdotes of marine life reproduction that arose during interviews. While this is a significant number of responses, in comparison, it is only 26% of the 1178 responses recorded for question 7 from the same interview group. Question 7 asked if there were many or few of a given organism. A categorization of the responses to question 9 is found in Figure 10. Each response is placed in only one category.

Figure 10 Marine life reproduction responses to question 9 sorted by dominant theme in a response.



217 of the responses referred to a location where the creature was thought to reproduce; but many of these were offhand answers, including 88 which specified ***ni takali*** (in the open sea) and 62 of ***cakau levu*** (main reef). A similar problem of vague answers was encountered with question 6 regarding habitat, a problem which was remedied to a reasonable degree in question 6 responses with requests for more specific answers. In the case of question 9, further questions for specifics were unproductive, as people giving these types of general responses could rarely provide further details. The other 67 location-focused responses to question 9, include 42 simple

answers of habitat zones terms which are listed in Table 4, such as ***yamotu*** (coral patch / brain coral) or ***nukunuku*** (sandy bottom). This response suggests specific knowledge of where reproduction takes place, but not how. The remaining 22 responses addressed certain location-specific behaviours of animals that were associated with reproduction, such as moving from the open sea to the inner lagoon, or coming close to the mangroves to lay eggs. Several people talked about fish kinds that had their babies or 'waited for their time' under coral overhangs or in holes in the reef. The most detailed descriptions of spawning activities may include location information; but I grouped these in Figure 10 under the Other Knowledge heading, in contrast to the short answers of location terms placed in the location category.

The 13 responses in the category of 'Eggs float in sea' refer to the dispersion of tiny eggs into the sea to float for various time periods before settling somewhere to grow bigger. These responses include nine explanations for fish, five of clams, and one of sea cucumbers. People do not seem to have any conception of a larval stage, or use terms that describe an intermediate phase between eggs and fish or other larval stage marine creatures. Most of these responses were drawn from knowledge gained at education workshops held by the Fisheries Department. One older man, whom I will call David, had completed a one week Fisheries course some years ago; and drew upon this education to give 10 of the 13 responses of this sort, such as "these fish usually go into the open sea to lay their eggs and the eggs float until the egg hatches. The baby fish will stay wherever it hatches." This man also described how clams disperse their eggs into the sea in a rush of water expelled from their shells, an explanation given by four other people. David gave a similar description of rapid egg expulsion to describe sea cucumber spawning practices.

The 11 explanations of grouper spawning are similar to those grouped under 'Eggs float in sea', in Figure 10, but with a few more details that reflect the SCRFA education programs noted earlier in this chapter. Eight different interviewees contributed responses of this sort, including two responses from David. The SCRFA program is having some success.

15 responses to question 9 were focused on matters of time, most often the months or moon cycles when fish were either seen to be filled with eggs, or found in large groups, a topic upon which follow-up questions 9.1 - 9.3 focus. One person associated the spawning time of a type of ***kawakawa*** or grouper fish (*Epinephalus caeruleopunctatus*) with the leaves of the ***tavala*** tree turning brown. The ***tavala*** tree is common on the shores near villages, and its edible nuts are a food source for villagers.

The 11 responses categorized under 'carry eggs in belly' were a range of references of this sort using the terms ***kete*** or the Standard Fijian ***kete-na*** (belly) that can also mean womb (Gatty 2009). These terms are applied to both humans and animals. For example, ***ketedromo*** is the name of a yellow bellied riverine fish (Eliotridae) and a common bird (*Pachycephala pectoralis*) in Fiji (Gatty 2009). A swollen belly or eggs found inside a fish is the sign of marine life reproduction most evident to people as they observe a fish in the sea, or clean and eat their catch. Many kinds of fish eggs are considered good eating in the villages.

Three kinds of ***ika bula*** (sea turtles) frequent Fijian seas. No other turtles or tortoises are endemic to Fiji. ***Ika dina*** (*Chelonia mydas*; green sea turtles) and ***taku*** (*Eretmochelys imbricata*; hawksbill turtles) are common to see in local waters, and come ashore to lay eggs on Nakasaleka beaches in December and January. I have not seen any leatherback turtles (*Dermchelys coriacea*) in Kadavu water, although they are found in Fiji. ***Tu vonu*** (*Carretta caretta*; loggerhead turtles) are less common, and do not breed in Fiji (Ryan 2000: 183). Most of the 10 responses to question 9 about turtle reproduction were quite detailed, as until recently in Kadavu, turtles were consumed as chiefly food, and turtle eggs were eaten as a delicacy. Recent laws and stiff penalties introduced in 2010 have curtailed turtle fishing (Nasome 2012), which in times past was a ritualized procedure, as described by Wallace Deane (1921: 175-181). The Nakasaleka stories about turtle reproduction describe the 'mothers' coming out of the sea to dig a pit on the beach in which to deposit their eggs, before returning to the sea to wait nearby for a week or more to allow the babies to hatch out and make their way to the sea. Some people described how turtles dig and fill false holes; in the past, people found the active nests by poking a stick in the sand to look for egg yolk on the withdrawn stick. One person stated that the 'mother' came back in a week to dig out the babies. It is well known in international science that sea turtles will come ashore to lay eggs more than once in a breeding season.

A quite consistent report in question 9 responses was of 'mother turtles' waiting in the surf when their babies hatch, and eating any of their babies that come near to them during the dash of the hatchlings to the sea. One person thought that the 'fathers' were the ones to eat the hatchlings that came close to them in the surf. I understood people's conceptualization of this story as a sort of survival of the fittest lesson; you are on your own, little turtle! To me, this story seems a bit odd coming from Fijians who place so much focus on supporting family, and who automatically kiss any baby within reach. However, a reputable source does confirm this report as "a popular South Pacific legend" with no basis in fact, not least because adult green sea turtles are vegetarians

(NOAA). A similar legend is also told in Sri Lanka about olive ridley turtles (*Lepidochelys olivacea*) eating their young, according to an experienced turtle protection officer. This man has seen many turtles breeding, but has never seen or heard reliable evidence of this story (Thrushan Kapurusinghe: personal communication, December 20, 2011). Nevertheless, my friends in Nakasaleka are quite clear on the truth of this infanticide practice by adult turtles.

Responses about turtles to question 9 often led to longer stories. Several people spoke of how sea turtles cry when you come near to them on land, and in fact some people call them ***ika tamata*** (man fish) when they are on land. Nakasaleka people equated the crying to the stress of females being threatened while laying eggs, or to the pain of being flipped on their backs and perhaps cut up for food while alive. A few people thought that it was good that killing turtles was banned now, as the crying response made turtles too similar to humans to eat. According to the Georgia Sea Turtle Center website, 'turtle tears' are an ongoing process that expels excess salt from their bodies from a gland behind the eye. Wallace Deane heard the name ***ika tamata*** in Kadavu in the early 20th century, and speculated that the name was given because turtles breathe air or bleed like humans (1921: 176). I question this idea because the same might be said for dolphins and whales, which do not attract such a name in Kadavu.

In summary, it is clear from the depth of information gathered on turtles from question 9, that people do pay considerable attention to the reproduction of creatures when processes are readily observed; and that question 9 can be productive in certain circumstances.

Five of the 21 responses grouped in Figure 10 under 'other knowledge' describe specific behaviours of procreation, such as ***dri*** (sea cucumbers) rubbing against each other, ***lokoloko ni qio*** (starfish) joining to reproduce, and pairs of ***ulavi*** (parrotfish) or ***nuqa tabanicau*** (rabbitfish) chasing each other. These responses include a detailed description of the sand-pit nest building and defensive behaviours of the ***qau*** or titan triggerfish (*Balistoides viridescens*), described previously under question 5. Three of the responses in this category involved fish placing their eggs in safe places. Four responses addressed sharks releasing their live young, known as ***bulabula***, well inside the reef or near the mangroves. The term ***bulabula*** is also used in greetings to reference a person's good health, and may describe fertile land in other contexts (Gatty 2009). One person advised us that pregnant sharks have short tempers and should be avoided. Three observations addressed the small wormlike object, which people think is a baby, found inside the sea cucumber types known as ***loli ni cakau*** (*Holothuria edulis*) and ***vula ni cakau*** (*Bohadschia argus*). The wormlike object may be a pearlfish of the Carapidae family (Simon Foale: personal communication 05.27.13), but was not described as a fish by interviewees.

The final category of responses to question 9 is a tall tale, illustrating a longstanding tradition of entertaining guests in Fijian villages and elsewhere in the South Pacific, a practice famously debated in the case of Margaret Mead's early work in Samoa. Late one evening, I listened to a woman, who I will call Eleni, slowly invent a fish breeding story with several changes, when it seemed to Eleni that as an experienced fisher, she ought to be able to answer question 9. Once the story was developed, it was quickly applied by Eleni to almost any kind of fish being discussed, whereas earlier questions for similar kinds had yielded no answers at all. A number of tall tales emerged during the course of this research; and we attempted to either eliminate them from the encyclopaedia (Gordon 2012), or present them by specifying the context of 'some people believe that…', such as the story of adult turtles eating their young. Several of my interpreters and editors were very helpful in this regard, as some villagers have well known reputations for creative storytelling. In some cases people who were drinking ***yaqona*** during interviews seemed to be more creative than at other more sober occasions. As editors, we often trod a fine line between recording cultural knowledge and providing an educational tool that is helpful in future decision making to support sustainable fishing practices.

Eleni's story was not included in the encyclopaedia; but I include it here as one of the more creative efforts I encountered, which also seemed to become very real for Eleni very quickly. The story was told first in English in response to question 9) '***Era vakaluveni vakacava***?' in regard to a picture of ***jila*** (*Acanthurus olivaceus*), a common surgeonfish kind. Completing this version of the story took a minute or two while Eleni slowly settled on the first part, and then thought some more before adding the second part. "These fish open their mouths so that eggs can come out. The eggs float around so that some fish that do not have any eggs can swallow them, so that they can have eggs too." This story is not without meaning, but it is included here to demonstrate the generosity of Fijian hospitality that leads people to practice creative avoidance of disappointments for their guests.

A few weeks into the 10 week primary interview period for this research, I was chatting with one of the interpreters about how to make question 9 more useful; and we decided to ask people what they knew about the topic of what and when creatures carried or laid eggs. The first night we tried these additional questions out with a middle aged man and woman, who are experienced and knowledgeable fishers and very thoughtful people. These people were having trouble remembering which months certain fishes were found to be carrying eggs. This quiet man, who I will call Apo, looked up at me and said "We should know this. We should have notebooks and write down when we see different kinds of fish with eggs. We know that they get eggs, but we do not think about when they get them." Following up on this suggestion, upon my first departure from this village I gave a notebook to one of Apo's nephews who fishes frequently and has aspirations of studying marine science at college. Apo's nephew kept careful records of which fish kinds that he observed to be with or without eggs, and the dates and moon cycles when they were caught and examined. When I returned three months later, there were many pages of records, data which are now in the encyclopaedia. This information is also kept as part of a growing collection of marine life related books, charts, and other educational materials which we are assembling in the village community hall. This local research is important, given that knowing when different kinds of fish spawn and when to ease up on fishing for them is such a key concept in adopting sustainable fishing practices.

Questions 9.1, 9.2, 9.3) Are eggs seen?, in what months?, when they are gone?

Question 9.1) Do you see eggs inside these fish? a) yes b) no.

A) ***Sa bau gaca mada na yaloka i loma ni ika***? a) ***io***, b) ***mino***?
LT: Ever see, please, the eggs inside this fish? a) yes, b) no

Question 9.2) What month(s) do you see eggs inside?

A) ***Na vula yava ra dau gaca kena yaloka***?

LT: What month(s) do you see their eggs?

B) ***Na vula yava i dau vayaloka ke***?

LT: What month(s) would there be eggs?

Question 9.3) What month do you not see eggs? When are they gone?

A) ***Na vula sa mino na yaloka***?

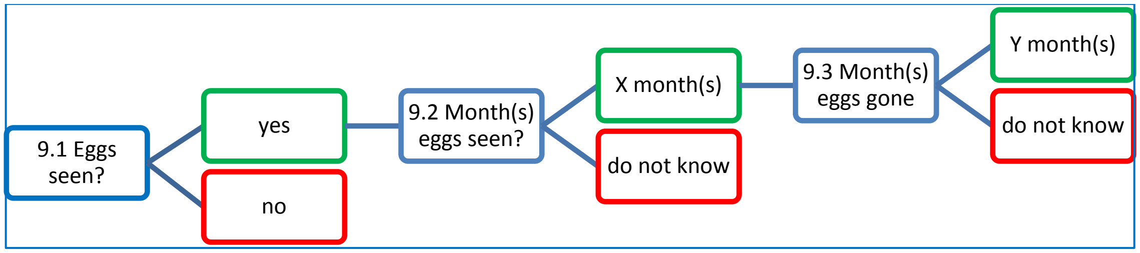
LT: The month there are no eggs?

Discussion

The language used in Questions 9.1 – 9.3 is Nakasaleka dialect, as these questions were developed later in the research period. The change in question 9.2 from version B to A was made for added clarity, and to encourage people to think about any observations made when cleaning or eating fish. Questions 9.1 to 9.3 were asked in regards to invertebrates as well, with a replacement of the term '***ika***' (swimming animal), when appropriate, such as ***sasalu*** (non-swimming sea creatures) to refer to sea cucumbers and other non-swimming animals.

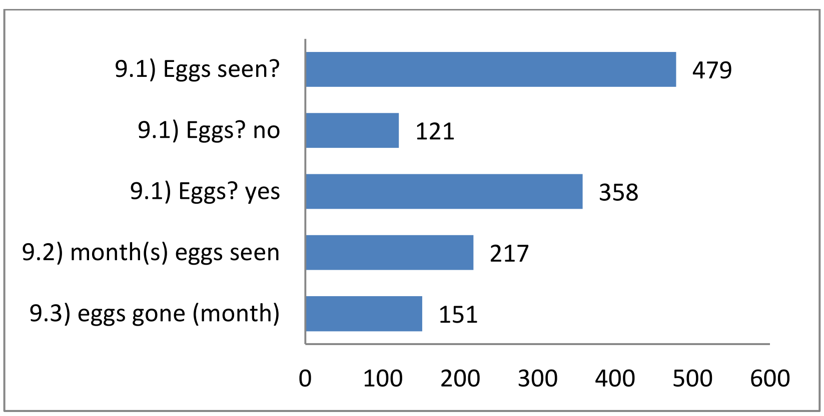
Questions 9.1 to 9.3 were designed to be used sequentially, with a positive response leading to the next question and a negative response closing the topic to avoid making the interview longer than necessary. Thus, as shown in Figure 11 below, if someone remembers seeing eggs in a certain kind of animal in 9.1, they might remember when they saw them to be able to answer 9.2, in which case they may remember the month when the eggs are no longer seen in answer to 9.3.

Figure 11 Question sequence for 9.1, 9.2, and 9.3.



These connecting questions on smaller topics that seek to identify the timing of the spawning cycle of the animal in question help people work through what they know to reach the answer. This suggestion process was productive, and at times even led back to some of the detailed responses recorded to question 9, but not elicited by question 9 itself. A summary of the responses to questions 9.1 to 9.3 are shown in Figure 12.

Figure 12 Question 9.1, 9.2, 9.3: Responses regarding the presence or absence of eggs



479 people responded to question 9.1, which was introduced well into the primary interviewing stage, and asked in about two thirds of the interviews. This number is substantially more than the 306 responses to question 9, on reproduction, which was given to many more people. Thus, using a more specific question that people can answer more confidently is more productive. The 358 positive responses to question 9.1 led to the more detailed knowledge of when the eggs are seen in response to question 9.2 on 217 occasions. People were then able to identify when the eggs were

gone in 151 of these cases, thus providing a bracket estimate of a few weeks for the spawning period of the given animal. This is the type of traditional ecological knowledge (TEK) that R. E. Johannes (1990: 39) was insisting should be learned from local people and integrated with international science knowledge to build sustainable fishing management practices.

From what I have been told in Kadavu, spawning aggregations for many kinds of fish vary somewhat from year-to-year with seasonal change, lunar periodicity, ocean currents, winds, and other events. These variations in the spawning cycles of Pacific marine life were pointed out long ago by Johannes (1978: 70-72) in making the point that a TEK expert has been taught to observe the interplay of these factors over many seasons, and can make accurate estimations of when and where to fish for what. A simple example of this point was mentioned earlier under the question 9 responses, by the man who predicted the spawning season of a kind of fish by observing when the leaves fell off the ***tavala*** trees near the shore. ***Tavala*** is likely *Terminalia catappa*. Many people around the world watch deciduous leaves turn brown and fall off trees, but this man builds ecological connections between specific events to develop TEK expertise.

In early 2011, the chief of a Nakasaleka village had died after a long and vital life. I stayed in this village a few months later. I was told by a man considered to be one of the best fishermen in the village, at least by his own account, that this chief was sorely missed. The chief had consistently provided very reliable advice to villagers on their fishing plans, based upon a well-respected knowledge of the tides, winds, best times to fish, and spiritual matters associated with fishing. Fishing trips consume expensive fuel; and too many trips with poor catches are a serious economic problem for fishers, as I observed on several occasions. The guidance of a TEK expert is of great value to many people.

Spawning cycles and aggregations of different kinds of Pacific reef fish occur at different times of the year. More knowledgeable people described this phenomenon as an annual sequential cycle observable in certain locations in which, as one experienced fisherman told me, first the ***donu*** (*Plectropomus laevis*) come, then the ***kawakawa*** (*Epinephelus polyphekadion*), followed by the ***kake*** (*Lutjanus* sp.), the ***seravua*** (*Epinephalus fuscoguttatus*), and finally the ***ta*** (*Naso* sp.). A sequential memorization method of predicting fish behaviours can be interwoven with observations of ecological connections to keep track of the many different kinds of marine life. Fijians also told me that aggregations of the same kind of fish may occur in different regions at different times.

In Marovo Lagoon of the Solomon Islands, Johannes and Hviding (2000) recorded 16 different names and meanings of various kinds of fish aggregations, a corpus which they claim represents a more diverse set of terms than those of international biologists. Only a few of these terms describe behaviour connected with spawning activities by the authors and a few expert fishers; but only one of the terms, *sae*, is specifically stated as just applying to a spawning behaviour. Rather, these other terms for aggregations describe a range of behaviours which local fishers relate to fish that are: feeding, in groups on the move, hunting other fish, or being hunted by other marine creatures or seabirds. Thus, aggregation terms in Marovo are not focused on the spawning behaviours that international science marine conservation programs focus upon.

The goal of the Conservation of Fish Aggregations (SCRFA) organization is "to promote responsible stewardship of reef fish spawning aggregations" (SCRFA 1), not the wide range of fish aggregations on coral reefs. This difference illustrates a fundamental variation between how many Melanesian fishers think about large groups of fish, and the focus of international scientists interested in conservation. In my research, I fell into the trap of placing a primary focus on spawning behaviours, rather than starting with more salient behaviours and working towards possible knowledge of spawning activities embedded in other observations. Thus, I would recommend asking people more questions about aggregations first, perhaps as a follow up to question 5, which asked 'how do these fish go about?' When people respond with an answer of 'in groups of 10 or more', a question about what the group is called might be productive, and this inquiry would provide a good segue into question 9.1 to 9.3 regarding the presence of eggs, before asking more detailed questions about reproduction.

However, it should be noted that people in different Marovo villages sometimes use different names for the same aggregation type or the same names for different aggregation types, indicating the use of localized and quite varied terminology. Examples of these aggregation types range from quiet motionless groups of fish referred to as '***sakoto***', a term used for a human mortuary feast to '***umoro***', a term that describes predatory fish, such as tuna, herding baitfish, an event which often attracts seabirds. Johannes and Hviding (2000) follow up this review with a summary of recorded Marovo knowledge of 20 different kinds or groups of fish that aggregate in a predictable fashion, thus demonstrating the diversity and depth of the knowledge required to be an expert in these matters. Further mention is made of the similar in-depth knowledge of Morovo women on cycles of shellfish availability. Thus, if the goal is to facilitate the condensation of TEK into an encyclopaedia, or to educate people about protecting spawning, the names for the different aggregations may be important to know for conservation program developers. The terms provide a pathway to help people elucidate their knowledge. It is critical to communicate when an aggregation is associated with reproduction, or when it is time to have a good fishing harvest and enjoy a tasty meal.

Clearly everyone in a village cannot be a TEK expert. Some older people, who were experts in their younger days when they fished everyday using underwater methods such as spear-diving, may now go fishing only once or twice a week using hand-lines from a boat or the shore. At times, older people speak uncertainly of unstable modern environmental conditions that some relate to climate change, a very real observable fact in Kadavu where sea levels are rising and threaten the future of low-lying villages. The TEK of today's elders may thus be dated and less reliable. Old and young fishers alike told me that old people know more about fish because their elders learned to fish with hand-spears rather than modern spear-guns. Newer weapons allow divers to make kill shots from much greater distances, and hence require less in-depth knowledge to anticipate fish behaviour. Environments always change, and TEK experts consolidate historical and current observations. It is not clear whether elders rely upon current in-depth knowledge from young and active underwater fishers, who today lack the ability or interest to provide it in detail. Whether the trope of disconnect between modern times and old ways is a new one, or an established notion that has been in play for centuries is not the point here. What is relevant is that in Nakasaleka some people are concerned about the future, and seek to learn ways to ensure sustainable resources.

For this reason, the facilitation of ways for people to organize their historical ecological knowledge collectively, integrated with current conditions, such as we began to facilitate by the use of questions 9.1 to 9.3, is of practical value. This knowledge is important to support sustainable fishing practices, as fish aggregations are the most efficient times to fish for maximum yield, but pre-spawning harvests of fish will have negative long term consequences for stocks. The current survey questions address only the presence of eggs, but these results show them to be useful links in a chain of questions about the behaviours of creatures. Certain responses of active fishers might be separated from those of less active fishers to identify change, although in the case of observations of egg presence, anyone cleaning or eating fish can notice fish eggs. Building upon questions about the months when eggs are seen, one could ask about where and in what groups these fish are seen, either when they are filled with eggs or before and after this time. The sequential approach of questions 9.1 to 9.3 was productive, and people might best remember fish behaviours in a seasonal or sequential fashion, such as the man describing a series of spawning aggregations, who was mentioned earlier. For example a useful question sequence might be:

1. How do these fish go about? (group size) A) one B) two C) three to nine D) 10+.
2. (Ask if question 1 answer is D) What do you call them when they are in a large group?
3. Do you see eggs inside these fish? Only when they are in the large group or other times and places? Please describe.
4. In what months do you see eggs inside these fish?
5. Where are these fish found in these months?
6. When did you last see them or catch them in these months?

7. Do they form large groups sometimes? Please describe the membership and size of the groups?
8. Are they feeding at these months?
9. Are they easy to catch in these months? In the daytime or nighttime?
10. How do you catch them in these months?
11. Are other creatures eating them in these months?
12. Do other creatures come to the spot where you see them in groups before or after them?
13. Do these other creatures have eggs inside? *Continue question cycle from 1 for any new creature.*

The above proposed question sequence uses elements from the current research in a more connected fashion, to improve productivity and address a key weakness of the current survey. The questions that we asked were posed in a general context without attention to seasonal changes, which may affect group size, habitat, salience, and perceptions of plenty or scarcity; population trends; what they eat; and the best ways to catch, cook, and eat them. For example, an old woman told me that when ***balagi*** (*Acanthurus blochii*) are filled with eggs, the flesh will be hard; and you must boil it in salt water first for three minutes to soften the flesh. More TEK of this sort may have been available, but not encouraged. Our questions about group size often received multiple answers, as discussed under question 5 in Chapter 3. The proposed approach might associate a specific group size with a season or location.

This more fine-grained approach offers tools to address some of the information gathering inadequacies highlighted by Johannes in a 1994 critique of fisheries management programs by well-meaning outsiders, in projects which give lip service to the value of TEK without gathering or using it in effective ways. In particular, Johannes was against the use of broadly administered questionnaires (1994: 169-170). Furthermore, in later years Johannes (2003) wrote of problems associated with the idealization of TEK for political purposes by indigenous people, environmental activists, and social scientists, through ignoring both the potential selectiveness of data and the presence of environmental maladaptations in practices of non-Western cultures (Johannes 2003: 120-121). However, I argue that a well-designed series of questions using a modified form of what H. Russell Bernard calls landmark events (Bernard 2011: 185 from Loftus and Marburger 1983) to improve accuracy is a productive way to gather information in that it can be compared, evaluated, and given back to the participants as a community project. These authors recommend the use of landmark events for life history and past event recollections in order to prevent forward telescoping when people think something happened more recently than it actually occurred, but there are parallels in methods and goals with the current research.

In the current research domain, the question sequence uses the presence of eggs, where the egg-bearing fish are seen, and what is going on when they are there as landmarks. These landmarks attempt to focus the interviewee's memories on events involving the kind of fish under discussion, as distinct from those involving any of several hundred other kinds of fish in the sea. In fact, a question sequence of this sort, if appropriately administered, acts as a buffer against data selectiveness and idealization of TEK by exposing inaccuracies through comparisons. More structured results may also highlight bias towards overvaluing responses, such as when interpreters are relatives or friends of interviewees, or when interviewers are over-empathetic to hosts.

Question 10) Where do the young ones live? See list of options (Figure 9).

A) ***Ra bula i ya na luvena***?

   LT: The offspring, they live?

B) ***Era bula e vei na luvena***?

   LT: The offspring, they live where?

C) ***E ra dau bula tu e a na luvena***?

   LT: The offspring of this one live where?

D) ***E bula vakacava na luvena***?

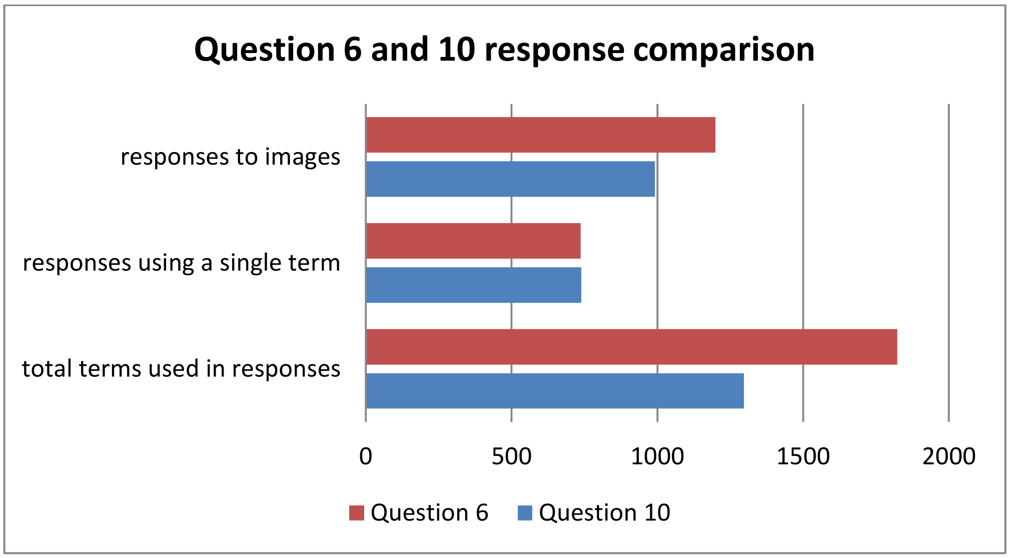
   LT: The offspring live how?

Discussion:

Version D of question 10 was used briefly before switching to using versions C and then B, based on differing advice of interpreters and school teachers. In version C, the word ***tu*** indicates a state of being in this context (Gatty 2009). Version A was put into use about one third of the way through the primary interviewing in order to better phrase the question in Nakasaleka speech, which is less formal in this example than the Standard Fijian of versions B or C. In version A, '***vei***' (where) is implied rather than spoken. The vowel in front of '***ra***' (they) is not written, although a good ear might still hear a trace of it.

Question 10 drew 992 responses from the interviewees about where the young ones live, contrasted with 1199 responses to the more general question 6 about where the fish live, as compared in Figure 13. During the interviews, the table of terms shown in Table 4 under question 6 was also used with question 10 for interpreters and interviewees to reference. Figure 13 also shows that most people responded to questions 6 and 10 with a single word term. This response occurred 739 and 737 times respectively for questions 6 and 10. Single term responses were recorded 74% of the time for question 10, but only 62% of the time for question 6. The third comparison in Figure 13 shows that in total, 1832 terms were recorded for question 6. This number is 29% more than the 1297 total terms gathered from Figure 13.

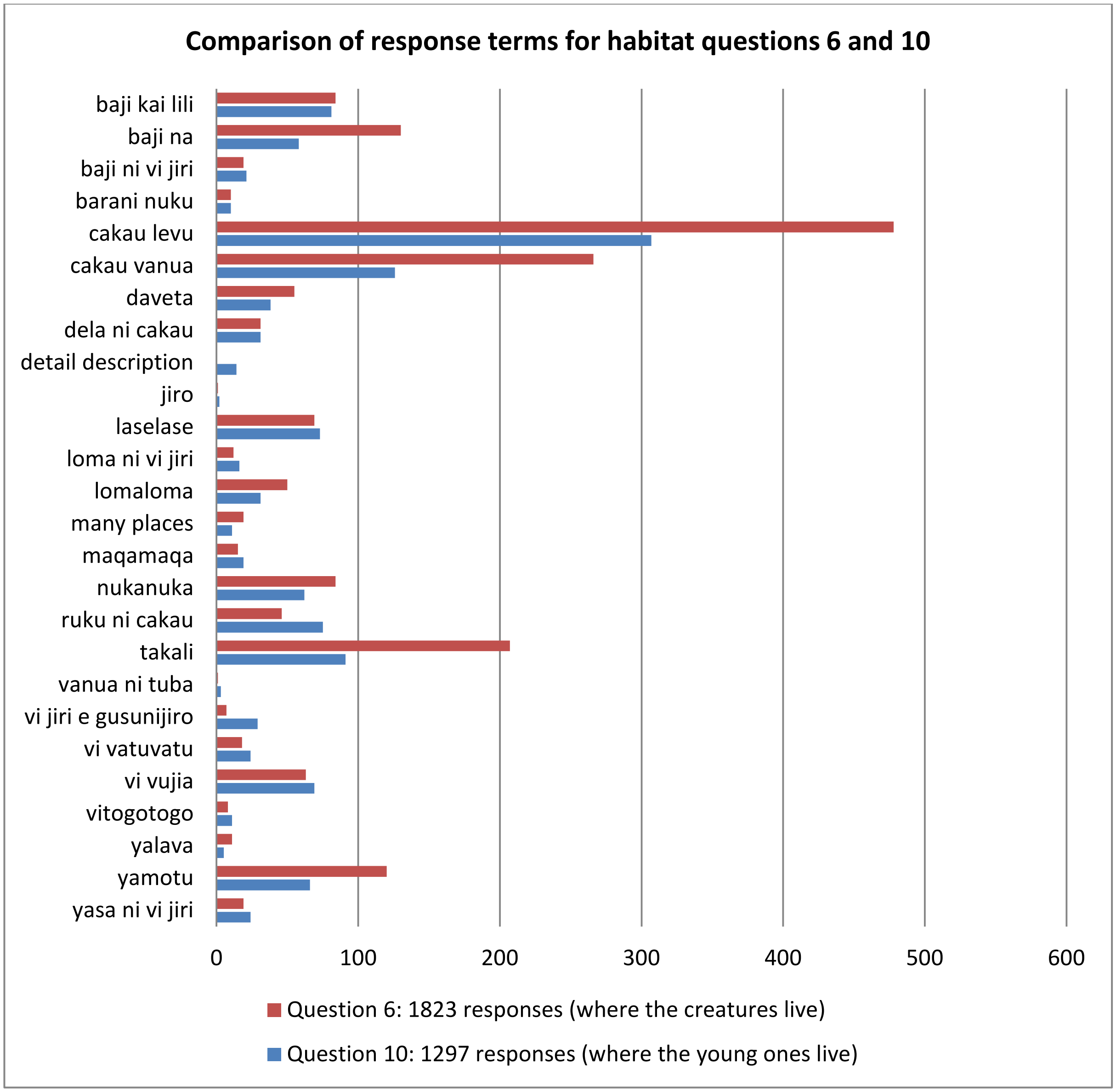
Figure 13 Comparison of question 6 and 10 responses



Both of these questions showed good response rates, as compared to results from other questions used in the survey. Given many people's uncertainty about reproductive practices, it is not surprising that there are 17% fewer responses to the question of where the young ones live than to the more general habitat questions. Worthy of note is that almost the same number of single term answers were recorded for each question, as the higher percentage for question 10 could reflect a more detailed knowledge depending upon how specific the habitat described by the single terms. The greater number of total terms recorded for the more general question 6 also shows that further investigation and comparison of the actual terms recorded is worthwhile, as shown below in Figure 13 and Figure 14. The habitat terms used in these figures are the same terms provided and translated under question 6 earlier, with the addition of the terms:

barani nuku (sandy shore), ***vanua ni tuba*** (deep in the reef), ***vi jiri e gusunijiro*** (estuarine mangrove), and ***yasa ni vei jiri*** (side of the river). These four terms describe places where small fish can be seen living or feeding.

Figure 14 Comparison of response terms to habitat questions 6 and 10



In reading Figure 14, it is important to note that the total number of terms from question 6 is 29% greater than the terms gathered from question 10. Rather than presenting term response totals for each question as a percentage of the whole, I stayed with the raw numbers in order to illustrate the specificity of people's knowledge of where the little ones grow up. The category of 'many places' reflects responses in which people chose five or more terms for a single creature. This response occurred 19 times for question 6 and only 11 times for question 10. In general, Figure 19 shows a trend of proportionately more specific habitat terms being applied in the question 10 responses, than in question 6 responses. These include 14 quite detailed descriptions, such as in holes, under the coral / reef / rocks, and with or beside the big ones (adults). Table 7 gives examples of key specific habitat terms notable in Figure 14.

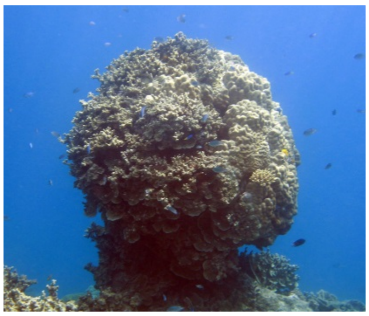
Table 7 Habitat terms of more specificity

Nakasaleka	English translation
baji kai lili	outer edge of reef
baji ni vi jiri	edge of mangrove
dela ni cakau	top of main reef
laselase	branch coral
loma ni vi jiri	inside of mangrove
maqamaqa	mudflats
ruku ni cakau	inner edge of reef
vi jiri e gusunijiro	estuarine mangrove
vi vatuvatu	rocky shore
vi vujia	sea-grass area
yasa ni vei jiri	side of the river

While 29% more response terms were recorded for question 6, the majority of the differences between the responses to question 6 and 10 are comprised of general terms such as ***baji na*** (the edge), ***cakau levu*** (main reef), ***cakau vanua*** (inshore reef), and ***takali*** (open sea). The term ***yamotu*** (coral patch / brain coral) can be general or specific depending upon its context of use. A ***yamotu*** includes any sort of rock or coral outcrop in the lagoon, as in Plate 17.1; and any small and short patch of corals growing in a sandy area. A ***yamotu*** is also a brain coral, which are certain coral types of family Faviidae, as in Plate 17.2. Some may host certain kinds of organisms, such as the parasite cleaning station shown in Plate 17.3, which are often associated with this type of coral formation. This ***yamotu*** example illustrates the difficulty of determining just how specific an answer is being given.

Plate 17 *Yamotu*: a multi-purpose term and concept

17.1 rock and coral outcrop



17.2 coral formation: Family Faviidae

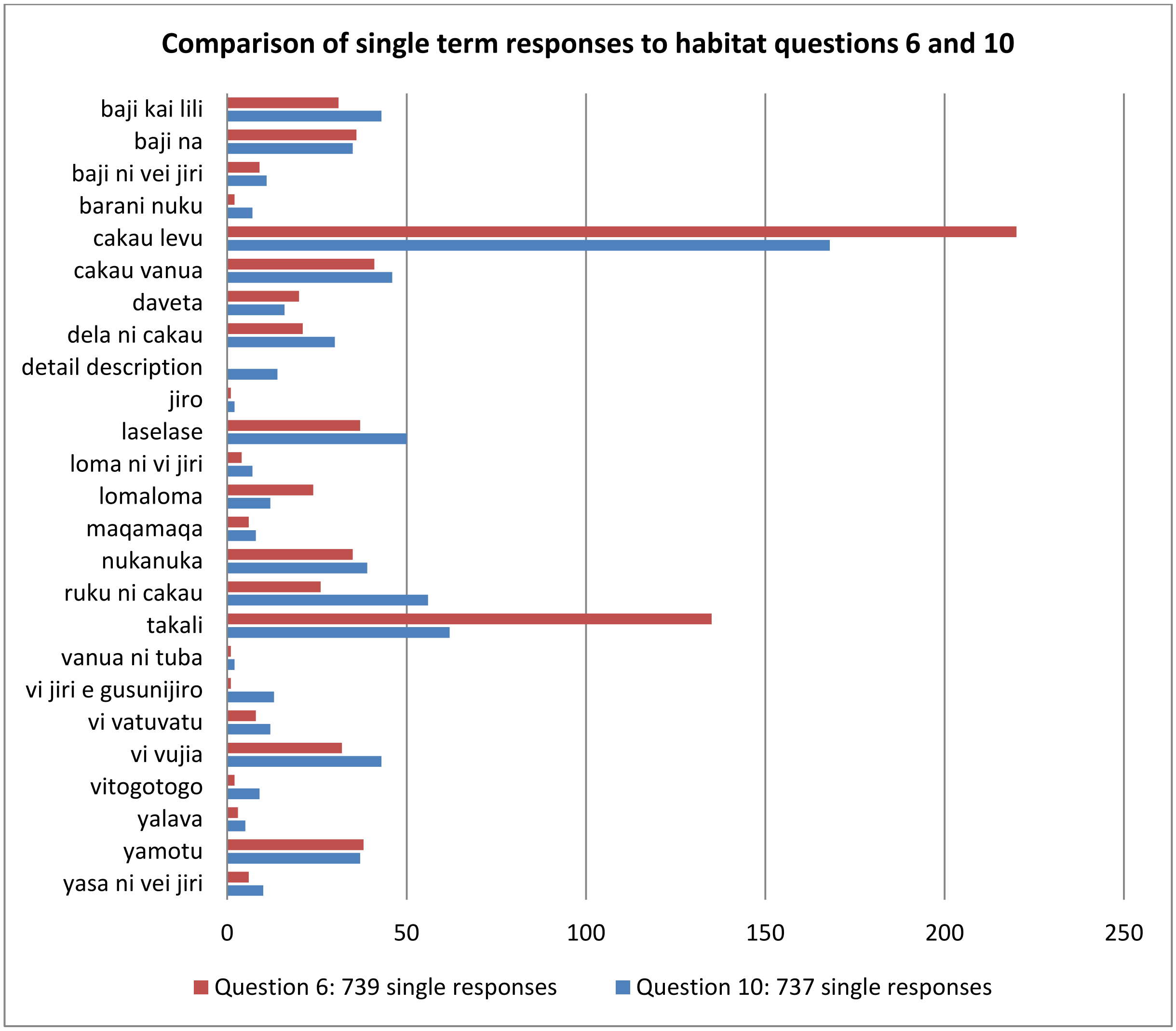
yamotu

17.3 Faviidae coral base for *Labroide*s sp. cleaner wrasse station

However, I argue that comparing the results from questions 6 and 10 demonstrates that, while people's knowledge of marine life reproduction and embryonic life phases may be limited by the difficulty in observing these processes, people do have in-depth knowledge of where many of the young creatures live and grow up. The Figure 15 data supports this notion in a comparison of the responses recorded when people gave only one term per question to answer questions 6 or 10. The almost equal number of occurrences of single term responses between the questions provides a close comparison model. Many of the more specific terms listed in

Figure 15 are used more often as single answers to question 10 than for 6, and interestingly the discrepancy in the totals for ***yamotu*** disappears.

Figure 15 Comparison of single term responses to habitat questions 6 and 10



These data support the interpretation that a broad section of the villagers have good knowledge of the early life stages of many forms of marine life, based upon the interviewees' consistent ability to provide details of where the young ones can be found. This observation suggests that other questions in future surveys about the early life stages of these creatures may demonstrate further knowledge, if this is of interest. However, one could argue that the greater number of broad habitat terms applied more frequently in question 6 responses reflects the increased mobility of the adult creatures across more ecological zones. Thus, these broad answers to question 6 may reflect the difficulty of defining finite habitats for creatures whose environment is in a constant state of flux with frequent variations of tides, currents, seasons, el niño / la niña, and other weather patterns. Understanding the regular and irregular movements and behaviour of marine life is what makes fishing a challenging business. However, small creatures in a big ocean often need to stay in small safe places, so in that case their habitat may be more specific by definition during their early growth stages. Another variable is that the salience of younger fish for humans may increase in the case of small fish that serve as '***baca***' (fishing bait), or if the young fish attract larger predatory fish that people want to catch.

In an earlier discussion of the other terms used for the habitat zones listed in Table 4, I raised some of the issues associated with the use of the concept of habitat in this context, as the concept does not translate very well. It should be noted here that the term ***yalava*** (customary fishing grounds), as discussed under question 6, was also recorded five times with question 10 from the same five people who used it for a question 6 response, but in reference to different creatures for question 10. All five responses were single term responses for a given image; no other habitat or location term was received from these people for the given image.

Two people used ***yalava*** for ***draunikura***, the under 70 centimetre juvenile phase of ***varivoce*** (*Cheilinus undulatus*), the humphead wrasse, which can reach 229 centimetres in length and a significant weight (Allen et al. 2003). This is a valued and respected fish for Nakasaleka people. On a number of scuba dives in Nakasaleka waters, the slow steady gaze of large specimens has given to me an impression of significant intelligence. Plate 18 shows a specimen of about 120 centimetres in length. However, it is interesting that the interviewees used ***draunikura***, the name of the younger phase.

Plate 18 *Varivoce* (*Cheilinus undulatus*; humphead wrasse) A young one-rope specimen.

This response may be because large ***varivoce*** have been very rare for years. The 70 centimetre division between growth phases was an arbitrary size division agreed upon by several expert fishers. In interviews, other people made their own distinctions, and the fish in Plate 18 attracted both names. International scientists class the Plate 18 fish as an intermediate phase (IP) and the specimen in Plate 19 as a juvenile phase (JP) (Allen et al. 2003). A mature adult has a larger hump and a more solid green colour.

Plate 19 *Draunikura* (*Cheilinus undulatus*) juvenile phase at 25 centimetres.

The following is the translation of the excerpt on ***draunikura*** / ***varivoce*** in the Nakasaleka encyclopaedia, which is consolidated from multiple interviews.

> *"**Draunikura*** that grow past 70 cm become ***varivoce***. It is illegal now to kill ***varivoce***, and the population is growing. In the past, these big slow-moving fish were easy to spear. One rope-like bump grows on top of the head as they mature. Two ropes is a well-grown fish and three ropes is full grown. Our fathers

used to catch them with two and three ropes, but no more. ***Varivoce*** breeds in passages after the time of the ***kawakawa***" (Gordon 2012: 44).

In the past, a large ***varivoce*** was a high status fish to spear and bring back into the village to share as a tasty meal with others. However, today in Kadavu the fisheries department is meting out strict punishments of fines and jail time to anyone who catches or tries to sell these fish, as discussed in Chapter 9. Medium sized specimens, such as shown in Plate 18, can now be seen browsing the outer side of the main reef without fear; and the smaller ***draunikura*** are not uncommon on the reef. This did not seem to be the case during my 2009 dives on the reef, when the fishing ban had just recently been introduced; and I did not see any intermediate or adult phase fish. I expanded upon this item because the fact that two different people located this fish-kind in their customary fishing grounds could suggest changing attitudes towards a sort of ownership that does not include harvesting them.

My observation of this possible attitude shift is reinforced by another person's use of ***yalava*** to describe where ***ika bula*** (sea turtles) live, another recently protected creature in Kadavu. The fourth use of ***yalava*** was used for ***qio dina*** (true or real shark) by a woman whose husband had narrowly survived a shark attack many years ago. This use may have very different thoughts underlying it, with possible spiritual aspects. In contrast, however, the fifth use of ***yalava*** in question 10 was for ***mataroko*** (*Mulloidichthys* sp.), a type of goatfish, by an older woman whose husband just loves to eat them. There were 59 different interviewees contributing to this research with different and ever-changing backgrounds, knowledge bases, and perspectives on the many kinds of marine life in local waters.

In summary, question 10 is useful in this project for several reasons. The question addresses knowledge that many people possess, based upon the 992 responses. People have quite specific knowledge of where young creatures live, an observation which supports the value of marine education programs that focus on the difficult-to-observe spawning and embryonic stages that illustrate life cycles. Question 10 accesses the sort of traditional ecological knowledge (TEK) that should be recorded for the benefit of future generations, and might be shared with fisheries staff and international biologists interested in supporting sustainable fishing practices. This knowledge could be built upon to insert the spawning and embryonic stage information in a way that is congruent with what people already believe. Furthermore, I have shown in Figures 13, 14, and 15 that comparisons of responses to questions 6 and 10 illustrate the depth of people's knowledge, and provide a broader picture of a creature's life cycle.

Question 11) What do they eat?

A) ***Na yava era kania***?
   LT: What do they eat?
B) ***Na yava ra dau kania tu***?
   LT: What are they usually eating?
C) ***Na cava era dau kania***?
   LT: What do they usually eat?

Discussion

The question versions posed here and the literal translations have insignificant semantic variations in respect to the responses gathered. However, the larger question of what it means 'to eat' in a given cultural setting requires consideration. In the 2009 pilot project for the current research, I showed people in these same villages over 100 images of marine life in four categories to ask for local nomenclature, followed up by a general question about what the creatures in each group ate. The four groups of marine life used in 2009 represented members of each of the Acanthuridae, Holothuridae, Serranidae, and Scaridae Linnaean families. In the pilot study, ***nuku***, (sand) was a common answer given for the diet of many creatures. I had not thought of sand as food before, given my perception of sand as an inorganic substance, although I have fed sand to cage birds many times as a digestion aid. This perception represents a naïve attitude on my part. Thus, the responses to the question about what creatures eat are all approached here as valid answers if people perceive these items as food, without regard for possible distinctions between organic and inorganic substances in defining food, a division which in this case I will show to be quite indistinct. In Figure 16, I provide an overview of the total responses before moving on to the analysis of consensus responses for specific groups of creatures. I will use this information to make comparisons between what is often termed as traditional ecological knowledge (TEK) and information drawn from published sources for the same creatures which we could term as international science knowledge (ISK).

The primary ISK source used here is *Reef and Shore Fishes of the South Pacific: New Caledonia to Tahiti and the Pitcairn Islands* by John E. Randall (2005) published by the University of Hawai'i Press. Randall, whose research interests are "classification and biology of tropical marine fishes," has been the senior ichthyologist at the Bishop Museum in Hawai'i since 1984; and has published extensively for scientific audiences and popular press (Bishop Museum 2012). Randall's innovative use of photography for fish identification allowed him, as of 2005, to describe a record-setting 582 species of coral reef fish; and author "551 scientific articles, 18 books, 68 book sections, and 44 popular scientific articles" (Carpenter and Pyle 2005). Randall's volume, often referenced as ISK in this chapter, draws upon a broad base of research by Randall and the cited work of others to produce an authoritative source of information in this domain. The book was reviewed in *Library Journal* as "invaluable as a reference for snorkelers, scuba divers, marine biologists, or those simply wish to identify fishes on insular reefs, Randall's accessible and high-quality volume is appropriate for academic libraries and specialized marine science collections" (Barnett 2006: 93). Randall's book then represents a broad representation of ISK, which includes academic and popular science.

In this section, I supplement these references with knowledge drawn from a few other reputable sources for creatures not covered by Randall. The ISK used then represents the knowledge of specialists and others interested in marine life, much as my interview base for the TEK used in the encyclopaedia drew upon knowledge from villagers who were considered experts and other people who do or did some fishing (Gordon 2012). Villagers who defined themselves as only farmers and not fishers were not interviewed. I will review varying levels of agreement between these two knowledge bases for diverse groups of creatures, and provide some analysis throughout the comparisons.

Figure 16 the 1736 total responses to the question of 'what do they eat?'

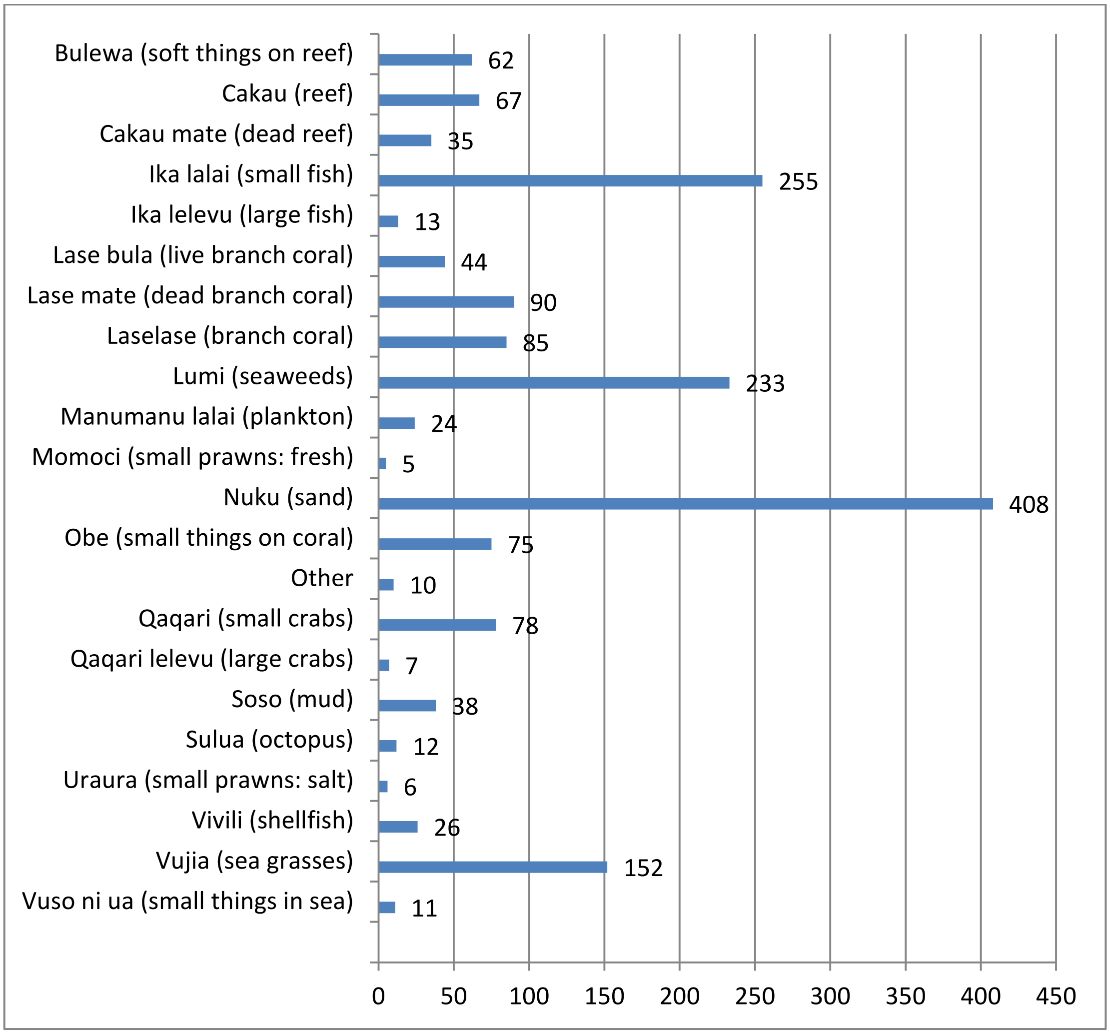


Figure 16 Notes: 'Other' includes ***nama*** (1) (*Calerpa racemosa*) (a seaweed enjoyed as salad in Kadavu), ***gasagasau*** (1) (long spine urchin), ***bonu*** (1) (swamp eel), ***drove*** (1) (*Ulvacaea*) (seaweed/algae), ***bolanivilu*** (1) (jellyfish), ***sici*** (1) (small univalve gastropods), ***waitui*** (3) (water), small bubbles (1).

A comparison of traditional ecological knowledge (TEK) and international science knowledge (ISK).

In this section, I will select response data organized into 25 categories of marine organisms. The categories include 207 of the over 300 images of creatures shown in the survey, of which 268 were used in the encyclopaedia (Gordon 2012). The creatures for this comparison were chosen in groups to present meaningful comparable data. To achieve this objective, fish groups are categorized into Linnaean families. Shark Families are grouped together under Superorder Selachimorpha. For practical reasons the invertebrates described here are grouped and named with common names in English, given the scope and complexity of both their Linnaean and Fijian classifications, and the relatively small sample sizes.

The responses used throughout this analysis are the consolidated responses of best consensus for each image as presented in the encyclopaedia (Gordon 2012), with a maximum of three responses per image and an average of 2.05 consensus responses per image. This procedure allows a cleaner comparison to be made than could be made with the raw TEK data. This method eliminates some outliers; but it does provide consistency in responses per image, as some images were viewed by more people than were other images in establishing the consensus responses used here. The 25 categories used here vary in size from a single creature/picture category with 2 consensus responses to a 22 creature/picture category with 50 consensus responses. The data are not used so much statistically, but as a tool for subjective comparison, given the complexity of incongruities and commonalities between TEK and ISK in the marine life domain.

One intriguing concept in this analysis is whether to distinguish between things that are eaten which directly yield nutrition in an ISK sense, and things which do not. As mentioned above, ***nuku*** (sand) might be considered an invalid or mistaken answer to the question 'what do they eat?'; or perhaps thought to reflect a responder's poor understanding of biology. The 408 responses of ***nuku*** represents 23.50 % of the 1736 total responses recorded for this question, as shown in Figure 16; and thus cannot be ignored. Therefore, ***nuku*** is a valid answer, based upon the fact that the creatures consume sand, as it is often found in their digestive tract and faeces. In any case, few of us have the ability to judge accurately how much nutrition we gain from consuming anything. Furthermore, sand is a vital part of the digestive processes of some fish, such as the gizzard-like stomachs of the fish of Acanthuridae family; in particular, the genus *Ctenochaetus* members. Later in the summary of this section I will further address the issue of sand as food, given sand's ability to host microscopic organic bacteria and larger organisms in a marine environment, a now-critical concept that took marine aquarists decades to understand. Today marine aquarium filters that circulate 'live sand' are often used to enhance biological activities and nitrogen cycles, whereas in the 1960s, aquarists used activated charcoal to 'clean the water', with poor outcomes in marine fish survivals. Thus, in what follows, ***nuku*** (sand) is considered a valid response, as is ***lase mate*** (dead branch coral) and ***cakau mate*** (dead reef) for similar reasons. These items function with organic properties in this context. Furthermore, a good amount of the marine substrate consists of foraminifera, a Phylum of single celled protists with shells (World Register of Marine Species: WORMS). The planktonic forms fall to the bottom when they die, to join the many other benthic forms of foraminifera, providing a rich food source for the creatures adapted to processing and ingesting them (Wetmore 1995).

For brevity, only the 22 Nakasaleka terms are used in many of the figures in this section. Table 8 provides English translations for the Fijian terms in the other figures.

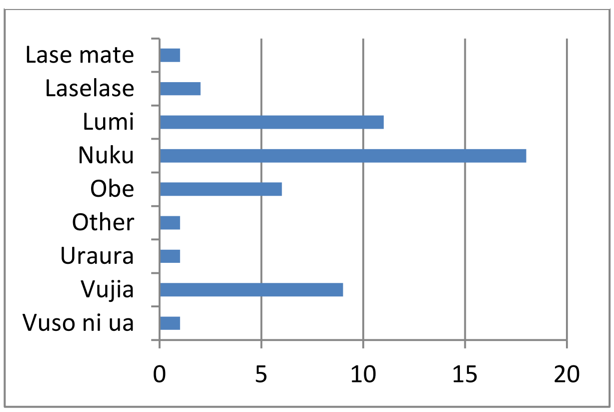
Table 8 Language key to Diet of the creatures

kania	**Diet of the creatures**
bulewa	soft things living on reef surfaces
cakau	reef
cakau mate	dead reef
ika lalai	small fish
ika lelevu	large fish
lase bula	live branch coral
lase mate	dead branch coral

kania	**Diet of the creatures**
laselase	branch coral
lumi	seaweeds
manumanu lalai	plankton
momoci	small prawns- freshwater
nama	edible seaweed (*Caulerpa racemosa*)
nuku	sand
obe	small things on coral
qaqari	small crabs
qaqari lelevu	large crabs
soso	mud
sulua	octopus
uraura	small prawns – saltwater
vivili	shellfish
vujia	sea grasses
vuso ni ua	small things floating in the sea

The relative strength of agreement between TEK and ISK for each category is designated below by the following terms, which in each category section are set in underlined bold type: complete, strong, moderate, weak, or none, as summarized in Figure 39**.** Details of results are provided in each category.

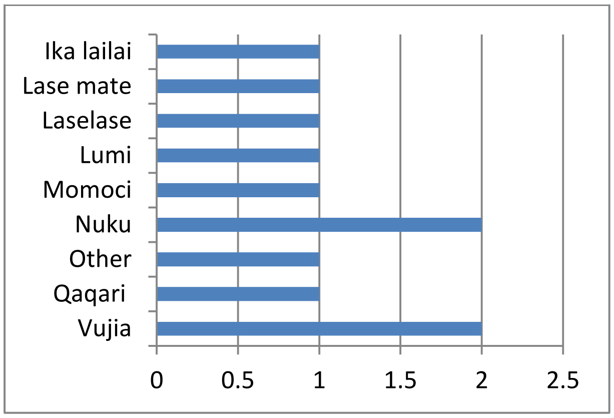
Figure 17 Acanthuridae: 50 TEK responses from 22 pictures



Acanthuridae or surgeonfish have a long intestine to digest the ***lumi*** (algae) and ***vujia*** (plants) that most kinds graze from ***lase mate*** (dead coral/rocks), ***lase*** (coral), and the substrate to consume ***nuku*** (sand) and other ***obe*** (small things) in the process according to ISK. Large fish of genus *Naso* feed on ***uraura*** (small prawns) and primarily on ***vuso ni ua*** (zooplankton), which some plant eating types will also enjoy when it is thick (Randall 2005: 573-574). TEK responses from

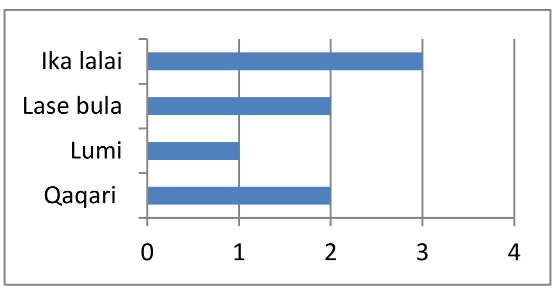
Figure 17 show **strong** agreement with ISK, given the diversity of diets in this group, and the amount of sand found in the guts when people clean these fish.

Figure 18 Balistidae: 12 TEK responses from 5 pictures



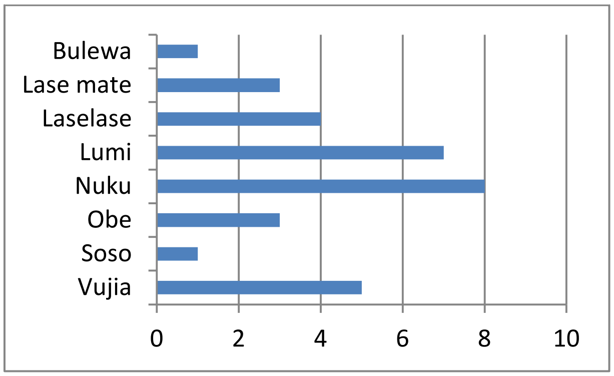
The primary diet of Balistidae or triggerfish consists of invertebrates, such as ***qaqari*** (crabs), molluscs, and sea urchins according to ISK (Randall 205: 619). These fish can be observed blowing ***nuku*** (sand) to expose their prey, and consume sand in the process of eating it. The TEK responses in Figure 18 show **weak** agreement with ISK, but the single 'other' consensus response of ***vitomika*** (things picked up) does address the diverse range of diet.

Figure 19 Carangidae: 8 TEK responses from 5 pictures



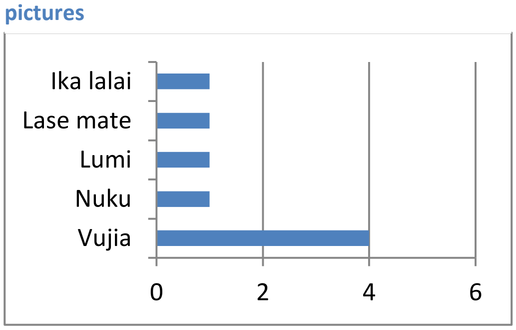
From the large Carangidae family of jacks and trevallies, five Linnaean species of fish were shown including various ***saqa***, whose diet is primarily ***ika lalai*** (small fish) in ISK (Randall 2005). These Carangidae fish often school near reefs; but individual fish will investigate feeding options on the reef, which may well include ***qaqari*** (crabs) and collateral ***lumi*** (seaweed) in the process. I have no observations on ***lase bula*** (live coral) consumption. The TEK responses in Figure 19 show **moderate** agreement with ISK.

Figure 20 Chaetodontidae 32 TEK responses from 15 pictures



The Chaetodontidae family of butterfly fish are broadly known as ***jivijivi*** in Kadavu, with only a few people differentiating between the 15 Linnaean species shown, despite sharp colour distinctions. ISK groups these fish into the coral-polyp feeders and other species that feed upon benthic algae and small benthic invertebrates including crustaceans and worms (Randall 205: 308). Despite people's limited interest in these kinds of fish, TEK responses from Figure 20 show **<u>strong</u>** agreement with ISK.

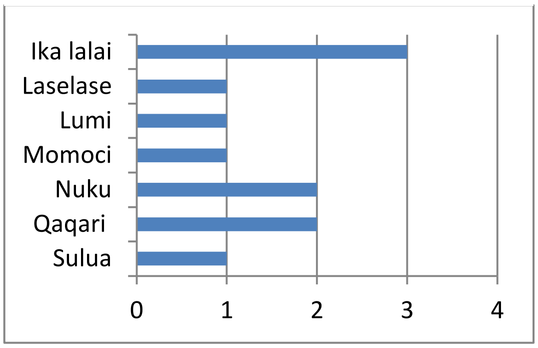
Figure 21 Chelonioidea 8 TEK responses from 4 pictures



Two pictures each were shown of the two most common sea turtle kinds found in Kadavu. ***Ika jina*** (*Chelonia mydas*), the green turtle, eats mainly sea grasses and algae. ***Taku*** (*Eretmochelys imbricate*), the hawksbill turtle, eats sponges and ascidians on coral reefs according to ISK (Ryan 2000:182-183). Other than one response of ***ika lalai***, the TEK responses in Figure 21 show **<u>strong</u>** agreement with ISK. Breaking the responses apart by turtle kind shows moderate overlap between the diets of the two kinds. This pattern may reflect the circumstance that, for some people, all turtles are ***ika bula*** in Kadavu dialect, or ***vonu*** in Bau dialect. A number of people also had trouble differentiating between the kinds of turtles shown in the pictures, a reaction which may not be the case when they view turtles in the sea.

The 5 Haemulidae images shown were of the Linnaean genus *Plectorhinchus*, including ***sevaseva***, a popular fish to eat in Kadavu. The primary diet of these fish includes crustaceans and other benthic invertebrates, according to ISK (Randall 2005: 264). This category would include ***momoci*** (prawns), ***qaqari*** (crabs), and ***sulua*** (octopus). These fish likely also eat small fish, given their behaviour of lurking under rocky ledges. However, this comparison ranks here as a **moderate** agreement between TEK responses in Figure 22 and ISK.

Figure 22 Haemulidae 11 TEK responses from 5 pictures



The Holocentridae are nocturnal fish often divided in ISK into squirrelfish, eaters of benthic crustaceans; and soldierfish, which have a main diet of larger zooplankton (Randall 205: 86). Thus ***obe*** (small things on coral), ***qaqari*** (crabs), and ***vuso ni ia*** (small things floating in the sea) are agreement items. Zoo plankton might include tiny fish to correspond with the ***ika lalai*** responses. Plant matter and coral or substrate consumed would likely be collateral consumption. This category shows **weak** agreement between TEK responses in Figure 23 and ISK.

Figure 23 Holocentridae 14 TEK responses from 6 pictures

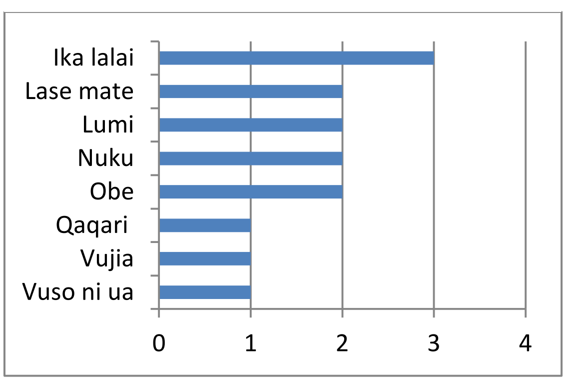
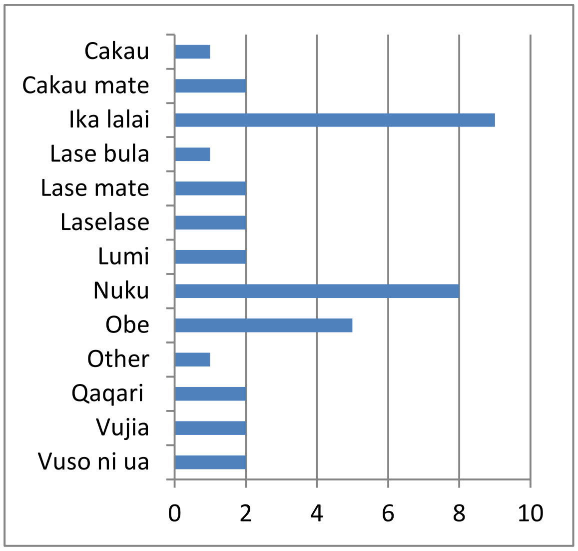
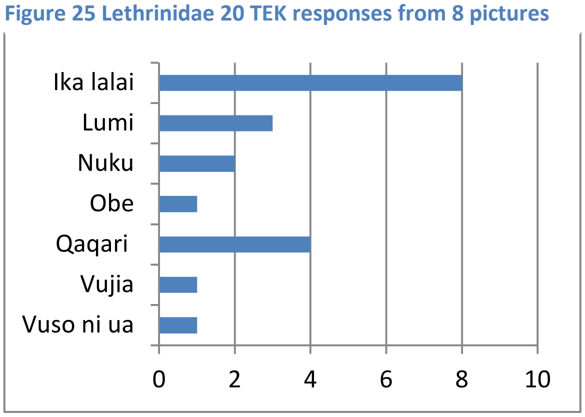


Figure 24 Labridae 39 TEK responses from 19 pictures



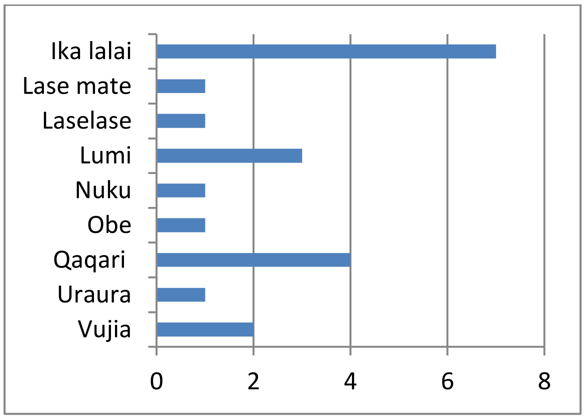
Labridae fishes in ISK include fish eaters, certain specialized types which consume coral polyps; and many kinds which literally suck in "crustaceans, mollusks, worms, and foraminifera along with sand and detritus." Some kinds then flush excess sand out their gills, while others ingest and process it. (Randall 2005: 388). While the large size of the category obscures some inaccuracies in TEK between subgroups, the diversity and key items in diets of Labridae fish show **strong** agreement between TEK responses in Figure 24 and ISK. The 8 ***nuku*** (sand) TEK responses agree with foraminifer consumption concepts in ISK.

Figure 25 Lethrinidae 20 TEK responses from 8 pictures



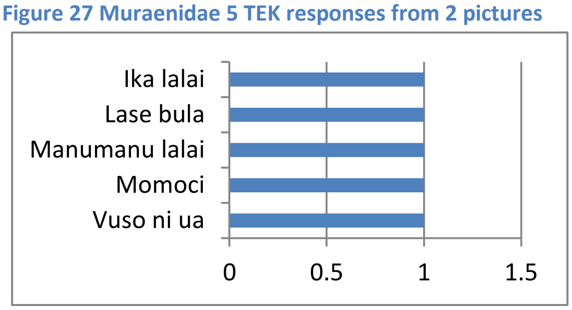
In ISK, the Lethrinidae or emperor fish are carnivorous fish which specialize in eating hard shelled invertebrates or smaller fishes (Randall 205: 272). 12 of the TEK responses match this description; large items of ***obe*** (small things on coral) and ***vuso ni ua*** (small things floating) might refer to small invertebrates. This category shows **moderate** agreement between TEK responses in Figure 25 and ISK.

Figure 26 Lutjanidae 21 TEK responses from 8 pictures



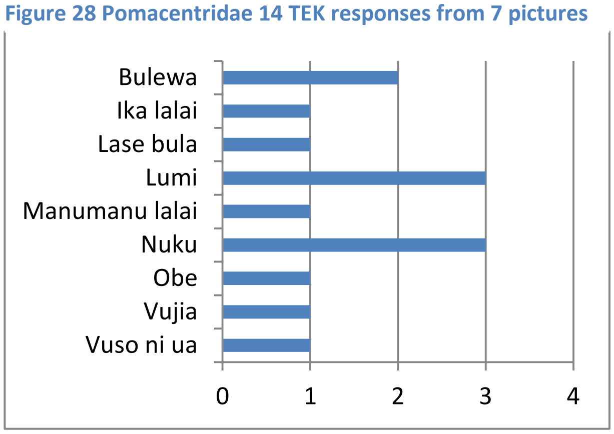
The Lutjanidae or snapper fish are carnivorous fish, many of which focus on eating crustaceans, with some specializing in smaller fish according to ISK (Randall 2005: 241). These items are well represented in the TEK responses. People often catch Lutjanidae and Lethrinidae fish on handlines using small fish or fish chunks as bait. However, given five responses of plant matter, this category shows <u>**moderate**</u> agreement between TEK responses in Figure 26 and ISK.

Figure 27 Muraenidae 5 TEK responses from 2 pictures



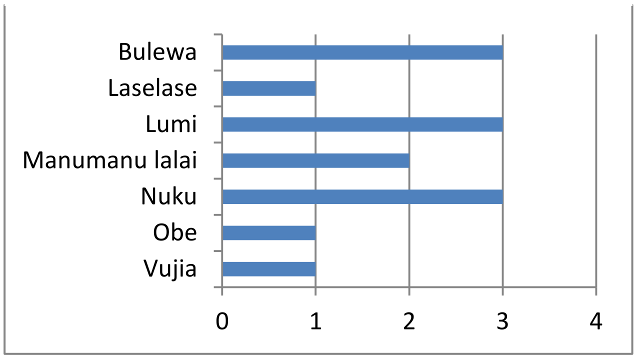
In ISK, the Muraenidae or moray eels shown from the genus *Gymnothorax* have long teeth for eating fish, crustaceans, and octopus (Randall 2005: 34). The TEK response of ***lase bula*** (live coral) does not match the ISK, nor does ***vuso ni ua*** (small floating things). The agreement level between TEK responses in Figure 27 and ISK for this category is <u>**moderate**</u>.

Figure 28 Pomacentridae 14 TEK responses from 7 pictures



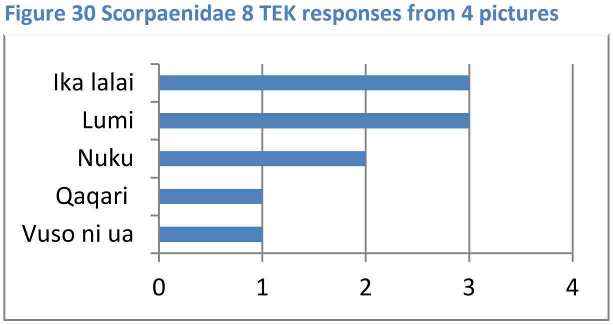
Some of the Pomacentridae fish, such as chromis and anemonefish, feed mainly on larger zooplankton, while the omnivorous damselfish consume benthic invertebrates and algae, according to ISK (Randall 205:346). The agreement of TEK responses in Figure 28 with ISK is **strong** with the clear exception of ***lase bula*** (live coral). The ***nuku*** (sand) responses may reflect collateral consumption by bottom feeding damselfish.

Figure 29 Pomacanthidae 14 TEK responses from 7 pictures



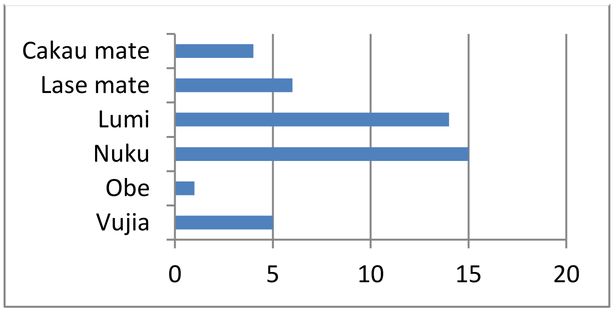
In ISK, the Pomacanthidae angelfish types shown in these pictures feed mainly on sponges, algae, and detritus (Randall 2005: 329). The agreement level between TEK responses in Figure 29 and ISK is arguably **complete**, given a lack of a term in Fijian for sponges, which are classed as ***bulewa*** or ***laselase*** by most people. Agreement is strengthened by the fact that neither domain mentions ***ika lalai***.

Figure 30 Scorpaenidae 8 TEK responses from 4 pictures



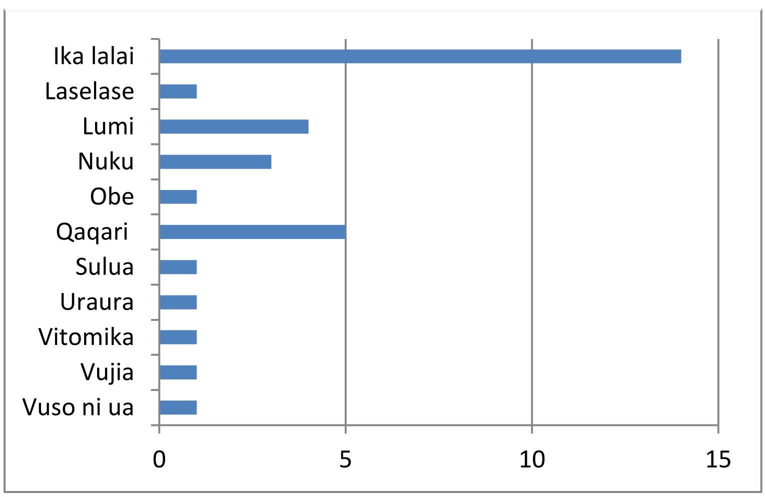
The Scorpaenidae images include two different lionfish kinds and two stonefish kinds. In ISK, all of these types are carnivorous feeders of fish, crustaceans, and large zooplankton (Randall 2005: 114). The agreement between TEK responses in Figure 30 and ISK is only **moderate** given the three responses of ***lumi***.

Figure 31 Scaridae 45 TEK responses from 19 pictures



The Scaridae family of parrotfish have 10 genera in ISK; but they can be divided into grazers of plants, scrapers of algae, and excavators of dead coral and sand in their common pursuit of herbivorous matter. This behaviour includes the activity of grinding algae out of dead coral (Randall 2005: 444). Large quantities of sand are digested and defecated in the process. People in Kadavu like to catch parrotfish at night in order to be able to eat the long intestine, a delicacy, without chewing on sand. Scaridae fish can frequently be seen defecating plumes of sand. Agreement between TEK responses in Figure 31 and ISK is **complete** in this category.

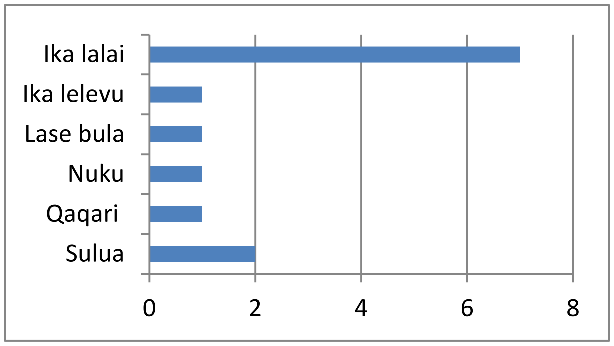
Figure 32 Serranidae 33 TEK responses from 18 images



The groupers of the Serranidae family considered here feed primarily upon fish, crustaceans, and on occasion cephalopods, according to ISK (Randall 2005: 136). One Nakasaleka man told me they eat anything that they can get in their mouths, a response which supports the single response of ***vitomika*** (things you pick up). The dominant TEK responses in Figure 32 of ***ika lalai*** (small fish), ***qaqari*** (crabs), and one

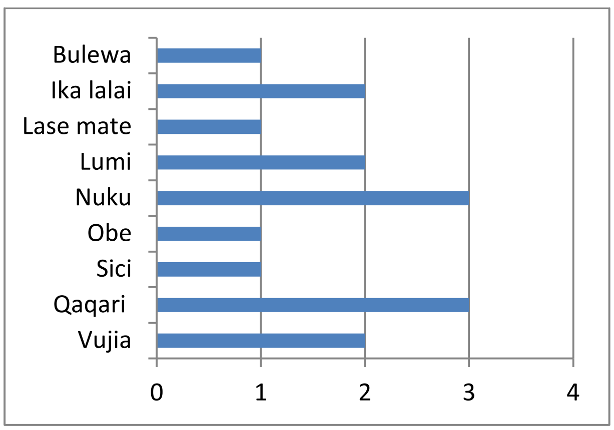
sulua (octopus) match the ISK. However, the five plant material responses shown in Figure 39 make this result only a **<u>strong</u>** TEK-ISK agreement level.

Figure 33 Sharks 13 TEK responses from 8 pictures



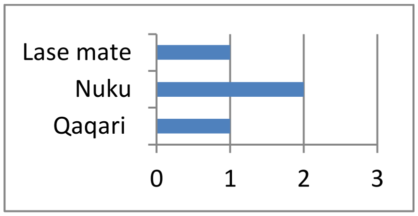
The pictures of sharks shown to people included types said in ISK to eat fish, crustaceans, and octopus (Randall 2005: 8-15). The TEK information in Figure 33 shows **<u>strong</u>** agreement with the ISK, with only two responses of ***lase bula*** (live coral) and ***nuku*** (sand) not matching ISK.

Figure 34 Tetraodontidae 17 TEK responses from 7 pictures



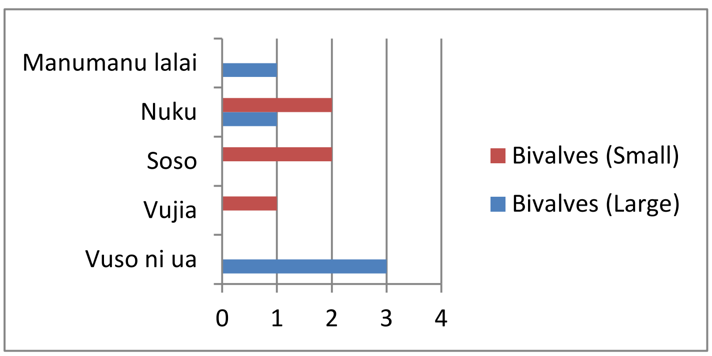
Gut analysis of Tetraodontidae pufferfish has yielded coral, sponge, tunicates, zooanthid, and algae (Randall 2005: 646). This ISK corresponds with ***bulewa***, ***lase mate***, ***lumi***, ***obe***, ***vujia*** and arguably ***nuku*** for a **<u>moderate</u>** agreement level between the TEK responses in Figure 34 and ISK. The ***ika lalai*** responses do not match, while ***qaqari*** (crabs) and ***sici*** (small clams) are pertinent to Diodontidae diets, fish that bear some morphological similarities to Tetradodontidae fish.

Figure 35 Diodontidae 4 TEK responses from 2 pictures.



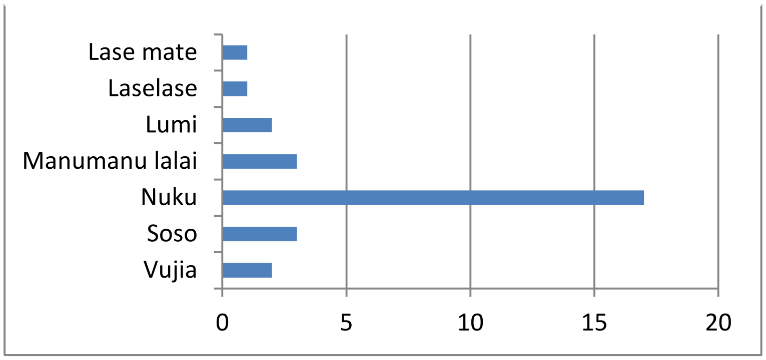
In ISK, Diodontidae porcupinefish crush and eat molluscs, crabs, hermit crabs, and sea urchins (Randall 2005: 652). The numbers of TEK responses in Figure 35 are small, but these ***sokisoki*** are well known fish; a large one makes a good dinner for a family. Only ***qaqari*** (crabs) from the TEK matches with the ISK. ***Nuku*** (sand) consumption may occur in the course of eating bottom dwelling invertebrates. Hence a **<u>moderate</u>** agreement level is assigned for our purposes, given that spear fishermen also told me that they look for piles of shell fragments near reefs to track and kill these fish.

Figure 36 Bivalves 5 TEK responses to 5 pictures for each of the categories of small and large clams.



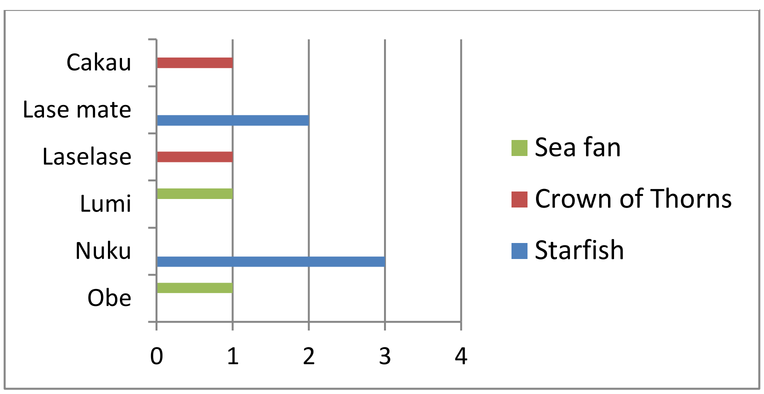
Most of the images of large clams shown were *Tridacna,* a popular, but now scarce food source in Kadavu, where Fisheries Officers supply brood-stock to villages to re-establish stocks. The TEK recognizes the filter feeding mechanism known in ISK of large clams to feed upon ***manumanulalai*** and ***vuso ni ua*** (plankton), but not the supplementary symbiotic algae photosynthetic process well known in ISK that provides further nutrition to the clam. The small bivalves referenced in Figure 36 live in the ***soso*** (mud) or ***nuku*** (sand). In well-known ISK, clams filter out their food by pumping water, which will contain varying amounts of the substrate recognized in TEK. These two categories both show **<u>moderate</u>** agreement levels between TEK responses in Figure 36 and ISK.

Figure 37 Holothuridae 31 TEK responses from 18 pictures



In ISK, the Holothuridae family of sea cucumbers filter detritus, plankton, and other organic matter from the sediments and seawater which they continually pump through their bodies (Monterey Bay Aquarium 1). Given that ***nuku*** (sand) can be foraminifera and ***soso*** (mud) can also be considered a food source for Holothuridae, there is a **strong** agreement for this category between TEK responses in Figure 37 and ISK, with the possible exception of ***laselase*** (coral).

Figure 38 Starfish 6 TEK responses from 3 pictures and 2 responses from one picture for each of sea fan and crown-of-thorns starfish

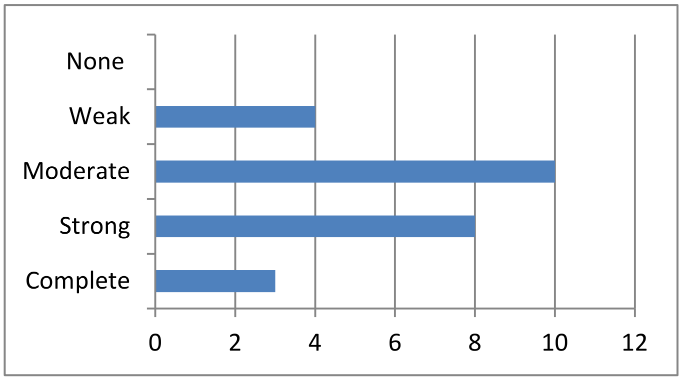


Sea fans are known in ISK as colonial organisms which filter plankton from the sea (Monterey Bay Aquarium 2). In Figure 38, the TEK response of ***obe*** (small things on coral) could have some **weak** relevance to the ISK, given a limited vocabulary in the TEK for such creatures, an absence that does not preclude knowledge of them. The ***bula*** (*Acanthaster planci*) or crown-of-thorns is well known in ISK to consume coral, as is the case in Kadavu TEK, in which several ***bula*** population explosions killing much coral have occurred in recent memory. This is a **complete** agreement between the TEK in Figure 38 and ISK. The TEK of ***cakau*** (reef) and

laselase (coral) completely agree with the ISK. The other starfish kinds shown consume a range of organic materials and small animals (Monterey Bay Aquarium 3), which have **<u>weak</u>** correspondence with the TEK responses shown in Figure 38.

Summary of the comparison of traditional ecological knowledge (TEK) and international science knowledge (ISK).

Figure 39 Summary of agreement levels in 25 categories between traditional ecological knowledge (TEK) and international science knowledge (ISK).



As stated at the outset of the comparison, each response shown in the figures represents the best two to three consensus responses received for each picture from four to six people in most cases. Thus 424 responses were associated with the 207 pictures grouped into 25 categories for this comparison. The subjectivity of the methods used is necessary to generate meaningful results, which of course can be questioned on the grounds of this subjectivity. However, efforts to increase the objectivity might simply obscure fuzzy and arbitrary categorizations within inaccurately rigid classifications for the sake of performing questionable statistical analysis. The methods used here indicate a result of a **<u>moderate</u>** to **<u>strong</u>** agreement level between TEK and ISK, as shown in Figure 39.

The categories with complete agreement are Scaridae, Pomacanthidae, and ***bula*** or crown-of-thorns starfish. The first two groups represent fish that are highly visible and active daytime feeders, which are also often consumed by people as food fish. In contrast, the ***bula*** is well known for its coral consumption through local observations and outsider-driven eradication programs. People are also well aware of the dangers of stepping on ***bula***, an accident which yields painful results. The weak agreement categories include starfish and sea fans that feed on small items in the sea, creatures which are hard to see with the naked eye. Starfish and sea fans are more active feeders at night. These items are not eaten by people, although starfish are cut up for fish-trap bait; sea fans are used in homes for decoration. Holocentridae and Balistidae were the categories of fish with weak agreement levels. The Holocentridae fish are also nighttime feeders, although they are often speared or netted in the daytime as they hide under reef ledges. The weak agreement category of Balistidae is not easily explained, as these fish are active feeders in the daytime; habits which spear fishermen pay attention to, given the food value of this fish and their potential territorial aggression using sharp teeth.

As described earlier, The ISK used in this comparison is drawn from reputable sources, such as Randall (2005), a text which has been assembled from field studies and observations by Randall and others. These data often includes gut samples. Nakasaleka people also notice what is in the guts of the fish that they clean for eating, but with some different interests than international scientists. Variation in the knowledge comparison should be expected, as these ISK results are drawn from across the Indo-Pacific seas; there may be variation in what the same kind of fish eats in Hawai’i, Fiji, or Vanuatu, given differences in climate, biodiversity; or lagoon and shoreline topography . There may also be seasonal variations as different food sources become more or less available in different places. One would expect a reasonable degree of variation between diet information on one reef and a database of results drawn from many diverse remote environments. Hence, if a quite high percentage of complete comparative agreements had been achieved in the present study, this outcome would demand a closer examination of the methods and locations used to gather data to determine validity. In contrast, the current results are not an unreasonable result, although comparing these results to TEK regarding similar creatures in diverse Pacific islands would yield further insights.

The recognition of substrate materials such as ***nuku*** (sand), ***soso*** (mud), and ***lase mate*** (dead coral) as food items is important and quite realistic, given the complex intermingling of organic and inorganic substances which are utilized by highly specialized feeding systems of many coral reef dwellers. For example, the various unicellular foraminifera are a significant component of sediments and planktons, which build protective shells by blending organic compounds with sand or crystalline calcite, as well as farming algae within their structures (Wetmore 1995). Numerous other creatures are adapted to reprocessing these creatures. People in Kadavu do not have electron microscopes, but they seem intuitively to have a good sense of what is eating what in the sea.

In conclusion, this comparative exercise has demonstrated consistent agreement between TEK in Nakasaleka, Fiji, and established ISK pertaining to the diets of a wide range of marine creatures found in Kadavu waters. This finding was only achieved by allowing interviewees to provide their own categories of what they thought the creatures eat, without the researcher pre-determining the boundaries. Subsequent analysis demonstrated ways to compare perceptions based in TEK and ISK, which showed moderate to strong agreement levels. To some extent, ISK has influenced TEK through fisheries education programs, such as education workshops on establishing giant clams, or eradication programs of surging crown-of-thorns starfish populations. I suspect the degree of influence of ISK on TEK reflects each person's amount and level of participation in workshops and training sessions on marine life facilitated by Government and NGOs, or hearing of these second-hand. This situation is best shown by the variations in people's knowledge about marine life reproduction as discussed under Chapter 9. Knowledge levels of the reproductive processes of groupers were much higher than for other kinds of fish, a situation which reflects the current education projects by marine conservation focused NGOs working in Nakasaleka. Thus ISK influences TEK but in unpredictable ways, as many people then applied their understanding of grouper reproduction to other sorts of fish to which the knowledge is much less relevant.

Chapter 5: Survey questions and responses about practical and social aspects of marine life for Nakasaleka people (a) fishing practices

This section addresses the practical matters of how people catch, cook, and use marine life in Nakasaleka. People often appeared more enthusiastic about discussing these practical aspects of marine life knowledge than they showed with the earlier questions about the marine life itself. These questions generated a number of the stories recorded under Question 15.

Question 12) What is the best way to catch them?

A) ***I da rawa ni kauji ira mai vakia***?
LT: We are able to catch them how? (The pronoun *da*, means 'many' in the first person inclusive.)

B) ***E da rawa ni kauti ira mai vakia***?

C) ***E da rawa ni kauti ira mai vakacava***?

Discussion

This question yielded thousands of responses and over 30 terms for fishing methods, a corpus which was later edited down to the list of 21 terms used in the encyclopaedia (Gordon 2012), also shown here in Table 9. To begin with, a list of 22 Kadavu fishing methods drawn from Calamia et al. (2008: 12) served as an interview reference list, which was continually adjusted to reflect the opinions and responses of interviewees to the question. Table 10 lists a number of terms which were not included in the encyclopaedia. In some cases these terms were used too infrequently or inconsistently to justify their inclusion. A key purpose of the encyclopaedia is to serve as an educational tool for Nakasaleka children to learn knowledge, practices, and language use. Thus, Bau terms were not included if a Nakasaleka equivalent was available and given significant use in the survey. Attention to fishing methods which are now illegal, such as dynamite use, fish poisoning, and killing turtles, was minimized in the encyclopaedia to avoid making these practices appear normal, as they now result in significant penalties in Fiji, as discussed in Chapter 6. The minimization of this data segment creates some necessary distortions, given the ethical goals of this research to minimize potential risks for the participants. The example of ***kari loli*** (fish poisoning) described in and below Table 11 demonstrates the manner in which illegal fishing activities were addressed in the encyclopaedia, when they were included. Community leaders approved of this approach to the complex issue of discussing illegal activities. Key points discussed in this section are perceptions of spear fishing as a sport for men; and also the complexity of the social aspects embedded in notions of the fishing tools, such as the larger nets used communally for the benefit of many people in and beyond the village.

Interpretations of the responses to Question 12 are complicated by efforts to differentiate terms and descriptions of the actions of fishing from terms and descriptions of the tools used to fish with. For example, suppose a man takes a hand spear to go spear fishing. ***Kilivati*** refers to the fishing expedition. ***Vucu*** refers to the action of using this kind of spear. The spear itself is called ***moto***. The format of question 12 does not specify the difference between tools and actions. However, I suspect rephrasing the question would still lead to people mixing up terms for fishing tools and actions, unless one were to use sentence frames to elicit responses. For example, a sentence frame such as, ‘I spear octopus with a _______, or I spear eels with a

_________’. However in Nakasaleka, the verb ***vucu*** ‘to spear’ applies to using a ***moto***, rather than a ***dakai*** (mechanical trigger spear), which is used with the verb ***vavana***. Hence, the initial choice of either the verb or the tool used to construct the sentence frame would predetermine the associated term as the answer, and limit other possibilities. Furthermore, it would be naïve to expect that eight different interpreters with varying sociolinguistic backgrounds, as described in Chapter 5, would convey this information precisely in the casual interview settings of this research style. Efforts to confine these answers to sentence frames would limit the scope of the information gained by transforming ***talanoa*** (story telling) interactions into a common Fijian schoolroom model of call and response. Sentence frame exercises can be boring and exasperating for interviewees and interviewers (Bernard 2011:229). This method must be avoided in a project relying upon voluntary interview participation, such as this one.

One way to improve this line of questioning is a two part inquiry such as, what tools do you use to catch this ______? This inquiry could be followed with a second question of, how do you use the aforementioned tool to catch _____? This difference might avoid triggering an association response between tool and usage terms, while the ‘how’ question encourages storytelling about using the tool, and other related fishing experiences. Another deficiency to address in Question 12 is to pay attention to gender related terms and experiences. For example, in Fiji’s Lau islands, which have had significant linguistic influence in Nakasaleka, Sharon Jones (2009: 119-120) notes that ***moto ni coko*** is the multi-pointed hand spear used by men, in contrast with ***moto ni nunu***, the single-pointed hand spear used by women. This gender specific terminology may or may not be pertinent in Nakasaleka, but I did not seek it or record it. In retrospect, I did observe a gender distinction in spear use on many occasions, although not exclusively. In general, the fishing methods, roles, and catches of men and women in Nakasaleka do differ; and should receive more attention than was given in my survey. However, this situation is complicated by the fact that a good number of my interviews were with married couples. At various times one partner might leave the room, and at other times couples cooperated or even competed on answering questions. These inconsistencies complicate ascertaining gender specific answers; but they are difficult to avoid when interviewing in Fijian homes, where life must go on around the researcher's agenda. A comprehensive investigation of fishing methods requires considerably more time and effort than was allocated to the topic in this survey.

The fishing methods

Various descriptions and perspectives of coastal fishing methods used in Fijian coastal villages are available in historic and modern records, including:, Thomson (1908), Deane (1921), Hocart (1929), Sahlins (1962), Thompson (1940), Williams (1982), Veitayaki (1995), and Jones (2009). I had reviewed these sources in advance; but to minimize risks of predetermining data in the actual fieldwork, I relied only upon the fishing methods list from Kadavu used by Calamia et al. (2008), which I had expected to replicate. However, my results showed more variation than expected from the terms elicited by these authors, who had worked in different Kadavu villages and districts.

Some variations are noted in this section. The importance of fishing to a village economy varies by the village according to the quality and quantity of each village's ***yalava*** (fishing territory) and agricultural land. People's hereditary practices are often related to the available resources. Matasawalevu people tell how their village was established as a fishing village owing to their proximity to the reef and large mangrove bordered cove, as shown in Plate 20. Matasawalevu people provided much of the information in this chapter.

Plate 20 Nets and boats in the Matasawalevu lagoon in the early morning

My main purpose is to review the fishing methods discussed in the survey in order to demonstrate the information and issues that arose as a result of the survey methods used. This process may also add some information specific to Kadavu to the existing literature. In Table 9, I provide a list of terms and methods used in the encyclopaedia (Gordon 2012), with unused relevant terms and methods shown in Table 10. Illegal fishing terms and fishing methods, which arose in conversation, are addressed in Table 11. Following each of the figures, I review items that merit discussion.

Table 9 Terms and methods for catching fish listed in the encyclopaedia (Gordon 2012).

Vakasasa (to hunt/fish)	**Catch method: tools or actions**
dakai	spear with trigger (factory made)
kawa	fish trap: a weighted basket trap
moto	a hand or sling spear
nunu	diving and pick up
nunu	diving with trigger spear
qoli	a fishing net
qoli lawa	net fishing with 2 or more people
rarako	handnet for one person in the river
siwa boto	line fishing from boat
siwa kolokolo	line fishing: throwing
siwa nunu	line fishing with goggles
siwa sina	line fishing using light

Vakasasa (to hunt/fish)	**Catch method: tools or actions**
tala lawa	setting net
taraki	handnet for one person (See Plate 26)
tataga	handnet for one person in the sea
tomika / tomi	hand gather ***sasalu*** (sea cucumbers and other invertebrates)
vakasavuba	trolling
vavana	action of using or voyage to use a ***dakai*** (trigger spear)
vivili	shellfish collecting
vucu / vucuvucu	action of using a ***moto*** (hand spear)
yavirau	scare line used for a fish drive

Spears and fishing

Plate 21 Historic bow and arrow used for fishing.

Some interviewees used the responses ***dakai*** (trigger spear) *and* ***moto*** (hand or sling spear) interchangeably in reference to underwater spear fishing. If a group of men go out to the reef to spearfish, they may have an assortment of different types of spears, any of which might be used to catch many of the same kinds of fish. While I am not aware of ***dakai*** often being used above water, ***moto*** are routinely used both from above the surface and from under the water. Thus, a more in-depth survey of fishing methods for certain kinds of fish should address these distinctions. These are in fact two very different kinds of fishing, which Joeli Veitayaki defines as ***cocoka*** (surface or thrustspear fishing) and ***vavana*** (underwater spear fishing; 1995:47). In addition, as shown in Plate 21, the Fiji Museum displays a bow and spear-like arrow that were used for fishing in past years, a practice said to require great skill, given surface refraction when looking into the sea. I did not hear discussion of this tool being used in Kadavu; but on some beaches in Nakasaleka, I observed young men patrolling the shallows on the ebb tide with long multi-pointed spears to catch octopus or good sized fish stranded in shallow pools. The name used for the now archaic bow was ***dakai titi*** "(***dakai*** = bow, whilst ***titi*** is the term for aerial roots, both of the mangrove and screw-pine)" (Hornell 1940: 50). This usage suggests an etymological connection between the older bow and arrow and the modern trigger spear.

Historically in Fiji, underwater spear fishing was focused on turtles and invertebrates, which move more slowly than fish (Veitayaki 1995: 47). In 2009, a village chief in his late 70s from an Ono village told me that when he was a young man, he was the first one in the area to get goggles for diving. At first, everyone laughed at him until people caught on to the benefits of goggles, and later on snorkel masks, both of which allow better aim when spear fishing. Soon, many people started using goggles or masks for spear fishing. In Fiji's more isolated Lau district, Laura Thompson estimates the use of goggles for fishing began in the mid-1920s (1940: 130). James Hornell (1940) suggests a Japanese source for early goggles, and also estimates a mid-1920s introduction of goggles in Fiji. Hornell provides a photograph of a woman wearing basic goggles, similar in concept to those of modern competitive swimmers, with lenses bordered by some material that is pulled to the face with a head strap. Hornell compares them in form to 'motoring goggles', and provides a local name for them of '***suvamarini***' or 'submarines' (1940: 49: Plate 8). I was told that these types of goggles often leaked, due to poor contact between the material surrounding the lenses and the face. Hence, these goggles would be useful to a woman briefly submersing her head to locate prey while net fishing, but of less use for a spear fisher who is underwater for longer periods. Goggles were in use in the Fijian island of Moala in 1954 (Sahlins 1962: 52). The use of modern snorkel masks represents a significant technological change that allows people a greater breadth, distance, clarity, and duration of underwater visibility when spear fishing.

More recently, the acquisition and use of high-powered trigger spear guns has increased the distance from which the fish can be speared and the size of the fish which can be shot and captured, as the spear is attached to a cable. Large fish can then be hauled to the surface. This situation is quite different from wrestling with a fish on the end of a hand spear, not to mention the associated factor of prey proximity to one's body with sharks and eels potentially drawn to the event. This attraction of predators is the most common cause of shark attacks in Nakasaleka. Other diving gear such as fins, wetsuits, and underwater lights also increase the range of fishing by divers (Veitayaki 1995: 47). However, spear fishing with SCUBA tanks or underwater lights is now illegal in Kadavu.

Older people talk of their younger days when the bulk of spear fishing was done in the mangroves and shallows, rather than on trips to the reef. Today spear fishing is better classed as a sport, where a gang of men go out to the reef in the typical 23-foot outboard motor powered fibreglass boat, known as a fibre, for a day of spear fishing. On one such trip to catch fish for a Sunday church lunch, I counted nine men going out to the reef in one boat. The trip took four and a half hours from their village, which is located about 25 minutes in travel time from their ***yalava*** (fishing territory) on the reef, thus allowing for three and a half hours of fishing time in the water. The catch was said to be a disappointing one of about 30 fish of roughly 30 centimetres in length, most of which are shown in

Plate 22 The bulk of a day's catch

Plate 22. Thus, each man on the trip caught an average of three and one third fish. A string of five of these fish can be sold in the village for $10 FJ ($5.50 USD). The value of this catch is then about $60.00 FJ. The cost of the fuel used to take the boat out to the reef and back with nine men in the boat is at least $80.00 FJ, presuming that the men anchored the boat near the reef and did not change locations often. However, if the catch was disappointing, it is likely that they moved the boat between several fishing locations. On this fishing trip and others, underwater spear fishing delivered a negative economic return; but if you ask any fisherman in this village what kind of fishing he does, the first answer will be an enthusiastic response of underwater spear fishing!

This example supports my observations of spear fishing activity being experienced and perceived as an important sport culture in the village. Blending perceptions of spear fishing as a Saturday sport, along with villager expectations for the men to provide fresh fish for the important Sunday lunch, encourages people to discount the major economic factors of fuel costs and catch size when planning fishing trips. Support for this notion of modern spear fishing as a 'sport culture' is provided by parallel observations made many years ago in Eastern Fiji by Laura Thompson that turtle fishing was "one of the greatest sports in Lau" (1972: 8). Alan Tippett (1968) provides Thompson's observations as evidence of significant Western contact-driven cultural transformations by villagers, since a sporting approach "would have horrified an early Fijian," given historic practices of prescribed rituals and taboos around turtle fishing methods and turtle eating rules well known in Fiji in the 19th century (1968: 116). Thompson's ethnography of Southern Lau (1940) reinforces this idea. "Only when fishing becomes a sport, as in spearing, or when it is connected with a ceremony, as in communal fishing, do men participate." (1940: 129). Further support for this notion comes from Sahlin's observation's in Moala that "spear fishing is a man's activity and some practice it avidly as fine sport" (1962: 52). Hornell refers to spearing as the most popular Fijian fishing method, which "village lads practice with miniature spears as soon as they pass the toddling age" (1940: 49).

This sporting culture which has arisen around spear fishing is an important item to factor into conservation program planning, as it defies utility based approaches, and can be very destructive to fish stocks. With the acquisition of diving gear, sport fishing by men has become a more significant regular practice in recent generations of villagers. This practice may have greater effects on the behaviour of many people today than do notions of stewardship sought out in so called 'traditional practices' in attempts to connect traditions with modern conservation practices by program developers. Conservation programs which attempt to address this spear fishing sport culture will not be easy to develop.

In 1940, Thompson wrote the book *Fijian Frontier* as an instruction manual for colonial administrators. In it she states, 'just as the elimination of warfare has tended to sap vitality from the culture, so also shielding the people from the economic structure, which would otherwise destroy them, has tended to weaken them" (1972: 80). Today, this paternalistic quote can be questioned on the grounds that the period of empire building and significant warfare in 19th century Fiji, vividly chronicled in early missionary days, was associated with a surge in availability of ***tabua*** (sperm whale tooth) from trade with European whalers. Sahlins (2005) demonstrated this point to show that the availability of muskets had little effect on increasing the amount of warfare. In fact, easy access to ***tabua***, the key relationship-building gift in Fiji, still essential for weddings and other ceremonies, generated more complex intergroup social relationships. Thompson's advice to administrators is based upon assumptions of the fading of long-standing Fijian traditions and strengths which incline the natives "to become lazy" (1972: 80), while overlooking that the traditions in question are of relatively recent vintage.

Plate 23 Strings of fish being loaded on the ferry to be sold in the Suva fish market.

Likewise, if marine conservation programs are to address the sport fishing ideology in regard to destructive aspects of spear fishing practices, they must first identify spear fishing as a recently introduced sporting practice. Second, the social aspects of this sport in village culture must be identified. Key activities for men are spear fishing, and listening to or watching rugby, pastimes which in turn fuel conversation around the kava bowl at night. Is spear fishing to be perceived as the 'new warfare' that makes men strong? Is spear fishing as a sport more about the social relations reinforced on the fishing trip, which men visiting the village from the city often join? Today the economic basis of this activity seems questionable. Despite Thompson's concerns, I found that many Nakasaleka villagers were very engaged in the local and regional economic structure; however, the importance of the contribution of fresh fish to the Sunday lunch by the men is of great social significance, and a failure to provide this fare reflects poorly on the village. Fishermen who spear surplus fish can also sell them locally or ship them to market in Suva on the ferry, as shown in Plate 23.

What practices to ease pressure on fish stocks might villagers develop in order to generate comparable social and economic benefits without precipitating notions of loss or weakness? How can program developers work among villagers in a non-paternalistic fashion in this regard? I question whether the standard model of workshop village education visits used by governments and NGOs, followed up by a kava session at night and a return to 'normal activities' the next day, is the method. A group of people must go fishing before the event to be able to provide the visitors with ***itakitaki***, a fine meal and appropriate hospitality. Even more unlikely to succeed would be attempts to rehabilitate the much older rituals and taboos mentioned by Tippett (1968: 116), which were associated with pre-Christian social forms, in little evidence in modern Fiji.

The common spear fishing term, ***nunu***, broadly describes various sorts of underwater diving, with secondary terms added to define the purpose, such as ***nunu dri*** listed later in Table 10. My interpreters advised me just to use **nunu** for both the actions of picking things up and for diving with a spear, as in Table 9. However, Gatty provides distinctive forms of ***nunu***, such as ***nunuvaka*** (to swim underwater) and **nunuvaka e dua na moto** (to dive with a spear). ***Duanunu*** is a diver (2009:180), and Calamia provides ***nunu sici*** (diving for *Trochus*), although the snails *Trochus niloticus*, of export value for their shells (Veitayaki 1995: 14, 37), are scarce today in Nakasaleka waters.

Fishing with nets

Alan Tippett (1968: 118-120)provides a typology of Fijian fishing nets, distinguishing nets used by individuals, small groups, or large communal groups of people. Tippet suggests that alternative indigenous typologies could be used, which sort net types by either the gender of the users or by the fishing zones where the nets are employed. However, Tippet claims that categorization of nets just by form is inconsistent with Fijian perspectives, as shown. The following review is not a comprehensive typology of the nets; but reflects the knowledge which emerged from the interview process used in this study, along with comparisons with other sources to show context and relevance to other records.

The term ***qoli*** does not appear in Tippett's typology (1968: 118-119). The term ***qoli***, as shown in Table 9, is used either as a verb, 'to fish with a net', or as a noun that describes a fishing net. The related term '***iqoliqoli'*** is a clan's fishing ground (Capell 1968, Gatty 2009), also known in Kadavu as ***yalava***. Gatty (2009: 194) suggests the use of '***qoli***' in association with net fishing is quite old in Fiji, in contrast to ***siwa***, the base word for line fishing, a practice thought to be of Polynesian origin, as is the use of the throwing net (Gatty 2009: 194). ***Qoli*** is defined as 'to fish' or 'going fishing' by Hazlewood (1979). This definition of ***qoli*** is expanded to include use as a common noun meaning 'a fish' by Geraghty (1983: 336, 470).

Table 9 shows ***qoli lawa*** as the Nakasaleka term provided for net fishing involving two or more people. Gatty (2009) defines ***lawa*** as a general word used for fish nets, based on the concept of catching or encircling something in a mesh, or even people in an ambush. Associated meanings for ***lawa*** include both making laws, and beginning to weave something from pandanus leaves. Geraghty (1983: 336, 443) identifies ***lawa*** as a Proto-Polynesian word, with cognates in use throughout Fiji which mean 'enough', 'abundant', or 'completed'. The use of the term '***lawa***' to reference fishing nets which require cooperation between people to achieve a common purpose suggests a relationship of meanings with those meanings that indicate anticipation or achievement of a result. Again, this review demonstrates the difficulties in asking this survey question and recording accurate contexts of use. Most fish nets are in fact artifacts of the social interactions encompassed in the processes of net construction or acquisition, use, mending, and the sharing of the harvest gathered with the nets.

Plate 24 Women preparing to use a *qoli lawa*

Most of the inshore ***qoli lawa*** activity that I observed involved at least three women. Two women hold the sides of the net, as shown in Plate 24. Other women scare fish into the net, or anchor the base of the 'U' shape formed with the net. I also observed ***qoli lawa*** carried out by mixed gender groups on the reef; people encircle coral outcrops with long nets and beat the water to scare the fish into the nets, to be hoisted into open boats where fish are removed by hand. Plate 25 shows a group of women creating a circle with their nets to trap their catch in the lagoon area on an ebb tide.

Plate 25 Women fishing with nets in the lagoon

These observations accord with well-known established practices in Fiji, whereby women are the primary net fishers except in the case of special event fishing, as indicated earlier by

Thompson's (1940) quote about fishing by men. Tippett (1968: 119) similarly describes men helping with large heavy "communal fishing nets." Jones (2009: 119) confirms women as doing the bulk of the inshore fishing in Lau. Thus it was surprising when one of my interpreters in Kadavu, an older man with extensive diving experience, tried to convince me that women knew very little about fish, a claim that he later realized was untrue after we interviewed several women, including his wife.

The term '***mabuke***' refers to a sort of long rectangular net with a smaller mesh size that is used in the lagoon by women to catch ***vaya***. Calamia et al. (2008) did not list ***mabuke*** as a fishing method. I learned of the use of this term late in the study; in retrospect, it should have been on the list of terms from the start. The responses recorded for ***vaya*** fishing are ***qoli lawa*** and ***tataga*** or ***rarako***. A single-person dip net used in the sea is called ***tataga*** in Bau or ***rarako*** in Nakasaleka; both terms are in use in Nakaslaeka by different people. A ***taraki*** is another single user net used for river prawns or ***vaya***. Tippett defines ***taraki*** as a four by two foot net with support rods on each side. Floats and sinkers are strung top and bottom to extend the net vertically to trap fish flushed out from the holes in broken coral (1968: 118). Plate 26 shows a ***taraki*** used for ***vaya*** in Nakasaleka. There was some variation in defining the specific uses of these terms for single user nets among different people, such as definitions of ***tataga*** as a net used in the sea in contrast with ***rarako*** for use in rivers; but these definitions lacked consistent substantiation. Hence the quality of the data used in the encyclopaedia (Gordon 2012) on this topic is less reliable. The terms ***lawa***

Plate 26 *Taraki* used for catching *vaya*

viritaki or ***jila*** (throwing net) are recorded by Calamia et al. (2008: 37-38) from several Kadavu villages as a method to catch different kinds of mullet and ***vaya*** (*Thryssa baelama*). I did not see anyone fishing for ***vaya*** this way, despite living for many weeks adjacent to where shallow water ***vaya*** fishing was a regular event. Perhaps the throwing nets are used when fishing in deeper water where wading is not possible. I am unclear on whether the term '***lawa viritaki'*** was used in Nakasaleka. I did not include it in the encyclopaedia listings. Apparently, the use of nets thrown from the shoulder in Fiji was introduced by other Pacific Islanders (Gatty 2009: 226).

Plate 27 Mending nets on a rainy day

Groups of women often gather on bad weather days in someone's home in late morning or early afternoon to mend nets by stitching broken links together, as shown in Plate 27. In this social and enjoyable time, women chat and joke while they repair the nylon filaments cut by sharp corals and the sharp spines of fish such as surgeonfish. These sorts of events reinforce the idea of large fishnets as representative of a social group's health and abundance in the form of well-maintained and effective nets. In past times when nets were woven from spun tree bark fibres and coconut sennit, these work sessions would have been longer and more frequent.

Tippett (1968) speaks of elaborate rituals and taboos associated with the construction and use of turtle nets in past days, when turtle fishing was regulated by chiefs and conducted only with special nets. The chiefly taboos and associated turtle fishing practices were secularized by missionaries in the late 1800s. Tippett quotes Deane's (1921) descriptions from Kadavu of turtle fishing with spears and by dropping rocks on turtles to exhaust them as evidence of this practice (1968: 117-123). The introduction of store-bought nets represents significant change. Sharyn Jones (2009: 136) compares the high diversity of fishing methods and locally made net types recorded by Thompson (1940) in Lau with recent observations in Lau to conclude that the introduction of microfiber nets, which can be used in more different ways, has reduced the range diversity of specific types of net fishing methods. Whether this sort of change also reduces the depth of meaning associated with fishing nets and tools is a question worthy of further inquiry.

Traps

Plate 28 *Kawa* fish trap displayed in Fiji Museum

Kawa (underwater weighted fish traps) are still said to be used, although I did not see much evidence of this practice. Synthetic versions seem to have replaced the older woven basket styles shown in Plate 28. The traps are designed to require fish to push their way into the trap through an opening that closes to block their escape once inside. Various chopped up invertebrates, such as starfish, are popular bait for fish traps, as this firmer flesh is more durable in the seawater.

Plate 29 Abandoned *moka*

Moka refers to a tidal zone trap of rocks piled in a large semicircle arcing out from the shore, a structure which traps fish in the shallows as tide ebbs. The remains of these ***moka*** can be seen on almost every rocky point along the shore between the villages where I was hosted, as shown in Plate 29. They have been out of use for some years, but no one could tell me how long. In the past they were maintained regularly, and I suspect this would be a work project organized by the village chief and ***turaga ni koro***. Hornell (1940: 64) describes an alternate type of ***moka*** used in Kadavu only by women. Three foot high pyramids of stones would be surrounded by nets at low tide and disassembled to flush out fishes hiding within. No mention of this method arose in my interviews. Sahlins (1962) describes significant declines by 1955 in the use of ***moka*** in Moala, an island with many similarities to Kadavu. The term ***moka*** was not provided in the formal interviews, but came up in conversation near the conclusion of my fieldwork. On occasion, I did observe people poking around in ***moka*** to gather sea cucumbers and shellfish. However, the consensus was that there are no longer sufficient large fish in the inshore lagoons to justify the upkeep of ***moka***, a practice described as a lot of work.

Joeli Veitayaki (1995: 52) defines a ***yavirau*** as the use of a scare line of vines and coconut fronds by a large group of people who form a semicircle with the line and contract it towards shore on an ebb tide in order to trap fish in a place where other people scoop them up or spear them. Veitayaki describes this method as efficient in the short term, but very destructive with much coral and reef life destroyed in the process. We recorded just 10 responses of ***yavirau*** for different creatures from four people who either live in or were born in just one of the villages. I did not see a ***yavirau*** held in any villages, but I doubt that the remaining inshore fish populations would make them worthwhile today with any regularity.

Line fishing

Siwa, as shown in Table 9, refers to hand-line fishing methods, which include forms such as ***siwa boto***, ***siwa sina***, and ***siwa nunu. Siwa boto*** is an odd Anglicization; given the common Fijian term for boat is ***waqa***. ***Sina*** (a light) is the Nakasaleka version of the Bau term '***cina'***, which describes using a light at night to attract fish. Today, flashlights have replaced the use of burning torches of old. Sahlins (1962: 52) refers to Moala people using gas lanterns to fish in 1955. Kerosene lanterns still see much general use in Nakasaleka today, and might well be taken out in boats at night. ***Siwa nunu*** (line fishing while diving) is the Nakasaleka version of the Bau term, ***siwa ilo*** (line fishing with glass goggles). This method is surprisingly successful for catching fish such as groupers, which lurk near an outcrop and are attracted to bait hung on a line within striking range by the swimmer. This method is also used by international scientists on the Astrolabe Reef to catch large fish for tagging.

Plate 30 Handline fishing in the outer lagoon

Most hand-line fishing today is done from boats, as shown in Plate 30. It requires strong hands and arms to keep the baited hook in motion at all times. The bigger the fish, the more the nylon line cuts into the skin. People whose hands are used to keyboarding should wear tight fitting gloves for hand-line fishing, such as kayaking gloves. Hand-line fishing from boats is a social affair in Nakasaleka. Groups of three to six people will go out for several hours or more at appropriate times of day or night depending upon the tides, weather, personal schedules, and the household's or community's needs for fish. People bring their own ***baca*** (bait), which may be chunks of small fish or crabs supplemented by any small fish caught and filleted on the spot.

Nylon monofilament line is unwound from plastic spools and thrown from the boat with the hook, bait, and lead shot as ballast. As the line dips towards the boat, one releases more line and then starts pulling it in with a series of hand-over-hand pulls separated by a pause to mimic an injured creature. My instructors emphasized movement to make the bait look alive. Some large lures are also used, in particular when ***vakasavuba*** (trolling), a practice said to have been introduced by Samoans and Gilbertese (Gatty 2009: 226). Boatmen in Nakasaleka making runs to the ferry terminal or school in fair weather will often trail a line or two, and I have enjoyed some tasty and welcome ***saqa*** (Caranx sp.) caught in this manner. These catches are considered a bonus, given that the fuel cost of the trip has been prepaid by others or allocated to other purposes.

Other fishing methods

Plate 31 Women going out to gather shellfish at low tide

Tomika (to pick things up) or ***tomi*** is a Bau term often used by interviewees to describe gathering invertebrates while wading. Late in the research, I learned that ***vili*** was the appropriate Nakasaleka term; but this term came up too late to use in the encyclopaedia (Gordon 2012) in place of ***tomika***.

Plate 31 shows a group of women going out at low tide to gather shellfish and other creatures inhabiting the tidal zone. Table 10 shows other fishing methods not listed in the encyclopaedia with a discussion to follow.

Table 10 Terms and methods for catching fish mentioned but not listed in the encyclopaedia (Gordon 2012).

Vakasasa (to hunt/fish)	**Catch method: tools or actions**
buburu	prodding for mud eels in a river (Calamia et al 2008).
cavuta	to pull clams off rocks.
lawasua	crab net? (Calamia et al 2008)
lawa viritaki	throwing net
mabuke	big net used by several women to surround fish schools of fish or coral heads.
moka (Veitayaki 1995)	stone traps and fences in which fish are trapped by tides.
nunu dri	diving for ***dri*** (sea cucumbers)

The term, '***buburu***', was removed from the main terms list, as it was recorded from just one of the six people providing 11 catch methods responses for ***dabea*** (*Gymnothorax* sps.), the moray eels. No freshwater eel images were shown or included in the encyclopaedia (Gordon 2012). Some people say that they breed in the sea. I heard the term '***cavuta***' very late in the fieldwork time, and did not include it.

Plate 32 *Lawasua* displayed in the Fiji Museum

The term '***lawasua***' is translated as 'crab net' by Calamia et al. (2008) in their fishing method key, and hence was used on my initial list. The Fiji Museum has a ***lawasua*** on display, as shown in Plate 32. It is described as a mangrove crab trap to be baited with crab and hung from a branch, which can then be seen shaking to show when a crab is inside. Calamia et al (2008) recorded fishing method responses for many kinds of crabs in 21 Kadavu villages, but they do not list ***lawasua*** (crab net) in this context. However, they do provide it as a method used for catching a type of mullet fish known as ***burulo*** (*Mugil cephalus*) in the Western Kadavu district of Yawe and near Nakasaleka in Ono (2008: 16, 59). I asked five interviewees about how to catch one common kind of mangrove crab, ***qari*** (*Scylla serrate*). I received nine responses, of which only one was ***lawasua***; and given as a second choice. It is possible that the interviewee or interpreter chose it from the list of options used for coding by interpreters, in which it is defined as 'crab net' in English. ***Qoli lawa*** (net fishing) and ***moto*** (spear) were the most common responses. I asked a 79 year-old experienced Nakasaleka fisherman, who has spent most of his life in a village surrounded by mangrove swamps, about the use of the term ***lawasua***. This man stated that the term ***lawasua*** is definitely not used in his district, prompting its removal from the encyclopaedia (Gordon 2012), in order to avoid inadvertently creating Nakasaleka TEK. However, the single response of ***lawasua*** originated with either this man or from his wife, a woman also very knowledgeable on fishing matters. On many occasions, this couple were interviewed together; but at times one or the other was absent during interviews, and my records do not identify whether the man or woman used the term. The other response to this question for crab catching from this couple is the single response recorded for crabs of ***talalawa*** (net left overnight). I provide this discussion of ***lawasua*** as an example of the attention to detail that must be taken to ensure accuracy in this sort of work. Given this uncertainty, the encyclopaedia entries for catching ***qari*** (mangrove crabs) are ***qoli lawa*** and ***moto***. The questions remain as to whether the exclusion of the term ***lawasua*** contributes to the "extinction" of the TEK of this village, or if a decision to include the single response of ***lawasua*** would establish TEK not given previous significant use in this village?

Table 11 terms and methods for catching fish which are now illegal in Fiji and given limited or no use in the encyclopaedia (Gordon 2012).

Vakasasa (to hunt/fish)	**Catch method: tools or actions**
coko vonu	spearing a turtle with a ***moko.***
kari loli	poisoning fish with a liquid derived from a sea cucumber, ***loli*** (*Holothuria atra*).
qoli ikabula (Bau: ***qoli vonu***)	turtle fishing net
tatuva (Bau: ***duva***) (Lau: ***tuva*** (Jones 2009)	poisoning fish with crushed stems, roots, or leaves of certain plants, often the indigenous *Derris trifoliate* in Fiji.
the bomb	throwing sticks of dynamite into the sea near a reef to kill fish.

Plate 33 *Loli* (*Holothuria atra*) in the shallow lagoon waters

Table 11 lists a number of fishing practices that are now illegal in Kadavu. ***Kari loli*** involves rubbing a ***loli*** (*Holothuria atra*), a common sea cucumber, as shown in Plate 33, “against a stone to release a red bloodlike liquid that kills any fish in the area, making the fish easy to gather. However, today this practice is not done and is against the law” (Gordon 2012: 84). The liquid is a nerve toxin that kills fish and brings octopus out from their holes (Veitayaki 1995: 51).

Qoli ikabula (turtle nets) were likely made of nylon by the late 20th century in lieu of the special ***magimagi*** (coconut sinnet) used until the early 20th century (Hornell 1940: 72, Tippett 1968: 122-128). Wallace Deane (1921: 175-181) describes four turtle fishing methods used in Kadavu in 1910 including nets. Sahlins (1962) mentions that only one turtle net remained in everyday use in Moala by 1955. Tippett (1968) has compiled a detailed account of turtle fishing practices from many sources. At one time chiefs set catch limits and seasons, authorizing only certain specialists to catch turtles with nets made to specific standards, by certain net-makers who followed prescribed rituals through each step of production. Secularization of these practices, and missionary-supported rejection of bans on common people eat turtles, coupled with an export market for turtle shell, encouraged many people to hunt turtles whenever they came across them. Often a spear and a rope would be the tools at hand.

Turtle shell exports from Fiji between 1875 and 1879 were valued at over 2000 British pounds (Cooper 1879, Committee 1880). Later on in 1910, Deane values the finest ***taku*** or hawksbill (*Eretmochelys imbricata*) shell at up to five pounds in Fiji (1921: 176). However, Hornell reported that 80% of the hawksbill shells obtained in Fiji were dark coloured without the desirable “handsome mottling” desired in turtle-shell products. These inferior shells fetched low prices at London auctions, in which turtle-shell handicraft manufacturers based in Suva were actually buyers of turtle-shell to produce their wares in Fiji. (Hornell 1940: 5-6). Tippett (1968) refers to turtles as nearing extinction in Fiji. Today in Fiji, turtle fishing is illegal, as discussed in Chapter 6. When diving in 2009 and 2011, I often saw smaller ***taku*** (*Eretmochelys imbricata*) and ***ika jina*** or green turtles (*Chelonia mydas*) on the reef.

Plate 34 *Duva* /*tatuva* displayed in the Fiji Museum

To prepare to fish with ***tatuva***, the roots, stems, and leaves of certain shrubs are first ground up. A bundle of these is shown in Plate 34. The powder containing rotenone, a pesticide, is placed in a basket, cloth bag, or glass jar for release in the sea in order to poison the fish through interference with the cellular respiration of fish, but without affecting crustaceans (Gatty 2009: 79). People believe that the fish caught this way are safe to eat. However, piscicidal use of rotenone has recently been phased out in Canada, due to concerns about adverse health effects. (Health Canada 2008). The plants used include *Tephrosia sp*.; *Pittosporum spp*.; the indigenous *Derris trifoliate* (Gatty 2009: 79); and the invasive *Derris malaccensis*, *D. elliptica*, and *D. uliginosa*. This is a fishing practice of antiquity in Melanesia (Rickard and Cox 1986). Edvard Hviding reports common use of this fishing method in the Solomon Islands lagoon of Marovo, where restrictions on "***buna rokoroko*** (leaf ***buna***)" fishing began to be introduced in the 1980s (1996: 220). At least one species of *Derris* is very common to find growing wild in Kadavu. In the late 1990s, a survey by Calamia (2003: 244) in Kadavu found many people willing to confirm the use of ***tautuva***/***duva*** by others. Sharon Jones (2009) confirms occasional use in Lau. All of the older literature on fishing methods referenced earlier under 'fishing methods' discuss this method. I used the spelling of ***tatuva*** provided by my interpreters and interviewees who used either one of the terms, ***tatuva*** and ***duva***. The Austronesian language group cognates for ***tatuva*** and ***duva*** of the Malay '***tuba***' and the Sumbanese, Eastern Indonesian '***tuwa***' illustrate the antiquity of this fishing practice (Gregory Forth: personal communication 03.01.2013).

Using 'the bomb' means throwing sticks of dynamite into the sea near a reef to allow easy harvesting of fish on the surface. In the Solomon Islands, people associate this method with using plant toxins by calling it ***buna vaka*** (***buna*** from [European] ships) in the Marovo Lagoon (Hviding 1996: 220). Calamia (2003: 244) states that blast fishing saw little use in Kadavu since the early 1960s, unlike elsewhere in Fiji. Hornell reports a 1923 Fiji Government ordinance banning the use of explosive or poisonous substances to kill fish (1940: 47). However, in Kadavu people still tell stories about using ‘the bomb’ today, but these refer to events many years ago. This method kills coral, fish, and everything else, leaving obvious evidence. People say that using dynamite is a bad thing to do, and recognize the risks and associated destruction of reefs from this practice.

This survey of the responses to the question on catching methods for marine life has illustrated a complex knowledge of fishing techniques; and offered glimpses of profound associations among artifacts, actions, and social practices. The topic merits further detailed and temporal research, in order to provide richer understandings for marine conservation advocates of what it means to fish in Nakasaleka and other Fijian coastal villages. Fishing methods are subject to change and invention as conditions, available resources, valued resources, and people’s lifestyles change. In particular, I have demonstrated the importance of recognizing spear fishing as a well-established sport tradition which must be taken seriously in marine conservation planning and education programs. This is a challenge; however, effective education programs may yield positive results.

One man, who was visiting his Nakasaleka natal village, after having worked many years as a commercial spear fisher on Vitu Levu, became very interested in the education possibilities of my research in regard to teaching the younger people to fish more selectively. This man had watched and contributed to the severe decline of fish stocks elsewhere, and expressed concerns about preventing this result in Nakasaleka.

However, such goodwill must be given opportunities to express itself by conservation planners; and understood in its own context, rather than applying Western notions of stewardship, as discussed in Chapter 6. Likewise, the deep-rooted social aspects of net fishing must be considered and addressed in education programs as primary factors, without getting too concerned with differentiating notions of traditional knowledge and modern knowledge. These approaches need to recognize that how people are fishing now, and their childhood experiences of fishing, represent the traditions that are real for people. Economic pressures form complex relations with social beliefs and relationships. Thus, ethnographic information gathering is critical in understanding the social aspects of fishing tools and practices, as has been well recognized by others seeking to better understand traditional ecological knowledge of fishers, such as described in *The value of anecdote* (Johannes and Neis 2007).

Chapter 6: Survey questions and responses about practical and social aspects of marine life for Nakasaleka people (b) making use of marine life

Question 13) What is the best way to cook them?

A) ***Na yava na kena i vakariri vinaka duadua***?

LT: What way is it cooked to be the very best?

B) ***Na kena i variri vinaka duadua****?*

LT: It is cooked to be the very best?

C) ***Na cava na kena i saqasaqa vinaka duadua****?*

LT: What way is it cooked to be the very best?

Discussion:

The term ***yava*** is the Kadavu equivalent of the Bau term ***cava*** (what). ***Na kena*** translates as his, her, or its food to consume, in reference to a person or animal (Gatty 2009: 112). In version A, ***vakariri*** (to cook) is abbreviated to the Kadavu term, ***variri***, in version B. The Bau equivalent is ***saqasaqa***. The etymology of both words stems from terms for cooking in clay pots. These narrow-necked pots, with woven lids, were pressure cookers positioned above the fire to steam food with just a small amount of water, rather than the common modern method of boiling food in metal pots. Good clay pots were prized possessions of women. This method was used for centuries by coastal people in Fiji; but has fallen out of use given the ongoing breakage problems of the pots, which for this reason were often not be moved, but cleaned in place (Ravuvu 1983, Sorovi-Vunidilo and Vusoniwailala 1999, Gatty 2009). I did not see any clay pots stored or in use, although Burley and Balenaivalu (In press) report seeing numerous pot shards washing out of the Tiliva shoreline. Today, '***riri***' (boil) and the Bau term '***saqa***' (boil) refer to boiling in metal pots. ***Saqa*** was used more often than ***riri*** in the survey responses, but this frequency was not tracked. ***Mati ni vakariri*** (good cook) is also a common Nakasaleka term. In version C of the question, ***duadua*** is an adjective meaning "unique, exceptional, best" (Gatty 2009: 76). Table 12 gives the list of cooking terms used in the encyclopaedia (Gordon 2012), which were collected from interview responses.

In this section, I first review cooking resources and methods in Nakasaleka to provide context for the results of the survey, which will explore the diverse and expert uses of marine food resources. The responses to this question are relevant to investigations of dietary change, attitudes to food and cooking, general health, and diet-related illnesses such as diabetes and ciguatera. These are significant issues for modern Pacific Islanders.

Cooking resources

Today in these Nakasaleka villages, most cooking is done on a wood fire, with some kerosene stove use, as shown in Plate 35 Series. The photographs were taken in typical one or two room houses. An alcove extension is surrounded by corrugated metal with a raised platform for the fire, as shown in Plates 35.1 and 35.2. This arrangement allows people to stand up while they cook. A vertical extension of metal sheeting above the roof line acts as a chimney. Cooking areas tend to be in what is considered the 'lower' end of the house and as far from the sleeping area, or 'upper' end of the home, as possible (Ravuvu 1983: 28). Some homes have a cook-shack separated from their house, a less convenient that does keep the living quarters much cooler. These cook-shacks may be shared with relatives living in adjacent houses. Today, many village households also have a tap and sink with running water in the house or cook-shack.

Kerosene stoves seem to be used less often than wood-fire, given the cost of kerosene in 2011 of $1.40 USD per litre, and its unpredictable availability to villagers. The fumes from the kerosene stoves and lanterns, shown in Plates 35.3 and 35.4, are unpleasant in enclosed spaces; and the use of kerosene compromises fire safety. However, in times of bad weather, a kerosene stove is a practical cooking alternative to wet wood.

Matasawalevu village leaders designate a certain area of land as a communal firewood source, which in 2001-2012 was a steep slope accessed by a 15 minute walk on a rough trail. People also use their own designated agricultural plots of land to gather fuel. Women are often seen returning to the village with immense bundles of firewood strapped to their back. Younger men also fetch firewood, but I seldom saw older men perform this task. On occasion, I saw young men drag large logs from the bush to chop up with rather dull axes. One man used a chainsaw on rare occasions for this work, but a machete is the primary chopping tool for firewood. Injuries associated with this work are not uncommon.

Plate 35 Series Wood fire kitchens and kerosene stove

35. 1 Wood fire kitchen alcove

35.2 Wood fire kitchen and chimney

35.3 Kerosene stove (Yangzhou 2013)

35.4 Kerosene lantern (Yangzhou 2013)

Boiling, frying, and barbequing are the most common ways of cooking fish, as can be seen by the methods listed in Table 12. Cooking food in ***lovo*** (earth ovens) is done for special events, as will be described later. I understand that steaming food, as done in the older clay pots discussed earlier, was referred to as ***vakasaqa*** in Bau, and ***vakariri*** in Nakaslaeka, terms that today refer to both cooking by boiling and cooking in general. The change from steaming food in clay pots to boiling food in metal pots may be perceived in Nakasaleka as a practical technology shift, rather than a change in cooking methods, given the fragility and limited supply of clay cooking pots. Gatty confirms this shift in meaning of the term ***saqa*** from clay to metal pot cooking (2009: 33). Today, ***buta i na cawa*** is used to refer to steaming food in Kadavu. This phrase containing ***buta*** (to cook; cooked) and ***cawa*** (noun: steam; verb: to steam) sees common use elsewhere in Fiji as ***buta ina cawa*** (Gatty 2009: 33, Geraghty 2008: 108).

The Yawe district of Western Kadavu had a strong earthenware pottery manufacturing tradition until the early 1970s, when a dispute between potters and land owners over access to specific types of the required clay and sand put a stop to pot production. These pots were then being sold into hotel and city markets, presumably as souvenirs, when a disagreement arose about sharing the sales income with natural resource owners. Hence, the production of earthenware cooking pots for local use in Kadavu may have declined earlier than this time. In 1997, a Fiji Arts Council workshop was held in Yawe to allow two elderly women to teach pottery making skills to younger women and revitalize the pot-making industry. This working session involved a discussion of the taboos associated with earthenware pots, which "demand great respect, on par with that merited to chiefs and those of high social rank" (Sorovi-Vunidillo and Vusoniwailala 1999: 50-54).

Table 12 Cooking methods

Vakariri	**Cooking methods**
baovi	wrap in banana leaf and put in fire or ***lovo***
gaga	risk of poison. ***GAGA***:A: poisonous, ***GAGA***:B: often poisonous, ***GAGA***:C: sometimes poisonous
ginu	light BBQ- wrap in leaves and put in the fire
kari	make into a curry
kari lolo	curry and coconut milk
kokoda	raw with lemon
kovu *(SF for Baovi)*	wrap in leaf and put in fire
miji	boiled fish with raw coconut milk
riri / Saqa	boil or boil with ***bele***
surawa lolo	***lolo*** with curry
tatavu	BBQ on a fire
tavuteke	fry
tusala	wrap in banana leaves and boil in a pot

Vakariri	**Cooking methods**
vakalolo	boil in coconut milk
vesa	BBQ or smoke on a grill

Review of Cooking Methods

The brevity and simplicity of this list in Table 12 demonstrates the limitations in scope and context of the survey question. Nakasaleka people take great pride in their cooking skills and recipes, which contain numerous techniques and nuances not recorded in response to this question. For example, asking Canadians how they cook pasta would often yield the response ‘boiling’, but would not elicit the many ways that it would be cooked and served. An ethnographic research approach using participant observation would be required to do justice to this complex topic of cultural significance in Nakasaleka. Acquiring and preparing food for eating together, and sharing food among households is fundamental to village life. Here, I will review just a few segments of the many Nakasaleka cooking techniques.

Many of the interview responses of cooking methods for marine life listed in Table 12 involve wrapping the flesh in leaves to protect it from flames and keep it intact. Fresh-cut banana leaves are popular for this purpose. The spine of the banana leaf is striped to make it pliable, as shown in Plates 36.1 and 36.2. Plate 36.3 shows a leaf bundle, tied at the neck, that would be boiled in water, a process known as ***tusala***. Plate 36.4 illustrates a flat leaf package, as would be put in a fire for cooking in a barbeque fashion. This process relates to the methods described by ***baovi***, ***ginu***, and ***kovu***, which keep the enclosed flesh tender and allow marinating. The main marinades and flavour enhancers for meat are chilli, ***kari*** (curry), ***lolo*** (coconut cream), ***garliki*** (garlic), ginger,

moli (lemon), and ***verasa*** (onion). The very small bundles shown in the Plates are for demonstration only; there is no flesh being put inside these leaves.

Plate 36 Series: Banana leaf bundles

36.1 Removing the leaf spine

36.2 Folding the leaf

36.3 Leaf bundle for boiling

36.4 Leaf bundle for barbeque

There are gender distinctions for cooking responsibilities. Most often women carry out any cooking done in the kitchen or on a stove, while men are responsible for managing a ***lovo*** (earth oven) located outside a home, for special events. Asesela Ravuvu stated that “no man who likes to be considered manly will hang around the kitchen” (1983:28). Today, however, the day-to-day gender divisions are blurring in some homes; in particular in families which have switched from Methodism to a Pentecostal religious affiliation, in which men do not spend the pre-dinner hours drinking kava together. I also observed a few men cooking when women were out fishing or otherwise occupied. In these homes, women now often eat at the same time as men. This is a departure from what is described as the traditional manner of eating, in which women wait upon the men, who first eat their fill before leaving the remainder for women and children. However, in the cooking domain, organizing a ***lovo*** (earth oven) for a special occasion is an activity that most men seem to enjoy, although younger men do most of the work.

Making a ***lovo*** is a considerable amount of work. The same hole in the ground and heating rocks are used repeatedly; but much wood must be cut, as seen in Plate 37.1. The wood burns until it collapses into the hole under the rocks, as shown in Plate 37.2. The slow burning coals then create a strong even heat to the rocks above, which is diffused to the food. Banana leaves are gathered in advance to be laid on top of the heated rocks, both under and over the food being cooked in the ***lovo***. The leaves are also used to wrap the fish. Plates 37.4 to 37.7 show this process, which in this case features a young man's artistry in the braiding of leaves.

Root crops of ***dalo*** (taro) and **tavioka** (cassava) comprise the bulk of the food cooked in a ***lovo***. These items form the core of the villager diet, and are termed as '***kana***' (food). In Nakasaleka, the meat and greens that garnish the meal of starches are known as ***i lava***, or '***icoi***' in Bau. Plate 37.8 shows peeled ***dalo*** (taro) on top of some ***tavioka*** (cassava) waiting to be placed in the ***lovo*** for cooking.

This particular ***lovo*** had a smaller amount of food than would often be the case. This ***lovo*** was put on for my benefit to feed four of us, by my family in Matasawalevu on a Sunday before my first departure from this village. Sunday is not a workday in the villages for religious reasons. Thus, Sunday ***lovo*** preparations are made on Saturday. The fire was started on Sunday at 6:00 AM to ensure that the food would be cooked by midday for our lunch. This practice frees up Sunday afternoons for napping, as the remainder of the food from the ***lovo*** can be served as dinner for our household and some neighbours. In Tiliva village, where I stayed in the home of the ***vakatawa*** (preacher), villagers often made a ***lovo*** for Sunday lunch of which a share was delivered to our home as a weekly village responsibility.

Studies of ***lovo*** cooking have determined that cooking temperature in a ***lovo*** may reach 126° C. Food was generally cooked for at least one and a quarter hours. Longer cook times have been shown to reduce nutrient content significantly (Kumar and Aalbersberg 2006A).

Rourou is a Nakasaleka delicacy made from a type of ***dalo*** (taro; *Colocasia esculenta*) leaves that women take great pride in making with their own unique recipe variations. ***Lovo***-cooked ***rourou*** is considered particularly flavourful. The term '***drudru***' means to peel the skin off root vegetables or fish in order to cook them with ***rourou*** or ***bele*** (*Abelmoschus manihot*; previously *Hibiscus esculentus*). This was a common survey response as a cooking method for fish. However, I did not recognize the importance of differentiating this response from more basic responses of ***riri*** or ***saqa*** (boil) in time to create useful data in the survey. I suspect this ***drudru*** method is applied to more bland tasting types of fish, and hence would indicate variations in desirability of different types of fish for consumption.

Plate 37 Series: Cooking with a *lovo*

37.1 Starting the ***lovo***

37.2 Lovo ready for raw food

37.3 Preparing the leaves

37.4 Raw fish with onion and garlic

37.5 Wrapping the fish

37.6 Fish bundled in banana leaves

37.7 Braiding with coconut leaves

37.8 Raw dalo, tavioka, and fish

Here, I describe the ***lovo*** method of making flavourful ***rourou***. Making ***rourou*** starts with shredding split coconuts as shown in Plate 39.1. The person doing the shredding sits on the shredder-board tool shown in Plate 39.1 and applies the coconuts to the protruding metal blade. In earlier days a clamshell tool was used, as shown in the photograph in Plate 38 from the Fiji Museum. The shredded coconut is put into a cloth around a hot stone to melt the pulp, which is strained into a bucket to mix with garlic, onion, and ginger as shown in Plates 39.3 and 39.4. Next, the fresh ***dalo*** (taro) leaves, shown bundled on the ground in Plate 39.5, are folded into a cup-shape in a half coconut to receive the coconut cream mixture, as shown in Plate 39.6. The leaves are folded over to enclose the mixture, as shown in the pan in Plate 39.7. The filled coconut shells are placed in the ***lovo*** and later removed with the other cooked food, as shown in Plate 39.8. Making ***rourou*** in a ***lovo*** is a time-consuming labour of love. Whether ***rourou*** is made this way or less formally by boiling the leaves in a coconut mix, people always want to know what you think of their ***rourou***. ***Vakalolo*** means 'boiled in coconut cream', also a very popular way of cooking fish. This method adds fat content and flavour to a meal of lean fish. At times, people become bored with their fish diet, as I saw by their enthusiasm for eating store-bought chickens on occasion.

Plate 38 Old coconut scraper with clamshell blade

Plate 39 Series: Making *rourou*

39.1 Shredding coconut

21.2 Coconut shredding tool

21.3 Coconut cream mixture

21.4 Straining coconut cream

21.5 ***Dalo*** leaves (centre)

21.6 Filling the bowls

21.7 One ***rourou*** ready for ***lovo***

21.8 ***lovo***-cooked rourou (right)

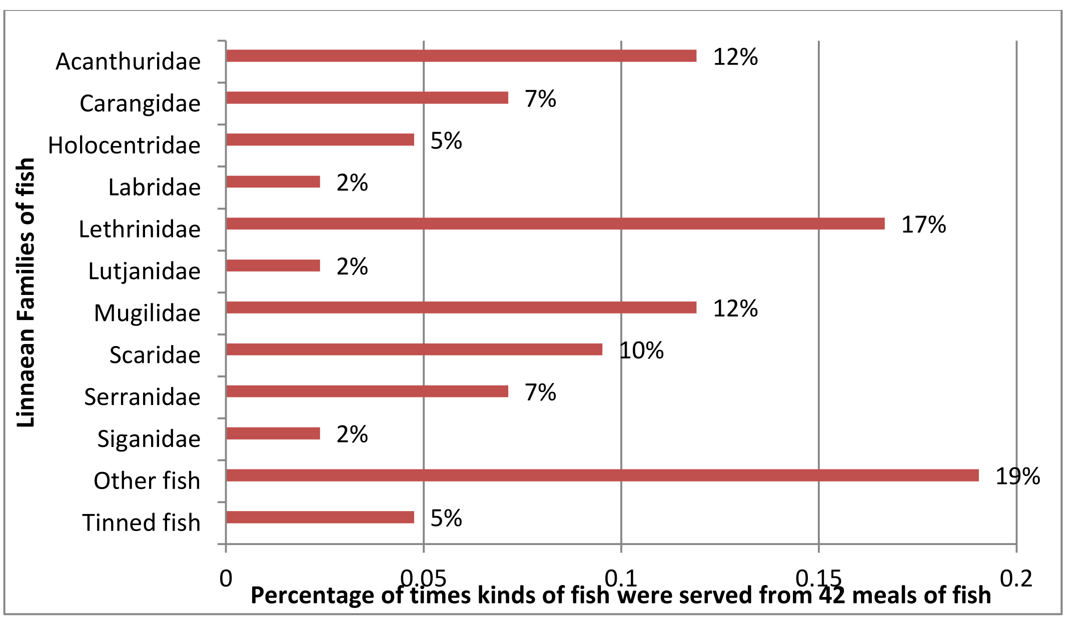
Diversity of fish kinds in the daily diet

Understanding the methods of cooking requires context, such as knowledge of what kinds of fish are being eaten in the village. I did not have the time or resources in this research to conduct daily surveys to determine what kinds of fish people were eating, and how the fish were cooked. However, over a 39 day span, while living in the small village of Matasawalevu, I kept a record of the fish and other foods that I was given to eat, along with some notes on cooking methods. In this village, my room and board money was paid to a community fund. Lunch and dinner were provided by 18 different households each day on rotation. This system, known as ***itakitaki***, is often employed to host visiting preachers and government officials. My meals were not a typical villager's diet. Village women monitored and discussed my eating habits and tastes, with an element of competition in evidence at times. However, this record does inform samples of what kinds of fish were available in the village for my daily meals, regardless of who caught them.

Over 39 days I was served 42 meals containing some type of fish. In other meals, I was also served boiled or fried chicken eggs 12 times and corned beef 8 times, as the protein component. The corned beef and most of the eggs would have been purchased from the nearest shop to this village, which requires an arduous 90 minute walk. Corned beef is a higher status food than many kinds of fish. I later came to realize that eggs were seldom obtained from local chickens, and usually were bought only as special food for children. Figure 40 illustrates the variety of kinds of fish served. If fish were supplied for my lunch and dinner by a village woman, often a different kind of fish would be served at each meal. However, on Sundays and occasions when an assigned hostess was unable to provide the meals, I ate with a leading village family with whom I had become quite good friends. Here, we might have some repetition of the same fish kind over two meals, although my hosts often apologized for this duplication.

For eight of the 42 meals containing fish, I was unable to determine the kind of fish being served, due to cooking method, darkness, or lack of opportunity to discuss it with the meal provider. These meals are represented by the category ‘other fish’ in Figure 40. On just two occasions, I was served lower status tinned fish during this period. However, these were popular recipes of tuna mixed with desirable ***rourou*** and ***lolo*** (coconut cream). This limited use of tinned fish is in sharp contrast with many meals I observed in other villages. There, one or two cans of tuna were added to dry-pack noodle soup to share protein among several people when their access to fresh fish was limited by weather or opportunity. Figure 40 illustrates that the meals with fish from my sample include specimens from types spanning 10 Linnaean families of fish. This diversity demonstrates the range of fish kinds available to people at the time. River prawns and marine shellfish are other staples not served to me, as I am allergic to them.

Figure 40 Kinds and frequency of fish served to visiting researcher over 39 days in January to March 2012

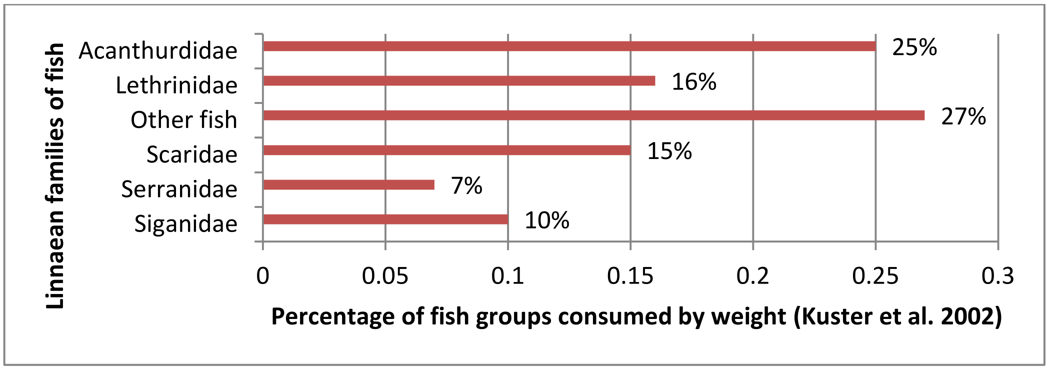


A notable absence from Figure 40 is the ***vaya*** (*Thryssa baelama*), a fish often available and eaten in Matasawalevu, but not served to me during these 39 days, as discussed in Chapter 7. The diversity of kinds of fish in my sample of meals is consistent with observations made by others of fish consumption of villagers in Fiji's Lau islands, where fresh fish is also an essential protein source. Sharyn Jones' observation that Lau people eat all kinds of reef fish is substantiated by the results of a one week survey of the fish consumption by five households. Jones (2009: 106) found that different people had their preferences. Women may focus on catching certain kinds, or trade with others for their household's favourite kind.This report agrees with my observations in the village and on fishing trips; little of the catch is wasted or thrown back.

During my 2009 pilot project, in Kadavu, I asked people to name their 'favourite kind of fish'. I recorded a significant range of responses and justifications often associated with taste or fat content (Gordon 2010). A report on fish creel and consumption surveys conducted by Kuster et al. (2003) in Ono-i-Lau remarks upon the diversity of kinds of fish caught using the common inshore fishing practices described earlier for Kadavu. Figure 41 shows consistencies between distributions of fish kind diversity caught in Lau and records of my meals, as shown in Figure 40.

In the 2003 study, percentages of 'weight of fish consumed' are found to be almost identical to the number of fish consumed (Kuster et al. 2003: 14). This study addresses the difference in units of measure to allow a reasonable comparison with the meals served to me in the weight category, given that many of my meals contained a whole or half fish. A key difference between diets in Nakasaleka in 2012 and Ono-i-Lau in 2003 not evident in these figures is the higher consumption of giant clams (*Tridacna* sp.) in Lau. These clams are scarce in Nakasaleka today.

Figure 41 Diversity of fish kinds caught in Ono-I-Lau, Fiji (Kuster et al. 2003).



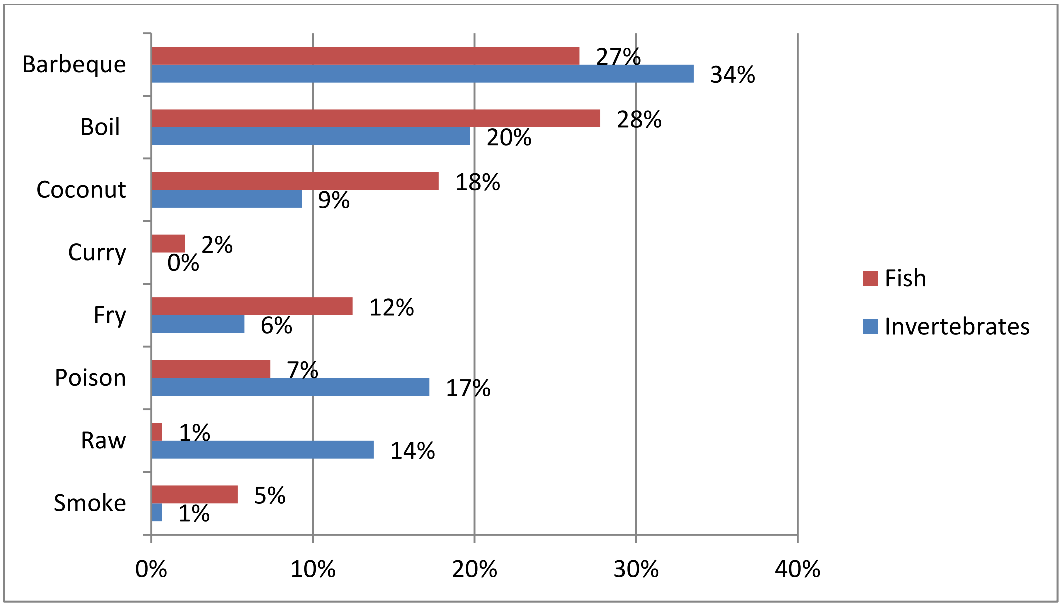
In a comparison between the diversity of fish kinds served to me, as shown in Figure 40, and the catch census records shown in Figure 41 from other Fijian coastal villages, the consumption percentages match closely for Lethrinidae and Serranidae fish. At certain times of year, Siganidae and Acanthuridae fish form large schools. This feature may cause the proportionately higher numbers of these in the Lau results. In any case, these comparisons confirm that the results in Figure 40 are a reasonable representation of the diversity of fish kinds consumed in Matasawalevu and not an aberration of the ***itakitaki*** hospitality program. This diversity of fish consumption patterns demonstrates the efficiencies developed over millennia of experimentation by Fijian fishers, which extends into a range of cooking practices and skills practiced by different people. A notable example of this knowledge is provided by villagers who have the skills to remove poison from pufferfish known as ***vusevuse*** (*Arothron* and *Canthigaster* sp.). In Japan this is a licenced skill for prestige chefs to produce a serving of '*fugu*' (pufferfish) sold for about $400.00 USD. (Chowdhury et al. 2007). Later, I review various approaches to preparing poisonous fish by village cooks.

Diversity of cooking methods for marine life

People have their favourite kinds of fish and invertebrates to eat. Personal tastes also vary on preferred ways to cook them, as evidenced by the range of the 1640 responses generated by the question on this topic. The encyclopaedia contains the most popular two or three methods recorded for each organism (Gordon 2012). However, the variety of organisms multiplied by the diversity of cooking methods and preferences creates challenges for summarizing these data here in a meaningful way. In what follows, I present patterns drawn from 77% of these responses, which are for the most part sorted into broad groups of organisms recognized in Nakasaleka folk biology and international science. This data sample represents 1144 responses regarding fish, which include eels, sharks, and turtles; and 112 responses regarding invertebrates, which include octopus and a significant 42 responses for sea cucumbers. Relatively few sea cucumbers are eaten; most are boiled for sale to Asian markets.

At a broad level, cooking methods might be broken down into eight categories as shown in Figure 42, although some cooking methods using coconut also involve boiling. Boiling is defined in this summary as boiling in water exclusive of ***vakalolo*** (boiling in coconut cream).

Figure 42 A summary of cooking method responses. 1144 responses relate to fish and 112 to invertebrates.



The broad categories of methods shown in Figure 42 illustrate the dominant use of the barbeque and boil methods. Barbeque refers to roasting on or in fires or ***lovos***, which includes unwrapped or leaf wrapped food, such as shown in Plate Series 37 and 39. Boiling includes methods such as ***tusala***, shown in Plate Series 36, in which food is wrapped in leaves before boiling. The importance of coconut water, cream, or flesh in cooking processes is both significant and diverse, as will be described later. Frying is a less popular cooking method, which requires the relatively significant expense of cooking oil, when taken as a percentage of food staples purchased in stores by villagers. The category of poison includes both organisms which are not eaten at all, such as ***gasagasau*** (a long-spine sea urchin); and creatures which must be treated to remove poisons before they can be eaten. A number of invertebrates are eaten raw, such as ***cawaki*** (a short-spine sea urchin), which are often consumed as snacks whenever people find them. The category of 'smoke' includes both preserving fish for a few days to eat or sell, and using a light cooking technique for thin fish. However, these broad categories ignore important distinctions between cooking methods and variations of the types of organisms being cooked. The more detailed summary in Table 13 identifies 16 methods used and preferences for cooking 24 different categories of fish kinds.

Table 13 A summary of cooking preferences for 24 categories of fish. The most popular methods per fish kind are highlighted in yellow.

Cook method	*Baovi*	*Baovi L*	*Tatavu*	*Ginu*	*Riri*	*Riri*	*Tusala*	*Kari*	*Tavuteke*	*Gaga*	*Vakalolo*	*Karilolo*	*Miji*	*Kokoda*	*Vesa*	
Kadavu terms	(*kama*)	(*lovo*)	*vesa*			*vata bele*							preboil/			Number
English				light		boil	boil				boil in	in curry/	serve in		smoke	of
translation	barbeque	barbeque	barbeque	barbeque	boil	with	wrapped	made in	fry	poison	coconut	coconut	coconut	raw with	over	survey
	leaf/fire	leaf/lovo	on fire	leaf/fire	water	*bele*	in leaf	a curry			milk	milk	raw milk	lemon	fire	responses
Wrasses	15%	1%	7%	1%	29%	9%	1%	0%	15%	1%	14%	1%	3%	0%	2%	92
Turtles	60%	20%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%	0%	5
Triggerfish	17%	7%	13%	0%	10%	3%	0%	3%	0%	0%	17%	27%	0%	0%	3%	30
Sweetlips	23%	0%	0%	0%	32%	13%	0%	0%	10%	13%	6%	0%	3%	0%	0%	31
Surgeonfish	12%	1%	11%	0%	31%	9%	0%	4%	5%	2%	12%	1%	2%	1%	10%	163
Squirrelfish	7%	2%	30%	0%	28%	7%	0%	0%	6%	2%	15%	0%	0%	0%	4%	54
Snappers	7%	0%	0%	0%	25%	6%	0%	0%	27%	6%	12%	4%	4%	0%	7%	67
Sharks	8%	0%	6%	0%	4%	4%	0%	4%	12%	2%	6%	39%	4%	0%	10%	49
Rays	20%	0%	10%	0%	0%	20%	0%	0%	0%	10%	10%	10%	0%	0%	20%	10
Rabbitfish	21%	0%	32%	0%	21%	11%	5%	0%	0%	5%	5%	0%	0%	0%	0%	19
Puffer: ***vusevuse***	9%	0%	5%	0%	18%	5%	0%	0%	0%	**59%**	5%	0%	0%	0%	0%	22
Puffer: ***gugu***	0%	0%	73%	0%	18%	0%	0%	0%	0%	0%	9%	0%	0%	0%	0%	11
Porcupinefish	5%	0%	0%	0%	32%	0%	0%	0%	0%	21%	11%	0%	32%	0%	0%	19
Parrotfish	6%	4%	2%	2%	12%	4%	0%	2%	22%	4%	17%	5%	2%	6%	11%	161
Lion/stonefish	0%	0%	7%	0%	38%	17%	0%	0%	7%	10%	14%	3%	0%	0%	3%	29
Jacks	11%	0%	0%	0%	44%	11%	0%	0%	15%	0%	4%	0%	11%	0%	4%	27
Herring	13%	0%	25%	0%	0%	0%	0%	0%	38%	0%	13%	0%	0%	0%	13%	8
Groupers	8%	3%	0%	0%	24%	13%	0%	1%	19%	7%	14%	2%	3%	1%	6%	124
Goatfish	13%	3%	3%	0%	23%	6%	0%	0%	16%	10%	16%	0%	0%	6%	3%	31
Emperors	2%	2%	0%	0%	42%	7%	0%	2%	13%	0%	11%	2%	4%	2%	11%	45
Eels	44%	11%	0%	11%	6%	0%	0%	11%	0%	17%	0%	0%	0%	0%	0%	18
Butterflyfish	6%	5%	24%	0%	27%	9%	2%	0%	6%	2%	14%	0%	0%	0%	6%	106
Barracuda	0%	0%	0%	0%	10%	10%	0%	0%	60%	0%	10%	10%	0%	0%	0%	10
Anchovie	0%	0%	8%	8%	31%	0%	0%	0%	23%	0%	15%	0%	0%	0%	15%	13
Total	10%	2%	7%	1%	24%	8%	0%	2%	13%	6%	12%	5%	3%	1%	7%	1144

The results in Table 13 use English common names for the fish categories in order to render a large amount of data easily comprehensible to the English speaking reader. In this section only, references to kinds of fish will use English common names, with some Kadavu names in brackets. The data in Table 13 and Table 14 represent 77% or 1256 of the 1640 responses received for this question. The remaining responses apply to many diverse types of marine life that would require too much space to summarize effectively in this chapter. The most popular of all of these responses are presented for each fish kind in the encyclopaedia (Gordon 2012).

In Table 13, a clear trend of diversity of cooking method preferences for similar kinds of fish is evident, given that these results are drawn from 59 interviewees living in three adjacent rural communities with close ties. The number of survey responses from each category listed in the far right column is a function of the number of pictures shown and the number of varieties within the categories, the latter of which could be considered a cause of this diversity in cooking preferences. However, the diversity is also evident in categories with few sub-category varieties and survey responses, such as the 10 responses for rays recorded in association with only two images of different varieties. Three different cooking methods for rays receive two votes each; and three other method responses were unique, with one person stating they did not eat the ray due to toxicity concerns. Similar cooking method diversity is shown in the small sample size categories of eels, goatfish, lion/stonefish, porcupinefish, rabbitfish, sweetlips, triggerfish; and notably, the single image and fish kind examples of herring (***daniva***) and anchovy (***vaya***).

The highest levels of agreement in cooking methods by category are for: non-poisonous pufferfish ***(gugu***) at 73% for the method 'barbeque on fire'; the barracuda at 60% for 'fry'; the poisonous pufferfish (***vusevuse***) at 59% for 'do not eat'; and turtle (***ika bula***) at 60% for 'barbeque inside a leaf in the fire'. No other categories showed response consistencies in excess of 44%. The average cross-fish-kind-category consensus level for each category's most popular method is 37%. The bottom row in Table 13 labelled 'total' shows the overall most common method to be ***riri*** (boil) with 24 % of the responses and nearly double the next most popular method for the sample categories. Further statistical analysis of these data is unnecessary to support the obvious fact that cooking practices and preferences vary significantly within this relatively small sample of people, despite using what would at first glance appear to be a limited range of technological options for cooking food. This result demonstrates the complexity obscured in the initial summary of eight methods shown above in Figure 42. The cooking preferences recorded for invertebrates in Table 14 show somewhat higher levels of consistency, based on a relatively small sample of nine categories and 112 responses. There were 11 methods recorded for cooking invertebrates in contrast with 14 methods for fish.

Table 14 A summary of cooking preferences for 9 categories of invertebrates. Most popular methods per invertebrate kind are highlighted in yellow.

Cook method	*Baovi*	*Baovi L*	*Tatavu*	*Ginu*	*Riri*	*Riri*	*Tavuteke*	*Gaga*	*Vakalolo*	*Kokoda*	*Vesa*	
Kadavu terms	(*kama*)	(*lovo*)	*vesa*			*vata bele*						Number
English				light		boil			boil in		smoke	of
translation	barbeque	barbeque	barbeque	barbeque	boil	with	fry	poison	coconut	raw with	over	survey
	leaf/fire	leaf/lovo	on fire	leaf/fire	water	*bele*			milk	lemon	fire	responses
Cawaki	13%	7%	27%	0%	7%	0%	7%	7%	13%	20%	0%	15
Civa	75%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	4
Drumani	75%	0%	0%	25%	0%	0%	0%	0%	0%	0%	0%	4
Gasagasau	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	5
Katavatu	13%	0%	0%	0%	0%	0%	13%	13%	13%	50%	0%	8
Sulua	24%	6%	6%	0%	24%	12%	0%	6%	18%	0%	6%	17
Dri	0%	0%	0%	0%	95%	0%	0%	5%	0%	0%	0%	42
Vasua	8%	0%	0%	0%	15%	0%	8%	0%	15%	54%	0%	13
Yaga	0%	0%	25%	0%	25%	0%	25%	0%	25%	0%	0%	4
Total	20%	3%	9%	1%	11%	3%	6%	13%	13%	20%	1%	112

Key to Table 14: ***Cawaki*** (short-spine urchins); ***Civa*** (medium size reef clam); ***Drumani*** (anemone); ***Gasagasau*** (long-spine urchin); ***Katavatu*** and ***Vasua*** (*Tridacna* sp./giant clams); ***Sulua*** (octopus); ***Yaga*** (spider conch).

As shown in Table 14, preference of cooking method agreement levels for ***civa*** and ***drumani*** are quite high. More than half of the respondents like to eat ***katavata*** and ***vasua*** flesh raw. This is a well-known method for women to address a common problem for Fijian women and children of iron deficiency or anemia (Vatucawaqa 2003). However, giant clams are scarce on Nakasaleka reefs today. Many weathered *Tridacna* shells can be seen around the villages. Consensus is strong on the cooking method for the ***civa***, a medium sized clam that attaches so firmly to rocks and reefs that the flesh must be cut out in the sea. Everyone agrees on not eating ***gasagasau***, the poisonous urchins; but there are many ways to eat the popular ***cawaki*** urchins. Preferred methods for cooking ***sulua*** (octopus) and ***yaga*** (spider conch) are diverse. In summary, preferred cooking methods for this small sample of invertebrates show significant diversity, but a lesser range than seen with the responses for fish. The 95% agreement level for ***dri*** (sea cucumber) is an exception, as these all must be well boiled to prepare them for sale or on occasion eating.

Cooking and eating poisonous things

Nakasaleka people are quite resourceful in their ability to deal with poisonous defences and other accumulated toxins found in marine life. This section will further demonstrate the complexity of people's daily decisions informed by traditional ecological knowledge regarding handling and eating marine life. In the encyclopaedia, the risk of ***gaga*** (poison), or ***poisoni***, was designated as ***Gaga*** (A) poisonous, ***Gaga*** (B) often poisonous, or ***Gaga*** (C) sometimes poisonous, as shown in Table 12. The information on poisonous creatures included in the encyclopaedia reflects the knowledge and beliefs of the interviewees and interpreters, rather than my knowledge drawn from other sources (Gordon 2012).

The complexity of dealing with 'always poisonous' creatures may require specialized skills such as the pre-cooking removal of the deadly tetrodotoxin poison of ***vusevuse*** (*Arothron* and *Canthigaster* sp.), a fish which 59% of respondents did not eat at all, as shown in Table 13. Large ***dabea*** (*Gymnothorax* sp.; moray eels) also require careful preparation. Some villagers are considered experts in the pre-cooking removal of an eel's poison sac and what I assume is either a blood vessel running along the spine or actual spinal fluid. Others describe discarding the tail and scraping the black blood out from the gut. However, large eels may also accumulate high levels of ciguatera toxins; and cause serious illness when cooked and eaten (Lehane and Lewis 2000). In Saipan, in 1949, of 57 people who ate cooked slices of a six-foot moray eel and became ill, 50 "were bedridden, hospitalized, and unable to talk," with a recovery time of one to two months for the 48 survivors (Bartsch and McFarren 1962: 43). In Nakasaleka, eel is a popular dish with a high fat content, and said to taste like pork. Another interviewee spoke of their daughter's village on another island where the eels are not poisonous, due to different corals. In that village people do not remove the spine before cooking an eel.

Other 'always poisonous creatures' such as ***toa*** (lionfish) and ***novu*** (stonefish) require careful handling. People cut off these poisonous spines with scissors before cooking the fish. One older woman recalled learning as a child from her grandmother to quickly bite off and spit out the poisonous dorsal and pectoral fin spines of ***kaboa*** (*Plotosis lineatus*; striped catfish), when pulling the slippery fish from the net. For other poisonous dorsal spines, such as those of the popular ***nuqa*** (Siganidae), the fish are first boiled to dissipate toxins. I will discuss the treatment of stings received from ***novu*** and other creatures later under stories of marine life. ***Drumani*** (anemone), toxins are also dissipated through cooking processes, such as the barbeque methods recorded in Table 14; or through boiling, as was recounted to me by other people.

The 'often poisonous' or 'sometimes poisonous' categories are daily challenges for fishers and consumers of fish. Ciguatera is the most common form of food poisoning associated with consumption of tropical and subtropical coastal fish. This illness occurs when high levels of toxins from dinoflagellates (microalgae) and cyanobacteria accumulate in larger fish. Herbivorous fish may become toxic through incidental grazing of these algae. Many kinds of carnivorous fish become poisonous for human consumption through secondary consumption of the herbivores (Lehane and Lewis 2000, Skinner et al. 2011). Nakasaleka people have various theories about the toxicity risks of kinds of fish caught in certain places in certain seasons, as many people have experienced this illness to some degree. In fact, the name ***regu rawa*** (*Macolor macularus*; midnight snapper) means “kiss your wife before eating and prepare to die” (Gordon 2012:18). This is a popular joke in the villages. Many people demonstrate a macabre sporting humour in discussions of poisonous marine life, such as the man who described a game of trying to catch ***dadakulaci*** (*Laticauda* sp.), a sea snake with a deadly poisonous bite, by the tail and throw it as far as possible. I suspect this particular story was invented for my benefit.

People have good reason to be concerned about the ciguatera problem, as the incidence of people poisoned by ciguatera in the Pacific was estimated as 60% higher in the 11 year period of 1998-2008 than in the 11 year period from 1973-1983. Fiji was in the vanguard of this trend (Skinner et al. 2011). It is thought that many reef fish always contain low levels of ciguatera toxicity; but location-specific algal blooms spike the accumulation levels, a change which may be exaggerated on reefs disrupted by bleaching, damage, or eutrophication, although this process is not well understood. Nor is there clear consensus on what kinds of fish are most often toxic. Possible past evidence of eutrophication through the excess nutrient runoff associated with a period of rapid deforestation near Matasawalevu is presented under Question 8. A survey of three region-specific studies in the Pacific shows records of between 10 and 32 species found to be ciguateric in each area (Lehane and Lewis 2000). Hence, I include in Table 15 the over 27 Linnaean species recorded as ciguateric in the Nakasaleka responses. I know that my research contributors would be glad if their knowledge advances ciguatera research, and improves available treatment of this daily matter of concern. Some of these fish kinds, such as *Caranx* sp., *Epinephalus* sp., *Lutjanus* sp., and *Plectropomus* sp., are well known to cause ciguatera (Lehane and Lewis 2000: 93). However, some kinds listed here may not be known elsewhere as poisonous. In contrast, some well-known ciguateric types common in Nakasaleka, such as mackerel (*Scomberomorus commersoni*) and barracuda (*Sphyraena* sp.) were not mentioned as poisonous by interviewees.

Table 15 Species of fish identified as ciguateric in Nakasaleka, Fiji

Carnivorous kinds	**Carnivorous kinds**	**Herbivorous kinds**
Carangoides plagiotaenia	*Lutjanus kasmira*	*Acanthurus bariene*
Caranx ignobilis	*Macolor macularus*	*Acanthurus dussumieri*
Caranx melampygus	*Melichthys* sp.	*Kyphosus vaigiensis*
Cephalopholis argus	*Parracirrhites arcatus*	*Parupeneus crassilabris*
Epinephalus fuscoguttatus	*Platax boersii*	*Siganus doliatus*
Epinephalus howlandi	*Plectorhinchus chaetonoides*	*Siganus spinus*
Epinephelus merra	*Plectorhinchus vittatus*	*Siganus uspi*
Gymnothorax sp.	*Plectropomus areolatus*	*Upeneus vittatus*
Lutjanus bohar	*Plectropomus laevis*	
	Plectropomus leopardus	

All of the fish kinds listed in Table 15 are commonly eaten in Nakasaleka, except ***baji lau*** (*Lutjanus bohar*) and ***regu rawa*** (*Macolor macularus*). These common kinds of snappers are considered to be almost always poisonous with ciguatera and best avoided, although hunger may tempt adventure. One older man told me ruefully about catching a large snapper that he decided not to eat; he has been stricken with ciguatera several times in his life. He threw the suspect fish into the bush. Another man picked the fish up and took it home for dinner with no ill effects. My friend then caught another one and ate it without any trouble. This man also told me about the day that he met all his friends at the health clinic with the same symptoms from independently eating fish that were ***gaga***.

People have devised a number of tests for toxicity that are said to have some reliability. For ***baji lau*** (*Lutjanus bohar*), some people cut out the gills, guts, and a black bone in the front abdomen before boiling the fish hard for at least one hour to remove the poison. Coconut meat is boiled with the fish. If the white coconut meat turns black in the pot, then the fish is discarded. Another poison detection method is to put a coin with silver content into the boiling water with the fish. A silver coin turning black or brown indicates a poison fish. Coins with silver content have not been issued for over half a century in Fiji, so I suspect this method is not often used today. A well-known test that does see current use is to lay the fish out and watch it to see if flies settle on it. If the flies avoid the fish, it is considered toxic. This fly-test method is also in common use in Florida for barracuda (*Sphyraena* sp.) according to a cooking recipe website (Grygus 2011).

People with more detailed knowledge of how to anticipate and deal with poisons in fish have access to a wider range of protein sources than do others. One interpretation would position this skill as an individual competitive advantage. However, in Nakasaleka villages of extended families and multi-generational cooperation arrangements, much food is shared among households; and at times eaten collectively. Thus, this depth of knowledge is more a village resource than it is an individual's evolutionary asset. Some people speak with pride and respect of the knowledge of their village experts.

There seems to be a general belief that in large 'sometimes poisonous' or ciguateric fish, the poison is most concentrated in the heads. The head of a large fish is always served to an honoured guest or a chief; in particular the head of a Serranidae or

Carangidae fish, categories which represent 10 of the 27 kinds of fish identified here as at least sometimes ciguateric. I was once served two large fish heads of these types sent from two different households at one meal! Whether there is an association between a chief's ability to consume high risk substances is a question of further interest, as is looking into an association between this consumptive ability and the chief's accumulation of ***mana*** (efficacy).

The responses to the question on cooking methods have informed a basic review of popular cooking methods and illuminated current trends. More in-depth insights gained through significant participant observation in food preparation and cooking practices would contribute to research concerned with drastic dietary changes underway in Fiji that are associated with rising levels of diabetes, anemia, and other diet-related health problems (Lako 2001). Most people live in Nakasaleka villages by choice, and the ability to grow and catch one's own food features prominently in discussions of the value of 'village life'. People returning from the city often have much to say about the high expense of inferior food options to be had in Suva. The diversity of the kinds of marine life eaten and preferred is clearly shown in the results presented in this chapter. This fact should be of particular interest for planners of dietary education programs, as should be the compounding diversity of cooking method practices quite evident in the responses to this survey question. However, not all traditional cooking practices provide the best nutrient retention, including reductions in vitamins, protein, and ash, as has been shown for some methods of ***lovo*** cooking when contrasted with the higher nutrient levels retained by oven roasting and microwave cooking (Kumar and Aalbersberg 2006a, 2006b).

Furthermore, the 1640 responses and many associated stories elicited by this survey question demonstrate people's strong interest in the topic. In Fiji, ***kana*** (food; to eat) refers to rootvegetables, such as ***dalo*** (taro), and ***tavioka*** (cassava). ***I lava*** (garnish) is the fish, meat, or greens served with the root vegetables. The garnish is what makes the meal interesting, as evidenced by the variety of cooking methods for fish, and the competitive recipe-making for the delicacy of ***rourou*** described earlier. Hard and somewhat bland-tasting root vegetables, such as ***dalo*** and ***tavioka***, may offer fewer creative cooking options, although many varieties of ***dalo*** are grown. Growing, gathering, and catching food are activities central to daily life in Nakasaleka villages. A significant reason that people live in the village is because they like eating food obtained this way. They enjoy exploring the possible variations in taste and preparation. The popularity of curries and dhal also demonstrate openness to new ideas. While staying in a village, I started eating raw garlic cloves with each meal, as I became concerned about my low vitamin intake. Several people in the village observed my practice and began trying it themselves.

The discussion of eating potentially poisonous creatures provides further insights into traditional ecological knowledge in what may represent one of the most detailed knowledge areas explored in this research. Further investigations focused upon both cooking practices and knowledge of toxins may productively inform research in these topics. This survey question has been most productive, and could be expanded upon in future research. Research into diet-related health issues for Pacific Islanders has found strong associations between reduced dietary diversity and increased consumption of refined and packaged foods. The responses to this survey question show that further ethnographic research into preferences, and the complex social aspects of cooking and eating, may contribute to better understanding these trends.

Question 14) What are they used for?

A) ***Na yava tale i so na kena yaga***?

LT: What else is its useful/necessary?

B) ***Na yava so na kena yaga***?

LT: What is its useful/necessary?

C) ***Na cava tale e so na kena yaga****?*

LT: What else is its useful/necessary?

Discussion:

Question versions A and C differ only by the Nakasaleka pronunciations of '***yava***' and '***i so***'. ***Yaga*** is translated in this context as useful, necessary, or valuable (Hazlewood 1979, Capell 1968, Gatty 2009). The use of ***tale*** (else) in the context of versions A and C might imply that the creature was already useful in its existing state before being caught. This meaning is not captured in my original question in English or its faithful translation in version B, which did see less use than versions A and C. However, at times, interpreters might just ask interviewees '***kena yaga***?' When used in a different context, the word ***yaga*** also refers to the spider conch (*Lambis* sp.), a mollusc referred to in these results.

This usage question is very general, as are the response categories used, as shown in Table 16. These were drawn from early interview responses. I had hoped that this question would stimulate stories about marine life, to be expanded upon with the broader question about stories to follow. This response did happen on occasion; but often only general answers of ***kana***, ***baca***, or ***volitaki*** were elicited, and conversations went no further. This question needs refinement. For example, the survey could be improved if responses of ***baca*** (bait) were followed up by an inquiry about how the bait was used and what was expected to be caught with it. A response of ***volitaki*** (sell) could also be further qualified by determining for each type of creature if it is sold in the village, sold to other villages, or sold to markets in Suva. This information might generate more discussions on the local economic aspects of fishing.

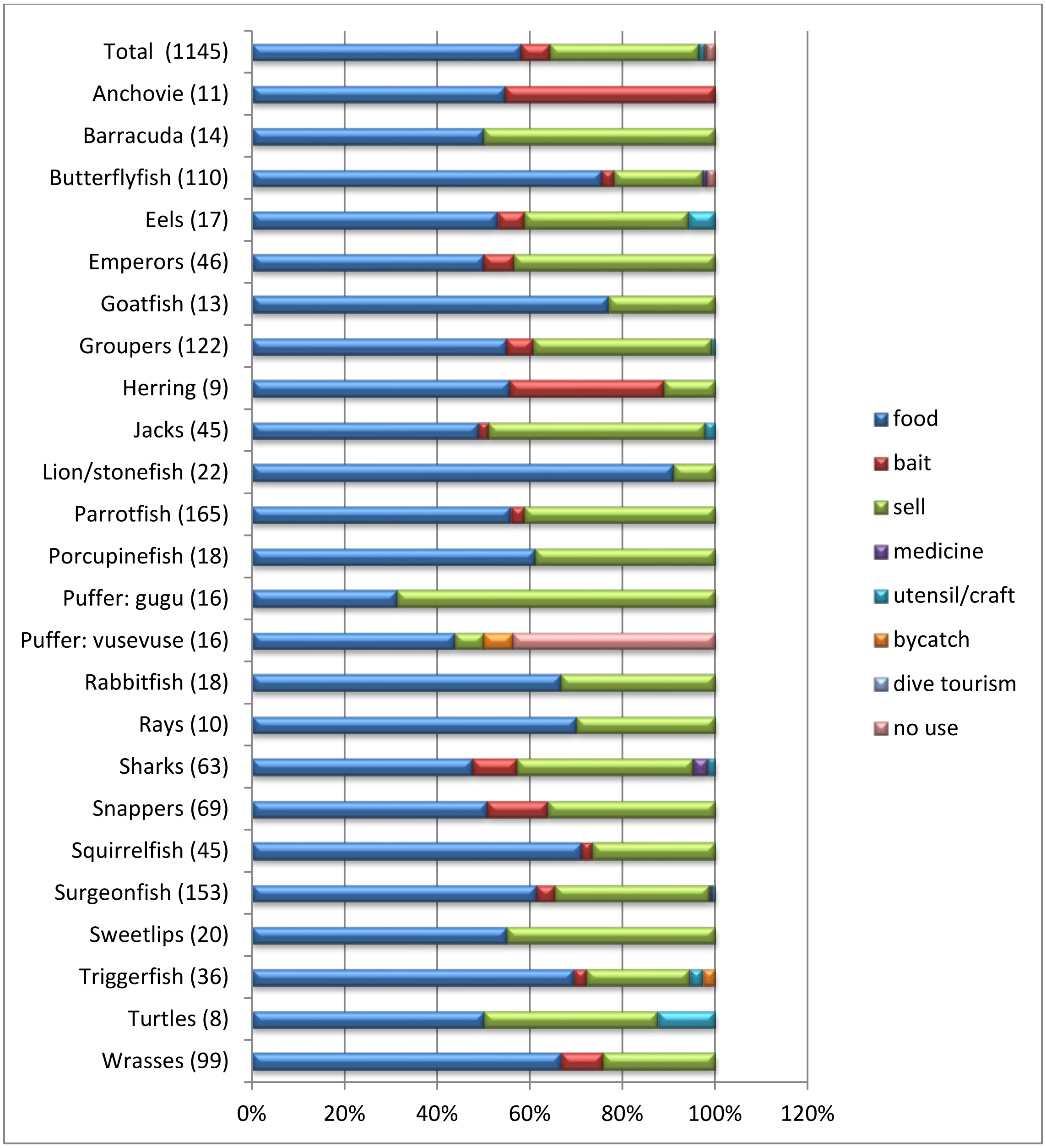
Table 16 List of use terms for marine life used in the survey.

Kena Yaga	**Uses**
kana	food
baca	bait
volitaki	sell / commercial use
wainimate	medicine
yaya ni cakacaka	utensil and craft
biulaivi	bycatch
valagi	attract scuba divers and tourists

1760 responses were recorded for this question. An enthusiastic '***kana vinaka***' (good food or good to eat) was often the first response. As the earlier discussion of cooking methods has shown, there are ways to cook and enjoy eating a wide array of marine life. However, the problem of responses falling into a rhythm of single-term responses of ***kana*** and ***volitaki*** represents lost opportunities to explore motivations for fishing. I tried different ways to break from this call and response pattern in order to better elicit stories in the question that followed. For example, I encouraged interpreters to build on a ***volitaki*** response in order to generate more information by asking for the current market price of the creature in question. This approach did not work very well. Some prices were recorded, but ensuing discussions often went in unproductive directions and interpreters become focused on asking for the market price only, instead of creating the desired open-ended opportunities to elicit stories.

To facilitate further discussion here of the responses regarding uses, Figure 43 provides a summary of 1145 responses to this question about uses for the same 24 categories of fish utilized for the responses on cooking methods analyzed earlier under Question 13. In Figure 43, the number of responses recorded in brackets for each category of fishes is partly a factor of how many images of given fish types were shown to X number of people. Precise records of these variables were not kept, given the informal nature of the interviews. However, one can infer rough totals, as most pictures were of a distinct variety and were shown to five or six people on average.

Figure 43 A summary of 1145 responses to questions about use for the members of 24 categories of fish. The number of responses recorded per category is shown in brackets.

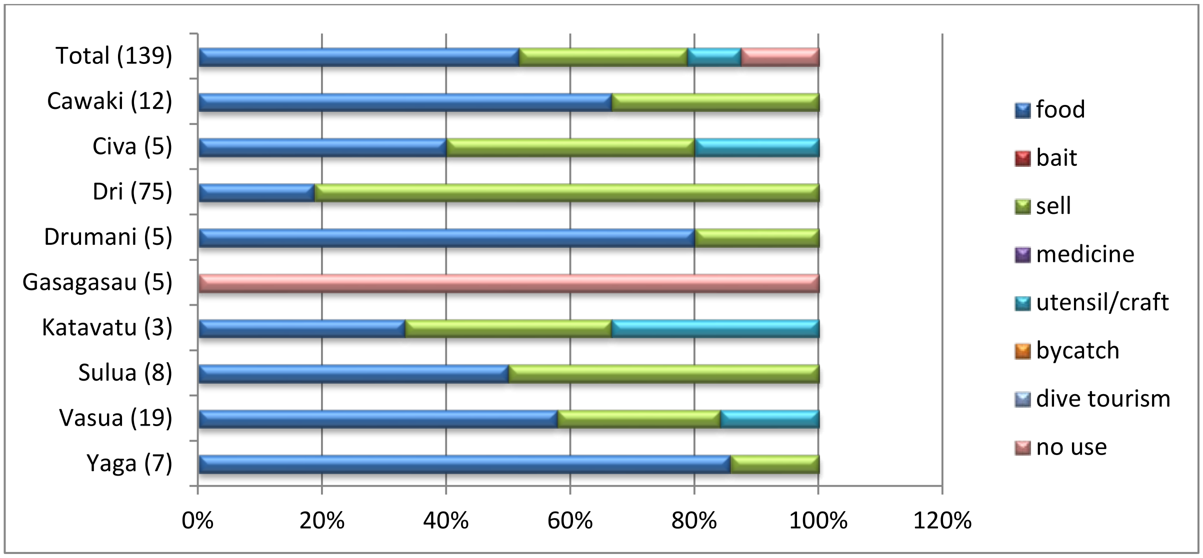


The results in Figure 43 show the importance of the fishery as a food source for villagers. ***Kana*** (food) represents 59 percent of the responses. Even the very toxic pufferfish, ***vusevuse***, discussed earlier under cooking methods, generated 44 percent of the responses for 'food' compared to 44 percent of 'no use' and 6 percent of '***biulaivi***' (bycatch). 'No use' was not provided as a coded response list item during interviews, but it was recorded when given. I learned of the term '***biulaivi***' by asking people for a word to describe 'fish you catch that you do not want'. The term was familiar to interviewees. Gatty describes '***biuta laivi***' or '***biu laiv***i' as a verb meaning "to throw it out" or "throw it away" (2009: 23).

Many images elicited two responses. ***Volitaki*** (sell) at 32 percent occurred just over half as often as ***kana*** (food). These choices and ***baca*** (bait), at only 6 percent, comprised 97 percent of the 1145 responses. The responses for uses of other fish kinds, not included in Figure 43, follow similar trends. The relatively few responses recorded for the categories of medicine and utensil/craft were often from older people. For example, a lady in her 70s described using the cheek-spine from ***droudrouwa damu*** (*Plectropomus leopardus*; leopard coral grouper) as a tool to slice ***kie*** (pandanus) leaves for mats. This story was told to us while this lady was slicing ***kie*** with a metal tool. Many former uses for components of fish bodies have no doubt been replaced with metal tools. I will provide further examples of these response categories following a review of the responses regarding invertebrates.

The 139 responses about invertebrates in Figure 44 represent the same categories of invertebrate creatures analyzed under Question 13. Of the 1760 total responses to Question 14, these 139 responses, along with the 1145 responses summarized in Figure 43, represent 73 percent of the total number recorded. This manageable format provides substantial evidence of trends.

Figure 44 A summary of 139 responses to questions about use for the members of 9 categories of invertebrate creatures. The number of responses recorded per category is shown in brackets.



Key to Figure 44: ***Cawaki*** (short-spine urchins); ***Civa*** (medium size reef clam); ***Drumani*** (anemone); ***Gasagasau*** (long-spine urchin); ***Katavatu*** and ***Vasua*** (*Tridacna* sp./giant clams); ***Sulua*** (octopus); ***Yaga*** (spider conch).

The data in Figure 44 represent ***kana*** (food) as 52 percent of the total responses; this figure is skewed lower by the 61 responses of ***volitaki*** (sell) given for ***dri*** (sea cucumbers). Another way that these data could be misconstrued is by assuming that many people are actively eating and selling all the various creatures. This is not the case. For example, ***vasua*** (*Tridacna* sp.; giant clams) are now scarce. As part of a current government-led project to place seed clams in village Marine Protected Areas, people are being encouraged to leave the remaining clams alone in order to rebuild the population. Thus, few people may be actively catching and consuming ***vasua***. In Figure 44, many of the utensil/craft responses involve clams. Historically clam shells provided materials for a significant range of tools, such as the coconut scraper shown earlier in Plate 38. Today, many clam shells serve as ashtrays and garden decorations.

Kana (food)

As the responses to Questions 13 and 14 demonstrate, Nakasaleka villagers consume a broad variety of marine resources. It was not uncommon for someone to look at a picture and exclaim “I want to eat one of those now!” ***Gasagasau***, (*Diadema setosum*; *Heterocentrotus* sp.; long spine urchin) is the only category of creatures surveyed and shown in Figure 43 and Figure 44 that people did not eat at all. I continued to show pictures of these common creatures, as they are a constant hazard, with their sharp and poisonous spines, for people walking on reefs. These images generated various stories about dealing with the toxins, as will be discussed later.

There are many forms of marine life that people do not eat or pay much attention to. For example, thin reef fish, smaller than about 10 centimetres, slip through nets, such as those in Plate 40. An area for future inquiry about small fish is to investigate what fish population density levels and ease of capture factors make them attractive as a food source.

Other organisms, such as soft and hard coral varieties, receive little interest, although people may admire their colour. The small dramatically coloured and toxic nudibranchs are unknown creatures for most people. I routinely showed a small selection of pictures from these categories to gauge the outside parameters of local knowledge, but I learned to minimize this component to avoid boring the interviewees. Some people would attempt to name unfamiliar organisms, with a known name for a similar creature, such as the five

Plate 40 *Ptereleotris* sp. seldom recognized by interviewees.

to 10 centimetre long, colorful, and toxic nudibranch (*Chromodoris* sp.) shown in Plate 41. One of 13 viewers of this creature named it ***bosucu ni cakau***, literally, 'land slug of the reef'. Another named it ***wabosucu***, a term defined as a climbing vine by Gatty (2009: 307). This latter semi-homonym may just be a mistake. Some interviewees had worked with tourists on diving trips on which nudibranch spotting can be a sort of competition among some recreational divers. This contact with tourists raises local awareness of nudibranchs, and hence encourages some responses for uses that recognize the creature's role in attracting tourists. However, the bulk of the survey focused on organisms familiar to villagers, most of which were consumed or used, along with a selection of creatures, such as ***gasagasau***, which might not be consumed, but are still potentially salient organisms for humans active in the seas.

Plate 41 *Bosucu* (*Chromodoris* sp.)

Responses of '***kana***' to questions about types of sharks reveal a significant change in fishing and dietary preferences in Kadavu. Older people are clear that sharks were not eaten in the past. This report aligns with a well-known belief of mutual respect between Kadavu people and sharks. Kadavu people were said to be protected from being attacked by sharks after the Fijian shark god, ***Dakiwaqa***, was long ago subdued by the octopus god thought to protect Kadavu. Today, many people say that they catch sharks for their fins, which can be sold to traders or restaurants in Suva. Market price estimates from interviewees varied from $22 to $83 USD per kilogram. With a range this wide, it is hard to determine how much shark fishing actually takes place for the fins. One man, who often spoke of the high value of shark fins, described taking a few fins to a dealer in

Suva to sell, only to have them rejected by the broker, who bought shark fins only in larger quantities. Worldwide, the shark fin industry represents a substantial portion of the estimated 97 million sharks killed each year, with most of the fins destined for China (Worm et al. 2010). Occasional shark fishers from Kadavu may well be inconsequential to this industry, where long line fishing boat operators can catch and fin many sharks in an afternoon. Shark-finning refers to the practice of slicing off the fins and discarding the carcass. Chinese fishing boats are often anchored in the Suva harbour. Today, shark meat is said to be served as the fish component of 'fish and chips' in Suva restaurants, in contrast with many shark fishers elsewhere. Nakasaleka people do state that they eat the bodies of the sharks they catch, and also that the flesh may be used as bait. One person said that ***bulabula*** (baby viviparous sharks) were used for medicine.

Some categories of fish in Figure 43 that show high percentages of food use, such as butterflyfish and lionfish, are not highly valued food items; and they are low demand items for selling. People will eat these fish when they catch them, and sell the higher demand fish for cash. In contrast, several kinds of ***dri*** (sea cucumbers) may be eaten; but these can be cooked or preserved and sold for cash, a practice which discourages consumption.

Plate 42 *Nama* (*Caulerpa reacemosa*)

Edible seaweeds are an important category of food from the sea not captured in the above data summary. ***Nama*** (*Caulerpa racemosa*), shown in Plate 42, is the most popular of these. This tasty and succulent plant is rinsed and eaten as a salad or snack. It is said to be most plentiful "when the dry season is coming", which I expect is April or May, although it can be gathered most of the year.

In summary, this analysis of the use of marine life as food illustrates how this sort of survey might monitor change and the effectiveness of marine conservation education programs. Responses to questions about sharks suggest a modern increase in consumption associated with the growth of demand for shark fins; however, repeated interviews raised questions about the veracity of these statements. Turtles have recently become illegal to catch; yet 50 percent of the responses to this question, as shown in Figure 43, were ***kana*** (food); of the remainder 38 percent were ***volitaki*** (sell), and 13 percent were ***yaya ni cakacaka*** (utensil and craft). Assuming that the turtle fishing ban is successful in discouraging this practice, will a similar survey carried out in five, 10, or 20 years yield different results, given the strict penalties being applied? How long does it take for people's perception of a use to fade if they no longer practice the use? Does the relative strength or weakness of this perception of use affect people's adherence to regulations? Further research into these questions is of value in determining realistic responses to conservation policies in locations with limited official fisheries supervision, but intense peer monitoring of fishing activities, such as occurs in Kadavu.

Baca (bait)

There are two uses for bait. Bait is either used on hooks for handline fishing, or to bait traps as discussed under fishing methods. Hook and line fishing with bait was introduced into Fiji from Polynesian sources within the last two to three centuries, as discussed under Question 12. However, the use of bait, such as chopped up starfish, has likely been practised for millennia in Fiji for the basket traps, as shown in Plate 28. Hence, any differences in perceptions or references between the types of bait used with handline fishing and traps would merit investigation and questions.

In Figure 43, the ***vaya*** (anchovie) and ***daniva*** (herring) responses show significant use for bait. Historically, ***vaya*** were not to be used as bait by people in Matasawalevu, nor were the ***daniva*** in Tiliva. In view of the survey results, these traditions appear to have faded; but it is unclear to me as to when this decline occurred. Nakasaleka stories about these two kinds of fish are discussed in Chapter 7.

Missing from the results presented in Figure 43 are the popular baitfish used for hook and line fishing, ***salala*** or ***ereni*** (*Caesio* sp.; *Pterocaesio* sp.; fusiliers) shown in Plate 43, and from Figure 44, the ***sanini*** (hermit crabs). The name ***ereni*** is said to mean 'good bait'. ***Salala*** and ***ereni*** may be sliced to bait hooks; or used as live bait by putting the hook inside the fish, which then swims alone and erratically, a behaviour which attracts predators. People first catch these swift swimmers with small hooks or with nets at river mouths on the ebb tide. Often people set out on a fishing expedition with a few bait-fish, such as ***vaya*** or ***daniva***, netted near shore. As other smaller fish under about 25 centimetres are caught, they are filleted and sliced into bait to catch larger fish. Hence almost any fish can be used as baitfish, unless it is a poisonous type considered unattractive for this use, as shown by the results for pufferfish and lionfish in Figure 43. Fish with firmer flesh, such as wrasses and snappers, are

Plate 43 *Salala* (*Caesio lunaris*)

preferred as bait over softer flesh types like parrotfish. ***Sanini*** (hermit crabs) are collected on beaches by women and children for baiting hooks. The crabs are pulled out of their shells, and serve as particularly good bait for ***kawakawa*** and ***droudrouwa*** (Serranidae; groupers).

Plate 44 shows a large group of unidentified parrotfish hovering near the surface above a reef, an unusual behaviour for these grazing fish, in my experience. Interviewees were not surprised to see this image; some people described spreading ***vujia*** (sea grass) on the surface for the fish to make them easier to catch, I assume by net or spear. Spreading ***vujia*** on the surface is a well-known and long documented method to attract and catch turtles in Kadavu (Deane 1921: 179). This was a use of ***vujia*** as bait for turtles mentioned in several responses.

Follow up inquiries to survey responses of bait could determine what creatures the bait is used to catch, and how this is best done. This approach would indirectly encourage explanations of current fishing practices. Further inquiries into how the bait is obtained would indicate the scale of use of the type of bait. This question would differentiate the creatures intentionally gathered for bait from those that happened to be caught and put to use.

Plate 44 Parrotfish surface agregation

Volitaki (sell)

The selling of marine life can be categorized as catches either sold within and between villages, sold to a Kadavu broker or fisheries cooperative, or sent directly to Suva for resale. Small fish are strung together and sold in a ‘bundle’ weighing at least three kilograms. Thus, a sample catch of ***kakarawa*** (Scaridae; parrotfish), ***corocoro*** (Holocentridae; squirrelfish), and a small ***kawakawa*** (Serranidae; grouper) will be sold as a unit. The value of the bundle varies somewhat with the kind of fish content. For example, ***sabutu*** (Lethrinidae: emperors) would increase the value of a fish bundle to the higher end of the $5.50 to $8.50 USD per bundle price range described to me in the villages during my 2011-2012 visit. Some fish, such as ***saqa*** (Carangidae; jacks) and particularly ***roqoroqovatu*** (*Trachimotus blochii*; pompano), fetch higher prices. I purchased the yellowfin tuna (*Thunnus albacares*), shown in Plate 46, from a local deep-sea fisherman for $2.00 USD per kilogram as a special dinner gift. Fresh tuna proved to be an unfamiliar choice of fish for my Kadavu hosts, who were unsure of how to cook it. Villagers focus on fish of the mangroves, lagoon, and reef using the methods discussed under Question 12.

Tuna are caught outside the reef with rod and reel for shipment to commercial markets outside Kadavu. A village woman who grew up in Suva told me that, as a young girl, she did not see tuna in the Suva fish market; but it became available in later years. Ironically, tinned tuna, of much lower quality, is often purchased in villages from local shops by many village households in order to add protein to a meal, at a cost of $4.40 USD per kilogram. This amount is substantially more by weight than I paid for the fresh tuna, allowing for some minimal loss of weight in cleaning, considering that fish heads are consumed as food. Tinned tuna is a convenience meal at premium prices that also creates the waste disposal problem shown in Plate 45. Most of the tins shown in this garbage pile had contained tuna. In Plate 46, the size of this tuna fish can be gauged my comparison with my foot at the bottom of the picture.

Plate 45 Packaged food waste

Plate 46 Local deep sea tuna (*Thunnus albacares*)

Village prices for fresh fish are related to city market prices. Getting fish to market requires selling to a broker with a freezer, or shipping it on the weekly ferry to get it to the market. People may ship the fish in a fresh or smoked state, but ferry schedules are often unreliable. This situation makes the fresh fish shipping option risky, given the hot climate and lack of refrigeration. One man stated that the broker price for fresh fish was a quarter of the retail price in the Suva fish market. However, brokers also must burn fuel to run generators and freezers. Smoking fish is a drying process that decreases the net weight substantially. Additional costs of shipping and handling to get to the market are incurred, but people feel the return is better if they can get the fish to market themselves. However, if fishing is being done to raise cash quickly for a school or church-related project, the broker option is attractive.

Ten to twenty years ago there were much larger catches to be had. People told me about how they would fish all night and day for several days to fill their 23 foot outboard fiberglass boat with fish, before making the 100 kilometre open-ocean crossing to Suva themselves to earn their best return. Catch sizes today do not warrant this practice. Few people now spend the majority of their time fishing; growing kava yields better returns. Plate 47 and Plate 48 show the obvious difference of weight and quality between fresh fish and a batch of fish dried and ready for shipping to Suva on the ferry.

Plate 47 Fresh *balagi* (*Acanthurus* sp.)

Plate 48 Smoked *balagi* (*Acanthurus* sp.)

The results in Figure 43 show the diversity of the kinds of fish caught for resale in Nakasaleka. There are significant seasonal variations to the catch. For example, ***nuqa*** (rabbitfish) form large schools in December and January. The Fijian names for the related lunar months describe this phenomenon, as discussed in Chapter 5. Annual spawning and growth cycles of fish, crabs, octopus, and other creatures affect availability of the creatures to harvest.

Dri (Holothuridae; sea cucumbers) or bêche-de-mer collection represents a significant commercial activity in Fiji which has seen several boom-bust fluctuations over the last two centuries (Ward 1972). The term ***sasalu*** is also used in Nakasaleka for sea cucumbers, but ***sasalu*** is also a general category for most marine creatures that do not swim. In Fiji, the term '***dri***' may be used for sea cucumbers in general, as I will use it here; or it may be applied to particular kinds. Elsewhere, I have reviewed the history of the ***dri*** trade in Fiji, and investigated the taxonomy and use of many of the kinds of ***dri*** found in Kadavu (Gordon 2010). Mark Calamia (2003) has written about the tensions created by commercial collection of ***dri*** in relation to marine tenure in Kadavu, as well as the use of SCUBA and other technologies to collect this 'cash crop'. Here, I will touch on a few points regarding these creatures, whose primary use is seen as a commodity to be sold, as shown by the 61 of 75 responses in Figure 44.

Many people today pick up ***dri*** when they find them and prepare them for sale to a broker. However, larger scale commercial collection of ***dri*** is becoming more limited, as people need to go ever-deeper to find any concentration of quantity of the animals. People may cook and dry the ***dri*** themselves, or sell them 'wet' to a broker at a lower price. These creatures are found on reefs and sea bottoms. Only the low value types are found in the lagoon shallows today. Over the course of a 45 minute SCUBA dive on the reef or in the deeper lagoon, I might see five or six ***dri*** of low and medium value, but never yet a ***sucuwalu*** (*Holothuria nobilis*), the highest value type. However, some people will spend days free diving for medium value types such as ***melamela*** (*Bohadschia graeffei*), as shown in Plate 49. This type becomes much more common to find in November and December. A good day's work gathering these types can yield one person a gross of $100 USD from a local broker, after deducting the cost of fuel. This significant return could not be repeated often, given the availability of the creatures, and the limitations on a person's access to only specific marine tenure areas.

Plate 49 *Melamela* (*Bohadschia graeffei*)

In 2012, the harvest of ***dri*** in Nakasaleka represented a small scale commercial fishery involving most people who practice fishing regularly to some degree. They are a ready source of quick cash when sold wet, or they can be cooked and dried for slower and higher returns. ***Dri*** are one component of a subsistence economy of root crops, kava, and fish in which people face growing demands for cash, a situation which increases the pressure on these resources.

This survey question about uses could be improved by following up responses of ***volitaki*** (sell) with inquiries about where, when, and how a given creature is sold. The information that was gathered from inquires about market-price is of little consequence without determining these additional details. An alternate approach would be to spend a week at one of the island fisheries stations, where some people bring their catch to be kept on ice before shipping. This approach would allow a broad survey that would yield detailed and quantitative data on what is being caught and sold at that time.

Other responses to Question 14

As seen in Figure 43 and Figure 44, the other responses of medicine, utensil and craft, bycatch, and supporting tourism amounted to only 3 percent of the responses. There are, no doubt, many more of these sorts of uses for marine creatures than were gathered with this question. The responses of food, bait, and sell might be considered obvious and primary responses for a given creature. We did not often focus on going beyond the primary responses if people did not volunteer additional information. To gather these secondary responses more effectively, they need to be addressed in the interviews as a separate topic from the more day-to-day activities of eating, fishing, and selling. However, there were several responses of interest, which I will review here.

The cheekbone of ***nonu*** (*Scorpaenopsis diabolis*: scorpionfish) can be ground up into a powder known as ***so mica***. This is mixed with water as a drink to remedy dislocated joints. Another item is the cure for ***gusukaka*** (literally: mouth-stutter) in children. For this problem, the meat of the mollusc, ***yaga*** (*Lambis* sp.), should be eaten many times. Gatty (2009: 317) recites a similar Fijian belief for feeding ***yaga*** to children in order to cure speech impediments including lisps. Gatty terms this medicine as '***wai ni vosa***' (water of words/speech). He suggests that people may make sympathetic association between the rubbery texture of the shellfish meat and the desired increase in flexibility of the mouth to improve speech. As mentioned earlier, a medicine is said to be made from ***bulabula*** (very young viviparous sharks), but no further details are available. Another item is a beauty product in the form of an acid for straightening hair that is produced from boiling an unidentified soft coral or tunicate.

A pointing game was the use often given for ***dusidusi*** (*Corythoichthys* sp.; pipefish) or ***ose ni waitui*** (seahorse) shown in Plate 50. This game involves holding the ***dusidusi*** upright by the tail and flipping it around while saying in the Nakasaleka dialect "If you want it to point to the village, it will point to the village. If you want it to point anywhere, it will point there" (Gordon 2012: 62). This game is played when these creatures are found, perhaps while net-fishing in the lagoon, although I observed a small boy carry an expired ***dusidusi*** around for some time and hit his friends with it, again by holding the tail and flipping the surprisingly durable body.

Plate 50 *Dusidusi* (*Corythoichthys* sp.; pipefish)

Several marine organisms are used to decorate homes. ***Baka-ni-waitui***, the colonial organisms of Order Gorgonacea (sea fans), see common use as decorations inside the home, as shown in Plate 51. People also mentioned techniques for drying out sea fans for sale in Suva's tourist markets. ***Baka*** is also the Fijian name for the banyan tree (*Ficus obliqua*), a very large tree with "drooping branches and hanging roots," which has pre-Christian associations here with spirits known as ***tevoro*** in Fiji, or ***jimoni*** in Nakasaleka. According to Hocart, ***tevoro*** (devil) was introduced by Tahitian missionaries as ***tevolo*** and ***timoni*** (demon) was "particularly a Moala word." These words displaced '***kalou***', then re-allocated to the Christian God, although in the 19th century all of these words were also used for the souls of the dead (1929: 185). Moala people have intermarriage ties to Kadavu. The tree, ***baka***, is also used to make reference to great chiefs in Fijian idioms (Gatty 2009: 10). The ***baka*** shown in Plate 52 is said to be hundreds of years old, and stands in the overgrown ruins of what was once a chiefly-village site. In cleared village sites these trees spread wide branches, giving shade.

Plate 51 *Baka* (Ssea fan) house decoration

Whether keeping dried ***baka-ni-waitui*** in the house has any significance beyond decoration is a subject for further inquiry.

Plate 52 *Baka* (*Ficus obliqua* or similar) in forest

Coral is said to be used in the villages to make white paint or plaster in order to coat the exterior surfaces of rocks around homes. Chunks of coral are burned in a ***lovo*** (earth oven), and the ash that remains is mixed with water to the appropriate consistency. I do not remember seeing these painted rocks, but a number of people mentioned this use for coral. I did see a man paint the interior of his house with store-bought white paint, so perhaps use of this coral-based paint is in decline. Chunks of broken coral are used for construction projects, such as the base of a jetty.

Various spines and bones from specific kinds of fish, such as ***sokisoki*** (Diodontidae; porcupinefish), are used as toothpicks; or as culinary tools to pull the meat out of univalve molluscs for consumption. Two sea shells of particular symbolic importance are the ***buli*** (*Ovula ovum*; cowry) shown in Plate 54, and the ***tavui jina*** (Bau: ***davui dina***; *Charonia tritonis*, giant triton) shown in Plate 53. I was told by an old man that it is good luck to find a cowrie; and in particular to find a red one, which are very rare. The white shell in Plate 54 is such a keepsake. Their use has chiefly significance in Fiji. ***Buli*** are attached to specific points on ***tanoa*** (***yaqona*** bowls), which are always positioned in the direction of chiefs or honoured guests. Gatty (2009: 30) sees them as representations of male genitals in this context. The ***tavui jina*** shown in Plate 53 has both practical and symbolic use in the village. It is kept and blown as a trumpet by the ***turaga ni koro*** (village mayor/manager) to summon men to meetings or

Plate 54 ***Buli*** **(*Ovula ovum*; cowry)**

Plate 53 ***Tavui jina*** **(Bau: *davui dina; Charonia tritonis*; giant triton)**

community work projects. It is not blown by a chief, but on his behalf by another. The shell is a symbol of village leadership and cohesiveness.

In Matasawalevu, the men meet each Monday morning at 6:00 AM to discuss work projects for the coming day of community work projects and other village matters of importance. The ***tavui jina*** will often be blown at 5:30 AM and 5:45 AM by the ***turaga ni koro*** to encourage attendance at the meeting. This practice did not take place during my stay in Tiliva village or in the settlement of LagaLevu.

Summary of the results of Question 14

I have shown that this survey question was of value; but as a general question it yielded too many general answers, and for this reason it did not generate as many stories and anecdotes as it might. The responses supported the results of Question 13 that demonstrated the diversity of people's marine life diet. This trend of diversity is also seen in a wide range of fish kinds sold and used for bait. However, the use choice of food dominated the responses for most creatures, except sea cucumbers, reflecting the current state of this artisanal (small scale and low technology) fishery. Villagers say they will make strategic choices to sell higher commercial value creatures, and eat lower value organisms if they have a choice. However, in practice people's desires to demonstrate hospitality to guests may supersede these ideas. A ***saqa*** (Caranx sp.) is a high value fish for commercial purposes, but it is also a special fish to give to chiefs or guests in an act which gives status to the gift giver. The final disposition of the ***saqa*** is more than a simple economic decision.

People have deeper ecological knowledge about creatures which are eaten or sold in most cases than those that are not. However, dangerous things are also very salient, as will be discussed in the next chapter. There is also an eclectic range of other creatures used or known, such as the soft coral or tunicate that can be cooked into an acidic hair straightening product. In general, very small fishes receive little attention; but small invertebrates, such as two centimetre long clams, are collected to make a snack or meal. Edible seaweeds were not a well-developed part of this survey, and deserve more attention in a comprehensive survey of marine life use.

A wide variety of fish may be used for bait, and this practice is under-appreciated by conservation organizations and fisheries programs active in the areas. Education programs to conserve adults and protect spawning aggregations fail to inform and encourage people to be more selective in the choice of baitfish. The responses to this survey question clearly show how broad is the range of potential baitfish here. This is a significant point.

As a mechanism to gather more information about other uses for marine life such as utensils, crafts, medicines, and other practices, this survey question in isolation was of limited effectiveness. The example of the lady slicing ***kie*** (pandanus leaves) with a metal tool and being prompted to think about the old days of using a fish spine demonstrates the situational nature of traditional ecological knowledge gathering. This lady had been interviewed several other times about similar kinds of fish that have the same spine, but she had not thought to mention this use. At the least, if I was using this question again, I would include some follow up questions postulated here for the responses of food, bait, and sell. I would try to address the other types of uses under a different question; or use the topics of utensils, handicrafts, and medicines as possible examples in order to prompt some of the stories sought under the next question.

Chapter 7: Survey questions and responses about symbolism, meaning, and belief.

Question 15) Do you know a story, song, or other things about this fish?

A) ***Dua nai talanoa, tei na sere, tei dua na ere o, kila me baleta na ika ke***?
LT: One story, just a song, just one anything you know concerning the fish here?

B) ***Dua nai talanoa, se na sere, se dua na ere o, kila me baleta na ika ke***?
LT: One story, still a song, still one anything you know concerning the fish here?

C) ***Iko rawa ni dua na nomu vaka macala***?
LT: You able your one explanation?

D) ***Dua tale na ka o ni rawa ni vakamacalataka na cava e duatani kina mai vei ira na kena vo***?
LT: Recall – review – explain something different which you remember?

Discussion

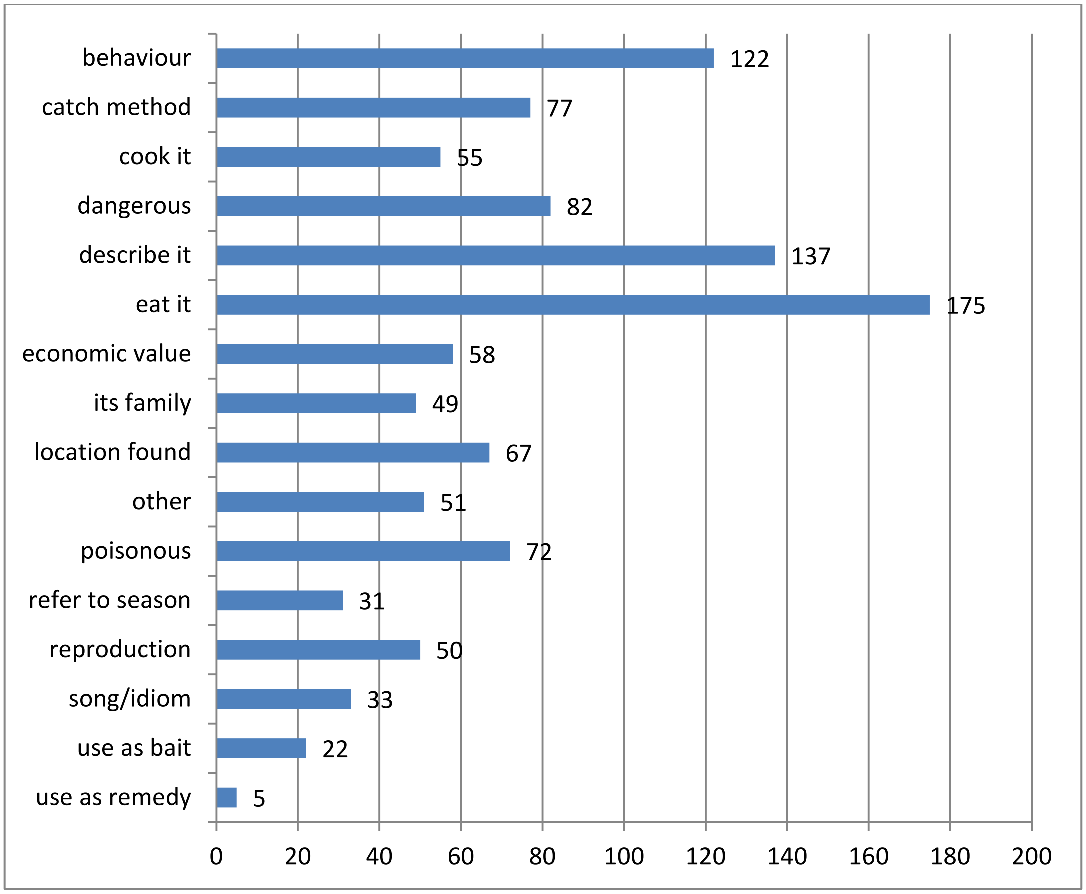
This was a challenging question to structure and deliver in a way that encouraged meaningful responses. Different interpreters and school teachers suggested the versions used that are shown above. Version D saw use in the first village, Tiliva, in which the poorly structured format of the question restricted the results achieved here, as did the interpreters' limited knowledge of marine life. Thus, it was difficult for interpreters to engage interviewees in storytelling. Version C was used briefly in the second village, Matasawalevu, in which the results varied with the ability of the interpreter who had proposed version C to ask and explain this question to different people. The results of these efforts were also unproductive. Another interpreter in this village proposed Version B, which was then used consistently in Matasawalevu and Lagalevu for the balance of the survey. The word ‘***se***’ in version B is a preverbal particle that indicates “that the event is not new, but continues a previous state,” in contrast with the use of the particle ‘***sā***’ in many Fijian languages to indicate a new development (Geraghty 2008: 31). The replacement of ‘***se***’ with ‘***tei***’ in version A was a Nakasaleka refinement suggested by my advisors during the final stages of producing the encyclopaedia.

The 844 stories collected in this category consisted of both formal responses given to the question and a range of responses that arose around the other survey questions. These other questions often had pre-defined ranges of answers, such as the name of a related fish, the length of a fish, or what a fish eats. When these questions were answered with more information than was allowed for in the coding system used to record responses, a Question 15 response was recorded in addition to the response to the original question. All of these other 17 questions have been discussed in earlier sections of this thesis, often with the use of many anecdotes drawn from the stories collated during the fieldwork under Question 15. Interpreters were encouraged to elicit and record stories at any point in the question sequence; a productive practice when mastered, but a challenging one for many interpreters more comfortable with a well-defined sequential process.

The content in these stories varies significantly from people’s brief observations, such as ***kana vinaka*** (good food/good to eat) or ‘hard skin’, to a lullaby or a detailed story about ***vai roqo*** (*Manta birostris*; manta ray) towing a boatload of people across the sea. The number and depth of the stories recorded in an interview reflected the knowledge level and interest of the interviewee, but the most significant factor was the interest level and conversational skills of the interpreter. The proffered stories were either written down by myself, primarily in English; or by interpreters in the language used by the interviewee. 884 responses were collated under stories; 260 came from Tiliva, 67 from Lagalevu, and 516 from Matasawalevu. Many Matasawalevu stories came from several older villagers, whose extensive marine life knowledge and strong interest in the project enriched the results immeasurably.

To structure this chapter, I have sorted the recorded stories, observations, and anecdotes about different forms of marine life into 16 categories based upon key features mentioned in the stories. An individual story may contain more than one of these features; thus there are 1086 features coded from the 884 stories, as shown in Figure 45. For example, ***kana vinaka*** (good to eat) is found within a response 112 times; but this phrase represented the complete response on only 47 occasions.

Figure 45 Categorization of 1086 features mentioned in 884 comments and stories.



I chose the categories shown in Figure 45 as the best way to represent a large body of diverse data recorded from a range of contexts and interviewees in a variable process, given the unique learning curve trajectories of each of the eight different interpreters and myself, as we developed our methods. In what follows, I will review the types of responses in each category and provide examples to illustrate the sort of information gathered. Particular attention will be given to the category of behaviour, and the overlapping categories of 'dangerous' and 'poisonous', in order to address various topics not covered elsewhere in the thesis. The purpose of this chapter is to explore the types and depth of information gathered through the methods used, an approach which suggest specific topics for fine-grained survey questions in future research. These would prompt more frequent and detailed responses than the broad question used here.

In presenting the stories to follow, I am mindful of Alan Howard's analysis of the Polynesian style of Rotuman oral narratives as "residues of living performances……constructed out of an extensive array of semiotic codes, which are transmitted in a variety of media" (1985: 7). Oral narratives involve physical and social interaction in communicating ideas, and an ongoing reciprocal reflection of the background knowledge between the story teller and audience. When someone in the village asks me into their house in the evening for ***talanoa***, they are not planning to tell me stories all evening by the light of their kerosene lantern. They may want to ask me some questions, but most likely they will talk with their friends and be happy to know that I am not alone somewhere else. ***Talanoa*** implies conversation and sharing.

The stories of Nakasaleka presented here are such residues. They have been translated, decontextualized, and flattened of meaning through the limitations in the methods of collection and subsequent impersonal transmission to the reader. I apologize in advance for this shallowness. In order to appreciate the remaining depth and meaning in these stories, our analysis must allow a "suspension of disbelief for the moment" (Coleridge 2009: 270) of linear trajectories and value judgements.

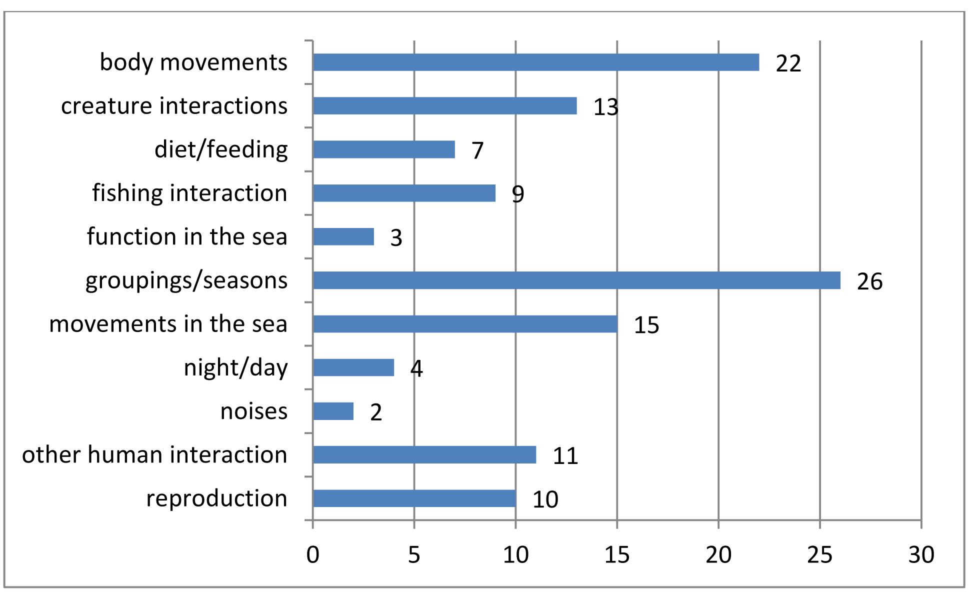
First, let us imagine that we are seated upon a woven pandanus mat laid over a plank floor in the main room of a small wooden Fijian village home. It is mid-afternoon on a sweltering hot day, and our hosts have returned from a long morning of gardening and fishing. They have bathed and eaten lunch before sitting down with us to talk. The air is still; but the small children are not, as they roam in and out of our interview-setting among the notebooks and photographs of fish as they test the boundaries of what they can get away with during this unusual visit. Our generous hosts take a moment to consider what they might have to say about the picture of a ***qio*** (shark) that we have given them, before inquiring as to just where the picture was taken.

I am honoured to have been given express permission by the people in these villages to tell their stories in the context of this thesis and elsewhere. Today, village life is often a choice people make in Fiji. Their hard work allows them to grow and catch their own food while feeling closer to their ancestors, families, and stories. I will begin as my Fijian friends would begin, by thanking you, the honoured guest, for listening.

Story Category: Behaviour

The 122 responses shown in Figure 45 for the category of behaviour cover diverse topics that merit the further subdivision shown in Figure 46 in order to facilitate discussion.

Figure 46 The diverse topics addressed in story-type responses about creature behaviour.



Observations of a creature's body movements often refers to their being either ***malua*** (slow) or ***totola*** (fast); factors of obvious practical importance for people fishing. Some of the comments are anthropomorphic, such as '***qio vucesa***' (lazy shark; *Triaenodon obesus*) or the 'lazy and cheeky' ***teiteimolo*** (*Cephalopholis argus*). Other comments refer to physiological observations, such as the ability of ***kakarawa*** (Scaridae sp.; parrotfish) to secrete a protective jelly around their body as they sleep in holes, or the abilities of various wrasses (Labridae sp.) to extend their sharp toothed jaws to eat prey or defend themselves. One man mentioned how ***babale*** (*Stenella* sp.; dolphins) move forwards and backwards by moving only their tail. Another described how the ***niuniu*** (*Myrichthys colubrinus*; banded snake eel) digs itself into the sand backwards with only its tail; a novel process to observe as the ***niuniu*** watches you carefully while it disappears from your view.

An example from the category of interactions with other creatures is the ***labe*** (*Anampses* sp.; wrasse) that is seen as an odd single relative of groups of ***kakarawa*** and ***kamotu*** (parrotfish) grazers. A person observed that a single wrasse of this type may travel with these grazers, but they did not mention that ***labe*** eat small animals exposed in the wake of the grazers. In Linnaean taxonomy, wrasses (Labridae) and parrotfishes (Scaridae) are closely related, and share many morphological features excluding dental and digestive structures. Other examples in this category include interactions between ***bakewa*** (*Echeneis naucrates*; sharksuckers) and sharks, turtles, and large fish. The ***bakewa*** are perceived to be sucking the blood from these creatures, as discussed earlier under Question 2. An example shown separately in Figure 46, in the category of 'function in the sea', is the ***quru kedra na matai*** (*Amphiprion* sp.; clownfish), which ***dau yadrava tiko na drumani*** (guards the anemone), as shown in Plate 55. This expression

Plate 55 *Quru kedra na matai* (*Amphiprion* sp.; clownfish)

was translated partly into English to me as 'looks after the ***drumani*** like a policeman'. Another man stated that ***ciri*** (*Pomacentrus pavo*; blue damselfish) and ***loli*** (*Holothuria edulis*; sea cucumber) had the 'job' of cleaning the coral.

A number of people made observations about a creatures' diet and where they fed, such as in the mud or in the coral. More specific observations include the piles of clam shells left by ***sokisoki*** (*Deodon hystrix*; porcupinefish) and the perceived blood-sucking practices of ***bakewa*** (*Echeneis naucrates*; sharksuckers). Stories about fishing interactions often took the form of warnings about fish that can bite you when being held, such as the flexible wrasses that twist and extend their heads to nip people; or more serious issues with shark bites, which I discuss later. There were 11 other behavioural observations about human-marine life interaction, from small fish picking at hair on the legs of divers to the famous ***qau*** (*Balistoides* sp.; triggerfish) that bit off a chunk of a local man's ear in defence of either its mate, young, or territory in various versions of the story told to me. Another man had noticed how some ***drevu*** (*Anampses* sp.; wrasse) had learned to catch small fish that were startled by divers, and had exposed themselves to these predators in their escape.

Figure 46 shows that groupings of creatures, including seasonal aggregations, were frequently mentioned in stories. Many of these are well known habits of diverse reef fish, but some of these observations were of features seldom or no longer seen. ***Ta penikau*** (*Naso* sp.; unicornfish) swim into the current in reef passages, and can be used from a boat to judge the speed of deeper currents before a person dives into the sea. The once common large schools of these popular food fish have declined as they have come under increased fishing pressure. Another man recalled that seven years ago in June was the last time he had observed large schools of a spectacular type of ***jivijivi*** (*Zanclus cornutus*) coming in through the breakers over the reef. This type of fish is normally seen in pairs or trios in the lagoon; and in contrast with ***ta penikau*** is seldom specifically targeted by fishers, given its thin and lean body.

Plate 56 *Ujimate* (*Synodus variegatus*)

The category of movements in the sea includes several references to fish that do not move much, or may stay in holes or under-hangs. For example, the ***ujimate*** (*Synodus variegatus*; lizardfish) sits very still in the open on coral heads waiting for prey to come near, as shown in Plate 56. The name of this fish translates as ***uji*** (penis) ***mate*** (dead) in an obvious description of its shape and lack of movement. This fish is never to be fed to men; and no one eats the head of this fish, a somewhat unique stipulation for consuming a fish in Nakasaleka according to this survey.[3] One day, there was a lengthy debate among some older women about whether it was appropriate to speak this fish name aloud in my presence. Another fish known for limited movement is ***ika tu*** (*Gnathodentex aurolineatus*; striped large-eye bream), which means 'fish that stays in one place'. In contrast, people also made a range of observations about types of fish

[3] People were quite clear that the restriction on a man eating *ujimate* was related to fears of limiting a man's potency. However, I did not learn specific reasons for everyone not eating the head of this fish, although I understand the reason to be related to the comparison between this fish and flaccid penises.

that moved with currents and tides in relation to the reefs, lagoons, mangroves, and river mouths. In some cases movements and groupings were associated with reproduction. Observations of reproduction mentioned included: territories; pair bonds; small fish seen with a large fish or 'mother'; and a number of items about turtles laying eggs, which are topics discussed under Question 9.

In Figure 46, the category of night/day includes observations that certain creatures are active at certain times of day. For example, a person stated that ***ravi*** (*Aluterus scriptus*; scrawled filefish) comes out only at night now, due to overfishing by poachers from Suva. I do not know the extent of the poaching problem, but I did see ***ravi*** in the daytime on a number of occasions.

There were two stories about noises made by fish. A type of ***lati ni daveta*** (*Pomacanthus semicirculatus*; semicircle angelfish) are said to make a repetitive rhythmic singing noise that allows spear divers to find them in their hiding spots underneath reef shelves. The closely related *Pomacanthus imperator*, also known as ***lati ni daveta*** in Kadavu, has been observed elsewhere by aquarists and SCUBA divers to make a repetitive grunting noise (Shedd Aquarium web guide). The ***gugu*** (*Arothron* sp.; pufferfish), when speared, cry out and make a noise in their throat. I have heard pufferfish make croaking noises when they are netted from aquariums.

Story Categories: Catch method and Cook it

Most stories recorded about catch methods focus on the technology used, such as the handlines, nets, poisons, and spears, discussed under Questions 12. Much of this information is practical advice, such as to quickly turn the head of a ***sulua*** (Octopus sp.) inside-out as soon as you spear it in order to prevent it attacking you or squirting its ink.

Advice is given on the best time of day to catch various types of creatures, or ways to kill and detach the flesh of large clams and anemones.

The earlier discussion of cooking methods under Question 13 covers much of this material, including details of how to clean poisonous fish such as ***vusevuse*** (*Arothron* sp. pufferfish). Advice for cleaning fish and preparing them for cooking often described the appropriate choice of skinning, scaling, and removal of specific body parts for various creatures requiring special attention. For example, it is well known that **ravi** (*Aluterus scriptus*; scrawled filefish) is to be skinned alive in order to facilitate either consuming it raw, or cooking this fish.

Story Categories: Dangerous and poisonous

Poisonous things are obviously dangerous; however, a significant number of dangerous creatures are not poisonous, or the poison risk is secondary to the physical danger. The second topic will be discussed first using the examples of surgeonfish and sharks. I will consolidate many of the responses on these poisonous and dangerous creatures and give key examples.

Cuts: Many fish have sharp spines that can cause deep wounds and scars. Surgeonfish (Acanthuridae) represent a large group of fish that all have one or more sharp ***ta*** (spines) at their ***tolo ni buina*** (caudal peduncle; base of the tail). These spines project horizontally on each side of the ***tolo ni buina*** at right angles to the ***bui*** (tail). The fish types known in Fiji as ***balagi***, ***ikaloa***, and ***jila*** erect

Plate 57 *Ta bui dromodromo* (*Naso lituratus*) with erect double spines.

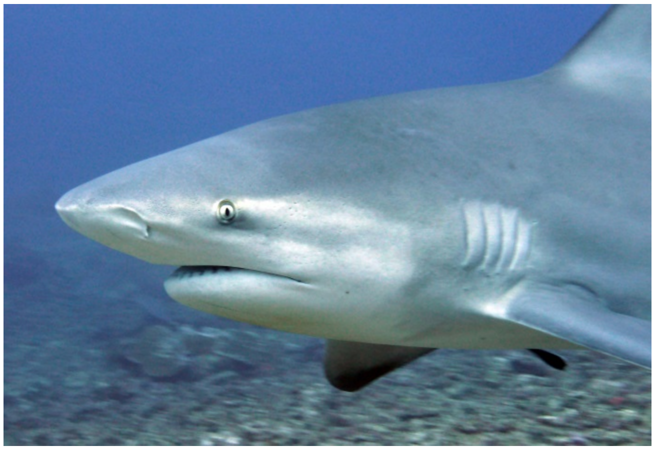
these spines when threatened, and these types are classed together by most people. Fish of another related subgroup of fish kinds are called ***ta*** (*Naso* sp.); and have one or more sets of fixed erect spines, seen in Plate 57. Both of these groups of algae or zooplankton grazing fish are often caught with nets while wading; they are common and important food fish in Nakasaleka, and in many other South Pacific artisanal fishing communities. Many people in Nakasaleka have scars on their legs from wounds incurred while netting these fish; in particular, from the fast swimming and territorial ***jila*** (*Acanthurus lineatus*), shown in Plate 58, which use their blades as offensive weapons.

Plate 58 *Jila* (*Acanthurus lineatus*) with retracted spines

Jila and some ***balagi*** types also have venom on their tail spine (***ta***) which increases the pain and healing time of the wound (Randall 2005: 577). The blades of these fish also slice the fishing nets, an event which creates many hours of work to repair the damage. People often talked about the care required when dealing with these muscular fish, which must be handled with care to remove them from the net and again later when they are cleaned. The topics of these fish and others with sharp spines represent many of the comments categorized here under dangerous. Some fish spines release venom on contact; but in other cases the deep wounds become infected from other sources, a development which may lead people to assume that the spines are toxic.

Bites: In Fiji, sharks have special significance, often through associations made with Dakuwaqa, the well-known pre-Christian shark ***vu*** (ancestral god/spirit). Although the **vu**, Dakuwaqa (outside-the canoe), has the most significance for the people of

Plate 59 *Qio leka* (*Carcharhinus leucas*)



Cakaudrove in the island of Vanua Levu, this mobile entity is said to have appeared in many places in Fiji as either a tattooed shark or on occasion a man. There are legends of a common mother for humans and sharks, and stories of past days when sharks could be sent out on tasks by powerful men told today in popular media (Turagabeci 2011). Some Fijians have portrayed Dakuwaqa as an enemy for living sailors, and as a psychopomp who conducts those lost at sea to the after-world (Moray 1932). Plate 59 shows ***Qio leka*** *(Carcharhinus leucas; bull shark)*, which is one of the more dangerous types of sharks in coastal waters. Matasawalevu village people have a respectful relationship with Dakuwaqa that is relatively strong because they trace their lineage back to Dakuwaqa'a home in Vanua Levu, in contrast with many other Kadavu villages considered to be of a more ancient Kadavu heritage. Missionaries recorded historical accounts of the shark form of Dakuwaqa saving men by towing them to shore when they have been lost at sea. A longstanding tradition of pouring libations to Dakuwaqa into the sea before voyages is said to be practiced in some places yet today (Waterhouse 1866: 373-376, Gatty 2009: 56).

Kadavu people were said to be safe from sharks so long as people did not kill and eat them. This belief is substantiated by the well-known legend of the struggle between Bakaliceva, the octopus ***vu*** of Nacava district in Kadavu, and Dakuwaqa.

Bakaliceva held onto the reef with four tentacles and caught Dakuwaqa tight with the others. To obtain his release Dakuwaqa was forced to promise never to eat people from Kadavu (Tomlinson 2009: 212). This story is told in Kadavu; and is often found in tourist and popular media sources about Kadavu, followed up with the assertion that no Kadavu man has since been eaten by sharks (Starnes et al 2009:216, Turagabeci 2011). In contrast, the beliefs in the potency of shark ***vu*** are demonstrated in a Nakasaleka story told about the mother of a Kadavu man eaten by sharks. The woman asked of an 'old time' priest, who was in a possession trance at the time, why her son had been eaten. The ***vu*** (god/spirit) replied through the priest that "he could do nothing to save the man because he ate me first." Waterhouse (1866: 374) states that "the shark is worshipped in several islands, districts, and towns, but under many names"; and lists the English translations of the names of 10 other Fijian shark gods. Basil Thomson (1908) blends his own observations with the Waterhouse account to define Fijian shark-worship as "pure totemism" because sharks help their worshippers with problems and these people are not to eat sharks. This problematic statement is tempered by Thomson's admission that many other "usual features" of totemism are lacking in these beliefs (1908: 115). In Chapter 10, I address the topic of misconceptions of totemism in Fiji.

In Nakasaleka, people say that if you ignore the word of a chief, the sharks will bite. This moral concept was famously learned by an older Nakasaleka man, who as a young man ignored his work assigned by a chief and instead went fishing to help prepare for a brother's fourth night wedding feast. While out on the reef spear fishing, with a large ***sevaseva*** (*Plectorhinchus chaetonoides*; sweetlips) fish on his spear, a large shark attacked him and ripped considerable flesh from his right thigh and left arm. He pulled on the shark's head to be released; but the shark attacked again, dragging him far from his boat and companions. His life was saved only by the coincidental arrival on the scene of a large cutter. The captain and passengers of this sailing vessel decided to rush him to a distant hospital. Everyone in Matasawalevu and some surrounding villages knows and tells this 30-40 year old story, including some eye-witnesses. A variation on this moral belief is a common saying to the effect that bad behaviour or broken promises will cause you to be bitten by a shark. Other people have been bitten by sharks to lesser degrees. Often sharks will 'taste' their prey with a light bite before swimming a loop to come back in and feed on their prey. One man described how these sharks have 'weak teeth' that they use on their first bite, before going away to return with their 'strong teeth'. Some of the inspiration for this story may be drawn from the many shark teeth that can be found on the bottom of the Nakasaleka lagoons.

Plate 60 *Qio kaboa* (*Nebrius ferrugineus*)

The stories told about sharks demonstrate that some people are well aware of the differences in behaviours and risks with different kinds of sharks. For example, the large slow moving ***qio kaboa*** (*Nebrius ferrugineus*; tawny nurse shark), shown in Plate 60, often lie on the substrate in reef caves, where divers today may try and spear them or even rope them by the tail. The caution described for these processes was "they try and bite you like a dog". This notion is a far cry from attitudes towards the dangerous ***qio leka*** (*Carcharhinus leuca*; bull shark) or ***qio saqa*** (*Carcharhinus amblyrhinchos*; grey reef shark), described by several people as ***ika vakarerevaki dau kata*** (fish with the frightful bite). One person said that pregnant sharks “get angry quick”. However, other people say that all sharks are dangerous and that they are afraid of them all.

Sharks have a significant place in the Kadavu social world. Sharks demand respect, given the uncertainties involved in interactions with certain kinds. A shark is often identified as Dakuwaqa by its tattoos, in the relevant stories recorded in Waterhouse’s (1866) accounts. Given the common historic and current use of body tattoos by Fijians, a shark with a tattoo stands cosmologically closer to humans than other fish in Kadavu folkbiology. Sharks in general are classed as ***ika*** (fish/swimming things). Sharks are also closer in size to humans than most other marine creatures. Eugene Hunn (1999: 48-49) has demonstrated the significance of large body size of organisms in connection with ecological salience in human classification and perception of taxonomic groups. Hunn defines ecological salience as representative of the degree of the likelihood of meaningful encounters occurring between people and the organisms. Cultural salience is the variable role that a set of organisms “plays in local cultural plans”, such as the culturally conditioned behaviours of fishing and travelling in Kadavu. In this case, people are most likely to interact with sharks when spear fishing for food or travelling in small boats, in an environment in which sharks may be seen as any or all of co-predators, predators, prey, companions, indicators of environmental conditions, and agents of punishment for people who break rules. There are many reasons to pay attention to sharks, and ways that interactions with them might occur. Thus sharks are simultaneously quite ecologically and culturally salient in some very social ways.

The perspective of the present survey then recognizes a significant number of oft-told stories about sharks and particularly human-shark encounters as symptoms of the cultural significance of sharks and the socio-political perspectives of Kadavu people. In legend, Kadavu people are to be protected from sharks by respecting Dakuwaqa as a vanquished enemy, rather than a worshipped ***vu*** (god/spirit). Perhaps this belief is a reification of the famous Kadavu sense of independence manifested in the idiom, ***manu dui tagi*** (each rooster has its own cry), to describe the long-running struggles for political autonomy between Kadavu chiefs, and by the chiefs from outside authority (Tomlinson 2009: 36). Today in Nakasaleka, some people admit to eating sharks and other people are clear that they do not eat sharks.

In practice, Nakasaleka people who are more familiar with the characteristic behaviours of each type of shark through spear fishing experiences demonstrate inconsistent levels of respect, related to measures of a given shark type's aggression, physical features, and unpredictability. Shark attacks are an occupational hazard when spear fishing. In the last few decades, the growth in popularity of spear fishing, and interest in selling shark fins, as examined under Question 12 and 13 respectively, may have increased physical interaction between people and sharks. This development raises the question of how these changes affect the cosmological views towards sharks and Dakuwaqa, which exist alongside strong Christian beliefs. Midway through the fieldwork, I started asking people, "what makes the sharks bite?" This was a productive question that prompted many of the detailed stories about sharks that were told, and it suggests an approach to understand the social position that sharks hold in this and other Fijian societies. The older stories suggest an era when sharks were respected, not eaten; nor considered as dangerous as they are by many people today. The question remains as to whether this was ever in fact the case. However, what may be more important is that people believe it to be true.

Stings and venomous bites: Four groups of creatures that are poisonous by contact generated a significant number of stories. The first is ***novu*** (*Scorpaenopsis diabolis, Antennarious* sp.; stonefish) and ***toa*** (*Pterois* sp.; lionfish); the second is represented by ***vai curuqara*** (*Dasyatis kuhlii*; blue spotted stingray); the third is represented by ***dadakulaci*** (*Laticauda* sp.; banded krait); and the fourth includes ***gasagasau*** (*Diadema setosum*; longspine urchin) and ***bula*** (*Acanthaster planci*; crown of thorns starfish). Much of the information below was gathered by asking people specific questions about injuries from these creatures and treatments rather than just the standard form of Question 15.

Plate 61 *Novu* (*Scorpaenopsis diabolis*; stonefish)

Novu (*Scorpaenopsis diabolis, Antennarious* sp.; stonefish) and ***toa*** (*Pterois* sp.; lionfish) are cooked and eaten, as described under Question 13. The term ***novu*** may also be used as a broader class of fish inclusive of ***toa***. ***Novu*** cause most of the foot injuries; but both ***novu*** and ***toa*** get caught up in nets, causing hand injuries. Many Nakasaleka people, including quite a few interviewees, have received painful stings on their feet and hands by these creatures; and endured painful cures. ***Novu*** are ambush predators of the mangroves, mud, lagoon, and reef. They are well camouflaged, as can be seen or perhaps not seen, as shown in Plate 61 where the fish is the large foreground object facing left. The ***toa***, as shown in Plate 62, is also well camouflaged for floating in nooks on coral outcrops.The toxic dorsal spines of ***Novu*** and ***toa*** often break off under the skin in the foot when people step on them. The neurotoxin is fatal only in extreme cases.

Everyone who was interviewed about these fish knew a "traditional" remedy for these stings involving heat. Treatment recommendations include combinations of bathing or immersing the wound in hot or boiling water, burning the flesh around the sting with a hot coal, and cutting out this flesh to remove the stinger. No mention was made of a botanical treatment, such as the leaves of the ***Dirigi*** tree (unidentified genus) used to treat ***novu*** stings in West Nggela, Solomon Islands (Foale 1998: 8). Today in Nakasaleka, an anti-serum injection is available at the health centre, although some people will not or cannot spend the $25.00 USD required to buy fuel for the trip. The injection shortens recovery time by weeks. Otherwise, the local remedies are consistent with home treatment recommendations of international medicine to remove foreign materials and soak the wound "in the hottest water the patient can tolerate" (U. Maryland Medical Centre 2013).

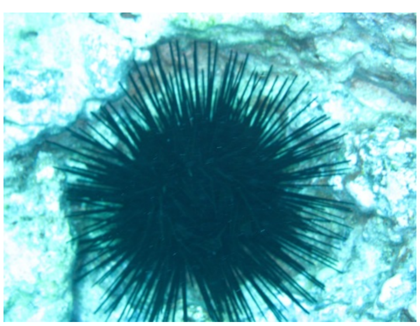
Plate 62 *Toa* (*Pterois antennata*; lionfish) Image taken from above to show toxic white-tip dorsal spines.

Vai curuqara (*Dasyatis kuhlii*; blue spotted stingray), are common in the nearshore mudflats, where people often walk barefoot as they fish or gather shellfish. Stepping on a ***vai*** causes the serrated tail to rise up and sting the person's ankle or calf causing significant wounding and pain. An anti-venom is available at the health centre; similar home remedies to those described for ***novu*** may be applied. Some villagers say that the ***vai*** population is increasing, as are the number of injuries.

Dadakulaci (*Laticauda* sp.; banded krait), as shown in Plate 64, are very common in Nakasaleka waters and at times on the shore. Their venom is a potentially deadly neurotoxin (Tamiya and Yagi 2011). It is not clear how much time a person has after a bite to reach the health centre for an injection of anti-venom. The time period is affected by the duration of the bite and amount of venom injected. Several people are known to have survived these bites after receiving the anti-venom. All interviewees agreed that one must go to the health centre right away. One man who caught a ***dadakulaci*** in his net was bitten and died in minutes. An adult dog was bitten and died within 30 minutes. No one offered a home remedy for these bites, but few people actually seem to have been bitten except in accidental situations in which people step on the snakes on the shore or when they are caught up in nets. In the sea ***dadakulaci*** will inspect divers at close range without incident if one stays calm. Parents viewing a picture of ***dadakulaci*** during an interview would often take time show the picture to children and warn them of the danger.

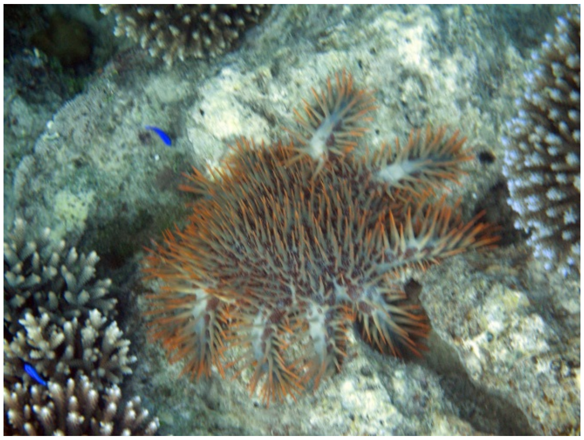
Plate 64 *Dadakulaci* (*Laticauda* sp.; banded krait)

Plate 63 *Gasagasau* (*Diadema setosum*; long-spine urchin)



Gasagasau (*Diadema setosum*; long-spine urchin), seen in Plate 63, and ***Bula*** (*Acanthaster planci*; crown-of-thorns starfish), seen in Plate 65 are both creatures that people wading in the sea may step on, an event which causes intense pain and illness. Both of these creatures inhabit coral outcrops and reefs and are more active

Plate 65 *Bula* (*Acanthaster planci*; crown-of-thorns starfish)



at night, but they can also be out in the open during the day. It is well known that if you step on a ***gasagasau*** or ***bula***, you must right away flip the animal over and step on the underside of the creature with your wound positioned against the suction mouth of the creature. This suction is said to remove much of the poison from the wound and lessen the symptoms. The heat treatments described earlier for ***novu*** stings in Kadavu will help. The venom loses toxicity at 60 degrees Celsius, and pain relief occurs at 45 degrees Celsius (Sato et al. 2008: 166). However, removing the tiny spines lodged in the skin is most difficult, given the "fragile lattice-like structures" of the two to 10 millimetre size of the spine tips that break off when removal is attempted (Sato et al. 2008: 162). Given the technology available in the village, aggressive burning, and cutting of flesh, as described for ***novu*** stings may be the only effective option. Sato et al. (2008) describe a patient treated ineffectively at a Japanese hospital with antibiotics and steroids for three months after a crown-of-thorns incident. Finally, micro-surgical techniques were used to remove the fractured spine tips. One Nakasaleka villager who stepped on a ***bula*** described very painful swelling in his leg that required weeks of convalescence.

Kadavu is a mountainous island, and villages are established along the coastline with few roads. People often walk in the sea to travel between villages, to get in and out of boats, and to fish or gather shellfish. The lagoon contains a variety of sharp, venomous, and biting organisms that people have developed folk remedies to deal with over centuries. A modern health centre located 30-45 minutes by motorboat from the Nakasaleka villages in question may be accessed for extreme wounds, such as rare ***dadakulaci*** bites; but home treatments will often be attempted for many of the other wounds described. The health centre treatment is free, but the cost of transport is an impediment. However, I discovered that some people choose not to seek treatment at the health centre for serious ailments even when their transport cost is paid.

In this section, I have demonstrated the significant cultural salience of shark interactions as opposed to interactions with other dangerous and poisonous creatures. In contrast to beliefs about sharks people did not tell me any reasons or folk wisdom for the causes of ***novu*** stings, stepping on a ***bula***, or being sliced by an angry ***jila*** other than advice to be careful when walking in the sea. These interactions and injuries are more common and experienced by a wider section of the population than are problems with sharks. A.M. Hocart (1952: 57) famously quoted "In Fiji all things go in pairs, or the sharks will bite" from a Lauan informant to emphasize the hypothesis that men take representative roles for opposing spirits in Fijian rituals. This quotation was inspirational to studies of hierarchy and dualism in Fijian societies (Toren 1994). My questions about sharks did not yield quotes as profound as Hocart's. However, in this section, I have substantiated through this body of current and legendary ***talanoa*** (stories or storytelling) that sharks continue to play active roles as social actors today in Nakasaleka fishing villages.

Story Category: Describe it

137 responses were coded to this broad category, many of which have been discussed under other questions, or cross-coded in this section and dealt with in other

categories. A significant number of the remaining responses differentiate between similar kinds of creatures by colour, morphology, or behaviour. Many of these responses were elicited with follow-up questions in order to clarify features defining differences in nomenclature, such as colour and body shape differences between parrotfish (Scaridae sp.). Types known in Fiji as ***kakarawa*** and ***kamotu*** often represent two distinct life phases of a single Linnaean species. These were important questions to improve accuracy of the encyclopaedia, but they do not merit further analysis here.

Story Category: Eat it

As mentioned earlier, 112 of the 175 responses coded here under 'eat it' contained ***kana vinaka*** (good food/good to eat). In 47 of these responses, ***kana vinaka*** was the only thing people offered as their answer to Question 15. In fact, with some interviewees, this idea became a running joke which spread into other responses, such as the man who suggested that the nearest family of the ***jila*** (*Acanthurus lineatus*; striped surgeonfish) is the cooking pot. However, the many ***kana vinaka*** responses do illustrate people's enthusiasm for eating a wide diversity of marine life, as shown earlier under Question 13. Here, I will provide just one example of a specialized eating practice not covered elsewhere in the thesis.

The ***yate*** (liver) in Fiji is considered to be the key body organ and seat of courage, much like the heart is in European cultures (Gatty 2009: 323). This is a common feature of most Austronesian language group societies, who regard the liver "as the seat of the emotions, temperament, and character" using "language reflexes of *qaCay" (Blust 2005: 538). The Fijian word ***yate***, pronounced 'yatay' follows this pattern. This meaning is demonstrated linguistically in the Fijian languages by the use of distinctive compound adjectives used to describe “human propensities” that often build upon the terms ***yalo*** (spirit, soul), ***yate*** (liver), and ***loma*** (mind, will, feelings). Examples include: ***yalo vosota*** (patient); ***yate dei*** (determined); ***yate va’a-laione*** (lion-hearted); and ***loma soli*** (generous; Dixon 198: 230). Thus, it is interesting to note that the ***yate*** (liver) of parrotfish (Scaridae) is a delicacy for Kadavu people; and considered best when eaten raw from freshly caught fish, after the sand is washed away. One person planned their lunch on a fishing expedition around ***tavioka*** (cassava) and the anticipated ***yate*** to be harvested. Symbolic significance of the liver is also demonstrated in other cultures that use terms for the liver to represent notions of ‘courage’, such as Hindu, Persian, Urdu, and Zulu (Wikipedia 1).

While I am not certain that the parrotfish organ being consumed in Kadavu as ***yate*** is in fact the liver, it is likely so, as parrotfish have a viscera made up of only the gonads, heart, liver, intestine, and swim bladder. Digestion occurs in the intestine in order to allow transport of the significant amount of calcareous material consumed with the algae that these fish scrape off and out of coral. Their liver is uniquely enlarged, weighing between 1.5 and 7.4 percent of total body weight depending upon the species. The liver is very oily, and thought to “serve as the primary lipid storage site” (Bellwood 1994: 39-40). Lipids, from the Greek ‘*lipos*’ (fat), are fatlike substances including fats, steroids, waxes, and the phospholipids, such as lecithin, essential for cell wall construction (Hickman et al. 1988, Chemistry.about.com). Other than coconut cream, fats are a scarce element in the Fijian village diet of root crops with fish and greens. Fats are much appreciated when available, and can taste quite exotic. During a village stay, after several days of a diet with limited protein and almost no fat, I consumed two sugar cube-sized lumps of pig fat. I immediately experienced a remarkable energy surge that tailed off over several hours. Fat is a high demand item. The fish heads served to honoured guests usually contain more fat than other parts of the fish. In 2009, many people told me that their favourite fish was ***sevaseva*** (*Plectorhinchus chaetonoides*; sweetlips) because “the lips tasted sweet”. Further inquiries determined that the adjective ‘sweet’ referred to ‘fat’ in this instance. The lips of these fish contain significant fat deposits.

Livers of one species of parrotfish, *Scarus ovifrons*, are considered a delicacy in Japan, in raw and boiled forms. Their ingestion can also be quite toxic to humans during many seasons of the year, causing forms of paralysis unique from the ciguatera toxins which are known to accumulate in *Scarus gibbus* in French Polynesia (Fusetani et al. 1985). *Scarus gibbus* has since been reclassified as *Chlorurus microhinus* for the Pacific populations. It is commonly seen and eaten in Kadavu without incident. In the Nakasaleka survey only one person reported toxicity concerns about a parrotfish, ***kamotu loa*** (*Scarus sordidus*).This is one of the more common parrotfish species of the many local kinds shown in pictures to people in the interviews.

In the case of ***ulavi takali*** (*Hipposcarus longiceps*; Pacific longnose parrotfish), some people wanted to eat only the ***yate*** (liver) and not the soft flesh of this fish. The term ***vakasoso*** or ***vasoso*** means to slit something down the middle, such as a banana, and insert other foods inside before cooking. This practice is followed by reinserting the liver in the gutted fish when cooking certain kinds of parrotfish that are known to have very large livers. Some people use the names ***kakarawa vakasoso*** or ***kamotu vakasoso*** for *Scarus schlegeli* (Plate 13 Series), *Scarus frenatus* (Plate 13 Series), and *Scarus sordidus* in recognition of their suitability for this cooking practice.

The strong interest people have in eating parrotfish livers raises questions of anthropological interest. One might consider this practice as any or all of: a good nutritional practice; a tasty snack; obtaining an energy surge; or a symbolic consumption of courage. Bravado related to toxicity does not seem to be relevant here. Further research might consider what people think about eating ***yate*** and how often they eat them, and inquire into the origins of the practice.

Story Category: Economic value

Many of the 58 responses coded under 'economic value' were elaborations of responses to Question 14 of ***volitaki*** (sell). Some people gave the current price of a bundle of a kind of fish, or spoke of how a certain kind was easier to sell than others in the fish market. One man noted that in Suva people from inland liked to buy the brightly coloured ***kakarawa*** (parrotfish) rather than fish of more drab colours. Most items of significance in this category have been addressed under other headings.

Story Category: Its family

These 49 responses consist largely of people differentiating between a given fish kind and other similar kinds. Various Fijian and English terms were used to refer to brothers, relatives, and families; but the most common preface was 'they are all the same, but', or something equivalent before people offered a key differentiating feature(s) of colour, size, or shape as shown in Table 17.

Table 17 Differentiating factors between similar kinds of fish by interviewees

Differentiating Factor(s)	colour	size	shape	skin hardness	size & colour	size & shape	shape & colour	location	size & location
# of responses	8	9	2	1	2	1	1	1	1

Many of these responses were given to direct inquiries in which people were asked to differentiate their nomenclature use for different kinds of parrotfish (Scaridae) or jacks (Carangidae). The results show the significance of size and colour to describe differences, with some use of shape, skin hardness, and location.

Story Categories: Location Found, Refer to Season, and Reproduction

I reviewed the locations described in the 67 responses coded to this category. The terms and use trends were very similar to those discussed earlier under Questions 6 and 10 regarding where creatures live. I will not reproduce this analysis here. Most of the locations mentioned in the 67 responses were ecological or topographical zones, except one reference to the Marine Protected Area of Tiliva village and another to the waters near Ono Island, adjacent to Kadavu. Some of these responses recorded under Question 15 describe movements of creatures from one area to another that may be associated with one or more factors of reproduction, growth stages, tidal habitat variations, and seasonal migrations.

References in the 31 responses coded under 'refer to season' describe: calendar months; lunar cycles; marine life aggregations and reproduction events; and synchronic associations between variations in marine life activity with changes in foliage of trees found near the shore, or with the yam harvest. I understand that in recent decades people have stopped growing yams in these villages.

The topic of reproduction has been addressed under Questions 9, 9.1, 9.2, and 9.3., in which much of the material coded in this Question 15 category has been discussed. The most significant groups of stories address either turtle egg-laying, or a range of variations on the grouper aggregation and spawning cycle descriptions taught in workshops by an NGO during their three previous annual visits. A number of other responses mention the presence of egg-laden fish, often considered a culinary delicacy.

Story Category: Song/idiom

Many of the 33 responses coded under 'Song/idiom' have been discussed elsewhere. I will relate just three ***talanoa*** (stories) here. One story was told by an 80 year old man about ***babale*** (dolphins), and not mentioned by anyone else. This man described a method to call dolphins together by making a noise like 'boooo'. This one way communication has parallels with other experiments with teaching dolphins to respond to human words, but less in common with recent attempts to establish human-dolphin verbal communication using the clicks and whistles that dolphins seem to use among themselves (Campbell 2011). This man also said that dolphins will help save people who fall in the ocean by pulling them to shore. Unfortunately this man was not in good health, and I did not have an opportunity to learn more about where these stories came from. One does wonder about possibilities of historic Fijian earlier stories of sharks saving people actually originating from dolphins rescuing people. Fijians certainly know the difference between sharks and dolphins. However, Nakasaleka people have few stories and minimal knowledge of dolphins, often classing them together with whales, using the term ***tavuto*** (whales).

A story (***talanoa***) told about synergies between ***kaka*** (parrot) and ***kakarawa*** (parrotfish) has some similarities to one written down by Buell Quain (1942: 215) in the highlands of Viti Levu. In the Quain record, Flying Fox tricks Parrot into flying across the sea to another island. When Parrot tires, Flying Fox offers to let Parrot ride on his back; but soon drops Parrot into the sea to be eaten by parrotfish. This story explains the similarity of the beaks of parrots and parrotfish and why parrots fear flying foxes. In Matasawalevu, it is said that "in the olden days the parrotfish changed heads with the parrot," a belief which explains why they are named ***kaka ni vanua*** (parrot of the land) and ***kakarawa*** (parrotfish). The naming similarity is further justified by the bright red and green colours that both creatures have in common.

Plate 67 *Jivijivi* (*Chaetodon baronessa*) Triangular butterflyfish

Tivitivi, or ***jivijivi*** as some Nakasaleka people felt that it should be written phonetically, is the name given to a large number of Linnaean species of the Chaetodontidae family (butterflyfish), such shown in Plate 67 and Plate 66. Most villagers do not bother to differentiate between the types of these vertically compressed fish, which vary somewhat in body profile and significantly in colour. This lumping of Chaetodontidae fish into a single category using a name similar to either ***tivitivi*** or ***bebe*** for the category is a common practice in Oceanic languages (Hviding 1996: 192-193, Osmond et al. 2011: 89). The name ***tivitivi*** is related to the Fijian word ***tiva***, meaning to change direction quickly. As discussed previously, ***jivijivi*** were a more important food fish when larger specimens could be caught in the mangroves many years ago, and before underwater spear fishing offered opportunities to hunt larger meatier fish. A well-known ***serekali*** (lullaby) featuring ***jivijivi*** has been sung in Matasawalevu for many years. I include the English translation here. The Fijian version is found in the encyclopaedia (Gordon 2012: 52).

Plate 66 *Jivijivi* (*Forcipiger longirostris*; Long nose butterflyfish)

Jivijivi from Naboujini are good fish for barbeque
Do not complain.
You can go to grandmother in the corner
You can take a fishing hook.
A fishing hook.

People often told stories about the consumption of ***jivijivi*** causing pregnant women, babies, or small children to have cuts, sores, or other lesions appear on the back side of their ear lobes and the adjacent area of the skull. Four women and a married couple from one village gave detailed responses on this matter. Various people from all three villages acknowledged the relationship between consumption of Chaetodontidae fish and the appearance of ear cuts or sores. This belief may extend beyond Kadavu, as two older women in Matasawalevu who had grown up on the island of Viti Levu were quite definite on this association. I have not yet been able to gather international medical perspectives or knowledge on this issue. In a recent review of external ear diseases, the authors state that there are such large numbers of "pathological conditions of the external ear" that it is impossible to describe them all (Sand et al. 2008: 1-2). I will not speculate on the pathology of the problem spoken of in Kadavu or on possible international medical cause and effect explanations. Here, I will paraphrase the stories of what people observe and believe. This information may contribute to further knowledge and inquiry about this curious condition.

One older woman stated second-hand knowledge to the effect that one to four months after pregnant women eat ***jivijivi***, their ear lobes will get bigger and have cuts on them. Many people believe that if a pregnant woman eats ***jivijivi***, the baby will be born with cuts behind the ears. An older couple described how their daughter was born with cuts on her earlobes, and attributed this development to the mother's consumption of ***jivijivi***. A mature woman described from first-hand experience how small “children get sores or little cuts in the flesh where the ear meets the skull.” This woman went on to say that the old people would tell children not to eat ***jivijivi*** when children displayed these cuts. Babies are also said to get these cuts from eating ***jivijivi***. A married couple with several children described how their daughter developed these cuts after eating ***jivijivi***. These parents eliminated ***jivijivi*** from their daughter’s diet, and obtained an ointment from the health centre. The problem disappeared after two to three months of treatment. Today, the thin ***jivijivi*** are not eaten as often, given people’s current preference for spearing larger and meatier fish. However, forty or fifty years ago, people would cut off the mouth and nose of ***jivijivi*** to make it safe to eat, even by pregnant women. The older couple whose daughter was born many years ago with the cuts behind the ear treated the skin problem by taking a ***jivijivi*** and biting the cheek out of the fish before spitting on the fish’s fresh wound. This procedure was followed up by feeding the baby with cooked flesh of the same fish. Biting the cheek of the fish as a cure for this problem was also recommended by another man in his late fifties.

These symptoms are inconsistent with those of ciguatera or other marine life toxins known to occur in Fiji. The widespread acceptance of this belief suggests a topic for further research with both villagers and medical professionals in Fiji who may be knowledgeable of this health issue.

Story Categories: Use as bait, Use as remedy, and Other

Most of the significant stories in the 22 responses coded to ‘Use as bait’ have been addressed under Question 14 and elsewhere in the thesis, with one exception. One person commented on the image of the terminal phase (TP) of ***ulavi*** (*Cetoscarus bicolor*; Bicolor Parrotfish) that “we use this fish for bait and it tastes good”. This relatively large fish at 60 to 80 centimetres is always a large fish. For this Linnaean species the tiny reclusive juvenile phase (JP) is unknown to people. ***Sovi ni kie***, (***soni ni kie***), the under 60 centimetre intermediate phase (IP) of this fish, is considered to be a discrete kind. In general, parrotfish flesh is softer than that of many other kinds; thus ***ulavi*** is an unusual choice for bait. Soft flesh falls off or is pulled off a fish hook quickly. It is not a high status fish to eat. When people were asked to name their favourite fish, ***ulavi*** did not appear among 26 responses that I recorded in Kadavu in 2009, or in the 40 responses recorded in Lau by Sharyn Jones (2009: 77). However, some people enjoy eating ***ulavi***, often '***vakalolo***' (cooked in coconut cream). The key point here is that the ***ulavi*** response suggests that if people think that the ***ulavi*** tastes good to them, then they think that it also must be attractive tasting bait for fish.

There are five responses shown in Figure 45 coded to 'Use as a remedy'. Two of these responses state that sharks can be used to make medicine, but I did not learn details of this procedure. One response relates to the sores associated with ***jivijivi***, as described earlier. Another is a well-known remedy for low blood iron, a common condition for Fijian women. ***Vasua*** (*Tridacna* sp.; giant clams) serve this purpose, but are scarce today. ***Kai koso*** (*Andara cornea*; marine surf clam) is a popular food eaten raw or cooked, and high in iron. It is gathered at low tide from the Matasawalevu mudflats and mangroves at a shell size of seven to 10 centimetres across. People in Tiliva and Lagalevu regret not having ***kai koso*** available in their marine tenure zone, and are very pleased when offered some by Matasawalevu people. Freshness is a key factor with these and other shellfish. Gatty (Gatty 2009: 96) advises that ***kai koso*** do not keep well, and soon become deadly poisonous after sitting in Suva market stalls. Lastly, a plant-based remedy was described to heal the deep cuts received from the spines of fish, such as ***jivijivi***. A paste is made from the leaves of the common vine, ***wa bosucu*** (*Mikania micrantha*). Putting the juice in the cut is said to speed healing. According to Gatty, this is an invasive species, introduced in or about 1900 from America to Fiji, that is well known as a healing agent for stings and cuts (2009: 307).

Fijians have a diverse range of botanical cures used for a variety of ailments. Women in the villages use 'Fijian medicine' actively today, and I saw impressive results with a method for healing serious scalding on a young boy's arms. This topic is outside of my research project. Records of Fijian plants and their medicinal uses may be found online today in open source formats under Parham (1939, 1940, and 1941) and Gatty (2009).

Most of the 51 responses coded as 'Other' have been discussed previously. I will mention just a few here. A Nakasaleka man, who had spent many years taking tourists diving in the area, described taking a boatload of tourists out for a dive near Ono in 1995, when they met up with a group of about 25 ***vai beka*** (eagle rays). The tourists jumped in the water; the ***vai beka*** were not afraid of the divers, as they would normally be in my experience. The divers and rays swam together for almost an hour on this calm and clear day. One person held the tail of a ***vai beka*** and went for a long ride without incident, despite the poisonous spine at the base of the tail of the ***vai***.

Vai roqo (*Manta birostris*; manta ray), as shown in Plate 68, are not uncommon in Nakasaleka waters. With wing spans of five to eight metres, these large plankton-eating creatures often feed in relatively shallow water, inspiring respect with their size and graceful movements. The secondary lexeme in their Fijian name, ***roqo***, means to wrap around; and there are many vague stories about people being wrapped up in the wings of ***vai roqo*** and being carried away forever. This story contrasts with stories of sharks and dolphins saving people, and the ***vai beka*** passenger incident.

Buliya is a small island, located north of Kadavu and Ono Islands, where at times currents will consolidate plankton against the land to create a popular feeding spot for ***vai roqo***. Once, a ***vai roqo*** was startled by the motor of a Buliya villager's boat and flipped the boat over. In Nakasaleka, there is a famous story about a boatload of Tiliva village women who, when out fishing, were pulled by a ***vai roqo*** all the way across the Ono Channel and back again, a distance of 12 kilometres return. When the ***vai roqo*** and boat came close to Tiliva again, the village men jumped in the boat and eventually speared and killed the ***vai***. Some people think that the ***vai*** panicked when accidently caught up with the boat's anchor rope.

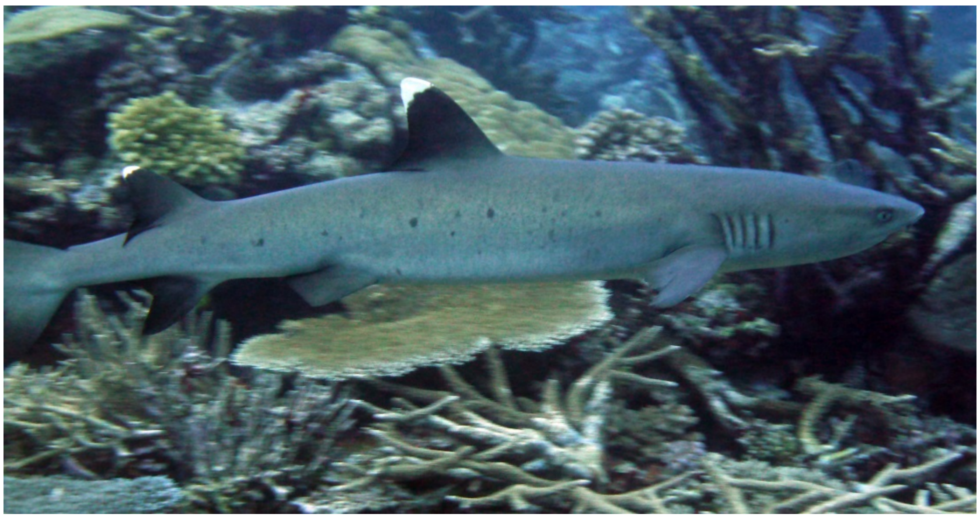
Plate 68 *Vai roqo* (*Manta birostris*; manta ray) The flippers of snorklers provide scale references.

Summary of Question 15 results

In this section, I have demonstrated methods for gathering stories of marine life, and some potential improvements to these methods that establish productive categories of interest to local people. Of particular interest in this case were the topics of behaviours of creatures, and that of poisonous and dangerous things. These types of stories suggested ways of connecting beliefs about marine life with practices, such as the comparison of the types of stories told about sharks and stonefish, and differential recent changes in fishing practices. This sort of fine grained data collection and analysis might benefit marine life conservation organizations seeking to anticipate how their messages should be developed and are likely to be perceived. Attitudes of people towards sharks and rays are of particular interest today, given the concerns for the impact of current fishing pressures on shark populations. On March 14th 2013, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) narrowly passed a motion to list five types of sharks and the two types of manta rays on the CITES Appendix II. International trade in these creatures can now be monitored through the issuance of CITES permits. Conservation organizations see this action as a critical first step towards regulation of the shark fin trade, and achieving CITES listings for other types of sharks; and advancing their education efforts to curb both the demand and the supply chain (World Conservation Society 2013). Thus, my research in investigating methods to understand how people actually think about such creatures is a topical issue at local and international levels.

The metaphors in many of the stories collected in this chapter will be told more often and with greater consistency than will many of the messages delivered in the travelling workshops often used to disseminate conservation education in rural Fiji. Other approaches, of a conservation activist type, co-opt local stories to embed messages in popular media reports, as in the Fiji Times article, ‘Hunters become the hunted’ (Turagabeci 2011). This type of scattergun approach also does not address people’s preconceptions about different forms of marine life. For example, knowing which type of shark people consider to be ***qio jina*** (Bau: ***Qio dina***; true shark) would indicate which type of shark to shape education programs around. For many Nakasaleka people it is the type shown in Plate 69, but this fact took a number of interviews to ascertain. These sorts of beliefs will shape people's reactions to the messages. Careful ethnographic research may demonstrate the realities of people's lifeways, knowledge, and beliefs as a starting point for richer ***talanoa*** that facilitate reciprocal communication of meaning.

Plate 69 *Qio jina* (*Triaenodon obeseus*) Whitetip reef shark. *Qio jina* means true shark.



Chapter 8: Language use and re-use in Nakasaleka

In an intriguing analysis of the indigenization of the Latin language, Salikoko Mufwene points out that most modern revitalization efforts of endangered languages focus upon the preservation aspects of writing them down, an approach which may only preserve them as “museum artifacts” (2004: 208). Latin is given as an example of a former colonial language, which was written down but also indigenized orally and literally in different types of broad use throughout Europe. Mufwene (2004) is interested in modern language changes in which formerly colonized people continue to make use of the colonial language that was imposed upon them, alongside *lingua fracas* and urban vernaculars, from which people choose to suit their purposes in different situations. These purposes are too complex to support simplistic notions of prestige language hierarchies; instead speakers often maintain an indexical web of language use, which shapes a marketplace of language competition and natural selection. Thus, Mufwene calls for scholars engaging in linguistic revitalization efforts to question the impact of whether their work on the rights of languages should “prevail over the rights of speakers to adapt competitively to their new socioeconomic ecologies” (2004: 216-219).

Mufwene’s argument raises important questions regarding a project to assemble local biological knowledge into an encyclopaedia using a local dialect with revitalization or enhancement of biocultural diversity in mind. The current language use patterns in Fiji resemble Mufwene’s post-colonial archetype. In what follows, I will situate the use and perception of language use by some Nakasaleka people within the complex linguistic setting of Fiji. My purpose is to examine the relative value and potential use of my research project, when it is viewed as a biocultural revitalization project in the sociolinguistic domain. Would I have delivered more long term benefits to Nakasaleka people by delivering English language classes, which might help the children do better in school and lead to better paying jobs in the city? Was I simply collecting museum artifacts in writing down local knowledge and in particular speech patterns, which then become faded and immobile snapshots of moments of language use?

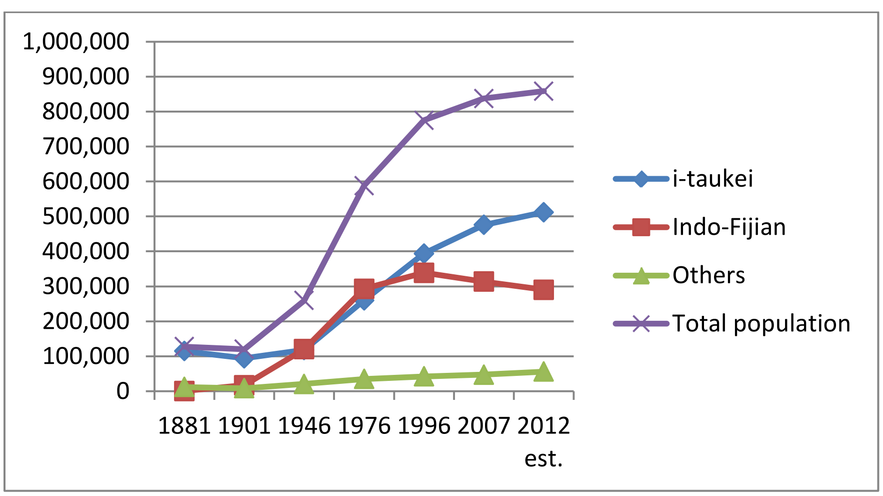
After situating and discussing language use in Nakasaleka, I will consider factors of language change and people's motivations for language choice by exploring the relevance of concepts such as polycentric indexicality, valuative authority, and prestige languages. I will explore ways to understand how language for Nakasaleka people is a form of what Keith Basso (1996: 108) termed as interanimation between people and their environment to continue to form and reform traditions. I will develop the idea that Nakasaleka as a language can only be understood as a "language of place', in moving beyond bounded analysis to consider the active agency within not a community of practice, but a community of practicers. As will be shown, the complexity of language use in Nakasaleka demonstrates that this is not a discrete 'language in place', but a 'language of place', which is generated and regenerated in Nakasaleka, in a poly-linguistic setting. I will demonstrate that the encyclopaedia of marine biology knowledge (Gordon 2012) is not a tool for saving the Nakasaleka language, but rather serves as an enrichment component of a vital multilingual linguistic environment nourished by and nourishing the Nakasaleka ***vanua***.

Overview of languages use in Fiji

Modern Fijians, whose ancestry in Fiji long precedes Colonial and Western contact eras, are known officially today as ***i-taukei*** (owners) in Fiji, by government decree. This designation is meant to differentiate these people who comprise 56% of the population, from the later immigrants, such as the 37 % of Fijians of East Indian heritage (Fiji Government 2012), whose Fiji-Hindi language is not significant in this research. Kadavu's population is predominately ***i-taukei***; and in the Nakasaleka villages where I stayed, the few exceptions were school teachers on rotational assignments. However, some ***i-taukei*** people enjoyed teaching me some Fiji-Hindi vocabulary that they had learned while living in Suva, the capital city.

Given the mobility of many Kadavu people, I begin with an overview of language use in Fiji before discussing a Nakasaleka communalect. Figure 47 shows the population of Fiji broken down into the two largest ethnic groups. In 1881, people were being brought from India to work on plantations; and the ***i-taukei*** population was recovering from a series of deadly epidemics.

Figure 47 Population of Fiji (Fiji Islands Bureau of Statistics)



In Kadavu the people were hit hard by the epidemics in the 1870s; but the population has since remained relatively stable over many years, as shown in Figure 48. This is a subsistence economy that sheds excess people to urban centres for wage work opportunities.

Figure 48 Kadavu population (Fiji Islands Bureau of Statistics, Calamia 2003, Committee 1880)

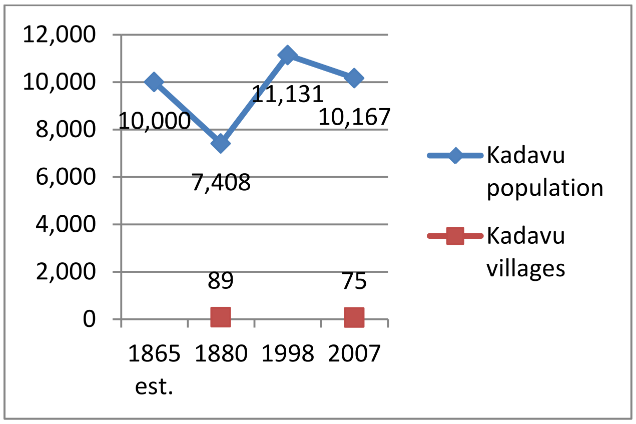
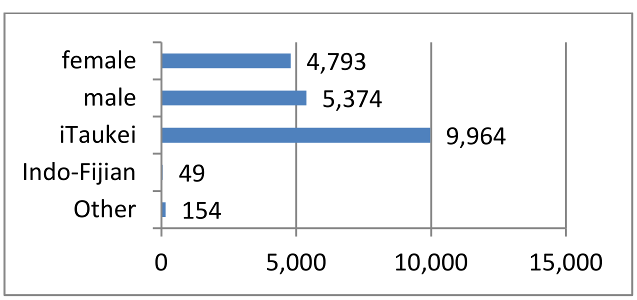


Figure 49 shows that the Indo-Fijian population size is insignificant in Kadavu demographics, and that overall men outnumber women by 5% in the island. From my observations only, the category of 'other' includes Chinese merchants and Caucasian expatriates. As for the gender imbalance, village life and domestic chores for women are quite demanding; and the village may be more attractive to young unmarried men who can do a little farming and fishing with time for leisure and kava drinking, a lifestyle not considered acceptable for young women.

Figure 49 2007 Kadavu population by sex and ethnicity (Fiji Bureau of Statistics)



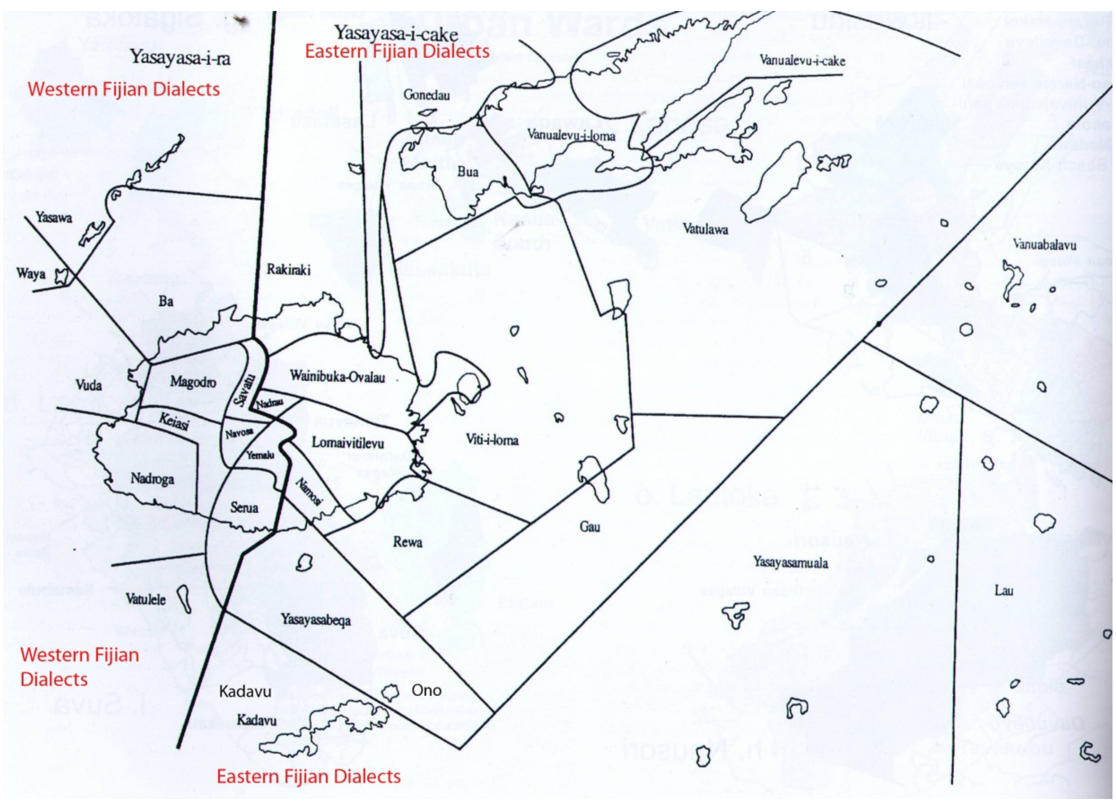
The official language of Fiji is English, with Standard Fijian and Fiji-Hindi taught in schools (Fiji Government 2012A). Standard Fijian was established by Wesleyan Methodist missionaries in the mid-19th century. Government documents and services are most often supplied in English. However, over 99% of ***i-taukei*** people use one of the over 300 dialects or communalects of Fijian as their first language, with an estimated 40% of those using Standard Fijian as a result of recent urbanization trends. In Fiji, English is often used in print media and television, with more use of Standard Fijian and Fiji English found in radio broadcasts, the dominant media source in Nakasaleka. Standard Fijian is based upon the language of the residents of the once politically powerful Bau Island, but with differences. Forms of common speech in Fiji include three pidgin languages: Pidgin Fijian, Pidgin Fiji Hindi, and Fiji English. Fiji English follows the phonology of Standard Fijian as a result of how English is taught in schools, in which students obtain only very limited literacy in any Fijian language (Geraghty 2005: 48-53).

The broadest language division in Fiji accepted by most linguists is the demarcation between Eastern and Western Fijian, as shown in Map 3; but in pre-colonial times this was not a named or well recognized categorization. It is doubtful whether pre-colonial linguistic unities were recognized on a scale larger than the language used in a village, district, or small island. Hence, the notion of a Fijian language arises with the Standard Fijian established by Wesleyan Methodist missionaries in the mid-19th century from the Bau dialect (Pawley and Sayaba 1971: 407-08). The limited local prestige of the Bau dialect was enhanced, and its official use continues to draw other Fijian dialects closer, as R.M.W. Dixon has shown for the Eastern Fijian dialect of Boumaa (1997: 104-114). However, it may be that Standard Fijian, sometimes known as 'Old High Fijian', today considered as an awkward missionary constructed version of the

Fijian language, may act as an impediment to Fijian students becoming literate in a Fijian language (Mangubhai and Mugler 2003: 428).

The Bau-Rewa dialect base for Standard Fijian is an Eastern Fijian language, as shown in Map 3. Eastern and Western Fijian are related languages with significant differences. Pawley and Sayaba (1971) proved that these languages are not derived from separate immigrations, based upon the presence of many shared innovations not found elsewhere. They proposed a Proto-Fijian language that differentiated from other Austronesian languages before diverging internally, but this proposed proto-language contained considerable diversity (1971: 411). Kadavu is an Eastern Fijian language area, as shown in Map 3; but with many variations, as discussed below.

Map 3 12 Western and 15 Eastern intermediate category dialects (Geraghty 2006: 388).



The captions in red type are added for clarity. The division between Kadavu and Ono is shown.

Pawley and Sayaba established the term ‘communalect’ to describe either a Fijian village, a small group of villages, or a ***tikina*** (district) which forms a homogenous speech tradition, often recognizable to others (1971: 407). This useful term is the smaller of two kinds of Fijian dialect divisions, which Geraghty (2006: 389) has put to use to map the approximately 300 Fijian language communalects. Writing with Geraghty, Calamia et al. (2008) confirms 30 dialects for Kadavu Province. This number includes Ono, which is shown in Map 3 as belonging to a distinct dialect group. The noted Fijian linguist Albert Schütz (1972: 91) describes the challenges of counting dialects in Fiji, given the difficulties of establishing criteria. For example, mutual intelligibility often occurs in chains of villages or village groups with neighbours communicating freely, but more distant chain members struggle to communicate. This is the case in Kadavu, where the Nakasaleka people in the east talk about how difficult it is to understand the speech of Nabukelevu people in the west. These differences are also perceived as cultural and political markers, in particular among close neighbours.

Kadavu communalects are Eastern Fijian (EF); and are said to be the “most clearly defined,” with “a large body of unique features, and fewer features shared with other Eastern regions (Geraghty 1983: 315). However, Geraghty also found that some Kadavu communalects share features with Western Fijian (WF); in particular, the adjoining Nabukelevu and Tavuki districts, but with less consistency in Ono. There are particular WF lexical features found in Kadavu districts, such as the use of ‘y’ for ‘c’ in certain words such as ***yava***/***cava*** (what), and the use of ‘i’ for ‘ei’ in Nabukelevu and Tavuki districts.In defining historical changes in vowel use from Eastern to Western Fijian, Geraghty addresses the monopthongization of ‘ei’ to ‘ī’ in the morphemes, ***vei***, ***mei,*** and when used as a pronoun marker, ***kei***; and notes their use in Kadavu communalects. (Geraghty 1983: 128,174,301). In Nakasaleka, I found consistent use of ***yava*** (what); and considerable use of 'i' to replace 'ei', as was used in the encyclopaedia. I was told that ***vi*** was considered appropriate Nakasaleka speech rather than ***vei*** in most cases, but space does not allow me to go into the lengthy details of the use of this common Fijian morpheme here.

Table 18 shows four common Western Fijian words which Geraghty found in regular use in Tavuki and Nabukelevu and in two cases on Ono. My records confirm the use of three of these WF terms for Nakasaleka. However, the term, ***tutu*** (grandfather), which I recorded in Nakasaleka, is unique from the common Western and Eastern terms shown here. This example further demonstrates the complexity of language use in Kadavu. I have not found ***tutu*** used specifically as grandfather in any other Fijian dictionaries to date.

Table 18 Samples of Western Fijian terms used in Kadavu

Western Fijian Term (WF)	**English meaning**	**WF use by Kadavu communalect ***	**Terms used in Nakasaleka****	**Standard Fijian*** (Eastern)**
driwadriwa	cold	Ono, Tavuki, Nabukelevu	***driwadriwa*** WF	***batabata***
sina	torch	Tavuki, Nabukelevu	***sina*** WF	***cina***
tai	grandfather	Tavuki, Nabukelevu	***tutu*** **?**	***tuka***
obo	clap	Ono, Tavuki, Nabukelevu, also SE Viti Levu	***obo*** WF	***cobo***

*Geraghty (1983: 302-303), **Gordon (2011-2012 fieldwork notes), ***Capell (1968).

Geraghty stresses the importance that Fijians place upon defining themselves in contrast to their neighbours by linguistic differences; and he defines a communalect as "a variety spoken by people who claim they use the same speech" (1983: 18). According to Pawley and Sayaba (1971), these speech traditions or communalects are named, such as the example of ***na vosa vakatavuki*** (the speech of Tavuki) the chiefly village in

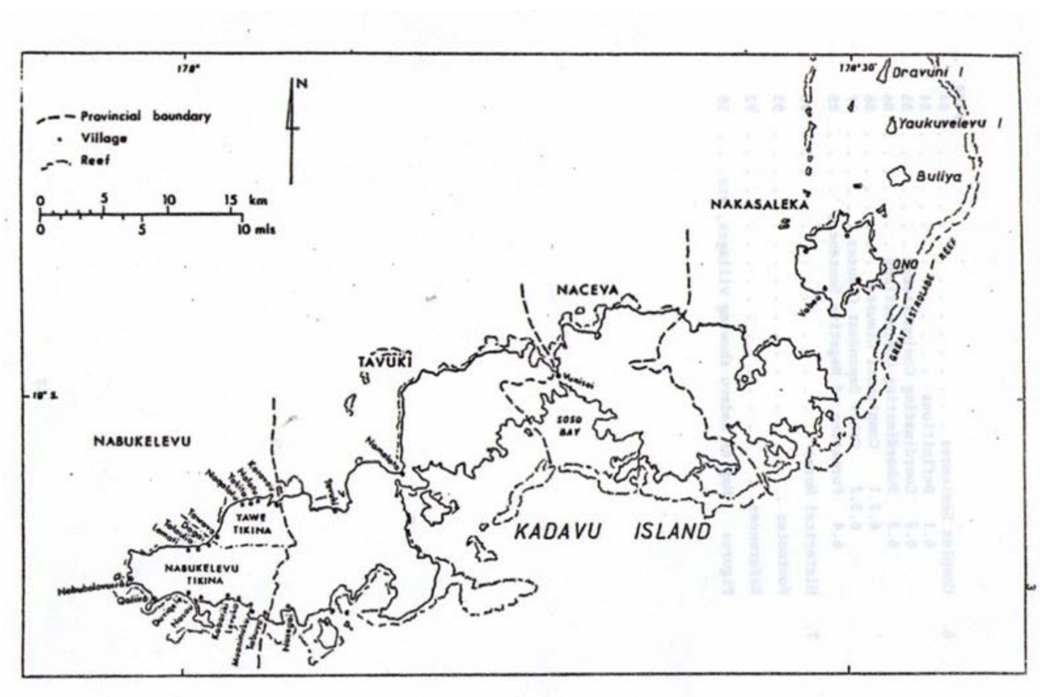
Kadavu. This local degree of language differentiation is proposed as the pre-contact model of language in Fiji. Pawley's definition of communalects allows for overlapping variations in speech among neighbouring communalects, features which often add up to more significant differences over longer distances that straddle many communalects and hence an accumulation of multiple linguistic divisions (1971: 408). Barbara Cook (1975: 70-71) further subdivides the linguistic identity group of Tavuki into smaller social identity groups which are self-identified by name, such as ***na kai Namalata*** (the people of Namalata), a village in the Tavuki district.

Geraghty's refinement of the communalect concept as a self-defined group is echoed by Cook's observations, made in Tavuki, that if people say and behave as though their language differs from that of others, then it is different (1975: 63). With only 863 hits arising from a Google search, the term and concept of communalect has not seen broad use by comparison with 30,400,000 hits for the word dialect. This useful communalect concept is not restricted by geographical boundaries. It may self-identify around a physical place; however, it admits mobility and long distance membership. In this way the communalect concept transcends ideas of bounded speech communities, to foreshadow current globalization-driven arguments, such as Jan Blommaert's call for a sociolinguistics of mobility which crosses boundaries just as people do (2010). The Fijians have had their own form of globalization underway for a few thousand years, as can be seen in Map 3 by the language sharing among islands separated by vast distances of open seas. Language relationships in Fiji are aligned with socio-political relationships through marriage, and in the past through conflict.

Kadavu language and politics

The modern political structure in Kadavu is dominated by a unique blend of lineage-based chiefs and government-appointed officials, who in some cases are the same person. The four major political districts match what Pawley and Sayaba (1982: 38) defined as the four distinctive language groups on Kadavu, as shown in Map 4. The Kadavu population may be dropping, as indicated earlier in Figure 48 as part of a larger trend of population decline in the smaller islands of the Eastern District (Fiji Islands Bureau of Statistics 1996). A recent roundup of people growing marijuana on Kadavu may shrink the economy and population even further. The key political districts are also shown in Map 4.

Map 4 Kadavu: 4 main administrative districts (Pawley and Sayaba 1982: 38)



Moving from west to east in Map 4, Nabukelevu, Tavuki, Naceva, and Nakasaleka are the historic Kadavu ***tikina*** (districts) that have been used here to demarcate language groups. Hocart (N.d.) recorded the same broad divisions over one hundred years ago. Today, Kadavu Province has been subdivided into are nine ***tikina***, one of which is Ono, now independent of Nakasaleka. Tavuki is both the chiefly village and district of Kadavu Island. The Tavuki dialect is associated with chiefly power; and this speech form is accorded higher status in Nakasaleka, whereas, as I understand it, visitors from Tavuki continue to use their own dialect or perhaps Standard Fijian. Barbara Cook's (1975) observations in Tavuki villages were that rules of hospitality dictate that when guests do not speak the host language, the host should use a common language familiar to the guest, such as Bau or English; or try and use the language of the guest. Cook notes that language choice also reflects the type of speech interaction. For example, a Fijian may give responses in Fijian to an English speaker who has some Fijian comprehension, but a request made of the English speaker will be attempted in English (1975: 69-71). I experienced this pattern of code switching myself, and I suspect a similar pattern occurs between Nakasaleka speakers and Tavuki speakers.

In terms of prestige, Naceva is the source of the Tavuki chiefly lineage; and historical references support Naceva's political and linguistic status over that of Nakasaleka. Oral histories date the ascendance of the Tavuki lineage to a Tavuki/Naceva alliance that defeated Nabukelevu forces in battle. (Hocart N.d.: 495, Nayacakalou 1975: 40, Tomlinson 2009: 29). The speech used in the western Nabukelevu ***tikina*** intrigued Pawley and Sayaba (1971) by its lack of clarity between Eastern and Western Fijian forms, a feature which they thought was unique in Fiji. Pawley and Sayaba estimated the divergence of what they term Proto-Eastern Fijian and Proto-Western Fijian as occurring at least 2000 years ago (1971: 410). These linguists also propose that Kadavu dialects began to diverge from Viti Levu dialects in the same time period, but this divergence was slowed more in the eastern Kadavu dialects than in Nabukelevu by different degrees of contact with people from Viti Levu (1982: 39). Thus, speech communities in Kadavu have demonstrated an eclectic range of language diversity, resilience, and absorption for some time, even by the Fijian standards of high sociolinguistic complexity.

Fiji is known to have been settled by different immigrations of peoples, including the early Lapita culture. Fijian Lapita sites date to at least 3000 BP (Nunn et al. 2004). Recent Lapita pottery finds at Tiliva, one of the Nakasaleka villages visited in this study, have been dated to 2550-2600 BP, usage which confirms local beliefs in the village's great antiquity. More intensive archaeological work in Kadavu will likely confirm Lapita material dating to 2900-3000 BP, based upon Kadavu-made early Lapita period wares found elsewhere in Fiji, finds which also demonstrate a wide trading network (Burley and Balenaivalu: In press). Long inhabitation, a degree of isolation, long distance trading voyages, partially independent chiefdoms, and limited colonial exploitation are factors in shaping the Kadavu linguistic setting.

Proto Oceanic is a proposed ancestral language category encompassing most of the Pacific languages of Melanesia, Micronesia, and Polynesia. This proposed Proto lexicon has been developed through matching terms from many languages from across and around the Pacific and comparing them with archaeological evidence, such as material and dates on Lapita pottery sites, to determine root words. ***Panua*** is one such word, with many cognates translated in different islands as land, island, village, place, where someone lives, or people (of the land). ***Vanua***, the Bau Fijian cognate of ***panua***, is particularly rich in meanings, which include "land (not sea), territory, region, place, community, (in expressions for weather) the visible world, land, and sea and sky" (Osmond et al. 2007: 40). My evidence shows most of these Fijian meanings to be valid in Kadavu, where Matt Tomlinson has described ***vanua*** as "a complex domain encompassing chiefs, their people, land, and tradition (2009: 6). In Nakasaleka, ***vanua*** includes the inshore region of the sea, in contrast with ***na cakau*** (the outer reef), as used in the terms ***loli ni vanua*** and ***loli ni cakau*** for two similar types of the Linnaean species of sea cucumber, *Holothuria atra,* which are found in waters near shore and on the reef respectively. The term ***vanua*** is also used frequently in Nakasaleka during Christian prayers for blessings. In its broadest sense ***vanua*** means land and everything living there; in particular the people. Shallow seas are part of the land because you can walk around in them at low tide. ***Vanua*** in this broad sense embodies the Fijian synthesis between land, sea, people, and language that supports the concept of Nakasaleka speech as a language of place with particular dialogical relations between Nakasaleka people and both their environment and other people. Both the land and the language energizes but does not define the Nakasaleka identity, as people manifest this effervescence in ways that shift between socio-centric and individual expressions of themselves.

Map 4 shows the use of Nakasaleka dialect across the eastern end of Kadavu and a number of other islands ranging to the north. Mainland Nakasaleka people consider themselves quite distinct from residents of Ono-I-Kadavu and mention differences in speech in this context, despite the mere six kilometre distance between Ono and Kadavu. As Geraghty (1983) has noted, linguistic differences may be exaggerated to express other feelings of differences; and in fact there are tales of significant violent interaction in the distant past between these groups of people; and also epic battles between each group's pre-Christian deities (Deane 1921: 47-50). Politically, the Ono chiefs are attached directly to one of the two senior chiefs of Kadavu Province based in Tavuki. My impression from a 2009 stay in Ono is that the residents consider themselves to be people of Ono rather than of Nakasaleka. I mention this belief to demonstrate the strong local distinctions made in Kadavu which are a force for maintaining linguistic diversity. I have recorded and published similarities and differences in marine life terminology use between some Ono and Nakasaleka villagers elsewhere (Gordon: In press).

Linguistic Boundaries and Prestige

Differences of lexicon, grammar, and intonation are considered boundary markers by speakers, who may focus on certain features and ignore others. Geraghty (1983: 64) describes some of the difficulties in determining linguistic boundaries. To begin with, most Fijians are multilingual. Many Kadavu people are highly mobile; in particular, small children and unmarried males (Cook 1975: 175). When I asked a Nakasaleka leader what the population of the ***tikina*** was, I was given only the total number of men living in the district. The idea was that male householders are the permanent residents of Nakasaleka, although some may spend considerable spans of time in Suva. When most women marry, they move to their husband's home in another village. If this new village is in a different dialect district, women are expected to learn the new dialect; but the obvious question is how thoroughly these women learn the new language, and how much of their speech repertoire influences their new neighbours. In the town of RakiRaki on the main island of Viti Levu, a bride reported working hard to learn the language of the new village in order to avoid the "contempt and suspicion" shown to those who do not (Brison 2007: 29). In contrast, one of my interpreters in Nakasaleka, a woman who had married in from a Tavuki village, was surprised to learn in the course of the research just how much of her regular speech was Tavuki dialect mixed with Bau rather than Nakasaleka. This conscientious woman spent many hours consulting with a Nakasaleka friend to render accurate translations for the project. How much Tavuki speech had my interpreter inadvertently taught to neighbours during the last few years of residence in Nakasaleka; or are Nakasaleka people resistant to this type of change, as suggested by centuries of maintaining close contact and linguistic diversity?

A quick survey of the natal villages of the 23 women living in a Nakasaleka village found that 11 of these women were from Nakasaleka villages, three women were from villages in the Tavuki district, and three women came from the Western Fijian speaking Nabukelevu district of Kadavu. The other five women were raised outside Kadavu on one of four other islands within different intermediate dialect categories, such as are shown in Map 3. Women in Kadavu villages spend considerable time working and talking together while fishing, mending nets, weaving, and other cooperative activities; hence some degree of constant mixing of communalects is likely the norm and has been for some time.

Standard Fijian (SF) is used in the Wesleyan translation of the bible and hymnbook, but sermons by lay preachers from Nakasaleka may contain local dialect and occasional English words used for emphasis. In 1999 and 2003, Matt Tomlinson observed preachers in Tavuki from outside the district using Standard Fijian in church services, while local lay preachers used the local dialect (2009: 90-93). This variation may be a recent development. In the early 1970s, in other Tavuki villages, Cook (1975:

74) observed the ministers using SF and lay preachers using SF as much as their vocabulary enabled them to in order to demonstrate formality. In 1985, during linguist Robert Dixon's stay in Boumma, on another Fijian island, he was asked to say a prayer in church. He recounts being reprimanded by the Christian priest for using the Boumma dialect, which he was learning at the time, because "God…only likes to be addressed in Bau" (1997: 105). Bau is the term that Fijians use to refer to Standard Fijian. Often, I was asked to say the grace at meals. I consistently used a short two sentence grace spoken in English, which, judging by the repeated requests, was acceptable. However, when I showed friends my attempts to translate my grace into Fijian, these were politely rejected out of hand, with long explanations of the many things that needed to be added and said differently in a Fijian version.

Many of the sources quoted here on language use in Fiji focus on power strata and language. Matt Tomlinson (2009:m 90-93) is clear that language in Kadavu is equated with power and order; local dialects are at the bottom of this framework below Standard Fijian and the dominant English. On occasion people would remark to me how much thicker the Fijian Bible was than the English version, as they explained how long it takes Fijians to say something. The Nakasaleka communalect in particular would seem to be the lowest status language in the Kadavu mix, yet the pride that people showed in seeing their language written out in the encyclopaedia exemplified the emblematic nature of Nakasaleka speech for people's identity and collective self-image. Is it possible that people view their language as low status and with great pride simultaneously? If a language community is happy to use another language for certain purposes, while reserving their own language for other more private uses, is this really a hegemonic process? Salikoko Mufwene makes the point that the very notion of prestige must be “reconsidered in rather complex relative terms” (2004: 217) when applied as a key language attrition factor. A key point made by Mufwene is that theories about language use and change must emphasize the “agency of speakers who actually select and give up particular languages” (2004: 218). I think that some of these ‘complex relative terms’ must represent the intangible values that people put on how they use their language, often with unique sparks of human creativity and ingenuity. There can be no “one size fits all” theories for language change, but there are interesting patterns for anthropologists to explore.

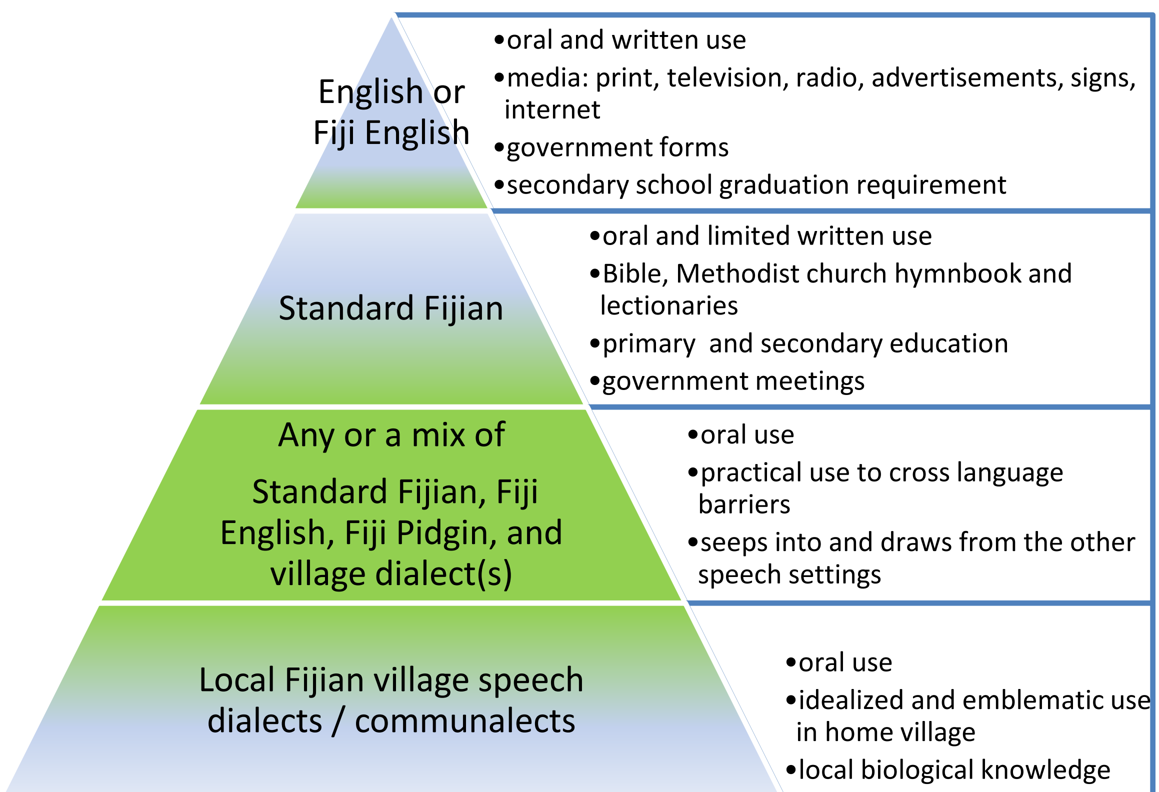
In Nakasaleka, English is seen as a language of power and economic value. A reasonable command of English is required to graduate from secondary school and attend a tertiary institution, a speech capacity which can lead to better economic opportunities such as a government job. Anecdotally, the leading cause of secondary school failure at the 2012 Nakasaleka high school final exams was inadequate English language skills. In comparison to English, Nakasaleka speech has a low economic value outside of village settings; and I was told that outsiders seldom if ever attempt to use Nakasaleka speech.

When I presented a draft of the encyclopaedia to the elders in a village meeting, I read from the book the acknowledgements that I had written with my translators, using Nakasaleka speech in order to demonstrate recognition of the tremendous support that I received from this community. I was told later that people were very surprised and pleased to hear me use my humble approximation of Nakasaleka speech and intonation. This effort made a significant impression on people. Later in the chiefly village of Nakasaleka, when I asked further permissions for this project from the

Nakasaleka ***tikina*** council, my sponsors at the meeting put much more emphasis upon the use of Nakasaleka dialect than on the marine life knowledge in the book. It was clear that the concept of Nakasaleka speech in written form was novel to everyone in the villages and the regional chiefs.

One might construct a hierarchy of language in this rural setting, drawing upon Geraghty's (2005) categories of language use in Fiji. The possible hierarchy shown in Figure 50 is a simplification to allow discussion; and it does not include the significant use of various Fiji-Hindi languages common in many places in Fiji, but not in Nakasaleka, except for loan words such as '***roti***'. For a comprehensive analysis of language use in Fiji see Mangubhai and Mugler (2003).

Figure 50 Classic hierarchy of language use in Fiji



This is the sort of schematic model which Salikoko Mufwene (2004) addresses in critiquing the framing of language use analysis within a colonial-centric structure. This simplistic hierarchy undervalues the use that ex-colonized people make of the languages available to them. People in Nakasaleka villages make good use of their speech repertoires in an indexical web of language use. They are proud of their speech traditions, even though they may not always follow them as they code switch, code mix, and practice heteroglossia in different situations. People have practiced a subsistence lifestyle with good success for centuries on this Fijian island because they experiment with things and ideas which come their way. Language use is no different, and it is inappropriate to over-emphasize a hierarchy which does not represent how people see different domains of their world. One of the challenges in doing anthropological research in rural Fiji is that one experiences many social practices each day which seem very hierarchical, such as where you should sit and who eats first. Hence it is very easy to assume that academic notions of prestige languages and linguistics hierarchies must also apply. On Fiji's Gau Island, Toren (1999) describes the continuous construction of "the Fijian idea that hierarchy is a principle of social relations" (1999: 23). However, I do not believe that this is a comprehensive language ideology.

"Fijian ritual is effective not because it denies the passage of time and the changes time brings, but because it incorporates change under the rubric of appropriate action" (Toren 1999: 63). In Fiji, incorporating new people, ideas, and things into their culture is a long standing tradition; and often a useful one when you live on small islands in a large ocean. Marshall Sahlins has famously written about the practice of people accepting the 'stranger king' in Fiji and elsewhere. "Fijians often complain that their ruling chief is a ***kai tani***, a 'different person' or 'stranger' in the land; or else, he is just a

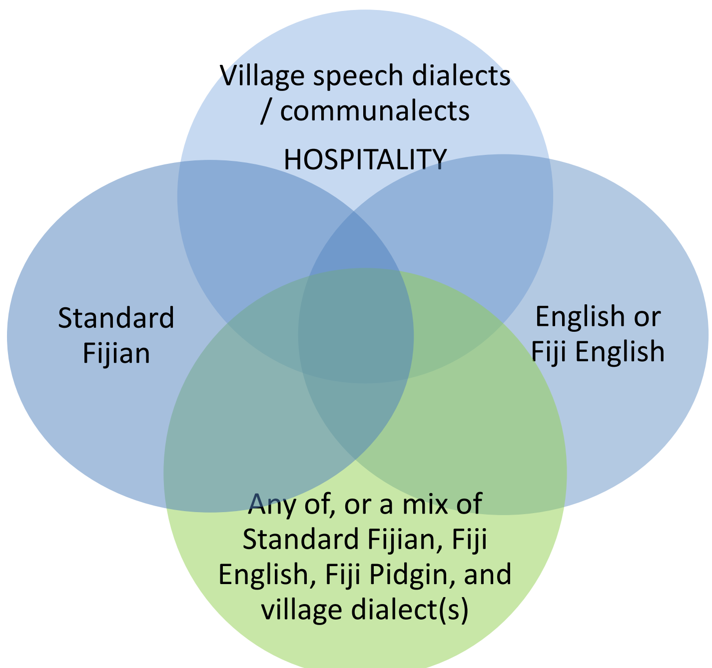
vulagi, a ‘guest’ (Sahlins 1981: 112). Fijians have long demonstrated an ability to incorporate change in novel ways. For example, in the 19th century, leading Fijian chiefs requested to become a colony of Britain in order to solve some problems; and for many modern villagers Wesleyan Methodism is Fiji’s ‘traditional’ religion. Grumbling about more powerful folks may be more reflective of the Kadavuan independent spirit than something to link to a language model.

Blommaert (2010) uses the concept of valuative authority to describe what are termed the scales and orders of indexical references which people make in their language choices. Scaling describes jumps between the individual and the collective or the specific and the general, such as occurs in Goffman’s (1974) frame jumping; but along a horizontal access of stratified power-invested scales of spaces. Blommaert’s orders of indexicality draw upon Foucault’s orders of discourse to develop a notion of semiotic register which is again represented horizontally in terms of politics of access and authority, such as could still be envisioned in the pyramid of Figure 50. However, Blommaert goes beyond this horizontal hierarchy by introducing the notion of a polycentricity of centres of authority, a notion which expands upon concepts of polyphony and multivocality to represent systematic authority by some centres over others, again with defined rules for access by individuals.

One might envision a pattern of overlapping circles of authorities. Blommaert’s goal is to explore a sociolinguistics of mobility which accepts the modern realities of globalization-driven movements of people and their speech repertoires. Globalization is not novel for Fijians and their Oceanic neighbours, who have been connecting themselves and their languages across vast distances between islands for centuries.

Kadavu people are a mobile people in their travels and language use. To better visualize language use in Kadavu, the polycentric relational representation shown in Figure 51 is more accurate than the hierarchical model of Figure 50. As Karen Brison (2007) points out, simplistic oppositions between communal and individualistic societies may exist as perceived systemic forces; but people's actions and reactions to these forces take unique paths as people appropriate what they need to fashion a translocal identity (2007: xiii). The model in Figure 51 allows for these unique paths and combinations of language practices.

Figure 51 Relational representation of language use



Language Socialization in Nakasaleka

Young children in Nakasaleka unknowingly embark upon a complex and daunting journey of language socialization with very limited support at home and at school. Adult literacy rates vary within the village, and few homes have visible books other than the SF Holy Bible, Methodist hymn books, and occasional well-worn schoolbooks in SF or English. The wear and tear on books is significant in the open-door one-room houses in this hot maritime climate. Primary language socialization for a child in the village is shaped orally by parents, siblings, and other caretaker relatives who may live in the child's natal village, other villages, or the city of Suva. The child may well experience all of these environments at some point in their development. Many village children board away from home. The Kadavu school teachers are often from elsewhere in Fiji and may strive to teach in Standard Fijian, but will also bring their own language into their work.

In 1975, Barbara Cook studied bilingualism, acculturation, and kinship in the Tavuki District of Kadavu. Cook interviewed and visited with people both in the villages and with Kadavu people living in the capital city Suva. Today, a considerable number of Kadavu people live in Suva and elsewhere, such that the resident Kadavu population has remained in the 9-11,000 person range for the better part of 100 years. In the villages, Cook recorded some code-switching between the village dialects and Standard Fijian (1975: 2). In Suva, 62% of the Kadavu migrants were sibling sets. These first generation urbanites felt that it was important for their children to speak their Kadavu dialect as part of their identity, and to maintain kinship solidarity with their village network. This goal was accomplished through regular visits to the village during holiday periods, in which the children were expected to learn respectful behaviour towards relatives, village ways, and a sense of belonging to their kinship network, whether they were born in Suva or the village (1975: 47, 85, 97). In 2011-12, I observed similar practices in Nakasaleka villages, in which children or youths who were not getting on well in the city were sent to the village to learn the proper ways to live, although with varying degrees of success. Some parents move to Suva for a few years while their children are in secondary school, where standards are perceived to be higher. It is not uncommon for a single mother or a family with ‘extra’ children to give a young child to raise to their married siblings who are unable to conceive. This practice relocates the child in either a permanent or temporary arrangement.

Many people came to the villages during school holiday periods, over-filling the ferry boat and many homes with visitors. When I moved back into my home village of 23 households after a three month absence, I was struck by the amount of turnover of people between the village and Suva. Kadavu people are well known elsewhere in Fiji for their rapid speech. In Suva, when I told people that I was going to Kadavu, often a remark would be made about Kadavu speech and how fast Kadavu people talk. Today transport between Kadavu and other parts of Fiji through Suva is much improved from the 1970s and from my first visit in 1996. An affordable weekly ferry service moves people and goods. One might argue that increased transit opportunities increase the access of city dwellers to the social identity aspect of the village when they live off island, as it is easier for them to present their children to the village and maintain social ties through exchanging food sent on the ferry shipments. This interpretation would contradict an analysis which pre-assumes the demise of this culture and language with a remarkable history of resilience. The key point here is that despite considerable out-migration and backflows of people, the emblematic function of Kadavu languages has retained great significance for people. In fact, Cook (1975: 69, 97) found that returnees who used Bau in regular discourse in the village were considered rude and snobbish.

Using the knowledge and the language

One day early on in my fieldwork, we interviewed a woman from the city who was visiting a village for a wedding. This woman's range of knowledge of marine life and fishing practices was broader and more detailed than many that I had yet encountered, despite the woman living many years in the city with only one or two annual village visits. This woman carries this detailed knowledge and vocabulary, and enjoys spending some time going fishing with the village women whenever possible during visits. My sense was that for this woman the shared experience of fishing, which incorporates language use that is specific to the environment, was as important as sharing the catch of fresh fish considered as far superior to similar fish bought in a Suva market. This is an example of Basso's notion of interanimation (1996). A city dweller recharges and reforms their Nakasaleka traditions through social experiences on the landscape or seascape. This woman likely minimizes the use of Bau discourse in the village to avoid being seen as snobbish by full time villagers; and in the process renews her village speech practices, which strengthens membership in the 'community of practice' and the 'language of place', or sense of ***vanua***, which this woman will soon share with other Kadavu relatives and friends in the city.

Education and language

Pacific educators recognize the imbalance of global and competitive influences in curriculum (Teasdale 2005: 5). For example, I was asked by some friends to help their 11 year old daughter with English lessons during a school break. This young lady could read English from schoolbooks remarkably well, but it soon became clear in conversation that the girl had no understanding of the meaning of the words and little comprehension of my English speech, although the girl used nonverbal cues to acknowledge my words to simulate understanding. The school primer of stories that we used to work on learning English featured experiences such as going to London's Waterloo train station. This was in a village where there are no roads and in a country where there are no trains.

Educational planners in the Pacific promote a "dynamic syncretism between tradition and modernity" which blends the "skills and confidence" to deal with global culture with knowledge and pride in their own cultural traditions and knowledge (Teasdale 2005:6). An anthropologist might use the term 'glocal' for this development. In Fiji, primary education policy researchers stress the importance for Head Teachers to support the teaching of the appropriate vernacular language, and to collaborate with parents and caregivers (Singh 2010: 102, 190). The encyclopaedia (Gordon 2012) assembled in this research project could then be an important tool for teachers in Nakasaleka to achieve these ends. The Nakasaleka language in the book provides a teaching aid, and represents collaboration with the parents and grandparents whose knowledge the book represents.

Chapter Summary

Children in this setting do not envision schematic diagrams of the language use showing horizontal or vertical axes, or isolate available vocabulary by languages categories as linguists do. They are more likely to learn and use language along with different roles and scenes on a word by word, phrase by phrase, situation by situation basis drawn from a smorgasbord or ***kanavata*** (meal of shared food among family) of language options. The marine life encyclopaedia will never represent the linguistic main course in children's education, given the importance of learning Standard Fijian and

English; but at a more subtle level it has a role to play in supporting the proposed syncretism between local and global, if teachers use the book as a bridge between the domains shown in Figure 8. The very use of the book in school establishes the value of the knowledge of their elders beyond that of village life, and addresses the educational goal of helping children find balance in a 'glocal' world. My role in the project as a ***vavulagi*** ('European' guest) from far away also helps to substantiate the value of local culture, as people observe the amount of work that went into the project. Producing draft copies on site was important, as participants and supporters were part, and felt part of the entire process of producing the book.

However, the key question is whether the book will be used or not. Does it just become a mouldy museum artifact, or part of Mufwene's language marketplace which children and adults access in the shaping of their identities? This project is not about saving a language, given the indeterminate definition of the language that was used in the encyclopaedia. Thirty years from now a similar project might produce a written document with many differences, which will be at least as valid for Nakasaleka people as this one is today. What I hope the project does accomplish is to accurately represent the language used by this community of practicers, and give their speech a more prominent position in the linguistic marketplace open to Nakasaleka people. It aids this objective by increasing the valuative authority of the Nakasaleka speech and communalect. Using the relational representation in Figure 51, it expands the zone marked 'village speech dialects', a feature which means that people have more language choices to meet their needs, and perhaps better tools for relating one language and associated culture to another.

I have shown the diversity inherent in Nakasaleka and other Kadavu speech traditions nested within the wider matrix of Fijian language use. Over the last 3000 years the language used in Fiji has gone through many stages of diversification and consolidation. There is no doubt that the colonization process brought sweeping changes and reduced language diversity with the introduction of Standard Fijian and English. However, in Kadavu resistance to wholesale change and colonial efforts to both consolidate the powers of chiefs and keep people in villages, contributed to people having limited exposure to secondary education and more significant language change. The encyclopaedia is not a colonial project to 'keep the happy villagers happy in their villages'; but may simply put the local language in more prominent use and serve as an option to privilege the rights of speakers to choose their language. I close with a quote from one of my best educated translators and editors, who consistently demonstrated great care in determining appropriate Nakasaleka speech for the book. "When I write these things down I feel something rise up inside of me."

Chapter 9: Biocultural diversity: an intuitively graspable concept with practical difficulties

Introduction to Chapter 9

Biocultural diversity methodologies draw upon decades of painstaking work by ethnobiologists to document the traditional ecological knowledge (TEK) of various indigenous peoples. Eugene Hunn (2008: 13) once described ethnobiologists as a motley crew of odd beasts, who are part anthropologist, part linguist, part field biologist, part evolutionist, part conservationist, and part social activist. Well before Terralingua, an organization focused upon revitalizing biocultural diversity, was launched in 1996, ethnobiologists, such as Roy Ellen (1979), Gregory Forth (1992), and Eugene Hunn (1982) were demonstrating the cultural and linguistic context of biological knowledge for small-scale societies in places of high biodiversity. Today many early career stage ethnobiologists focus on conservation and social activism in the form of indigenous intellectual property rights, as evidenced at the 2010 ICE general sessions, in which I also witnessed some heated exchanges on what the role of researchers should be in shaping agendas in these domains, and the ethics involved.

Throughout my research project, I made every effort to include members of the local communities through collaborative practices, as is considered ethically appropriate for this sort of ethnobiological research today (Gilmore and Eshbaugh 2011: 55). In preparation for this research, I often drew upon the theoretical construct of biocultural diversity to describe the ongoing interrelationships between biological, cultural, and linguistic diversity, which in concert are said to make up the diversity of life (Maffi 2010: 5). I have cause to question the use of certain aspects of the biocultural diversity construct as a research approach, although I continue to find myself seduced by the broader rhetoric of the concept. In the words of Louisa Maffi and Ellen Woodley: “it is intuitively graspable and appealing to many in an abstract way” (2010: 175). However, practical concerns lead me to examine the rationale for this blended formula and its relevance to the outcomes for the people who welcomed me into their communities in Kadavu to talk about local marine life and other aspects of our lives.

In order to examine the relevance of the biocultural approach for use in this fieldwork site and model, I will provide an overview of both the concept and the ideological roots of biocultural diversity, which mix environmentalism, ethnobiological methods, and a revitalization-focused linguistic anthropology. I question whether in some cases blending notions of ecological conservation and saving languages is appropriate for the people that it most affects, although it may seem to make good sense to researchers and donors from afar.

In Kadavu, some people collaborate with voluntary ecological conservation programs to support long-term sustainable fisheries, an approach which to some degree aligns with supporting biodiversity. However, other people comply with fisheries regulations and chiefly edicts only in response to the threat of significant penalties. If language conservation efforts are bundled too tightly with ecological conservation approaches, what is the message received by the people who are motivated only by penalties? Do these people then associate language conservation with just one more imposition placed upon them? Does this reaction confound existing economic incentives for regional dialect speakers to learn other languages in wider use, which give access to higher education and more employment options? Do these reactions cast the language and cultural conservation aspects of a revitalization project in a negative light? To address these points, I will review the conceptual basis of biocultural diversity, before discussing situations in which assumptions inherent in this model may be at odds with the practices and to some extent the beliefs of some of the people with whom I worked in Kadavu villages.

Biocultural Diversity

The logic of the concept of biocultural diversity is straightforward. Most natural environments in the world contain people. Human cultures adapt to natural environments and shape the environments in a continuous reciprocal process. Culture and language are manifestations of interrelationships between human communities and their environments (Maffi 2010: 4). Environments of high biodiversity often contain people for whom the biodiversity may represent resources that receive significant recognition in these people's language and culture (Hviding 2006: 72). The concept of diversity in Darwinian evolutionary theory is a fundamental component of natural selection. "A large amount of inheritable and diversified variability is favourable, but I believe individual differences suffice for the work" (Darwin 1998: 79). Today we know that only some of the genetic traits of an organism's genotype were observed by Darwin in phenotypes, but Darwin was on the right track; genetic diversity provides the resource pool for adaptability in successive generations.

A world full of biological diversity is often represented as a sort of Noah's ark of biological resources for adaptability. Using this model for linguistic and cultural diversity seems reasonable in certain ways. People living in different environments have diverse languages and cultures shaping and being shaped by the environment, at least at the level of the phenotype. A greater diversity of cultures and languages increases human capacity for adaptation to changing conditions. Today, many people perceive the planet’s environments to be changing dramatically, as evidenced by changes in climate, while growing urbanization and settlement trends draw people into global languages and mediascapes which shift people away from their ‘traditional’ languages and cultures. Biocultural diversity conservation proponents advocate for conservation policy to incorporate human rights that protect “vulnerable people” (Maffi and Woodley 2010: 183). Terralingua, a non-governmental organization (NGO) led by Luisa Maffi, builds its mission around sustaining “the biocultural diversity of life” (Terralingua.org 1).

In this model, languages and cultures can then be seen as trails of human creativity manifested in speech patterns. If the trails are paved over by greater forces, then the global database of human creativity is reduced. A network of paths becomes an expressway. In relevant ecological terms, the species richness and abundance levels decline, and have yet unknown impacts upon ecosystem health and stability. The biocultural diversity model places value on a world filled with 6,000 to 7,000 languages and cultures, of which the majority are found in relatively isolated places where people live more intimately and are spiritually connected with less-built environments than are people in larger societies inhabiting more-built environments.

> “Traditional ecological knowledge and practices, accumulated over generations, often make indigenous peoples and local communities highly skilled and respectful stewards of the ecosystems in which they live. Indigenous and local languages store and transmit this knowledge and the related social behaviours, practices, and innovations” [Terralingua.org 2].

The fact that many areas of high biodiversity can be correlated with high linguistic diversity, as is the case in New Guinea and Cameroon, is used to substantiate the blended biocultural approach (Terralingua.org 2). Thus, the conceptual underpinnings of the biocultural diversity concept associate the three components with the well-known diversity component of Darwinian evolutionary theory. However, a weakness of Terralingua's correlation between geographical correlations of biological, cultural, and linguistic diversity is that key biological data used to construct this "fundamental unity" includes only plant life, while the representative term used is not botanical diversity, but the broader category biological diversity (Terralingua.org 2). This difference is worthy of note, given the focus of my research on animal life.

Another key component of Darwin's theory of natural selection is the inevitable and natural process of extinction. "The forms which stand in closest competition with those undergoing modification and improvement, will naturally suffer most" (Darwin 1998: 85-86). Darwin accepted extinction as a functional and necessary occurrence, noting that climate extremes limit food and increase the struggles for existence (1998: 54). Ideas about extinction are where the concepts of biocultural diversity (BCD) and Darwinian evolutionary theory part company. For example, a working session which I attended at the 2010 International Congress of Ethnobiology (ICE), entitled "Where to, Biocultural Diversity?" addressed the research that shows that the loss of biological, cultural, and linguistic "diversities are affected by many of the same ecological, social, cultural, and economic factors." This idea is expressed in such statements as: "Alarmingly, this research has also shown that there is a 'converging extinction crisis' of BCD" (ICE Program 2010: 20). Biological conservation organizations, such as World

Wildlife Fund (WWF), support and partner with Terralingua to struggle against extinctions of organisms, cultures, and languages.

Indigenous people in small scale rural societies are often portrayed as knowledge keepers and caretakers of their local environments who can contribute to broader understandings of longer term ecological changes (Oviedo and Maffi 2000: 6). This stewardship image is fundamental to the biocultural diversity approach. Just as the International Union for the Conservation of Nature (IUCN) ‘red list’ is used to track the status of biological species, Terralingua monitors language extinctions; and provides a methodology for researchers to use in contributing to a Vitality Index of Traditional Environmental Knowledge (VITEK), which tracks generational transmission of TEK within communities (Terralingua.org 3). The Terralingua website states that “biologists believe that we are in the 6th mass extinction of life on earth”; rivalling the extinction of dinosaurs; and draws a direct comparison with a 20% loss of world language diversity between 1970 and 2005, as shown by the Terralingua Index of Linguistic Diversity (ILD) (Terralingua.org 4).

This stewardship image has its share of ideological problems. Viewing humans as stewards of biodiversity establishes what Janet Chernela (2012) calls a patrimonial view. Humans then exist outside of the web of all other life forms comprising biological diversity, in which each form is valued in terms of “scientific knowledge or aesthetic pleasure” for human beings. This observation illustrates a theoretical conflict in Terralingua’s vision of ““the true web of life”: (in which) you can’t think of people as separate from nature” (Terralingua 2). Are some people stewards and others actors in the “web of life,” who could do with some stewardship training? This patrimonial stewardship model also resonates within some Western archetypes of Christianity, which one might assume Christian Fijian villagers would share. However, I did not find that Kadavu villagers or clergy connected their Christian faith to ecological stewardship in this way. One Kadavu preacher told me that a person's fishing success was directly dependent upon their degree of religious piety, although not everyone agrees with this idea in Kadavu.

The concept of biocultural diversity was developed in reaction to losses of diversity in much the same way as environmentalism movements grew from reactions to careless practices with toxic substances to encompass other domains such as energy use and waste management. Hence, biological, cultural, and linguistic diversity loss are attributed to common factors, blending the three domains as biocultural, a viewpoint which makes a bigger tent to coordinate resources and more effective responses, much as environmental conservation NGOs such as WWF and government agencies like the EPA combine concerns for air, land, and water issues. My point is that in the biological, cultural, and linguistic domains, the appeal of the term 'diversity' is associated with popular notions of Darwin's natural selection, while the use of the biocultural diversity concept is framed within an environmentalist discourse of resistance as our planetary "collective "survival kit""(Terralingua.org 4). For example, researchers are urged to justify appropriate work using the precautionary principle, an accepted standard in international environmental law, which "denotes a duty to prevent harm, when it is in our power to do so, even when all the evidence is not in" (Canadian Environmental Law Association website, Maffi and Woodley 2010: 178). Some anthropologists and others would debate the use of this approach being applied to working with people. How much evidence is enough and who makes this decision? If people as stewards are seen to be outside the web of biological diversity, but comprise the domains of cultural and linguistic diversity, then how do we blend these three domains of diversity without suggesting that some of us are part of biological diversity, while others of us have a prescient and hence superior overview? In order to understand this notion of biocultural diversity better, it is important to dig deeper into the roots of its interrelationship with environmentalism.

Environmentalism and Biocultural Diversity

Environmentalism is a modern movement in Western Society that began in the 1950s as a reaction to atmospheric nuclear testing, irresponsible pesticide use on crops, and unregulated disposal of chemical waste in manufacturing processes. The courageous work of Barry Commoner, Rachel Carlson, and others helped blend a range of examples of harmful practices into a popular discourse known as environmentalism by the time of the first Earth Day on April 22, 1970 (Lewis 2012). However, the term environmentalism then and now has little specific meaning other than some degree of concern for the environment and a sense of resistance against careless or messy military-industrial practices. Today we have an international Earth Summit every ten years for global leaders to discuss sustainable development models, which balance standards of living with ecosystem preservation (Earth Summit 2012). Recognizing and supporting biological diversity is a well-known ecological principle. The first Rio de Janeiro Earth Summit in 1992 also provided a platform for the concerns of indigenous people living within high biological diversity areas to be associated with environmentalism on a global stage.

An early attempt to blend popular concern for biological diversity with support for cultural and linguistic diversity was made for commercial gain by the international retail chain, The Body Shop; but this went very wrong. An agreement to purchase Brazil nut oil from some Kayapo people of Brazil was made by the Body Shop. The retailer used the oil in a shampoo brand; and also aggressively marketed images of Kayapo people to demonstrate the product's quality and 'rainforest purity,' as well as presenting the program as evidence of the Body Shop's commitment to philanthropic work in supporting biological and cultural diversity. However, the retailer was paying the Kayapo only for their nut oil and not for their image. The Kayapo placed significant value upon their biocultural image, and felt they should be compensated accordingly. The business deal soon ran into trouble (Turner 1995).

The international reputation and mystique of the Kayapo as forest-keepers was publicised in the documentary films and writings of Darrell Posey (1990), an entomologist and controversial ethnobiologist, who has been accused of cutting ethical corners on behalf of indigenous people's rights. Posey, who passed away in 2001, was also a key founder of the International Society of Ethnobiology. Today, organizations, such as the USA based Conservation International, are providing at least 8 million dollars to the Kayapo to protect Amazon rainforest, under the agency's agenda that "people need nature to thrive" (Conservation International 2011). Biocultural diversity is big business. Clearly, a broader awareness of the linguistic and cultural diversity of smaller groups of people as a resource has emerged. This discourse was elucidated by NGOs, such as WWF and Terralingua in publications, in *Indigenous and Traditional people of the World and Ecoregion Conservation: An Integrated Approach to Conserving the World's Biological and Cultural Diversity* (Oviedo et al. 2000).

In principle, this biocultural model has gained acceptance internationally among people sympathetic to such causes. In practice, there are conflicts around resource management between “environmentalists from afar” and people living within and consuming biological diversity, as highlighted by the comments of the 82 year old Kayapo leader Raoni Metuktire after the 2012 Earth Summit, to the effect that he was still speaking to the same points in 2012 that he had addressed at the 1992 Earth Summit. Deforestation in Kayapo lands continues (Romero and Broder 2012). I have used the high profile Kayapo example to demonstrate the potential gap between what appeals to broad audiences of people and what can happen in practice around this brand of environmentalist rhetoric used by the international media and fund raisers.

Is the ideology and rhetoric of this sort of conservation and environmentalism an appropriate framework to use when encouraging language diversity? Should we even be talking about language conservation in the same way as biological conservation? Languages cannot be ground into powders for sale to remedy impotency in faraway places, but languages can fall out of use word-by-word. Maffi and Woodley clearly stress the need to support “inter-generational transmission of cultural traditions and languages, recognized as crucial to sustainable human-environment relationships” (2010: 24). However, biological diversity decisions may have significant negative short-term effects, such as hunger, as well as potential long-term benefits of biological, cultural, and linguistic diversity. Seen from this perspective, the three domains may have more causal factors of diversity loss in common than revitalization factors.

Biocultural Diversity Research Entry Points and Flows

In a review of 45 projects conducted using a biocultural perspective, Ellen Woodley (2010) groups the projects into three clusters in order to reflect the dominant entry point strategy used of either “conserving biological diversity through cultural affirmation,” reviving and supporting cultural knowledge, practices and beliefs associated with biodiversity,” or “sustaining and revitalizing languages and associated knowledge of biodiversity”(2010: 136-144). In short, projects are categorized by a primary focus either upon biology, culture, or language as an entry point. The emphasis put on the entry point here for classification is a critical recognition that entry points indicate direction, but not results, as was the case in the Nakasaleka project. The emphasis of my research project on biological diversity grew from my observations of the apparent declines in the local marine life biodiversity in terms of both species richness and relative species abundance on the Nakasaleka area coral reefs. Past and current marine life conservation projects in the district demonstrated some pockets of stabilization. However, anecdotal evidence gathered during my pilot research in 2009 suggested that while some villagers were interested in these initiatives, practical take-up by all residents was uneven at best. The 2009 pilot project was to gather local nomenclature on over 100 kinds of marine organisms for assembly into a laminated book to be given to each participating village as a record. In general, villagers and leaders seemed interested during this work. I was made welcome on my daytime village visits, and invited to return to stay in the villages if I wished.

In preparing for the 2011-2012 research, I drew upon the biocultural diversity model; but I expected to be focusing more on the biological issues and some cultural aspects. However, as I followed collaborative methods of developing and asking questions, recording information, and shaping the data for local use, the project outcomes shifted to emphasize cultural and linguistic strategies similar to those quoted earlier from Woodley (2010). It should be noted that while the Nakasaleka project was collaborative in practice, it was initiated from outside the community, a factor which may make a difference in both inputs and outcomes. However, several interpreters and a number of people in the community became quite engaged and supportive of the project as they began to see results in the form of sample pages and drafts of the encyclopaedia. During my three-month absence from the field site, one field assistant showed initiative in recording details of when eggs were found in the fish he caught. This is an example of at least a short-term biological diversity education outcome.

Intergenerational transfer of local biodiversity information is an important feature of research that uses a biocultural framework. A key goal of the Nakasaleka research was to produce materials for use in the local primary school for teaching local marine biology. The teachers were quite supportive of the project from the start; but upon receipt of two drafts of the encyclopaedia for teaching, they immediately identified the usefulness of the book for teaching languages and how to write stories about the local environment. Once again, the emphasis moved towards an interest in language and culture.

During the Nakasaleka survey to gather the information for the book, efforts were made in the selection and sequencing of questions in order to prompt discussions of ongoing biodiversity levels of local marine life. People were shown an image of a fish or marine invertebrate, and asked 18 questions about it. Questions 5 through 8 addressed group size, habitat, if there were many or few of the organisms to be found in the area, and whether the population had increased or decreased over the previous five years. While many answers were recorded for these questions, most responses were short; and yielded relatively few stories about changing populations of marine life, due in part to question design.

Of the 1178 responses as to whether there were many or few of a creature, 56% of the interviewees thought that there were ‘many’ of the pictured creature, as opposed to a 42% response rate for ‘few’ and 2% for ‘some’. In a similar manner, 59% of the 1162 responses regarding five-year change reported increases in population levels for various creatures, against 40% of responses confirming decreases and 1% observing no change. These response trends contrast with a more general common discourse in conversations about fishing to the effect that the fishing was getting harder, fewer fish were being seen, the fish being caught were smaller, and it was taking longer to catch the amount of fish that people needed. This disparity may be a function of the survey design or other factors. For example, not all of the creatures shown are desired for consumption or other uses. However, what did not emerge from these questions were significant opportunities to expand the biological diversity aspect of the research results based upon people’s detailed observations of various kinds of marine organisms. This is a critical problem in developing outcomes with a biocultural diversity framework. People did not seem focused on details of the changing population dynamics of individual types of creatures, although they exhibited detailed knowledge of these creatures in other domains. However, people often complained about the general decline in fishing results.

Whether people were not used to thinking or talking about increases and decreases of specific kinds of creatures and possible factors in an interview setting, or they just did not wish to, is hard to determine. The more general discussions on decline were often related to frustrations about poachers coming from Suva, across 80 km of open sea, to fish on the reef at night. Everyone knows that people from Suva, Fiji's capital city, are not the only people fishing illegally or overfishing in the area. However, outsiders are a convenient and vague conversational target on an island where the breadth and depth of kinship networks is rivalled only by the informal communication grapevine; one must be mindful about what and to whom one speaks about other people's activities. It was not the intent of this research to directly affect biological conservation policy in the area. However, I did expect to hear more about issues relevant to this topic, and more details of people's perceptions. What I did hear were anecdotes about high-profile charges placed against illegal fishers by fisheries officers, resulting in large fines and imprisonment. I return to this topic below.

Gathering and Using Ethnobiological Knowledge

As we gathered the information for a marine life encyclopaedia in Kadavu, Fiji, it was clear that terminology and stories about marine life involved more use of language containing fewer loan words and modified English words than does everyday dialogue in which terms such as ***fiber*** (boat), ***benzini*** (gasoline), ***soler*** (solar lamp), and ***veleti*** (plate) see frequent use. Nevertheless, the name of a fish with a vertically compressed body like a plate known as ***jivijivi veleti*** (*Platax pinneatus*) shows how terminology can change. In general, I do not question the well-established ethnobiological principle that language associated with indigenous plants and animals reflects much longer patterns of language use and deeper cultural associations than modern everyday speech. In fact, fish names in Oceania show particular longevity of use (Hooper 1994, Pawley 2011). For example, larger specimens of a common type of mullet fish (*Mugil cephalus*) are called

kanace in Kadavu. A similar version of this name for this tasty fish is used in various Polynesian and Melanesian languages from New Zealand and New Caledonia to Samoa and Hawaii (Osmond 2011: 57). In Fiji, where by custom one kneels before chiefs, there is a metaphor involving the ***kanace***. ***Rokoroko vakanace*** (show respect like a mullet), is said of people who fail to give proper respect, much as a mullet skips out of the water to avoid predatory fish (Gatty 2009: 101). ***Kanace***, which live just below the surface of oceans and rivers, are known to jump over people's heads to escape from nets.

However, loan words and imports are also culturally integrated. For example, cats are not indigenous to Fiji, nor is the letter 'p' used in Fijian speech except in introduced words. The Kadavu term '***pusi***' derives from English, by way of Tonga, where the letter 'p' is commonly used. Cats were an early 19th century importation to Fiji; today there are stories and songs about cats in Kadavu, such as the well-known interactive lullaby also featuring the ***sokisoki*** or porcupine fish (*Deodon hystrix*) with sharp spines. I provide the English translation here.

> **"Q:** Where do you go little cat? **A:** I go down to the sea to fish.
> **Q:** What fish did you catch little cat? **A:** ***Sokisoki***.
> **Q:** How do you cry? **A:** m-e-ow."

These are examples of biological, cultural, and linguistic knowledge, which can be recorded in ethnobiological fieldwork and given context. In my experience, these stories are often metaphors for human social interactions rather than commentaries on the ecology of the organism.

However, if we shape the product of our work to blend biological conservation-based agendas, this approach may be controversial in a place in which people are extracting their living from the sea and the land when the extraction is often perceived as getting harder. Rising sea levels and more erratic weather conditions, coupled with increasing fishing pressures, are topics of frequent concern. Is it then wise to put the promotion of linguistic and cultural diversity into this troublesome domain? At a theoretical level, forces related to development, globalization, and reproduction of goods and ideas threaten all biological, cultural, and linguistic diversity. It is easy to blend these ideas in a book or at an academic conference because these threats to diversity are found in many of the same places, and involve many of the same people and ideological oppositions. However, for the particular peoples in question, addressing these distinct domains of biology, culture, and language may mean very different things. If people lack significant exposure to the tropes of several decades of environmentalism as an oppositional force to development, then conflating these domains may not make much sense either.

Edvard Hviding (2006) makes observations concerning two decades of successive waves of environmentalist NGOs launching and failing at marine ecosystem conservation projects in Marovo Lagoon, a biodiversity hotspot in the Solomon Islands. The NGOs failed to recognize key cultural realities of the situation, such as types of community organization, local perceptions of biodiversity, and foreign perceptions of conservation. However, Marovo people continue to welcome and agree to collaborate with new and improved NGO funded projects in a spirit of what Hviding named “xenophilia” “(affection or desire of the unknown)”(2006: 83).

Biocultural Diversity Based Conservation

In 1978, Robert Johannes proposed that Pacific Islanders used a traditional conservation ethic for marine resource management using tenure systems and taboos to manage sustainable fisheries. However, Johannes thought that colonization and capitalism had undermined the system; hence the solution to modern over-fishing problems was to work towards sustainable practices through reinstituting "traditional practices"(1978). These ideas are attractive to biodiversity conservation projects, which, as Hviding also observes, require community collaboration as practical and ethical considerations (2006: 83). However, Simon Foale et al. (2011) have recently provided a convincing argument that in Melanesia "customary marine tenure and fishing taboos are primarily designed to manage relationships between social groups, rather than sustain food security from fisheries" (Foale et al. 2011: 356). This is a significant finding that demonstrates the risks of assuming that broad approaches address specific problems.

In Kadavu, for example, I observed design problems arising in the actual language used in workshops held in villages on environmental or sustainability programs. In a workshop that I attended on watershed management, the presenters from the University of South Pacific did not speak the local dialect, a shortcoming which I am told has a significant negative effect upon the degree of interest and attention that people give to the presenters. At other recent marine life conservation events, I was told that brochures in English and Standard Fijian were distributed, languages which many people can read to various extents; but few people seemed to have read them, from my observations. Fiji has 300 communalects or dialects, so it is often impractical for conservation education materials to be delivered in the local language. However, this situation means that languages which linguists, such as Robert Dixon (1997), would class as prestige languages are being used to encourage people to change their behaviour. If people accept the proffered ecological advice, is there an underlying message given off about their local language? Should they reject the ecological advice? Are they invalidating their language? Much of the discourse of environmentalism is generated in languages with international reach, and it is based in uniquely Western oppositional responses to post-World War II circumstances. Thus, the language of biological diversity may not always be a suitable marriage partner for addressing concerns about linguistic and cultural diversity.

One approach to thinking about this situation is to try and isolate some inputs and outcomes that people experience with a biocultural diversity approach, as shown in Table 19.

Table 19 Motivations, hopes, and possible results for people collaborating with biocultural diversity initiatives

Inputs and outcomes	Biological diversity	Cultural diversity	Linguistic diversity
Possible results for villagers Outcomes	*** HUNGER – NEAR TERM ECONOMIC SACRIFICES IN LOST INCOME OR PAYMENT OF FINES**	* Young people's interest in global and pop culture may devalue their perception of local TEK	*** PERCEIVED VALUE OF KNOWING ENGLISH AND STANDARD FIJIAN = URBAN JOBS AND ECONOMIC SUCCESS**
Hopes of villagers Outcomes	+ Hopes for long term sustainable resource supply	+ Elders' satisfaction in seeing their knowledge and culture passed on	+ Elders' satisfaction in seeing their language used and passed on
Hopes of villagers Outcomes	+ Hopes for near term better fishing results	+ Young adults valuing village life and perceptions of tradition	+/- Minimal language shift
Experienced results for villagers	* It takes longer and costs more to catch the fish you need	+/- Time spent with researchers may mean economic gain or may be	+/- Time spent with researchers may mean economic gain or may be

Inputs and outcomes	Biological diversity	Cultural diversity	Linguistic diversity
Outcomes		inconvenient.	inconvenient
Government motivation Inputs	**REGULATIONS AND STIFF PENALTIES**	Policy support for culture based learning	Policy support to learn Standard Fijian and English
Conservation program motivation Inputs	Conservation and sustainable practice education	Exercises or games that reference local fishing practices	Education materials that use Standard Fijian or English
Conservation program motivation Inputs	Marine protected areas and confirming tenure	Environmental encyclopaedia for use.	Local language orthographies.

+ : Items in which program initiator goals may align with villager aspirations.
+/- : Items in which program initiator goals may or may not align with villager aspirations.
* : Items in which program initiator goals will not likely align with villager aspirations.

Some items in Table 19 are likely to align villager interests with interests of program initiators. Other items are less likely to align, as indicated by the symbols used and explained in Table 19 . There are many other possible factors than those listed in Table 19. Maffi and Woodley (2010) provide a broader review. I have chosen the above items relevant to my research in order to situate the three key items shown in Table 19 with capital letters. I discuss these here: the short-term sacrifices of reduced fishing opportunities resulting from conservation initiatives, the motivational requirements of regulations and stiff penalties, and the effects of the language of conservation programs on the perceived value of language use choices by participants and young adults in particular. Program design that uses a biocultural diversity perspective must attempt to envision real possible outcomes in the frame of reference of the people who will live the process. Hence, the stiff penalties required to motivate broad adherence to fishing regulations, the near term hunger and economic sacrifices of going without, and potential prestige issues to do with the learning of local or outside languages by children are of great relevance to the people's lives and futures. As shown in Table 19 under the category of 'possible results for villagers', there may be significantly different real and/or perceived economic outcomes between saving biodiversity and losing linguistic diversity for affected villagers. Here I will focus on the regulations and punishment issue and possible spill-over from the biology domain to the culture and language domains.

Marine Tenure Issues, Penalties, and Attitudes in the Village to Conservation Programs

Social restraints in fishing practices are expressed in several ways in Kadavu, including licensing, bans on illegal fishing methods, and the general practice of not fishing on Sundays, or Saturdays in the case of Seventh Day Adventists. A second category of restraints include definitions of types of creatures which are illegal to catch or sell, minimum size limits for various kinds of fish, places from which people are not allowed to fish, and places in which only certain people may fish.

Kadavu people use a land rights-based marine tenure system of resource governance. The two types of authorities which exercise control over fishing practices in Kadavu are the Fisheries Department of Fiji, and various levels of chiefly authority. Quarterly meetings of village, regional, and island sub-chiefs are attended by fisheries officers in order to discuss current issues and to attempt to establish consensus between government policy and the decisions of chiefs. Mechanisms to encourage mutual support exist, such as Item 13 of the Fisheries Act, which regulates against non-members of a given ***mataqali*** (clan or lineage) from fishing within the marine tenure zone of that ***mataqali*** (Laws of Fiji: Fisheries Act). Thus, the Fisheries Act supports chiefly authority by allowing chiefs to pass illegal fishing problems to the fisheries officers, and this practice in turn encourages the chiefs to work with the fisheries officers on other issues.

The interactions between Fijian chiefs and state government on fisheries matters have in academic writing been related to the historical use and modern usefulness of indigenous fishing prohibitions or taboos for sustainable fishing programs. Mark Calamia (2003) and Joeli Veitayaki et al. (2011) provide chronologies and useful summaries of this literature for Fiji and some other areas of Melanesia. This is a well, but inconclusively debated topic which is beyond the scope of this chapter to address in detail. Elsewhere, recent scholarship raises serious questions about NGO programs in Madagascar which assume that complex cultures can be reduced to sets of seemingly simple taboos by attempting to wed conservation policies with indigenous taboos to achieve compliance (Keller 2009, Sodikoff 2012a: 74).

In reference to actual modern fishing practices in Fiji, Veitayaki (1995: 80) now Head of Marine Studies at the University of the South Pacific in Fiji, observed that the attitude of traditional fishing ground owners in Fiji was to respect fishing laws only when fisheries officers were around. More recently, Veitayaki et al. (2011: 46) called for harsh penalties for violators of the Fisheries Act in order to discourage others from illegal activities. These comments are pertinent to my observations in Kadavu, as will be discussed below.

A third type of restraint consists of inputs from marine conservation-focused NGOs such as the Fiji Locally Managed Marine Area (FLMMA), which have had considerable success in establishing no-take fishing zones. These NGOs often work together with the Fisheries Department and regional chiefs to encourage participation at the village level. Some individuals in villages demonstrate leadership and inspiration to other villagers to learn and practice sustainable fishing. However, these NGOs and individuals are not recognized as direct authorities, which make rules and administer penalties in the same way that government and chiefs can do. Often these restraints are explained to village leaders or villagers at public meetings or workshops in which host villagers are expected to provide the requisite meals and hospitality. Veitayaki (2011: 42-43) observes that resource management policies are often not well communicated beyond the leadership circle within villages.

Federal regulatory restraints are established and policed by the Fisheries Department under the Fisheries Act. Fisheries licensing officers are empowered to issue licences, inspect catches, and equipment, and impound suspected offenders along with their boats, catch and equipment. Penalties for breaking the rules include imprisonment; forfeiture of equipment and boats; and significant fines, such as the escalating scale of $1,000, $2,000, and $5000 FJ fines given for the first, second, and third offences of fishing with dynamite. For a financial scale of reference, in 2011 $3.00 FJ ($1.65 CAD) per hour seemed to be an average wage for occasional work in Nakasaleka, such as cooking or cleaning at a small tourist lodge, or construction work. Workers in Suva earn higher wages, but face higher living costs. In 2012, a used 7 metre fibreglass outboard boat with a 40 HP motor might be worth between $10, 000 and $15,000 FJ, subject to its condition. Fuel sells for about $16.00 FJ per gallon. Hence, confiscation of boats and fines of $1000 are life-changing events. In Kadavu, large purchases are usually financed by harvesting and selling a kava (*Piper methysticum*) crop, the source of a popular narcotic and hypnotic which takes three to five years to grow. A large crop will return a few thousand dollars, but requires years of regular weeding and maintenance.

In 2012 in Kadavu, the two fisheries officers are each stationed in one of the two ports of call for the inter-island ferry, which are also island administrative centres. The fisheries officers sell fishing licences to villagers. When on patrol the officers may request that people who are fishing produce their license. Fisheries officers are empowered to issue fines and sanctions for unlicensed fishing, use of illegal equipment or fishing methods, possession of no-take creatures, or fishing in marine reserves. In 2012, a fisheries officer was stationed in Nakasaleka on a multi-year term, far from his home and family on another Fijian island, a distance that may simplify the issuing of sanctions to Kadavu villagers. Fisheries officers are also in charge of a depot with freezers to store fish to be shipped off the island, a factor which allows officers to monitor some of the outbound catch. However, the freezers at the smaller Nakasaleka depot had been broken down for some months in 2011. Many people ship their catch themselves on the weekly ferry to Suva.

Enforcement of regulatory restraints by fisheries officers is limited, given the size of the island, the difficulties of transportation and weather, and the ratio of two fisheries officers to 75 villages and 10,000 people. Some people told me that they thought fisheries officers should do more patrolling of the inshore fishing grounds, while there are no doubt a few people who would disagree on this idea. The approach of each officer will vary during their term, given the relative geographical and administrative independence of their station. A range of regulations exist of minimum-take sizes for fish, rules which I did not hear much about from people. I did hear talk of the detailed specifications on mesh sizes of nets, but people seemed mainly to be aware of specific bans against catching a few kinds of larger creatures.

Many people told me about the regulations against catching a kind of large fish known as ***varivoce*** (*Cheilinus undulatus*) and catching ***ika bula*** (sea turtles), or digging up turtle eggs. The penalties of imprisonment and significant fines featured prominently in discussions of these catch restriction rules, as was also the case concerning the use of fish poisons, dynamite, spear fishing with scuba tanks, and the use of illegal mesh-size nets. A specific incident in which someone from another village was convicted and prosecuted for one of these offences would often be mentioned in these discussions. Various references were made to fines levied of about $2500 FJ, and imprisonment terms of six to 12 months. My perception is that turtle fishing had stopped only in the last few years in reaction to some well-known prosecutions. Turtle fishing has long been a ritualized practice in Kadavu, and people say that at one time only chiefs could eat turtle flesh (Deane 1921: 176-181); but many people today speak of eating it in the past, and of the good taste of turtle fat. Mark Calamia (2003: 245) confirms that the Fisheries Department moratorium on turtle fishing from 1995 to 2000 was routinely ignored in Kadavu; in particular, in the case of people collecting food for large ceremonial feasts in which chiefs would expect to be offered this delicacy (2003: 245). One hundred years ago A.M. Hocart (N.d.: 475) observed that turtles were chiefly food, but Hocart also mentions that people in Kadavu showed much less respect to their chiefs than was shown elsewhere in Fiji.

Chiefly authority in Kadavu is complicated, as is indicated by the well-known phrase to describe the politics in Kadavu of ***manu dui tagi*** (each rooster/bird its own cry;

Hocart N.d.: 475, Tomlinson 2009: 36). Without going into detail, one can say that there are village chiefs, lineage-based chiefs who are recognized leaders of multiple villages or components of villages, district chiefs, island sub-chiefs, and an island chief in Kadavu. Some of these leaders also hold dual roles as government representatives. In the past, chiefs and villagers took the punishment of poachers into their own hands through physical violence, confiscation of catches, and destruction of boats and gear. Temporary closures of areas by chiefs for fishing in general, or for catching certain creatures, is a long-standing tradition here, as elsewhere in Fiji (Calamia 2003: 174-175). However, whether these practices can be related to a 'conservation ethic', as understood in global media terms, is uncertain (Foale et al. 2011).

At the village level, in addition to the chief, there is a ***turaga-ni-koro*** (village headman), who is not a chiefly person, but a respected man who is responsible for the day-to-day business of the village, which includes policing any offences committed in the village or in the village territory. A man from one of the ***mataqali*** (lineage-based clans) in the village holds the position of ***turaga-ni-koro*** for one to four years, as per the practices of each village. This position rotates between representatives of the major ***mataqali*** which comprise the village. The ***turaga-ni-koro*** use their discretion to reprimand offenders in private with a few elders, or in more public settings with many village men present in order to ensure minor illegal activities are dealt with in ways that achieve some level of consensual approval in the village. More serious crimes or recalcitrant offenders may be reported to the Fisheries officer or the Kadavu Island police officer, an action which opens the path to possible fining and imprisonment of the offender, a very serious matter for one's neighbours to experience in subsistence-based economic settings. The ***turaga-ni-koro*** has a difficult job, with an insignificant government-paid stipend of $50 FJ per month, an amount which is quickly consumed by the frequent provision of meals and services to visiting government officers and the fuel costs of attending various mandatory regional meetings.

The point I wish to make clear here is that in this situation the restraints imposed upon fishing practices are respected by many people because of the escalating scale of penalties, but reporting offenders often has far-reaching ramifications. Minor violations of minimum size requirements are seldom addressed, and there are no measuring tapes kept in fishing boats. Idealistic notions of maintaining biological diversity through marine resource conservation practices are not driving most people's day-to-day fishing decisions; rather, penalties imposed by government authorities, or the perceived risks of disobeying chiefly authority would seem to be more significant factors. There is a well-known saying to the effect that men who disobey their chief will be bitten by sharks. I know one village man who famously came close to paying that penalty with his life to a hungry shark some forty years ago, and the story is still told often. Penalty-based punishment is a prominent feature in this society, in which increasing regulation from state government transforms local and regional consensus-based self-government. This context is a significant factor when considering the applicability of the biocultural diversity model here. To what degree is penalty-based adherence to rules the primary decision driver regarding resource use? This factor is impossible to measure; but trends can be observed, and the role of punishment in rural Fijian society in general should be considered.

Christina Toren (1990) has written eloquently of the people of Gau Island in Fiji, concerning how hierarchy schemes are acquired, as children learn and absorb cultural knowledge through ritual valuations of vertical and horizontal space in rural Fijian societies. Growing children are vigorously taught that in all social interactions, distinctions are to be made based upon seniority of age and rank. Older children may be very patient with younger children, but it is not uncommon for them to physically discipline younger children without rebuke from adults (1990: 183, 246). An available cat or dog may be next in the pecking order for the punished child to vent upon; but this interaction may draw fire from an adult, further frustrating the youngster. Discipline can be harsh, swift, and soon forgotten. I will present some evidence to consider how village schoolchildren are motivated and punished, a matter that needs to be considered in the use of the biocultural diversity concept.

Village households are smaller versions of the larger lineages which comprise village and regional social forms, as is indicated by the popular phrase "every man is a chief in his own house," even though at present new practices which increasingly empower women are emerging in some homes. Children of all ages who misbehave are scolded, somewhat erratically at times; and may be given a 'hiding' on occasion. In the smaller villages without primary schools, the students live away from home in school dormitories from Monday to Friday. Secondary school students stay away most of the term, with occasional visits home on a long weekend; but they often come home during longer holiday periods. At the secondary school, weekday classroom lessons are complemented by agriculture education programs, in which students learn to farm on the weekends in gardens near the school. All schoolchildren perform regular tasks of cleaning dormitories, toilet facilities, and classrooms. In Nakasaleka the schools are community run with partial government support; thus schools are an extension of community structures. Schools require regular contributions of labour and money from parents. Discipline in the schools is strict, and my observations were that children are careful to be very respectful to teachers and visitors in the school environment. Discipline is maintained through a schedule of punishments, which is posted prominently in every classroom. The listed punishments are shown in Table 20. This table serves as a key to the details of offences and punishments shown in Table 21.

Table 20 Punishment options (Key to Table 21)

Code	Punishment	duration
A	refrain from sports	2 weeks
B	inform parents	
C	counseling-admin	
D	refrain from dormitories	
E	refrain from all social activities	4 weeks
SBP	weeding	
SBP	bible studying	
SBP	farming	
SBP	drain cleaning	
SBP	attend to special compulsory programs set by the school	

Table 21 Offenses and punishments

Offence	1st Offender (Offend)	2nd Offend	3rd Offend	4th Offend	5th Offend
smoking (in possession, consumption, distribution)	SBP, A, B, C	D, E			
kava (in possession, consumption)	SBP, A, B, C	D, E			
indecent assault	SBP, A, B, C	D, E			
sniffing benzine (gasoline) / glue	SBP, A, B, C	D, E			
misconduct publicly	SBP, C	SBP, A, B	D, E		
vandalism	SBP, C	SBP, A, B	D, E		
truancy	SBP, C	SBP, A, B	D, E		
tattooing	SBP, C	SBP, A, B	D, E		
swearing at teacher	SBP, C	SBP, A, B	D, E		
dodging school activities	SBP, C	SBP, A, B	D, E		
robbing/thieving	SBP, C	SBP, A, B	D, E		
humiliating/belittling/bullying	SBP, C	SBP, A, B	D, E		
disobedience to teachers	SBP, C	SBP, A, B	D, E		
disobeying prefects	SBP, C	SBP, A, B	D, E		

Offence	1st Offender (Offend)	2nd Offend	3rd Offend	4th Offend	5th Offend
runaway from school	SBP, C	SBP, A, B	D, E		
gambling	SBP, C	SBP, A, B	D, E		
cheating	SBP, C	SBP, A, B	D, E		
forgery	SBP, C	SBP, A, B	D, E		
insubordination	SBP, C	SBP, A, B	D, E		
pornography	SBP, C	SBP, A, B	D, E		
adversity	SBP, C	SBP, A, B	D, E		
fighting	SBP, C	SBP, A, B	D, E		
romantic relationship	SBP, C	SBP, A, B	D, E		
harassment	SBP, C	SBP, A, B	D, E		
swearing	C	SBP, B, C	SBP, A	SBP, E	
prep (not done, incomplete)	C	SBP, B, C	SBP, A	SBP, E	
lying	C	SBP, B, C	SBP, A	SBP, E	
late from leave	C	SBP, B, C	SBP, A	SBP, E	
dodging school programs	C	SBP, B, C	SBP, A	SBP, E	
graffiti	C	SBP, B, C	SBP, A	SBP, E	
AWOL	C	SBP, B, C	SBP, A	SBP, E	
inattentive / disturbing in class	C	SBP, B, C	SBP, A	SBP, E	
misbehaviour	C	SBP, B, C	SBP, A	SBP, E	
gossiping	C	SBP, B, C	SBP, A	SBP, E	
arguing	C	SBP, B, C	SBP, A	SBP, E	
no kitchen utensil	C	SBP, C	SBP, B	SBP, A	SBP, E
littering	C	SBP, C	SBP, B	SBP, A	SBP, E
improperly dress	C	SBP, C	SBP, B	SBP, A	SBP, E
teasing	C	SBP, C	SBP, B	SBP, A	SBP, E
chewing gum	C	SBP, C	SBP, B	SBP, A	SBP, E
late comers	C	SBP, C	SBP, B	SBP, A	SBP, E
no kit	C	SBP, C	SBP, B	SBP, A	SBP, E

Many students seem to enjoy school, and by the secondary level they must recognize how hard their parents work to save the money for their fees, uniforms, and expenses; but judging by the long list of possible transgressions posted in each classroom, some students must misbehave, as they do in any school. Schoolchildren do not have money to pay fines for punishment; but they value sports, time spent with friends, and not doing arduous labour. My point here is not to judge the disciplinary system in the school; but to note the emphasis on strict punishment to shape behaviour, in a similar manner to the penalties imposed by the Fisheries Department for violations. One might assume that many of the students who drop out of secondary school will experience more than their share of punishments during their academic career. Without secondary education, these young adults may be more likely to stay in the village and fish regularly, a cycle noted elsewhere in Fiji (Veitayaki et al. 2011: 40 from Bolabola et al. 2006).

Another important agenda in the secondary school is a strict requirement of English language knowledge in order to succeed at the graduation examinations, an obligation which was not met by most students in 2011 at the Nakasaleka secondary school. These students must repeat a year in order to graduate or qualify for tertiary education, which will determine their future. Writing about education in Fiji, Mangubhai and Mugler (2004: 63) explore the significant role that the languages used in the education process play in social outcomes. I was intrigued that punishments listed in Table 21 were posted in only the English language in the classrooms as they are listed here. The punishments were written out in full in the classroom postings, rather than my letter codes used for brevity in Table 20 and Table 21. Plate 70 shows the six pages of offences and punishments posted prominently beside the blackboard in a secondary school classroom.

Plate 70 Offences and punishments listed on the classroom bulletin board in English only

Chapter Summary

The people in the Nakasaleka district are experiencing a challenging form of social change as government departments assume more prominent roles in monitoring and supporting agriculture, fishing, healthcare, and policing. Meanwhile chiefs renegotiate their roles with each other, with government representatives, and with villagers. At times, this process involves passing off the imposition of penalties upon offenders to the government, although this practice may undermine a chief's power. In Kadavu, chiefs maintain their power by respecting the needs of their followers, who are often relatives of some sort, and by attempting to achieve broad consensus on key decisions. Achieving consensus creates more room for leniency in the application of penalties at times. In contrast, as government representatives assume more prominent roles, penalties are imposed as a rule of law; and offenders may quickly find themselves in a Suva prison. I learned of an example of state-mandated punishments in 2012, when many Kadavu men were arrested and convicted of growing marijuana. Significant fines, on-the-spot confiscation; or destruction of proceeds of marijuana sales, and prison time were quickly imposed. In the case of Fisheries Act transgressions, leading Fijian researchers call for the application of harsher penalties by government (Veitayaki 2011: 46).

So what does the use of severe penalties in Fiji have to do with biocultural diversity projects? Directly or indirectly, people associate the harsh penalties with measures being taken to enforce marine life conservation. The use of penalties is not a new concept in Kadavu; but in the past penalties were applied for breaches of marine tenure, which is in fact a social transgression against your neighbours. This observation supports Foale's point that tenure systems manage social relations, not biological ecologies (2011). Marine tenure belongs to communities, and the trespassing and stealing is done by individuals (Calamia 2001: 243). Today illegal fishing rules are more often enforced by the state; and hence broad adherence to regulations or edicts which are designed to support biological conservation projects, such as protecting sea turtles, is achieved through the application of harsh punishments by the state. This situation implies that the crime is to a greater extent committed against the state and less so against one's neighbours.

The school system is also a blend of community and state; but the teachers are most often from elsewhere in Fiji and the language of punishment is English, which in Kadavu is perceived as foreign, despite its status as the official language of Fiji. The question of whether secondary students who speak the least English are most likely to experience the most punishment and drop out of school to become fishers is worthy of study. If this consequence were true, these people might be the least likely villagers to absorb and respond to conservation-focused messages delivered in workshop settings in English and Standard Fijian. Christina Toren (1990) demonstrated the strength of internalization of social hierarchical practices through children acting out these structures over many years. In Kadavu, I suspect that the harsh punishment-based respect-response model is the norm for many people, given its significant role in boarding school life for at least 10 formative years of a child's development. However, just as a child may accept a beating from an older child, but look for an opportunity to vent elsewhere, avoidance of high penalty transgressions of catching turtles may be manifested in other ways. One day a fisherman sadly told me that some months previously he had seen a large turtle floating in a lagoon with its head shot off. Was this an act of frustration by a fisherperson?

Biocultural diversity projects that associate marine life conservation with cultural and linguistic conservation may create an attitudinal shift to resistance to proposed fishing restraints that may be applied in the cultural and linguistic domains through the bundling process of biocultural diversity constructs. Furthermore, language revitalization may be at odds with learning the languages of conservation programs, Standard Fijian and English, which also yield employment opportunities. Conflicting interests between children learning local and global languages are intrinsic to any biocultural diversity project that seeks to facilitate the intergenerational transfer of TEK and biocultural knowledge in general. However, a villager's perceptions of how biological conservation affects their lives will often be local and shorter term than are framed in common ideals of international environmentalism and biocultural diversity, concepts which as described earlier are built upon broad resistances to development, globalization, and reproduction of goods and ideas. This possible result is an important consideration when we recall the 82-year-old Kayapo elder attending his third Earth Summit in 2012, only to remark on how little had been accomplished since the first. Hviding's (2006) observations in the Solomon Islands reinforce this message. Furthermore, in the Nakasaleka district, it seems that people have a long history of resisting being told what to do. Might we see this resistance as a reflection of cultural diversity, which rejected early colonial efforts to install socially and environmentally destructive plantation agriculture on the island (Kuhlken 2007)?

The International Society of Ethnobiology's (ISE) extensive and often-debated code of ethics uses the term 'mindfulness' to encourage ethnobiologists to work collaboratively and respectfully in support of the best interests of local communities (ISE website). The ISE code implies that in a trade-off between people's needs and biodiversity conservation issues, the inhabitant's best interests come first. There are many good reasons to bundle the concepts of biological, cultural, and linguistic diversity together, as all three domains are interconnected and often under pressure simultaneously. However, in charting paths of resistance to their decay, we must consider what other forms of resistance are already in play. Existing punishment-based enforcement of biological conservation may signal a potential conflict of resistances that will impede a biocultural diversity project, but these resistances may be hard to ascertain when researchers work across the three domains. Perceptions of risks and punishments for crimes committed against the state may differ from those for crimes against one's neighbours. Elders may be more supportive of biocultural diversity programs than younger people might. Growing families with fewer resources to meet expanding needs might experience greater privations from limits on fishing practices, and limits placed upon the career and economic prospects of their children who fail to learn English and Standard Fijian. Ethnobiological researchers often draw upon the knowledge of village elders, who are assumed to know more and may have more time to chat; but the elders may not share the attitudes and practices of younger generations of active fishers.

I have shown that there are inherent risks in making the assumptions that combining efforts to encourage biological, cultural, and linguistic diversity yields practical results for the people living in these high diversity environments, given the possible conflicting outcomes. As biocultural diversity becomes an ideology used to organize responses to critical problems, we can draw upon the sage advice of Janet Chernela (2012: 18) to differentiate between science which asks questions and ideologies which discourage questioning when they are seen to be universal or natural (Chernela 2012: 18).

Detailed ethnographic research into social relations may be the place to start, as perspectives of diversity are shaped by culture. Does a broad interpretation of Darwin's popular notion that all diversity is a good thing, also require us to accept that some extinctions are to be expected? How do we reconcile this reality between acceptable extinctions within each of the domains of biology, culture, and language? More research is needed on these questions, but my conclusion is that biocultural diversity projects must be not just collaborative. Their design must move forward fluidly, using trails and paths, rather than expressways, in the domains most acceptable to the participating communities, while carefully exploring points of resistance. Just as superimposing conservation programs on indigenous taboos ignores cultural complexity, treating biocultural diversity as a natural or universal ideology may lead to reducing complex cultural factors to simple but inaccurate academic models.

Chapter 10: Tenure, taboo, and totem: a troublesome trinity

Introduction

In a recent article, Simon Foale et al. (2011) make the point that customary marine tenure and taboos in Melanesia did not function "to sustain food security from fisheries", but rather to manage relationships between social groups. These authors question assertions made by Robert Johannes (1978) about the manifestation of traditional conservation ethics in tenure and taboo systems of Pacific Islanders in order to manage marine resources, and about the erosion of these ethics through the shift from subsistence to money-based economies. Johannes' oft-cited article has inspired many others to emphasize incorporating 'traditional tenures and taboos' within 'modern' conservation programs for marine resources (Matthews et al. 1998, Veitayaki 1998, Calamia 2003).

From a modern anthropological perspective, energizing traditional tenures and taboos with an international science-based notion of a 'conservation ethic' presents a series of ideological problems, which include embracing a simplistic deterministic functionalism (Foale et al. 2011: 365). However, the call by Foale et al. to investigate the roots of marine tenure systems and taboos in diachronic social relationships may in some cases generate other creative historical notions, even when based upon careful field-based research as Foale et al. recommend. Of particular interest is the way in which the term 'totem' is brought into play in association with the term 'taboo' by the authors mentioned above. Johannes (1978) does not use the word 'totem' in the essay which inspires the work of the others. On the other hand, he does use 'taboo' in relation to historic fishing restrictions which show intent to conserve fish, but not to describe what are categorized as religious or superstitious beliefs, such as restrictions on clans, castes, age groups, or women eating certain species. Johannes (1978: 351-352) suggests these latter beliefs may conserve fish in some cases, but intent to conserve cannot be ascertained. Nevertheless, some of these beliefs put forward by Johannes are described in the review by Foale et al. as “totemic avoidances” (2011: 358), a usage which nicely demonstrates how references to taboo often prompt us to think of totems.

In 21 articles on marine traditional knowledge and management written by Johannes and collected by Kenneth Ruddle (2007), I have found the term ‘totem’ used three times. Johannes notes the importance of learning the local significance of indigenous plants and animals as possible sources of “food, medicine, structural material, tools, soil improvers, totems or other sacred entities” in the context of advice for gathering and organizing traditional ecological knowledge or TEK (Johannes 1991: 34). In a report on I-Kiribati, Johannes combines his own observations with those of earlier authors to describe declining knowledge and use of sea-food taboos including those related to totems, using the term twice in one paragraph (Johannes and Yeeting 2000: 3). It is intriguing that such a passionate advocate of revitalizing traditional ways and knowledge in fisheries as Johannes makes so little mention of the term ‘totem’. In contrast, Francis Hickey (2006), who has co-published with Johannes, has more recently stressed the importance of totemic affiliations and food avoidances as effective traditional marine resource management methods in Vanuatu. The relevance of totems to TEK is a situational variable that is difficult to generalize.

In Fiji, the terms totem and taboo, along with their troublesome conceptual baggage, have been associated with marine tenure systems for some time to compose a troublesome trinity. In the development of effective marine conservation programs, the merging of these three concepts obscures the "critical understanding of their cognitive underpinnings" called for by Foale et al. (2011). I explore these issues in this chapter in the context of my current fieldwork site in Kadavu Fiji, where marine conservation programs, in particular marine protected areas (MPAs), have represented an emerging social fact since the late 1990s. I begin with a review of how concepts often associated with the terms 'taboo' and 'totem' have emerged in popular and academic literature to form cultural imaginations that structure preconceptions and use of the terms. I provide background on tenure issues in Kadavu before providing an analysis of the 'totems' of two Fijian villages, in order to illustrate the diverse possible range of interpretations.

Taboo

The origins of the term 'taboo', or '***tabu***' in Fiji and '***tapu***' in much of Polynesia, are well known from the journal of Captain Cook's third voyage, in which the word's broad use and 'mysterious significance' in Tahiti, Hawai'i, and Tonga are remarked upon. Cook's spelling of 'taboo' was soon adopted by Europeans to convey the meaning of something forbidden (Steiner 1956: 22-28, Knight 1996: 814-817). In Polynesia, taboo can mean something forbidden to touch or eat; but it also means something sacred, which could be marked off by or for a chief whose power and territorial tenure reflect the scale of his taboos issued and obeyed. Franz Steiner (1956: 33-36) explores the cultural and linguistic translation problems of a term that makes simultaneous reference to the sacred and profane, divergent concepts in 19th century European thought, in particular the 'unclean' subcategory of profane. In Fiji, ***tabu*** means sacred; reserved for a chief or special person; forbidden; a person not to be spoken to, such as a brother or sister in times past; and 'holy' in Christian traditions, such as ***yalo tabu*** (holy ghost;

Gatty 2009). However, in Fijian villages today, active small children often hear the word '***tabu***' more than once each day from their elders. Here, the meaning of taboo extends beyond the sacred and profane to the mundane.

In the 1875 Encyclopaedia Britannica, James Frazer defined taboo as "the name given to a system of religious prohibitions which attained its fullest development in Polynesia, but under different names traces can be discovered in most parts of the world" (Frazer, from Steiner 1956: 87). Franz Steiner (1956) traces the development of Frazer's culturally influential works, such as *The Golden Bough* (1922), in which taboo systems are blended with magic and totems in order to define the primitive stage of a universal social evolutionary system of development. Here, societies progress from the 'magic stage' infused with animism and totemism to the 'religion stage', which Frazer soon expected to give way to the final age of science in Europe. Therefore, societies structured by taboos were primitive and undeveloped. Thus, many Europeans avoided addressing the complex range of meanings encompassed under taboo in Polynesia, including things sacred, profane, and mundane.

In 1913, a similar evolutionary approach by Sigmund Freud in *Totem and Taboo: Some Points of Agreement between the Mental Lives of Savages and Neurotics* pointed out how savages, the mentally ill, and some early stages of childhood lacked the "sharp contrast that we make between thinking and doing" (Freud 1919: 160). For Freud, primary totems were most often animals. The totem represented a tribe's ancestor, and the primary taboo of incest established the social boundaries. A totemic society was said to hold a strict taboo against eating one's totem animal, except for "sacramental killing and communal eating of the totem animal" (Freud 1919: 138). In these theories, taboos were negative boundaries to rein in the savage instincts of people with limited intellect. Freud linked ceremonial totem-eating events to re-enacting a primal act of patricide, a practice which led to the emergence of social organization and religion based upon 'deferred obedience' to the slain patriarch, who has become a totem. The totem-eating events were also related to a universal incest taboo, which allowed women to be exchanged by the patriarch's male descendants (Freud 1919). Thus, tribes and clans were seen to classify and organize themselves around totems, with taboos to mark boundaries of membership and behaviour. For Freud, the results of psycho-analytical sessions with European patients who were discerned to resent their parents could then be associated with this stage of 'primitive' thought, categorized as mental illness. Today, it is hard to say how many people read Freud's works outside of certain academic disciplines, but shadows of these ideas still flit through modern popular discourse. This history raises questions about the use of such terminology in conservation programs designed to benefit people who not so long ago were characterized by Freud as just emerging from the 'primal horde'.

Most recent anthropological scholarship has left social evolutionism behind. Taboos came to be seen as context-dependent. Isolated cultures were accorded unique world views (Douglas 1979). Rather than adjusting observations to fit universal theories, scholars such as Gregory Forth (2007) and Valerio Valeri (2000) study taboos within societies in which people use taboos with little thought; but upon inquiry will often confirm that the taboo is 'right', given its long historical use. In small-scale rural societies, taboos may often be associated with creatures that are perceived to share properties or space with humans. These anthropomorphic themes often relate to perceptions of categorical boundaries which require careful contextual analysis in order to understand the metaphors that the users take for granted, although these may not be obvious or seem rational to the outsider. Breaches of some taboos may involve significant consequences, while breaching other classes of what I have termed as 'mundane taboos' have no consequences. (Valeri 2000: 199-202, Forth 2007: 215-218).

Totems

In 1903, Émile Durkheim and Marcel Mauss published *Primitive Classification,* a study which shows totemism as "a grouping of natural objects with social groups," to be viewed as a primitive stage of social evolutionary development (1963: 17-18). Durkheim and Mauss sought to grasp and objectify 'elemental forms of thought' through their notion of 'primitive thought' as concrete, emotive, and dialectical; but sharing social origins with 'modern thought', viewed as abstract, rationalistic, and analytical (Watts Miller 2012: 95-96). In many ways, the debate about the presence or absence of a conservation ethic is also about looking for a certain elemental form of thought. In 2013, an awareness of the problems with this distinction in types of thought is pertinent to definitions which still portray international science as abstract, rationalistic, and analytical. A key question here is whether attempts to identify a 'conservation ethic' in 'traditional' marine tenure systems are influenced by agendas of substantiating the presence of abstract, rationalistic, and analytical properties in Melanesian thought. Is this analysis done in order to engender the respect of international biologists for pre-contact practices still seen as concrete, emotive, and dialectical? As Durkheim and Mauss wrote, "emotion is naturally refractory to analysis…because it is too complex" (1963: 88).

Historian Robert Jones (2005) provides a detailed history of the use and misuse of the totemic concept from its 19th century roots. A key turning point in this debate occurred when Claude Lévi-Strauss (1963), using a structuralist analysis of totems and taboos, demonstrated totemism to be an attractive but vacuous metaphor, albeit an illusion with staying power in the popular cultural imagination. However, this analysis ignores the many complexities of human social relations. For example, Valerio Valeri (2000: 95) criticizes Lévi-Strauss' analysis of totems and taboos as unrealistically confined to taxonomic dualistic expression, given that human identities emerge from internalizations and externalizations of a person's total range of social relationships. With a nod to these authors, Gregory Forth (2009) has demonstrated how in Flores, Indonesia, taboo and totemic properties associated with the tamarind tree emerged in times of significant social change. Forth uses the term totemism as an 'odd-job' word to denote "a variety of relations between social groups (and especially social sub-groups or segments) and natural kinds or phenomena," rather than as a single category of cross-cultural analysis (2009: 263-264).

Frazer's theories of totemism drew upon missionary reports from Fiji, such as descriptions by Thomas Williams in 1858 of "certain birds, fish, plants and some men" as "supposed to have deities closely connected or residing in them" (1982: 219). Frazer draws upon reports from hill tribes in Viti Levu, Fiji, by J. de Marzan (1907) and W.H.R Rivers (1908) to convey the importance of totemism in Fiji. He quotes Rivers (1908) on the presence of "the three characteristic features of this institution: belief in descent from the totem, prohibition of the totem as an article of food, and the connection of the totem with a definite unit of the social organization" (Frazer 1910:138-139).

Tenure

The British colonial government established the Native Lands Commission (NLC) in Fiji in the 1890s in order to determine what land belonged to whom, and to simplify governing the new colony. A controversial misunderstanding between the signatories in Fiji's 1874 Deed of Cession to Great Britain gave the ownership of inshore waters to the Crown. The government then allowed Fijians to fish as a 'right of use' of the sea, without actual ownership of the seas, as is still the case today.

The NLC worked under the inaccurate assumption by the British colonial government that all Fijians belonged to a ***yavusa*** (descent group), ***mataqali*** (clan), and ***itokatoka*** (subclan). The ***yavusa*** stems from the ***vu*** (founding settler of a village or district). ***Mataqali*** are descendants of the sons of the ***vu*** who may have moved to start new villages, but are said to retain the same totems. ***Itokatoka*** refers to a household or a smaller group of households sharing common heritage (Capell and Lester 1941a: 316-318). For many years, the NLC moved throughout Fiji to establish legal territories, which were then accorded to the groups henceforth established as ***yavusa***. The NLC sat in Kadavu in 1917. This process often transformed a ***yavusa*** from a vague ancestral origin myth into a territory-based social group. People without a ***yavusa*** had incentives and opportunities to re-categorize themselves and their ***mataqali*** or ***itokatoka*** as a ***yavusa***, a claim which may have had little to do with their actual circumstances (Nayacakalou 1975). These new legal territories included fishing rights from reef to shore, and land ownership from shore to mountain crest. Much was at stake.

The NLC used key validations for the historical presence of a ***yavusa***: ancestral name, three totems, and war cry. Many creative answers were likely given and transformed into ‘official’ records and knowledge (Nayacakalou 1975, Gatty 2009). When totems were not recorded for a ***yavusa***, Capell and Lester (1941a; 1941b) state that this absence reflected either a lack of effort by the European Commissioners, or a ‘broken down’ system of totemism. However, these authors do confirm that the ***yavusa***/***mataqali***/***itokatoka*** system was not previously in consistent use throughout Fiji. (1941a: 318, 1941b: 25). They are also surprised by inconsistencies in Fijian totem systems, such as an example of a ***manumanu*** (animal) totem of a ***yavusa*** being replaced by ***uto*** (breadfruit), a food totem (Capell and Lester 1941b: 24). In 1984, Fiji’s Education Department carried out and published a similar creative totem gathering exercise (Gatty 2009: 40).

Thus, we see the fabric of perceptions of the trinity of tenure, totem, and taboo being woven as an orderly system with variations discounted. The totemic system of Marzan, Rivers, and Frazer was challenged by A. M. Hocart’s observations in Fiji (1914) that differentiated the spirit animal of a clan or tribe from the series of up to five organisms such as “a fish, a plant, a yam, a taro, and a banana” classed as ***vutiyadha*** (the utterance of the name). These ***vutiyadha*** had no connections with spirits, and are referred to as “”our fish” or “our plant””; some tribes were said to eat their ***vutiyadha*** as a special food (1914: 737-738). My friends in Kadavu do not know this word, although they refer to certain special plants as animals in a similar way, as will be discussed later. Ronald Gatty (2010) asserts that only the older stock of Melanesian Fijians living in the Viti Levu highlands have “true totems that represent their very private fertility and reproductive power.” Gatty contrasts these concepts with those of the Polynesian-influenced coastal dwellers, who have “iconic local symbols with no specific relevance to reproductive power, fertility, and sexuality” (2010: 4-5). However, these latter symbols were often set down as totems by the NLC; and the myth of the ‘totemic system’ prevailed. Hocart (1914: 739) recommended removing the word totem from field notes and reports, and if possible from ‘theoretic discussions’, given the inaccuracies referenced by the term.

Inspired by the work of Johannes, Mark Calamia’s PhD thesis (2003: 1) investigates sea tenure issues and the effects of marine conservation programs in Kadavu Province in the late 1990s. Calamia (2003) chronicles the development of the first Community Based Marine Protected Area (CBMPA) in Fiji, in the fishing territory of Ono-i-Kadavu, which adjoins Tiliva’s tenure area. This CBMPA was established in 1997 as a result of the efforts of two brothers who spent years coordinating support through an extensive kinship network, while negotiating with unsupportive factions including a village and regional chief. The brothers’ inspiration was the similarity between establishing a permanent CBMPA and the 100 night customary taboo placed upon a fishing area after the death of a chief in order to ensure a good harvest for the new chief’s installation festival (Calamia 2003: 405-406). However, Calamia notes that poaching in the CBMPA was an ongoing problem, which remained an issue when I visited this village in 2009. This event raises questions about both the ideas of a proposed built-in conservation ethic and a newly established one thought to resemble customary practices. What is the required critical mass of participation in a community in order to demonstrate a conservation ethic that will be effective in fisheries stock management? How are the complex issues dealt with of long-standing practices of neighbours or relatives from elsewhere who ask permission to fish in a given ***yalava*** (fishing area) on a temporary basis? Permanent closures require much broader community acceptance than do temporary closures. Marine tenure issues were not a central topic for my research. However, my focus is on what people know about the marine life. This work is more relevant to the issue of restrictions on fishing for certain kinds of fish, as I will explore.

Plate 71 *Varivoce* (*Cheilinus undulatus*)

For example, specimens of *Cheilinus undulatus* (humphead wrasse) which exceed 60-70 centimetres are known as ***varivoce*** in Fiji, as shown in Plate 71. Their distinctive hump-head appearance, stately movement, potential size of 160 centimetres, and thick flesh made them highly valued targets for spear-fishermen (Gordon 2012: 44). In the 1980s and 90s, modern diving gear became more available to fishermen in Nakasaleka, an introduction which made these large fish easier to catch; the ***varivoce*** population levels dropped to crisis levels. The Fisheries Department imposed fishing bans with significant penalties levied upon anyone catching these fish. Villagers are aware of this ban, and many people are pleased that a few larger specimens are now seen regularly on the main reef, as shown in Plate 71. However, immature *Cheilinus undulatus* are known as ***draunikura***, as shown in Plate 72. They look and behave very differently from the mature specimens called ***varivoce***. The category of ***draunikura***

Plate 72 *Draunikura* (*Cheilinus undulatus*) at 25 cm.

includes several other Linnaean species of wrasses in the 20-56 centimetre range, such as *Hemigymnus fasciatus*, shown in Plate 73.

Plate 73 *Draunikura* (*Hemigymnus fasciatus*) at about 25 cm.

Draunikura sub-types share morphological and behavioural features, but vary in colour and vertical body compression height. However, Plate 71 and Plate 72 do overemphasize the differences, given the contexts and perspectives of the photographs. Other kinds of midsize wrasses, including ***baba***, ***draunikura, drevu,*** and ***labe***, are often caught on the reef or in the lagoon to be eaten or cut up for bait. The raw flesh is firm and easily fileted into chunks to bait hooks to catch larger fish, such as ***kawakawa*** (groupers).

I found that some people, but not all fishers, are aware that ***varivoce*** start out life as ***draunikura***. Despite the ban on catching ***varivoce***, young specimens of ***draunikura*** may well be caught on lines and processed into bait. The NGO-sponsored conservation education sheet that I found in a community hall on the ***varivoce*** ban did not address killing the juvenile form of *Cheilinus undulatus*, only the adults. Using this example, if we suppose that in the past a chief laid a traditional fishing taboo on ***varivoce***, would people not have continued to catch ***draunikura***, much as may happen today? My point is that the imagined traditional taboo on ***varivoce*** could be presented as an example of conservation initiatives following traditional taboo models, but what are the parameters on species recovery success if juveniles are harvested and recycled into bait? Would this scenario still qualify as evidence of a conservation ethic?

Trinity

In a paper on marine resource management, Joeli Veitayaki (1998) describes the role of taboos associated with totems in maintaining fisheries stock in Fiji. This interpretation is supported by Capell and Lester's statement that "all indigenous Fijians have a plant, bird, and fish totem" (1953). Veitayaki confirms that these taboos restrict people from catching and eating certain totem fishes (1998: 53). Elizabeth Matthews et al., including Veitayaki, address the traditional cultural values which continue to influence marine use practices in Fijian villages, such as "1) land and sea tenure, 2) sacred areas, 3) rituals designed to appease potentially wrathful spirits, 4) totemic taboos, 5) simple fishing/collecting methods" (1998: 208, 223). This passage is recited by another scholar to support an analysis of community-based management of Fiji's Fisheries, in a thesis which states the importance of "the identification with plant, bird, or fish totems and their associated taboos" (Calamia 2003: 320, 529-530). During Calamia's extensive research into marine tenure issues in Kadavu Province, people were asked nine questions about sea cucumbers, including their local cultural significance; "e.g., is it a totem or tabu food item?" The term '***icavuti***' is used for totem and the term '***kakana vakatabui***' for 'tabu food' item (Calamia 2003:510). All of these authors share inspiration from and cite the famous Johannes (1978) article, noted earlier here as the touchstone used by Foale et al. (2011) to call for closer investigations of the development of marine tenure and taboo systems in order to understand their 'cognitive underpinnings'.

We can now see the long shadow of early scholarship and theory regarding taboos and totemism. I have shown how even in recent literature on marine tenure and resource management, the trinity of tenure, taboo, and totems emerges each time one or two of the concepts arises. The creative reshaping of each of these concepts raises important questions about how they find use in the context of marine resource management in Fiji, and perhaps elsewhere in the Pacific.

Kadavu

In my preparations for fieldwork on marine life knowledge in Nakasaleka, Kadavu, Fiji, I had discounted formal research into totems as a stale-dated and possibly offensive approach to understanding inter-group social relations among my devout Christian hosts. However, one night in a Kadavu village, when I was sitting with a few staunch Methodist men who were sharing kava and answering my questions about fish, the village chief looked at a picture of the fish known as ***vaya*** (*Thryssa baelama*) and told me that this was the totem fish of his village. Stories were then offered about this totem fish, using the English word 'totem'. I was assured that every village in Fiji had three totems: ***kau*** (tree/plant), ***ika ni masi*** (fish in this context), and ***manumanu*** (bird/animal), which belonged to the village. There was no mention made to me of a 'sacred totem' as described and differentiated from this series of special ***kau***, ***ika***, and ***manumanu*** items by Hocart (1914) and Gatty (2009, 2010).

The only equivalent offered for the term 'totem' in Fijian that I can find is '***icavuti***' (Capell and Lester 1941b, Capell 1968). Gatty (2009: 40) confirms that ***icavuti*** may be used to indicate a ***yavusa*** or ***mataqali*** totem, but calls this term an improper use. Gatty states that the 'sacred totems' mentioned above from Viti Levu should not be named in public at all in many villages (2009: 40). My friends in Kadavu confirm that '***cavuti'*** is "an old traditional way of addressing something, especially the village"; and does not equate to the English word 'totem'. I was told that there is no generic term for totem in Nakasaleka; people say ***na neitou manumanu na kula*** (our bird is ***kula***). Thus, if conservation program developers seek social differentiators between tenure zones, and villagers provide examples of 'totems', then we need to understand the role and perceptions of these examples by villagers and their neighbours. In Nakasaleka totem fish are designated as ***na neitou ika ni masi na*** X (our fish of the ***vanua*** [place you belong to] is X). In Chapter 5, I describe the various meanings and uses of the term ***vanua***, which in this case stresses the territorial association between the fish totem and tenure. To interrogate this topic, I provide details of one such 'totem' fish, or perhaps 'emblem' fish?

The ***vaya*** (*Thryssa baelama*) is the special fish of Matasawalevu, a village set in a large sheltered bay with mangroves lining the shore. ***Vaya*** are often found near the harbour entrance to the village in vast schools in shallow water, where larger predatory fish hem them in. At high tide, large schools of the small silver fish jump out of the water as they twist and turn to escape swift predators, such as ***saqa*** (*Caranx* sp.) and juvenile ***walu*** (*Scomberomorus commerson*). **V*aya*** may stay in the harbour for weeks at a time; at high tide, a group of women will wade through mud to slowly encircle milling fish in ***qoli lawa*** (large nets). Women fill a metal basin, small net, or plastic container with enough fish to meet the immediate needs of their family. ***Vaya*** are not sold commercially. ***Vaya*** dominate the catch, which also includes other kinds of small fish, such as ***daniva*** (*Heklotsichthys quadrimaculatus*), **v*oto ni moli*** (*Scomberoides lysan*); and on good days some larger predators of the ***vaya*** such as ***civicivi*** (*Caranx* sp.), ***saku*** (*Tylosurus crocodilus*), and the much desired ***saqa*** (*Caranx* sp.). Only small ***saqa*** are caught with the ***vaya*** now. In past days, large ***saqa*** would be caught this way; and served to a visiting chief or sent down to the home of a regional chief. ***Saqa*** are chiefly food in Nakasaleka.

Johannes recounts a ‘traditional conservation ethic’ once practiced in a similar setting in Palau. *Caranx melampygus* were said to have driven schools of herring up onto the shore, where sometimes the *C. melampygus* beach themselves as well in the chase. Rather than keeping these coveted fish, a traditional law in Palau was said to require these people to return the *C. melampygus* piscivores to the sea; thus, the predators would continue to chase the herring close to the shore for ease of capture by villagers (Johannes 1981: 67). Johannes is unclear in this account as to whether he learned of this story himself, or whether it derives substantially from the account of a 1910 German expedition to Palau recorded by A. Kramer (1929). This historic account is only directly cited as a confirmation of large seasonal shoals of herring in this area. I have not found an English translation of Kramer’s book to verify this story as yet. However, the manner in which Johannes confirms a similar law kept in the Marshall Islands suggests first hand conversations with fishermen (1981: 67). These practices are represented as aligned with a conservation ethic in Micronesia. In Nakasaleka, any ***saqa*** (*Caranx* sp.) caught with ***vaya*** were retained and consumed; old people talked fondly of catching large ***saqa*** this way in the distant past. However, in both situations, respect is accorded to the *Caranx* sp. as a co-predator with humans of the smaller fish.

Cooking ***vaya*** by ***riri*** (boiling), ***tavuteke*** (frying), or ***vakalolo*** (boiling in coconut cream) is quick and easy, given the small size and light textured flesh of these fish. Efficient eating of the cooked thin 12 centimetre long ***vaya*** requires an adept pinch and wiggle of the thumb and forefinger to remove the skin and small spine before one consumes the balance of the fish. This process takes some time to master for newcomers, but Matasawalevu villagers are experts. Once the women enter the water with their nets, the fishing process takes about 30-40 minutes. The women carry the wriggling fish to shore in containers, and a youth might help to lift them up the bank. Women enjoy fishing together; laughter and joking features prominently in this experience, particularly on the day when the ***vaya*** have returned after weeks of absence.

The ***vaya*** may be absent from the harbour for weeks at a time when the weather is bad, but also during periods of good weather. Some people say that the ***vaya*** stay in the lagoon for a month and go away, either after spawning, or in order to spawn. They are said to be smaller when they return. According to international scientists, *Thryssa baelama*, like other kinds of tropical anchovies, spawn multiple times each year nocturnally; and they mature within one year. An estimated life span of 1-2 years and a high population turnover often contributes to relatively stable population levels for this smaller *Thryssa* species. Spawning factors may include water temperature changes, lunar periodicity, and higher tides allowing increased egg dispersal; and associations between calm weather and density of planktonic food supplies (Hoedt 1994:76-86,136-138).

In February 2012, the ***vaya*** returned to Matasawalevu on the high tide of a new moon after an absence of over a month of unsettled weather. Village wisdom has it that when the ***vaya*** are gone for a long time, it means that a village woman is pregnant and has not told anyone, behaviour which is considered poor etiquette since a new child in the village is a blessing for everyone. As it happened during my stay, a village woman announced her pregnancy on the very day preceding the long awaited return of the ***vaya***. This story could be used to demonstrate what Durkheim called a 'rite of renewal' for both the people and their totemic species, to represent the vital principle of a totemic society (Watts Miller 2012: 98).

Old people in Matasawalevu tell of past days when their elders forbade them to use the ***vaya*** as bait because the ***vaya*** belong to the village. This example could be used to demonstrate a conservation ethic of sorts. Today, the historic bait taboo is often disregarded, although the ***daniva*** (*H. quadrimaculatus*) or goldspot herring caught with the ***vaya*** is preferred as bait for its firmer flesh that stays on a hook longer. In contrast, in the neighbouring village of Tiliva, the ***daniva*** is not to be used as bait (Yabaki 1994). Matasawalevu village elders tell the story of long ago when two men argued over who owned the ***vaya***. "One man tried to pick them all up, but he fell down on the ground and spilled the water and ***vaya*** everywhere" (Gordon 2012:28). This story demonstrates the community ownership of the ***vaya***; and could also be used to demonstrate a 'conservation ethic', which Matasawalevu fishers demonstrate by taking ***vaya*** only as needed.

Today in Matasawalevu, the ***vaya*** are valued as a readily accessible source of protein. Pots of ***vaya*** are given as gifts to people in neighbouring villages. People enjoy eating this totem fish, contrary to claims by Capell and Lester (1941b) about historic abstention practices for 'totem fish' in Fiji. However, wry remarks are made about ***vaya*** as the 'famous food' of Matasawalevu, in particular by women who have married into the village. In Kadavu, small fish are considered low status fare. One day I was visiting a woman associated with Tiliva village who asked me about what I was eating in

Matasawalevu. This woman gently scorned the ***vaya*** as 'too small and too much trouble'. The woman liked to eat bigger fish, an attitude common in Nakasaleka. People in other villages may scorn eating the ***vaya***, despite often lacking fresh fish for their own dinners and having to substitute even lower status 'tin fish' (low grade canned tuna or mackerel). Today, catching the desirable larger fish requires boat travel and fuel consumption, with no guarantees of success. Despite my requests to eat ***vaya*** on days when my Matasawalevu hosts ate ***vaya*** for their dinner or lunch, people most often incurred trouble or expense in order to serve me larger kinds of fish or canned corned beef, a practice also usually followed for honoured Fijian guests in the village. **Vaya** are not a high status fish in the village, nor is eating ***vaya*** a sacramental event.

Tiliva village is set in a wide sandy bay, which today provides very limited fishing productivity. Archaeological work in Tiliva confirms it as a Lapita site dating to at least 2500 BP (Burley and Balenaivalu: In press). Tiliva's ***ika ni masi*** is the thin 20 centimetre long ***seasea*** worm (phylum Annelida, subclass Oligochaeta), which is used to bait hooks for handline fishing. To the naked eye, the ***seasea*** that I saw resembled thin common earthworms; another group of segmentary worms in phylum Annelida. A few ***seasea*** can be dug out of the beach sand at low tide in an hour or two, a tedious chore practised only by old women today. I heard no stories about the ***seasea*** in my month-long stay in Tiliva, and only learned of it elsewhere. I see little association of the ***seasea*** with any vital principles, although they may have seen broader use as bait in the past. This speculation is given some credence by Wallace Deane's observations of cuttlefish as a preferred bait of Fijian anglers in the early 20th century (1921: 167). Many of Deane's reports on fishing were gathered in an Ono village just six kilometres across the Ono Passage from Tiliva. Today cuttlefish are very rare in Nakasaleka waters. In the course of over 60 SCUBA dives and many snorkels here in 1996, 2009, and 2011, I have not seen one. A few older people recognized a photograph of a cuttlefish that I had taken in Thailand, and were curious where I had seen it. A couple of men claimed to have seen one. Two other men reported finding dead cuttlefish on the beach. Thus, it has been many years since cuttlefish were available as bait in Nakasaleka; and one might conjecture that their excessive use for bait contributed to this scarcity. If so, the ***seasea*** of Tiliva beach may have faced similar population pressures from anglers.

Gatty claims that the "concept of hook and line fishing was introduced in Fiji by Polynesians" (2009: 226). For ancient Lapita people, fish caught by hook and line fishing represented a small percentage of their catch. It is thought that angling became important for people in Eastern Polynesia, where the shoreline topographies do not feature the reef-lagoon ecosystems so conducive to using nets for fishing in the Western Pacific. This trend is substantiated by the much greater abundance and diversity of fish hooks found in Eastern Polynesia sites, and by analysis of fish bones in middens. There are strong representations in Fijian middens of fish kinds that do not bite on lines, such as tangs (Acanthuridae) and parrotfish (Scaridae) (Kirch and Dye 1979: 72-73).This trend is confirmed in archaeological records of Eastern Fiji from four Lau Islands spanning many years (Jones 2009). The popularity of hook-and-line fishing likely increased with the introduction of steel hooks through European trade, which in Fiji was controlled by Tongans until the 19th century. The mid-20th century development of synthetic fishing line no doubt improved the efficiency of hand-line fishing. Early 20th century reports from Fiji emphasize hand-line fishing efforts as male activities (Deane 1921: 167, Hocart 1929: 115); but in 1933, Thompson (1940) reported both men and women line fishing in Lau, as is the case today in Nakasaleka. This chronology raises the question of whether the ***seasea***, as 'totem fish' of Tiliva, became important as bait for hook-and-line fishing when this became a popular fishing activity, as was likely the case in 1917 when the Native Lands Commissioners were recording totems in Kadavu villages. This history raises the possibility that the worm known as ***seasea*** could at one time have been seen as having the totemic property of contributing to the vitality of the village through its availability for bait to catch desirable types of fish.

The reader may wonder with just cause why a worm is considered to be a special fish. In Fijian folk biology, creatures of the ocean are subdivided into the categories of ***ika***, which are swimming things like fish and turtles; or ***sasalu***, a category which encompasses sea cucumbers, crabs, and other creatures that do not swim. However, in the NLC three-totem system it seems that various kinds of ***sasalu*** may be considered to be ***na neitou ika ni masi*** (our fish of the ***vanua***).

Table 22 shows the totems for two Fijian villages that share a primary school and Methodist preacher with Lagalevu, a settlement which is said not to have any totems. Lagalevu is on freehold land acquired by one Paddy O'Connor in the mid-19th century through a marriage with a Nakasaleka chief's daughter. Lagalevu has fishing and farming territories much like its village neighbours, but these seem to be controlled to some extent through a patrilineage. However, individual householders are said to own their land; and are encouraged, but not obligated, to contribute to village projects, as their neighbouring villagers are. Perhaps, the NLC did not require totems in Lagalevu to establish a ***yavusa*,** given that land ownership had already been defined. Paddy O'Connor would have been dead by 1917.

Table 22 Totems of two Nakasaleka villages

Koro	(village)	Matasawalevu		Tiliva	
manumanu	(bird/animal)	***secala***	*Halcyon chloris* white-collared kingfisher	***kula***	*Phygis solitarious* collared lory
ika ni masi	(fish/swimming creature)	***vaya***	*Thrysaa baelama* anchovie	***seasea***	Worm dug from beach sand for bait
kau	(tree/plant)	***vesi***	*Intsia bijuga* ironwood	***vesi***	*Intsia bijuga* ironwood

If we look for meaning or emblematic representations in totems, we might compare the Tiliva and Matasawalevu totems. The villages share the now rare ***vesi*** tree, a ***kau*** totem of high status. Fijian and Tongan boat builders preferred the dense ***vesi*** wood to build the keels for the great Fijian sailing canoes of the 19th century; and for making war clubs, the Fijian weapon of choice in this period (Tippett 1968: 94, Clunie 2003: 94-95). ***Vesi*** wood was a valued trade good. Today people are proud to possess a ***yaqona*** bowl made from ***vesi*** wood. This material adds to the bowl's status.

The type of ***manumanu*** totem differs between the villages; but each of these birds are common, brightly coloured, and noisy. The two ***ika ni masi*** totems seem to show the most significant difference, as I described earlier. This comparison of two **ika ni masi** shows that emblematic creatures recorded as totems by government officials in 1917 follow a more complex and variable totemic system than early scholars proposed; or perhaps reflect random choices made to please the visitors. Hospitality is paramount in a Fijian village.

Chapter Summary

Forth's (2009) use of 'totem' as an odd-job word for a range of relations between social groups and natural phenomena is important if we are looking for a 'conservation ethic' in intergroup social relations. The morals in stories told about the ***vaya*** in Matasawalevu demonstrate sharing and group ownership of the resource, and an association with the fertility and vitality of the village. In comparison, the neighbouring settlement of Lagalevu has no emblems or 'totems'; and the larger village of Tiliva has the diminutive and scarce ***seasea*** worm as ***ika ni masi***. These communities are associated through schools, churches, and intermarriage. Matasawalevu and Tiliva share the same high status ***vesi*** (*Intsia bijuga*) ironwood tree 'totem', and have different bird 'totems'. This unevenness substantiates Forth's caution about using the concepts of totems and totemism for cross-cultural analysis (2009). Thus, totems may have limited usefulness in investigating the social relations framing marine tenure systems in Fiji; in particular, for emblematic representations of social differentiations and relationships. Totems may be offered by villagers as representative of their village, but mean different things. They may have associations with diverse taboos and tenure understandings, or mean very little.

The term and concept of taboo are used in such a wide variety of contexts in Fiji that it may have limited usefulness for conservation programmers who seek to tap into or encourage fishermen to demonstrate a conservation ethic. Is the context of the new fishing taboo presented as sacred, profane, or mundane? The customary 100 night fishing taboo was concluded with a significant fishing drive and subsequent feast to invest a new chief, a meaningful event which enhances the ***mana*** (efficacy) of the community and the ***vanua***. This is not the case with marine conservation program taboos, such as a marine protected area promoted in concert with moderation in fishing harvests. Fijian fishing strategies and tools have changed significantly over recent centuries. Are historical traditions still relevant to modern villagers? Historically brother-sister avoidance taboos were exercised in some parts of Fiji, but they have much less significance today (Ravuvu 1983: 7). Bans on certain kinds of fish must take into account folk classification systems that may differ in categorization of life stages from the Linnaean system, such as shown in different interpretations of fishing bans for ***varivoce*** and ***draunikura*** (*Cheilinus undulatus*). In Nakasaleka the word 'taboo' is used often today in conversation and to scold children. How is this term understood when used in conservation efforts? Conversely, what sorts of ideas does the term 'taboo' evoke for people steeped in a background of European ideas in which notions of totem and taboo are conceptually linked, as I have shown here to be the case?

The current marine tenure systems do not have the ancient history in Kadavu that they are often accorded. They were more fluid in pre-colonial times; and their current form is a construction of a colonial organization model and indigenous initiatives that franchised some groups at the expense of others, and encouraged the winners to identify themselves in a 'traditional manner', which included establishing official totems. As Marshall Sahlins (2013) advises, we continue to create culture as we explore and represent differences among people.

I have reviewed the conceptual baggage that follows the use of the terms 'tenure', 'taboo', and 'totem' in order to show the risks of being unaware while collecting or digging up traditions in order to substantiate agendas. We must continue to interrogate broad attempts to find a 'conservation ethic' in 'traditional' marine tenure systems, as these may well be found in specific examples that do not represent a trend; or in other cases the traditions may lack history and meaning. This factor does not invalidate them; but their context should be considered in searching for ‘cognitive underpinnings’ of thought. How do we explore thought properties without reifying concrete, emotive, and dialectical schemes contrasted with the abstract, rationalistic, and analytical schemes often aspired to in the international science that gave birth to the concept of a ‘conservation ethic’?

Thesis Summary and Conclusions

Summary

In Chapters 1 through 7, I have shown that many of the methods used to gather information in this project became successful through patient processes of interactions and observations. Consistently encouraging ideas for methodological improvements from interpreters and interviewees was critical in order to adapt the survey methods, questions, and processes to be contextually relevant. These processes also encouraged local participation, and a heightened sense of local ownership of the results in most cases. In the summary to Chapter 1, I suggested some changes to survey question sequences that were not tested here, but may be applied in future research.

Here, I review a few approaches that did prove productive. The use of survey questions about relations between similar kinds of creatures, and about estimating the size of the creature being shown, were useful to qualify that people were identifying the creature actually being shown in the photograph. The analysis in Chapter 2 of size estimates confirmed that in the context of this survey people were not given to exaggerating the sizes of creatures, but in some cases under-estimated them. This question then acts as a control in the survey for accuracy and attention to detail by interviewees, a result which should lend legitimacy to the survey results in general. Another method, the 'springboard listing', model, was used to ask people to name creatures either related to or similar to a photographed creature. This method proved quite useful as a means to elicit names and information about creatures that I had not photographed, or creatures that I had not seen. The use of inquires about relationship concepts raised some complex issues when used in a Fijian society well known for complicated kinship networks. However, the method did provide insights into how people perceive and talk about relationships between marine organisms. In one humourous case, a close relationship between the aggressive fish known as ***jila*** (*Acanthurus lineatus*) and the cooking pot was identified.

In Chapters 3 and 4, I explored methods used to gather traditional ecological knowledge, such as behaviour, habitat, population trends, reproduction, and diet, which might be of interest to international biologists. Information of this sort could contribute to scientific knowledge, and be put to use in conservation education programs designed for delivery to the contributors. I believe that many of the methods used here are transferrable to other cultural and linguistic settings, if used with culturally appropriate flexibility. However, I stress the need first to understand culturally specific concepts. For example, in Chapters 3 and 4, I discuss my difficulties in determining vernacular terms or concepts which approximated the concept of habitat, as understood today in international ecology. The concept of habitat is a critical component of modern ecological conservation programs; but how well can this artificially bounded concept be communicated cross-culturally in Fiji, and elsewhere?

In question 8, the cumulative responses to questions about recent changes in population levels of individual types of creatures often indicated modest increases in stocks. These results contrasted with many general conversations in which people commented on the ongoing declines in fisheries stocks. This incongruity generated by different modes of inquiry requires further attention. Are people thinking and acting on general beliefs associated with a 'meta-culture of loss', which is in fact contradicted by their detailed knowledge of stock levels of individual kinds of creatures? This is an important question for fisheries managers. The methods developed in questions 9 through 9.3 regarding reproduction should be of interest to people developing Marine Protected Area programs. Learning what people understand about reproduction of a creature before an education program is designed and delivered is vital, as is utilizing effective methods to gauge learning and retention of training given in education workshops for sustainable practices. Regarding reproduction, building upon what people know about gravid creatures and where young ones are found is the critical first step in explaining processes not easily seen with the naked eye, and in some cases poorly understood by international scientists as well as vernacular biologists.

Asking people questions about how and why they catch specific kinds of creatures and what types they use for bait may also yield valuable contextual knowledge for marine conservation educators, as shown by the methods analysed under questions 12 through 14. These results highlighted the difficult balances people make between economic pressures, deep-seated beliefs, and their social relationships, all of which shape actual fishing practices in unexpected ways. Furthermore, preconceived assumptions of a common understanding of the Christian biblical notion of 'stewardship' may be unfounded; and thus unproductive as an educational concept or for use in conservation program planning.

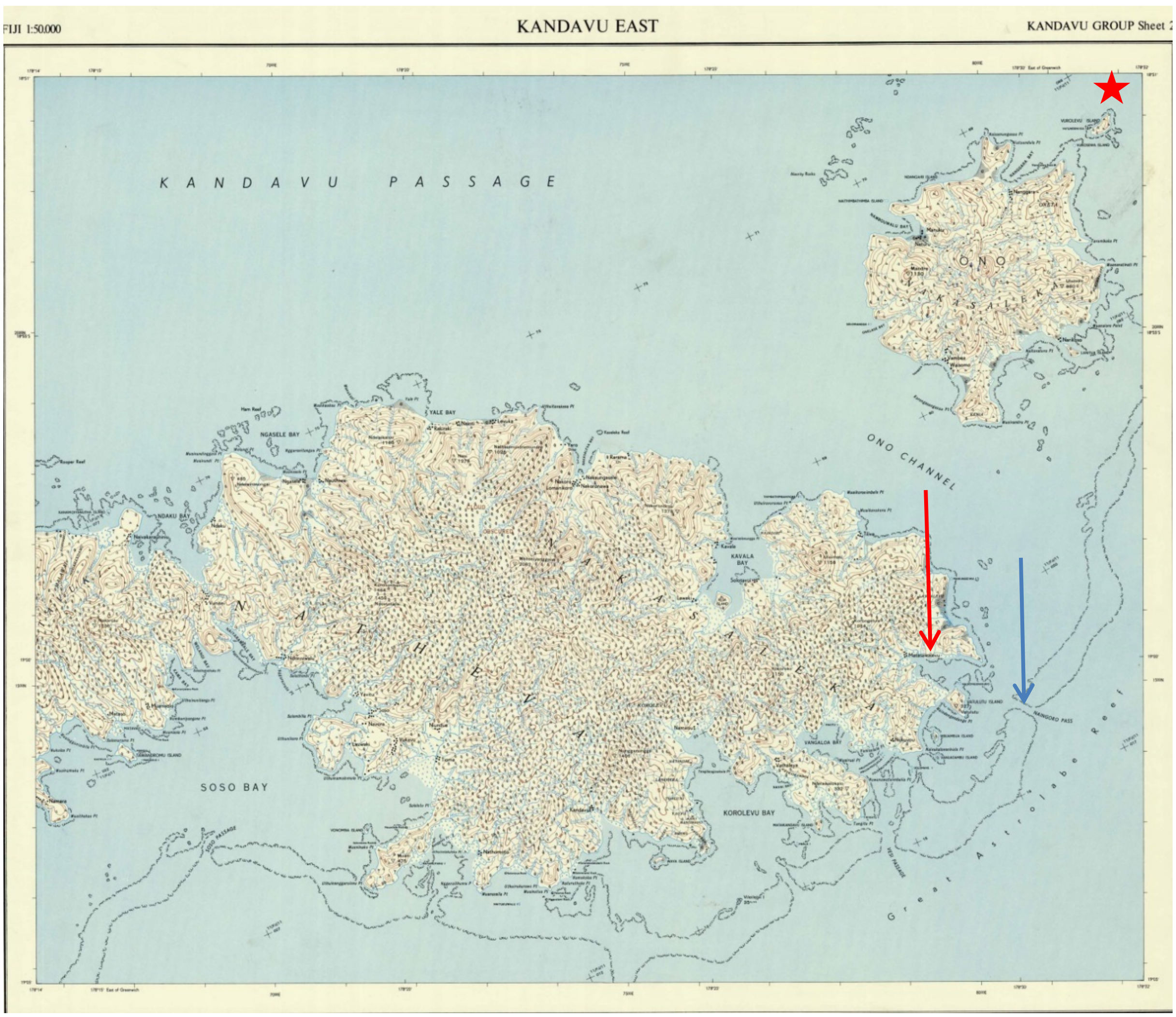
The exploration of people's knowledge of poisonous and dangerous creatures described under questions 13 and 15 demonstrated a rich vernacular knowledge of anatomy, cooking techniques, and healing methods for illness and injuries associated with these organisms. In future research, I would put more focus on creatures of these sorts earlier in the sequences of images used in each interview in order to stimulate deeper conversations. This approach would set a different tone for interviews, and likely elicit richer discourse regarding other creatures as well. The effectiveness of the other survey questions used here that demonstrated the diversity of marine life kinds caught and consumed should be of interest to marine conservation educators and healthcare planners concerned with dietary issues in the Pacific. Results of this sort yield baseline information that informs program planning and communication. Similarly, the stories and metaphors recorded under question 15 provide insights into the stories that people are telling each other before and after a travelling educational workshop passes through their village. These workshops and meetings are a primary means for government departments and NGOs to communicate environmental programs or directives to adult villagers in Nakasaleka. Detailed ethnographic research with a diverse section of the recipients may inform these sorts of educational efforts, with a net improvement of effective delivery of knowledge.

The analysis carried out in this thesis contributes to emerging discourses in environmental anthropology which seek to understand how “the high social value of biological and cultural diversity” smuggles often inaccurate preconceptions into program planning for conservation and development, with profound effects for the resident communities (Sodikoff 2012a: 13).

Conclusions

The people of the village of Matasawalevu justly envision themselves as leaders in marine life conservation in Nakasaleka. This village's marine tenure zone includes the 146 metre-wide Naiqoro Passage, a unique navigable passage through the Great Astrolabe Reef with open water on each side, as shown in Map 5 by the blue arrow. The red arrow marks the village. This is one of the longer fringe coral reefs in the world. The reef was named in 1827 by French explorer Dumont d'Urville when he almost lost his flagship, the Astrolabe, on this reef while trying to navigate a passage through it in the

Map 5 Nakasaleka and the Great Astrolabe Reef. (Directorate of Overseas Surveys UK 1963)



wrong place in the area shown by the red star. People in Kadavu have long known the Great Astrolabe Reef as Solo, which is also the word for ‘rock’ in Kadavu (Gatty 2009).

On modern marine charts, Solo refers to the top of a sunken volcano north of Ono Island. People say that this island was inhabited long ago by a village of people before they were submerged by large wave. The spiritual power of these ancient people is still recognized as inhabiting this part of the reef, and continues to be acknowledged through pre-fishing rituals and custodial practices (Calamia 2003: 217). However, in Kadavu the term Solo also refers to the entire reef that fringes the southern coast of the island, as shown in Map 5. Matasawalevu people tell stories of a small reef, the size of a house, that changes locations and moves up and down in the sea. It is considered to be a visible representation of Taveta, an important spiritual entity. This mobile reef, often seen in the recent past by people from their boats, rises and falls in different and unexpected locations that are proximate to the inside entrance to Naiqoro Passage, which is shown in Plate 74 (Gordon 2012). Another story told in the village tells of a princess who can be seen at certain times seated on the reef near the passage, as marked in Plate 74. Solo Reef is of significant cultural

Plate 74 Naiqoro Passage (red arrows) Approximate location where on occasion a legendary princess may be seen seated at low tide (red star).

importance to Kadavu people who inhabit the reef physically and symbolically. In the words of Unaisai Nabobo-Baba, when one grows up in a Fijian village one learns that "the environment is spirit filled" (2012: 56). Naiqoro Passage is also used by large fish and even whales to access the protected waters of the Ono Channel. Naiqoro Passage is subject to near-constant strong and unpredictable tidal forces and currents that support an exceptional diversity of marine life (SCRFA 4).

Plate 75: Naiqoro Passage Red arrow: marks the south edge of the passage to the left of the boat.

Until recently, Naiqoro Passage, shown from the sea in Plate 75 and on Map 6 was used intensively as a prime fishing location. Today, this reef passage is recognized as a critical seasonal spawning site for many types of fish.

Map 6 Naiqoro Point (red arrow) and Naiqoro Passage (red circle) (Directorate of Overseas Surveys UK 1963)

Village leaders have worked closely with the Fisheries Department and marine life conservation organizations, such as the Fiji Locally-Managed Marine Area Network (FLMMA) and Conservation of Fish Aggregations (SCRFA), to establish the entire Naiqoro Passage as a Marine Protected Area. This action was a very difficult concession of fishing rights to achieve in the village, given the significant village-wide economic sacrifice entailed. The village chief and other community leaders worked hard to build a consensus among residents to support and respect the decision. Some of these villagers have since devoted more of their energies to farming than fishing. Today, villagers monitor the passage to identify poachers; and they also collect a small toll from dive resort operators who wish to have their guests dive in this spectacular dive site.

Nearby is Naiqoro Point, the eastern-most tip of Kadavu and a spot of considerable spiritual significance for the island's residents, as shown in Map 6 and Plate 76. Here one can view the passage. Naiqoro point is well known in Kadavu as the jumping-off point for the souls of the dead who are making their voyage to the afterworld. This land belongs to Matasawalevu people, who often hear the spirits of small children cry as they pass by the village in the night (Gordon 2012). A century ago in Tavuki, Kadavu's chiefly village, A.M. Hocart wrote in his field-notes that Naiqoro is "the dying place…of all Kadavu…a point at the east end" where the souls go to meet Taveta (Hocart N.d.: 475). Taveta is a deity of the sea and reef who ushers the departed to the afterworld. Hocart identifies Taveta as a deified founding ancestor. Hocart's notes on how the people's souls encounter Taveta at Naiqoro Point include many similar details to the account that I was given in 2012 in Matasawalevu for inclusion in the encyclopaedia (Gordon 2012). With villagers,

Plate 76 Naiqoro Point as seen from the heights of Ono Island, using the perspective shown by the red arrow in Map 6.

poachers, government officials, tourists, aggregations of fish, an intrusive anthropologist, conservation NGOs, a deity, and the souls of the dead all coming and going in the Matasawalevu area, there is a lot of social activity in this particular place.

In the words of Genese Sodikoff, ecological “hot spots and protected areas are social relations” (2012b: 186). Sodikoff is speaking of forestry conservation projects in Madagascar, where conservationists strive to protect “outward forms of biodiversity and habitat,” and valorize “existing cultural formations that evoke an earlier more harmonious relationship between humans and the environment” (2012b: 160). Sodikoff is interested in the conflicting motivations for local people who are paid small wages by NGOs to perform conservation work as forest guards, while at other times these people complement their incomes through farming and degrading forests. Similarly, in Kadavu people are encouraged to establish Marine Protected Areas (MPAs) in order to increase marine life populations in the surrounding areas. This arrangement leads to the obvious question of just how close to the edge of the MPA it is appropriate to fish. “One cannot literally be in the process of “conserving” nature or proselytizing conservation all the time” (Sodikoff 2012b: 179). This is a critical reality to be addressed in conservation of high biodiversity and ‘lived’ forest or coral reef environments.

It is an awareness of this complex convergence of intense social relations in an area of significant biological, cultural, and linguistic relations that informs the analytical approaches used in this thesis. This is the sort of setting emphasized by Louisa Maffi to justify the theoretical construct of biocultural diversity, which Maffi illustrates by cross-mapping concentrations of these three types of diversity around the world, with a particular focus on the tropics (2010: 6-7). Nakasaleka meets these criteria. The sociolinguistic analysis in Chapter 8 of this thesis substantiates the linguistic diversity of Nakasaleka. The significant marine biological diversity on the reef has been measured by others (Obura and Mangubhai 2003, Planetary Coral Reef Foundation 2005).

The present thesis and the vernacular encyclopaedia produced during the fieldwork demonstrate the local biological diversity using the context of the cultural and linguistic diversity in a merger of people and place. Consequently, in Chapter 9, I explored the complexity of these overlapping biological, cultural, and linguistic domains in order to question accepted assumptions about addressing revitalization of these categories simultaneously with biocultural approaches. I explored how the blended concept, biocultural diversity, may not address other concurrent factors in the diversity stew, such as people exhibiting a diversity of resistances to being told what to do by outsiders. In Kadavu, such resistances are evident in both the complex competitive networks of chiefly authorities, and the range of responses by people to the risks and punishments for transgressions, as addressed in Chapter 9. This situation is further complicated by the fact that many Nakasaleka people live parts of their lives in a 'traditional' consensus driven village society, and other parts in the 'modern' urban setting of Suva. The four political coups held in Fiji since 1987 introduce further change factors for people attending to regulations. At present, Fijians are awaiting the re-establishment of a constitution and in 2014, political elections. Political instability compounds the complexity of people's varied responses to rules discussed in Chapters 9 and 10. Could we define the diversity of 'respect for rules' in Kadavu under cultural diversity? It is not the first thing that comes to mind when we read definitions of biocultural diversity as "a precious heritage to be cherished, protected, and nurtured for generations to come" on the Terralingua NGO's website (Terralingua 5).

In Chapter 10, I illustrated how easily one can err in making assumptions about other people's rules. This analysis placed particular focus on my concerns about tacking simplistic understandings of taboos onto ecological conservation programs. Hocart (N.d.) observed this complexity a century ago when he visited Nakasa, as the chiefly village of Nakasaleka was then known, for an important ceremony to install a chief. "On the day of the installation they assign (***yalataka***) the turtle as the chief's food. One small kind it is strictly forbidden for ordinary people to eat. Other kinds are also taboo, but this particular kind is precious" (Hocart N.d.: 498). Gatty (2009) translates ***yala-taka*** as 'to promise'. There are four Linnaean species of sea turtles commonly found in Fijian waters, and they all become quite large. The type known as ***ika jina*** (true turtle; *Chelonia mydas*; green sea turtle) is the second largest kind. What was distinct about the 'particular kind' that was precious?

Hocart's unpublished account suggests the existence of layers of taboos, with variable degrees of respect and observance. This interpretation contrasts the 'assumptions of decaying traditions' evident in Wallace Deane's observations, also made in Kadavu in the same time period. "In former times the flesh of the turtle belonged to the chiefs only. But now, much to the chief's chagrin, anybody who catches a turtle may eat it" (Deane 1921: 181). Was Hocart's observation an important distinction, missed by Deane, that demonstrates how a graded range of taboos are

Plate 77 *Taku* (*Eretmochelys imbricata*; hawksbill turtle).

glossed into a single idea for ease of transmission to outsiders? In Deane's role as a missionary in Fiji, notions of decaying customs may have been acceptable signs of progress. Allan Tippett (1968), a mid-20th century missionary in Fiji and meticulous researcher, stresses the importance in pre-colonial times of the specific rules for the making and use of 'sacred turtle nets' by distinct groups of craft specialists who are allowed to fish for certain kinds of turtles in specific areas, as was discussed in Chapter 5. Tippett's account supplies numerous 'traditional' taboos about the preparations for the catching of turtles. Many of these examples were recorded in Kadavu, where turtles are a 'sacred fish' (1968: 117-139). Plate 77 shows one of these kinds of turtles. Thus, there is a very complex web of taboos described here. These bring to mind the famous quote recorded by Cliffford Geertz in India, about just what it is that 'the turtle that supports the elephant that supports the world' rests upon? "Ah Sahib, after that it is turtles all the way down" (Geertz 1973: 28-29).

The preceding examples illustrate two key epistemological problems that seep into conservation education programs and biocultural diversity revitalization projects with which I am concerned.

The first, is the naïve use of 'traditional' concepts such as taboo. As, I have shown earlier in the thesis and reviewed here, it is simplistic to make assumptions about blending taboos and conservation. If taboos were used in the past to restrict some fishing activities, this rule does not mean that modern people should be accustomed to taboos being placed upon catching a certain creature in specific places for given time periods that fisheries management efforts might decree. This assumption ignores the complexity and context dependency of earlier taboo systems, which in practice required extensive and ongoing consensus building, negotiations, and punishments. Sodikoff (2012b) provides an interesting example of people negotiating direct conflicts between local animal taboos and introduced conservation policies in a Madagascar marine park. A local man employed as the conservation officer for a marine reserve observes his duties in regards to monitoring fisheries, but prioritizes his respect for a historic *fady* (taboo) against killing rats over the biosphere mandate to eliminate rats from islets in the biosphere (2012b: 153-159).

The second issue is to address the notions of decay and loss of language and culture which generate interest for NGOs and donors in revitalization projects in the first place. If there are indeed turtles and taboos 'all the way down', then we must step away from the metacultural messages of decline and loss so easily absorbed into efforts to save or revitalize biocultural diversity and marine life conservation. Reinforcing a 'sense of loss' is a particular concern in Kadavu and for Fijians in general. Matt Tomlinson (2007) has described the assimilation of "the loss of ***mana*** (efficacy)" as "a common theme in indigenous Fijian religious discourse". For example, the vital concept of ***mana*** is often shifted from its older use as a verb in Fijian contexts into use in biblical translations as a static noun (Tomlinson 2006). Tomlinson (2009) sees this reinterpretation as one that undermines cultural confidence to fuel this sense of loss as part of a long-running conflict between ***lotu*** (Christianity) and ***vanua***.[4]

[4] This use of the '***vanua***' by Tomlinson, emphasizes the 'original people' component of this term with broad and diverse uses. Asesela Ravuvu definition of ***vanua*** incorporates interrelated physical, social, and cultural dimensions (1983: 70). Unaisi Nabobo-Baba describes ***vanua*** as home, one's social relationships and status, communal landownership, knowledge systems, culture, spirituality, and values (Nabobo-Baba 2006). I discussed the term ***vanua*** and its etymology in Chapter 8.

As noted in Chapter 10, a theme of decay and loss is also common in early 20th century literature on Fiji, as in the assumptions of Capell and Lester (1941b: 25) and the Native Land Commission to the effect that some people had broken-down systems of totemism when they did not know or declare their totems. In fact, they may not have had any totems of this sort, as Hocart suggested long ago (1914). Laura Thompson was concerned about the natives becoming lazy upon the loss of their traditions (1972: 80). In contrast, Marshall Sahlins provides a more optimistic view of Fijians from the Island of Moala as engaged in "a very common process of intercultural adaption" (1962: 370). More recently Nabobo-Baba, a modern Fijian scholar and educator, emphasized the importance of recognizing the presence of elements such as spiritual forces resident in vernacular ecology (2006: 56). These latter approaches give credit to 'what is present' in contrast with the earlier approaches with 'what is lost'. Sodikoff uses the term "living-dead matter" to describe "ecologies in which humans have laboured" (2012b: 160).

The facilitation of the assembly of the encyclopaedia (Gordon 2012), and the analysis in this thesis of the encyclopaedia project are an attempt to recognize the 'what is present' Nakasaleka, with 'living-dead matter' as an active ingredient. The future presents new challenges for villagers, many of whom are thinking carefully about how to best integrate the increased intensities of interaction with government departments, NGOs, and off-island economic networks into their lives. Agencies engaged in this sort of work need to be aware of their own preconceptions, such as those that I have identified here. My hope is that printing and distributing the encyclopaedia in Kadavu provides a 'what is present' tool that reinforces the value of what Kadavu people have and know. What Nakasaleka people do with such a tool is up to them to decide.

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Appendix I: Encyclopaedia. *Na vu ni era rai kila me baleta na ika vata na sasalu iso na koro va Nakasaleka* (The knowledge of Kadavu marine life of some Nakasaleka people.)

The following draft of the encyclopaedia was assembled in the field under some limitations of technology, electricity, and time in order to immediately deliver draft copies to the participating villages. Further editing of this draft is planned before a publishing-ready version is produced.

Na vu ni era rai kila me baleta na ika vata na sasalu iso na koro va Nakasaleka.

Maji / March 2012

The knowledge of Kadavu marine life of some Nakasaleka people

Wase / chapters

Vakamacala taumada / Introduction

I na noqu vakasokumuna nai vola tukutuku ke, au via vaka vinavinaka valevu i vei ira kora na lewe ni koro ko Lagalevu, Matasawalevu vata kei Tiliva i na nomu vitokoni kina cakacaka ke vinaka valevu na duidui ni tavi mu vaitavitakina kemu ke me yacova sara na noqu mai qaravi jiko i na visiga. Au na mino ni cavu ila, ia au sa nuitakina ga ni tavi sa qaravi, ina va vinakatakina cake na noda kila na noda i qoliqoli tei na waitui vata na ere i bula tu kene.

Vinaka valevu na nomu vivabauji i na vitaro mu dau vatarogi au ke, au sa vabauta ni na yaga sara valevu.

Au kalougata valevu ni rawa niu mai jiko i Kadavu i na loma ni lima na vula sa kora, au mai sotava ke na nomu yalovinaka, dau vikauwaitaki, kau bau mai vulica ke i levu sara na ere vinaka, kau na mino tale ga ni tanuma rawa. Jina ga ni na mino ni vola i tei toqai vata nai tukutuku ni vi ere i bula tu i waitui.

Nai tukutuku ke i segaji sara ga me volai va na vosa va Nakasaleka. Me rawa ni va bulabulatakina na vosa va Nakasaleka. Na sotavi i so na dredre i na levu ni vitosoyaki ni lewe ni vanua, ka vicurumaki tu ke i so na vosa i vayagataki i Bau tu tale ke, so na vosa tale ni so na jikina i Kadavu, so tale na vosa i na so tale na yasana i Viti vata na vosa VakaBau. I vidani ni so na duidui ni vosa i vagataki, ka vatau sara ga na vosa vua na tamata (tabu saka yani) i tarogi jiko i na gauna kacei.

I levu na vakasama vata na nanuma. I baleta na viere i bula tu i waitui i mino ni jiko i na vola itukutuku ke baleta ni mino so ni levu na lewe ni Vanua mara duavata ke. Nai vola tukutuku ke i yavutaki mai na sua ni taro ka lelevu mara duavata ke. Au sa kerea jiko na vivosoji vake i so na cala i vidani jiko i nai vola kene. Na kena vamatalalaitaki na salevu i muria i na kena kumuni vata nai tukutuku ke i vidani mai na Ulutaga kena i vakamacala matailalai (Key to Descriptions).

Vailani vata na kena vai tuvatuva: ma sotavi na dredre ina kena segaji mera kila tei na kena vailani ni taba sa jiko rawa. Sa kerei na kena vivosoji vake i mino ni visotari vata na ila i kila tui Nakasaleka, vata na Linnaean classification na kena ila vavalagi i dau kilai levu kene. I tasoli tu na ila vake i cala tu na ila i taba tu. I levu sara na ika vata na sasalu i vidani i Nakasaleka io i mino ni vidani tei taba jiko i nai vola kene tei na ripote ke.

Na vi ere i rawaji mai na volatuku tuku ke i je nodratou vatabakidua na vikorokoro ka ra vaitavi kene kacei ko Lagalevu, Matasawalevu, vata kei Tiliva i na tikina vaka turaga ko Nakasaleka i Kadavu. Na lewe ni vola tukutuku ke i na mino ni vaga taki tale tei vukici, vavo ga vake sa vadonui mai vei iratou na koro ka tolu ke, ia ina kerei i mada vua na turaga ka vasokumuna tei biuta vata jiko nai tukutuku. Na kerekere me vagataki na vitaba ka jiko va nai vola tukutuku ke. Me kerei tala vua na turaga ka biuta vata nai vola tukutuku ke. Nai taba i na je nona jiko ga.

Na matua vosa (A) ki a ka jiko kene kenai balebale ni taba ke ma mino ni tauri i Viti, io sa vigaci jiko i Kadavu na ika kene.

Vinaka vakalevu.

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Introduction and acknowledgements

As the facilitator of this report, *vinaka vakalevu* to all of the people of Lagalevu, Matasawalevu, and Tiliva who supported this project, as contributers, translators, editors, hospitality providers, and so much more. I will not list names here as the list would take up too much space that is needed for your wonderful knowledge of marine life. Thank you for having faith that something of value would come of all the questions. I am privileged to have spent five months in Kadavu getting to know so many kind and generous people who have taught me much more than what you will read here about Kadavu marine life.

Best efforts have been used to present this information in the Nakasaleka dialect in order to provide a written record of the language. However, given the mobility of Nakasaleka people, there are variations of language use which incorporate other Kadavu dialects, Bauan, and other Fijian dialects. People do not always agree on what is the proper word, hence there are many inconsistancies of use in the text which represents the speakers' words and in effect the language as it lives and breathes.

There were many ideas and opinions about Nakasaleka marine life that are not included in this report; people did not always agree. I apologize in advance for any errors, as content was usually chosen from the most common answers. Details of methods used are provided below in the Key to Descriptions.

Naming and classification notes: identifying creatures from pictures is difficult at times and I accept full responsibility and apologize for any errors in Nakasaleka name selection, Linnaean classification, or English common names. Please feel free to let me know of any errors for correction. Please note that there are many more kinds of marine life found and well known in the Nakasaleka district than are included in this report.

Vinaka Vakalevu

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Kena i vakamacal matailalai / Key to Descriptions

Nai tukutuku taucoko ni kena vamata lalaitaki na vi ere i bula i waitui kia ka vola tukutukutaki jiko ke ma vasoqoni vata na nodra lomasoli, kila ka vata na nodra gauna i sivia na 60 na lewenivanua kara vai jikojiko i na vi korokoro ko Lagalevu, Matasawalevu, vata kei Tiliva i na Tikina ko Nakasaleka i Kadavu.

Na vatataro i ma va yacori ina loma ni vica vata na vula i na yabaki 2011 ki na 2012. I ma vagataki ke i so nai taba ni vi ere bula tu i waitui, me varawarawatakina na kena saumi na taro taucoko. I vuqa vei ira nai taba ke i vagataki jiko i nai vola tukutuku ke. I levu vei ira nai taba ke i ma vagataki vei ira i lewe tolu tei sivia na lewe ni vanua ina dua na gauna. Nai sau ni taro kia ma soqoni. Vata jiko i nai vola tukutuku ke ma kaumai va nai sauni taro kara ma lelevu i ra duavata kene. Na vica kia sa volai jiko ira i nanumi me varawarawataki na nodra gaca lesu tale na lewe ni vanua na kenai vavadewa i so. I vavinavinakataki va levu i so na ila vovou ka ra lajiva jiko mai, ka rawa. Jiko ni va tei sivia na ila i rogoci i na dua ga na ere bula i tarogi. Na vi taro kia ka toka i ra ma ra tarogi ga i na noda vosa ka vagataki tale i na levu na gauna. O ira na mai vivuke i na cakacaka ni vatataro kene ra ma qai vivukiakina nai walewale ni nodra vatataro, ia ra ma dei toka ga i nai balebale jina ni vatataro.

All of the information in these descriptions was condensed from the generous sharing of knowledge and time by over 60 people residing in the villages of Lagalevu, Matasawalevu, and Tiliva in the Nakasaleka Tikina, of Kadavu, Fiji. Interviews were conducted over several months in 2011 and 2012 using photographs of local marine life to prompt answers to a series of questions. Most of the photographs used are provided in this report. Most of the pictures were shown to at least three people, often several more. The information in the report represents the answers of highest agreement for each question. Charts of terms, shown below, were used for people's reference. New terms were welcomed and up to four terms could be recorded for many of the questions. The questions shown below were asked in Fijian and used as shown much of the time. Field workers did vary their word use at times, but remained focused on the meaning of the question.

1) **Kena balavu** / length: I vakia na kedra balavu? I ma sa varautaki jiko i dua nai varau me dau varautaki kere na balavu ni vi ere i dau vatarogi jiko, baleta ni so i dau vagatakina na nona liga me varaitakina na balavu ni ere i dau tarogi.
   How long is it? A tape measure was provided, often used to measure against a person's arm. Size estimates are an average of answers for each creature.

2) **Yavuni** / group size: I ra dau lako yavica tu na ika? A) dua, rua, tolu - ciwa, tina levu? I siva na dua nai sauni taro me baleta na ika i vasokumuni mai.
   How do these fish go about? As one, two, three to nine, or ten or more? More than one answer for a fish was accepted.

3) **Bula i na** / habitat: E ra dau bula tu i ya? (gaca Kena i tuvatuva 1) Where do these fish live? (see Chart 1)

4) **I sa bau**: population status:
   a) I ra dau vigaci va levu tei va vudua? Are there many or few of these?
      Sau ni taro / answers: wadu / many,
      iso / some,
      vica / few.

b) Ni vaka tautau vata taki na lima na tabaki sa kora i ra se levu tei sa lailai.
Compared to 5 years ago are there more of these fish or fewer of them?
Sau ni taro / answers: **Δ↑** / levu / more,
Δ→ / tautauvata / same,
Δ↓ / lailai / fewer.

5) **Kania** / diet: Na yava era kania? (gaca Kena i tuvatuva 2) What do they eat? (See Chart 2)

6) **Vakasasa** / catch methods: I dau rawa ni kauji ira mai vakia? (gaca Kena i tuvatuva 3) What is the best way to catch them? (See Chart 3)

7) **Vakariri** / cooking methods: Na yava na kena i vakariri vinaka duadua? (gaca Kena i tuvatuva 4) What is the best way to cook them? (See Chart 4)

8) **Kena yaga** / uses: Na yava tale i so na kena yaga? (gaca Kena i tuvatuva 5) What are they used for? (See Chart 5)

9) **Yaloka** / eggs:
   a) What month do you see eggs?
   b) Na vula yava sa mino ke ni va yaloka? What month are the eggs gone?

   Sau ni taro: 7-10 = Yaloka gaca ni Jiulai, Okosita, vata kei Sepiteba.
   Answer: 7-10 = Eggs seen in July, August, and September.

10) **Luvena bula i na** / habitat of little ones: Ra bula i ya na luvena? (gaca Kena i tuvatuva 1) Where do the little ones live? (See Chart 1)
    Nai sau ni taro kia ma varautaki toka ke me baleta ni so i duidui na vanua i jiko ke na ika lalai ka duatani na vanua i tu ke na ika lelevu. Answers are included if the habitat named differs from the adult habitat.

11) **Talanoa** / story: Dua nai talanoa, tei na sere, tei dua na ere o, kila me baleta na ika ke? Do you know a story, song, or other things about this fish?

Kena i tuvatuva: Nai tukutuku kia ka volai toka i ra i vagataki jiko ke i so na vosa va Bau vata na vosa va Nakasaleka. Na kena vavalagi na vi ila ke i mino ni vagataki va nai vola tukutuku io i volai toka ga i ra me je i dusidusi.

Key to terms: The Fijian and, where available, Nakasaleka terms listed below are used in the text of this report. The English translations of these terms are not used in the body of the text, but provided here for reference.

Kena i tuvatuva 1 / Chart 1

Bula i na	**Habitat**
Baji kai lili	Outer edge of reef
Baji ni vi jirijiri	Edge of mangrove
Bajina	Edge of a reef
Cakau levu	Main reef
Cakau vanua	Inshore reef
Daku ni tuba	Deep - inside reef
Daveta	Passage in reef

Bula i na	Habitat
Dela ni cakau	Top of main reef
Jiro	Tidal zone of freshwater stream
Jiro lailai	Small river
Jiro levu	Big river
laselase	Branch coral
Loma ni vi jirijiri	Inside of mangrove
Lomaloma	Lagoon area between cakau vanua and levu
Maqamaqa	Tidal flat
Nukanuka	Sandy bottom
Ruku ni cakau	Inner edge of reef
Takali	Open sea beyond the reef
Vi vujia	Seagrass
Vi togo i gusunijiro	Estuarine (river mouth) mangrove
Vi vatuvatu	Rocky shore
Vitogotogo	A mangrove area
Yalava	Qoliqoli: fishing territory
Yamotu	Coral patch / brain coral

Kena I tuvatuva 2 / Chart 2:

Kania	Diet of the creatures
Bulewa	Soft things living on reef surfaces
Cakau	reef
Cakau mate	Dead reef
Ika lalai	Small fish
Ika lelevu	Large fish
Lase bula	Live branch coral
Lase mate	Dead branch coral

Kania	Diet of the creatures
Laselase	Branch coral
Lumi	seaweeds
Manumanu lalai	Plankton
Momoci	Small prawns- freshwater
Nama	Lumi/ edible seaweed: *Caulerpa racemosa*
Nuku	sand
Obe	Small things on coral
Qaqari	Small crabs
Qaqari lelevu	Large crabs
Soso	Mud
Sulua	Octopus
Uraura	Small prawns – saltwater
Vivili	shellfish
Vujia	Sea grasses
Vuso ni ua	Small things floating in the sea

Kena i tuvatuva 3 / Chart 3:

Vakasasa	Catch method: tools or actions
Dakai	Spear with trigger (modern)
Kawa	Fish trap: a weighted basket trap
Moto	A hand or sling spear
Nunu	Diving and pick up
Nunu	Diving with trigger spear
Qoli	A fishing net
Qoli lawa	Net fishing with 2 or more people
Rarako	Handnet for one person in the river
Siwa boto	Line fishing from boat
Siwa kolokolo	Line fishing: throwing

Vakasasa	Catch method: tools or actions
Siwa nunu	Line fishing with goggles
Siwa sina	Line fishing using light
Tala lawa	Setting net
Taraki	Handnet for one person… see pic
Tataga	Handnet for one person in the sea
Tomika / tomi	Hand gather sasalu
Vakasavuba	Trolling
Vavana	Action of using or voyage to use a dakai (trigger spear)
Vivili	Shellfish collecting
Vucu / vucuvucu	Action of using a moto
Yavirau	Scare line

Kena i tuvatuva 4 / Chart 4

Vakasasa	Record of other common fishing terms not referred to in the book.
Buburu	1 person net used on river bottoms to catch eels.
Coka vonu	Spearing a turtle
Kari loli	Poisoning with bêche-de-mere
Nunu sici	Diving for trochus
Naka nunu dri	Diving for bêche-de-mere
Mabuke	Handnet for two persons to surround an area like a yamotu.
Tautuva	Duva or derris poison
Kilivati	A spearfishing trip with a moto

Kena i tuvatuva 5 / Chart 5

Vakariri	Cooking methods
Baovi	Wrap in leaf (banana) and put in fire or lovo
Gaga	Risk of poison GAGA:A: poisonous, GAGA:B: often poisonous, GAGA:C: sometimes poisonous
Kokoda	Raw with lemon
Riri	Boil or boil with bele
Suruwa lolo	Lolo with curry
Tatavu	BQ on a fire
Tavuteke	Fry
Vakalolo	Boil in coconut milk
Kovu (Bau)	Wrap in leaf and put in fire
Vesa	BQ or smoke on a grill
Kari	Make into a curry
Tusala	Wrap in leaves and boil in a pot
Ginu	Light BQ- wrap in leaves and put in the fire
Kari lolo	Curry and coconut milk
Miji	Boiled fish with raw coconut milk

Kena i tuvatuva 6 / Chart 6

Kena	Uses
Kana	Food
Baca	Bait
Volitaki	Sell / commercial use
Wainimate	Medicine
Yaya ni cakacaka	Utensil and craft
Biulaivi	Bycatch
Valagi	Attract scuba divers and tourists

Ika

Balagi, ikaloa, jila, ta.

Vacamacala taumada

I va retovaki nona i ta, baleta ni rawa ni va manukaji keda. I rawa talega ni taia na lawa. I mino ni dau siwaji na ika kene, i rawa ga ni vucuki tei qolivi. Ni dua i taia na ta, i rawa ni sui va na wabosucu.

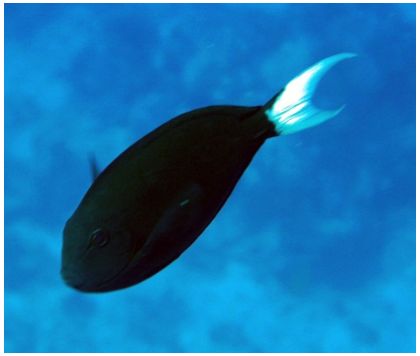
Na ika ka dau jiko i nodra bui na i ta kacei na jila, ika loa, ta masimasi. Me da dau qarauna vinaka noda liga na gauna i dau coko tu kene i na lawa baleta i rawa ni tai keda kene. Na nona i ta kene na nona i yaragi sara ga i na gauna ni leqa.

Fishes in this group have distinctive sharp spines at the base of their tail, known as *ta* or *rabo*. In Nakasaleka the word, *ta*, implies sharp. The spines are fixed on fish known as *ta*, or the genus *Naso,* and retracted on other kinds until raised for defence or attack. This spine cuts nets and flesh, often leaving deep wounds, which are slow to heal and leave scars. Some fish kinds have poison on the spines. You must be careful handling these fish, removing them from nets, and catching them while wading with nets. Use *wabosucu* leaves to make a paste to put on the cuts to aid healing. These fish do not bite on fishing lines. People catch them with nets or spears as the fish feed from the bottom, the reef, or in the current.

Balagi
Acanthurus blochii
Ringtail surgeon fish
Kena balavu: 38 cm.
Yavuni: 10+.
Bula i na: cakau levu, lomaloma, bajina. I sa bau: wadu, Δ↑.
Kania: nuku, obe. Vakasasa: vucu, dakai, qoli lawa.
Vakariri: riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: vula 5-8.
Luvena bula i na: bajina.

Talanoa: Ira dau kumukumuni vata na balagi qai vakavudua ni da qoliva i dua ina bogi, ni sa jiko na yaloka i nona kete, vakaririga vata na masima me tolu na miniti.

When you see eggs inside, before you cook it, you must boil it in salted water for 3 minutes to soften the hard flesh of the fish.

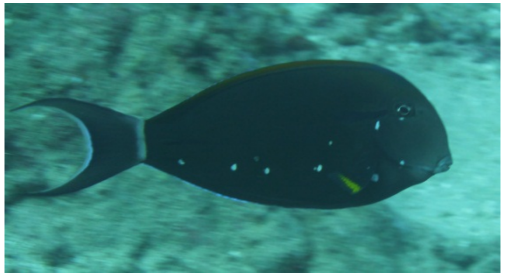


Balagi
Acanthurus sp.
Surgeonfish
Kena balavu: 30 cm. Yavuni: 10+.
Bula i na: cakau levu, cakau vanua.
I sa bau: iso, Δ↓.
Kania: nuku, lumi, obe.
Vakasasa: qoli lawa, vucu, dakai.
Vakariri: baovi, tatavu. Kena yaga: kana, baca, volitaki. Yaloka: 9-12.
Luvena bula i na: cakau vanua.

Balagi nawa
Acanthurus bariene
Roundspot surgeonfish
Kena balavu: 31 cm. Yavuni: 10+.
Bula i na: cakau levu. I sa bau: iso, Δ↑.
Kania: nuku. Vakasasa: dakai, qoli lawa. Vakariri: GAGA:C, baovi, riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: 8-11.

Balagi nawa
Acanthurus dussumieri
Eyestripe Surgeonfish
Kena balavu: 34 cm. Yavuni: 2,10+.
Bula i na: cakau levu, lomaloma, daveta. I sa bau: iso, Δ→.
Kania: lumi, nuku. Vakasasa: qoli lawa, dakai. Vakariri: GAGA:C, riri, baovi. Kena yaga: kana, volitaki, wainimate. Yaloka: 9-11.

Talanoa: Ra dau kumuni vata ka toso vata tu, ni dua na ere i cabolo tei da ravoti ira i wai i ra waji tuba. Na ika ke i dau lako i vanua nubu qai vakalutu yaloka sa na qai ciri mai cake kora kacei sa na qai kacabote me yacavo ni sa lako mai na luvedra lalai. Dua na turaga ma qoli jiko i cakau kora kacei nunu sara yani o kia me cemuria mai na ika i loma ni lawa, gai vadodonu takini kia mai dua na balagi nawa, taya sara nona laga. Na manuka ke i taura i dua na vula me mamaca, sa qai maka tu na vanua ma vita.
A big noise will frighten large groups of these fish to swim into nets. These fish usually go into the open sea to lay their eggs and the eggs will float until they hatch; here the baby fish will stay. A man was net fishing on the reef, he dived in to get some fish in the net and one swam right at him, slicing his leg with it's *ta*. This wound took one month to heal and left a permanent scar



Balagi
Acanthurus sp.
Kena balavu: 34 cm.
Yavuni: 10+.
Bula i na: cakau levu, yamotu, bajina. I sa bau: iso, Δ↓.
Kania: nuku, vujia, vuso ni ua.
Vakasasa: vucu, qoli lawa. Vakariri: riri, baovi, vakalolo. Kena yaga: kana, volitaki, baca. Yaloka: 10-12.

Balagi, ikaloa
Acanthurus nigricans
Whitecheek surgeonfish
Kena balavu: 18 cm.
Yavuni: 1,10+.
Bula i na: cakau levu, daveta.
I sa bau: wadu, Δ↑.
Kania: nuku, vujia, laselase.
Vakasasa: qoli lawa, vucu. Vakariri: riri, baovi. Kena yaga: kana, volitaki, cakau levu. Luvena bula i na: laselase.
Talanoa: Kuli kaukauwa. Hard skin.

Ikaloa bui dromodromo
Acanthurus pyroferus
Mimic surgeonfish
Kena balavu: 35 cm.
Yavuni: 1,10+.
Bula i na: cakau levu, cakau vanua, nukunuku.
I sa bau: wadu, Δ↑.
Kania: nuku, lumi. Vakasasa: dakai, moto, tala lawa. Vakariri: riri, baovi. Kena yaga: kana, volitaki. Luvena bula i na: bajina.
Talanoa: I ra mino ni dau vigaci valevu na ika ke qai vaka vo ga i na vula ko Seviteba. Many can be seen in September, but after that they are not as common.

Ikaloa dromodromo, **jila dromodromo**
Acanthurus pyroferus (juv.)
Mimic surgeonfish juvenile
Kena balavu: 15 cm.
Yavuni: 1,2,10+.
Bula i na: cakau levu, cakau vanua, dela ni cakau, bajina.
I sa bau: vica, Δ↓. Kania: nuku, vujia, nama. Vakasasa: qoli lawa, vucu, dakai. Vakariri: baovi, vakalolo. Kena yaga: kana. Yaloka: 5-12.

Ikaloa
Ctenochaetus striatus
Lined Bristletooth
Kena balavu: 18 cm. Yavuni: 10+.
Bula i na: cakau levu, cakau vanua.
I sa bau: wadu, Δ↑. Kania: nuku.
Vakasasa: qoli lawa, vucu. Vakariri: riri, tatavu. Kena yaga: kana.
Talanoa: Na luvena i ra dau yavuni, ka ra dau tu ga vakalevu mai takali. Tiny ones live in the open sea until they grow up.

Ikaloa jina
Ctenochaetus cyanocheilus
Blue-lipped bristletooth
Kena balavu: 23 cm. Yavuni: 10+.
Bula i na: cakau levu, cakau vanua, laselase, lomaloma.
I sa bau: wadu, Δ↑.
Kania: nuku, lumi.
Vakasasa: qoli lawa, vucu.
Vakariri: riri, tatavu, ginu.
Kena yaga: kana, volitaki.
Yaloka: 8-11. Luvena bula i na: laselase.

Jila

Acanthurus lineatus

Striped surgeonfish

Kena balavu: 20 cm.

Yavuni: 3+,10+.

Bula i na: cakau levu, lomaloma. I sa bau: vica, Δ↓. Kania: nuku, vujia, lumi. Vakasasa: vucu, qoli lawa. Vakariri: vakalolo, baovi. Kena yaga: kana, baca, volitaki. Luvena bula i na: yamotu.

Talanoa: I na gauna i mada ra dau vakayagataki na tubuda me je nodra i toci. In olden times, people used the *jila's* tail spine to slice the *kie* (pandanus) leaves to the right width for weaving mats and baskets.

Jila

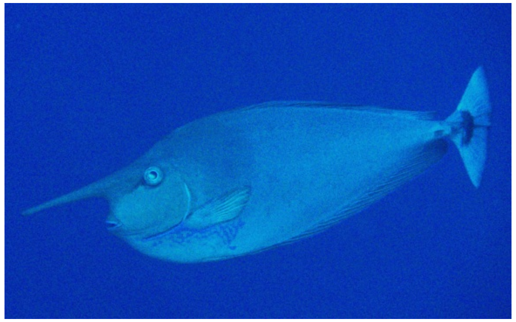
Acanthurus olivaceus

Orangeband surgeonfish

Kena balavu: 35 cm.

Yavuni: 3+, 10+.

Bula i na: cakau levu, lomaloma, baji kai lili. I sa bau: wadu, Δ↓. Kania: lumi, nuku, obe. Vakasasa: dakai, qoli lawa. Vakariri: vakalolo, baovi. Kena yaga: kana, volitaki. Yaloka: 11-1. Luvena bula i na: baji kai lili.



Ta qio, Ta penikau

Naso breviostris

Spotted Unicornfish

Kena balavu: 48 cm.

Yavuni: 10+.

Bula i na: takali, daveta, yamotu. I sa bau: iso, Δ→. Kania: lumi, uraura. Vakasasa: qoli lawa, vucu, dakai. Vakariri: riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: 10-12. Luvena bula i na: cakau levu.

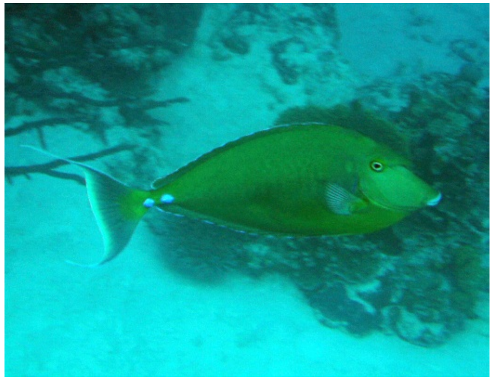
Talanoa: Ra dau bula vakalevu i na vanua kui, baleta ni rawarawa na nodra vitosoyaki. I ra dau vakaraitakina tale ga vei keda na vanua i lako jiko mai kene na kui. I na so na vanua i vakatokai tu me ta qio baleta ni tautauvata na nodru kuli vata kei na qio. I da rawa ni dani ira mai i na 7-8 na mita na kena nubu.

Ta penikau live in the rough seas where they swim in the current. This makes them good indicators of current direction and speed when you look down from the boat. They are not often caught today, but some were recently caught at night in a net at 7-8 metres depth. Some call these *ta qio* because the skin is rough like that of a shark.

Ta masimasi
Naso caesius
Grey unicornfish
Kena balavu: 42 cm.
Yavuni: 10+.
Bula i na: cakau levu, takali, cakau vanua, bajina.
I sa bau: iso, Δ→.
Kania: vujia, lumi.
Vakasasa: qoli lawa, dakai, siwa boto, siwa sina. Vakariri: baovi, riri, suruwa lolo. Kena yaga: kana, volitaki, baca. Yaloka: 11-12.

Ta bui dromodromo
Naso lituratus
Orangespine unicornfish
Kena balavu: 41 cm.
Yavuni: 2,10+.
Bula i na: cakau levu, cakau vanua, yamotu.
I sa bau: wadu, Δ↑.
Kania: lumi, vujia, obe.
Vakasasa: vucu. Vakariri: tatavu, riri. Kena yaga: kana, volitaki. Yaloka: 1-3.

Talanoa: I duatani na kena i kanakana mai vei ira kora na ika i dau rawa mai na bogi. This one has the very best taste of the fish that you can catch at night.

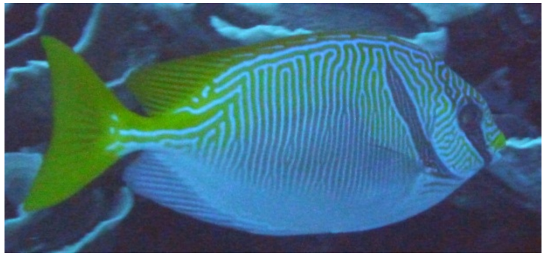


Ta
Naso unicornis
Bluespine Unicornfish
Kena balavu: 51 cm. Yavuni: 1,2.
Bula i na: yamotu, lomaloma.
I sa bau: vica, Δ↓.
Kania: nuku, laselase.
Vakasasa: qoli lawa, dakai, vucu.
Vakariri: riri, riri vata bele. Kena yaga: kana, volitaki. Yaloka: 11-12.

Talanoa: I mino ni dau vikana na kena kuli, qai mino tale ga ni vavari i ra dau bula tei kakana tu vakalevu i vinukurama. Remove the rough skin after cooking as you cannot scale them.

Nuqa, sarika, tabava

Nuqa tabanicau
Siganus uspi
Bicolor rabbitish
Kena balavu: 20 cm.
Yavuni: 2,3+.
Bula i na: cakau levu, cakau vanua. I sa bau: iso.
Kania: nuku, laselase.
Vakasasa: qoli lawa, vucu. Vakariri: GAGA:C, baovi, riri. Kena yaga: kana, volitaki. Yaloka: 9-10.
Talanoa: Ika dau vi lau. Dau levu na ika ke i na vula ko Diseba kina Janueri. Dau riri va vinaka me lako laivi na paisoni. Ika qaqa vinaka na kena lewe.
Contact with the poisonous dorsal spine is very painful. To cook, boil in water to deal with poison. They run in December and January. The firm flesh is good to eat when cooked.



Nuqa tabanicau
Siganus doliatus
Barred rabbitfish
Kena balavu: 30 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau vanua. I sa bau: vica, Δ→. Kania: nuku, vujia, lumi. Vakasasa: qoli lawa, dakai, vucu. Vakariri: GAGA:C, riri, tatavu. Kena yaga: kana, volitaki.
Talanoa: Tautau vata na cau (Vunikacu) na kenai bulibuli. The yellow tail is like the tips of the branches of the coniferous tree, *cau*, that grows near the shore, shown here.

Sarika
Siganus spinus
Scribbled rabbitfish
Kena balavu: 18 cm.
Yavuni: 10+. Bula i na: vi vujia, vi vatuvatu.
I sa bau: iso. Kania: vujia, nuku, vuso ni ua. Vakasasa: qoli lawa, tataga. Vakariri: GAGA:C, baovi, tatavu, tavuteke. Kena yaga: kana, volitaki. Yaloka: 10-11.
Talanoa: Ika dau vilau toto, me dau kuvui i na wai katakata me kua ni toto. Good fish to eat, but the dorsal spines have poison, treated

by putting hand in hot salty water before wrapping in a towel to make the bad blood come out.

Tabava, tavai
Siganus lineatus
Golden lined rabbitfish
Kena balavu: 8 cm. Yavuni: 3+. Bula i na: baji ni vai jiri, vitogotogo. I sa bau: wadu, Δ↑. Kania: nuku, soso, lumi. Vakasasa: taraki. Vakariri: tusala, vakalolo, Kena yaga: kana.
Talanoa: Dau bula i laga ni jiri. It goes in the mangrove.

Baji lau, bo, kake, mama, regu rawa

Baji lau
Lutjanus bohar
Red snapper
Kena balavu: 71 cm.
Yavuni: 2,10+.
Bula i na: cakau levu, takali, lomaloma. I sa bau: wadu, Δ↑. Kania: ika lalai, lumi. Vakasasa: qoli lawa, siwa boto, siwa kolo. Vakariri: GAGA:B, riri, baovi. Kena yaga: kana, volitaki. Yaloka: 8-10.

Talanoa: Na ika ke i dau gaga i levu i dau mino ni kania. Dau biu laivi nona se, qai tuna sara me vasavasavataki va vinaka nona kete. So dau variriga vata na niu, vake i loaloa na niu kacei i gaga. I mada dau levu sara da dau qoliva, ia na gauna ke sa mino sara. So na yasai Kadavu na baji lau dau gaga.

These fish are often poisonous and some people do not eat them. Other people cut out the gills, all guts and the black bone in the front abdomen, before boiling hard at least one hour to remove poison. Some people people boil it with coconut meat and if the coconut turns black it is poisonous. In the past, many were caught with nets, but not so many are caught now. Some people say that *baji lau* from Kadavu's south shore and from Split Rock are poisonous.

Bo
Lutjanus gibbus
Humpback snapper
Kena balavu: 48 cm.
Yavuni: 3+,10+.
Bula i na: lomaloma, takali, cakau levu. I sa bau: wadu, Δ↑. Kania: ika lalai, qaqari, lase mate. Vakasasa: siwa boto, qoli lawa, dakai. Vakariri: tavuteke, riri. Kena yaga: kana, volitaki, baca. Yaloka: 8-12. Luvena bula i na: baji ni vi jirijiri.

Kake
Lutjanus semicinctus
Black banded snapper
Kena balavu: 33 cm.
Yavuni: 1.
Bula i na: cakau levu, cakau vanua, bajina. I sa bau: iso, Δ↑. Kania: lumi, qaqari, laselase. Vakasasa: qoli lawa, vucu, siwa boto. Vakariri: riri, tavuteke, baovi. Kena yaga: kana, volitaki, baca. Yaloka: 9-12. Luvena bula i na: laselase.

Kake vola

Kena balavu: 27 cm.
Yavuni: 1,10+.
Bula i na: bajina, yamotu.

I sa bau: wadu, Δ↑. Kania: ika lalai, qaqari, uraura. Vakasasa: siwa boto, siwa kolokolo. Vakariri: tavuteke, vesa. Kena yaga: kana, volitaki, baca. Yaloka: 11-1. Luvena bula i na: vi togo i gusunijiro.

Kake dromo

Kena balavu: 21 cm.
Yavuni: 1,10+.
Bula i na: cakau levu, bajina, lomaloma. I sa bau: wadu, Δ↑. Kania: ika lalai, qaqari, lumi. Vakasasa: siwa boto, vucu. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki, baca. Yaloka: 11-1. Luvena bula i na: ruku ni cakau.

Kake dromodromo
Lutjanus kasmira
Bluestripe snapper
Kena balavu: 24 cm.
Yavuni: 10+.
Bula i na: cakau levu, yamotu.
I sa bau: wadu, Δ→. Kania: obe, ika lalai. Vakasasa: siwa boto, siwa sina. Vakariri: GAGE:C, riri, tavuteke. Kena yaga: kana, volitaki, baca. Yaloka: 10-12.
Talanoa: Na ika kana vinaka qai uro. Ina so na vanua i dau gaga. Inside the fish there is a sac of white liquid that is good to cook and eat. In some places, this fish is poisonous.

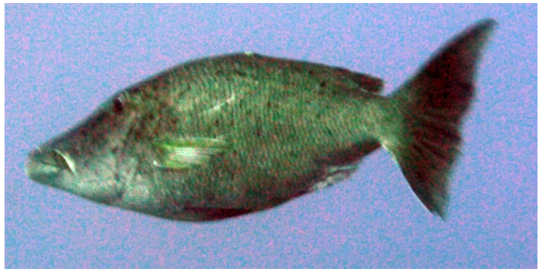
Mama
Gymnocranius microdon
Sea bream
Kena balavu: 39 cm.
Yavuni: 10+.
Bula i na: cakau levu, nukunuku.
I sa bau: wadu, Δ↑. Kania: ika lalai, nuku, vuso ni ia. Vakasasa: qoli lawa, siwa boto. Vakariri: vakalolo, miji. Kena yaga: kana, volitaki, baca. Yaloka: 11-1. Luvena bula i na: nukunuku.

Regu rawa
Macolor macularis
Midnight snapper
Kena balavu: 58 cm.
Yavuni: 1.
Bula i na: cakau levu, lomaloma, cakau vanua. I sa bau: vica, Δ↓. Kania: momoci, ika lalai. Vakasasa: dakai, siwa boto. Vakariri: GAGA:B, riri, baovi, tavuteke. Kena yaga: kana, volitaki. Yaloka: 7-10.
Talanoa: Na ika gaga, dau tukuni me da reguca rawa noda vitinani se bera ni da kania. The name of this, often poisonous, fish, *regu rawa*, means kiss your wife goodbye before eating and wait to die.

Guru
Macolor macularus (juvenile)
Midnight snapper
Kena balavu: 34 cm.
Bula i na: baji kai lili.
I sa bau: iso, Δ↑.
Kania: nuku, qaqari.
Vakasasa: dakai, qoli lawa.
Vakariri: vakalolo. Kena yaga: kana, volitaki. Yaloka: 10-12.

Regu rawa
Lutjanus rivulatus
Blubberlip snapper
Kena balavu: 107 cm.
Yavuni: 1,10+.
Bula i na: daveta.
I sa bau: wadu, Δ↑.
Kania: ika lalai. Vakasasa: dakai, qoli lawa. Vakariri: riri. Kena yaga: kana, volitaki, dela ni cakau. Yaloka: 8.

Dokonivuji, gusu gatagata, kacika, kawago, sabutu



Doko ni vuji
Lethrinus olivaceus
Longface Emperor
Kena balavu: 70 cm.
Yavuni: 1.
Bula i na: cakau levu, bajina. I sa bau: vica, Δ↓. Kania: vujia, ika lalai. Vakasasa: siwa boto. Vakariri: riri. Kena yaga: kana, volitaki.
Talanoa: Kacika ke i je ika lailai mai vua na doko ni vuji. I dau valuveni jiko i na vula ko Noveba. *Kacika* is rounder and stays smaller than *doko ni vuji*. These fish breed inside the reef in November.

ZA18 **Gusu gatagata**
Lethrinus sp.
Emperor
Kena balavu: 80 cm. Yavuni: 3+. Bula i na: cakau levu. Bajina. I sa bau: vica, Δ↓. Kania: ika lalai, sulua, lumi. Vakasasa: siwa boto, qoli lawa. Vakariri: riri. Kena yaga: kana, volitaki. **Talanoa:** Ni da tunaka da na dana na luvena lalai. Ika ni vesa. When we cut it open, we will see the baby. It is good to smoke on the fire.

Kacika
Lethrinus xanthochilus
Yellowlip emperor
Kena balavu: 80 cm.
Bula i na: cakau levu, vi vujia. I sa bau: wadu, Δ↓. Kania: vujia, lase, bula. Vakasasa: siwa boto, dakai, moto. Vakariri: tavuteka, vakalolo. Kena yaga: kana, volitaki.

Kawago
Lethrinus nebulosis
Kena balavu: 61 cm.
Yavuni: 10+.
Bula i na: baji kai lili, lomaloma, cakau levu. I sa bau: vica, Δ↑. Kania: ika lalai, vujia, nuku. Vakasasa: siwa boto, dakai, qoli lawa. Vakariri: riri, vakalolo, tavuteke. Kena yaga: kana, volitaki. Yaloka: 11-12.
Talanoa: Ke i dua na ika vinaka ni volitaki baleta ni sau vinaka qai naba 1 na makete ni ika. Ika valewe qai jiko i na $2.50 i rua kilo. I mada da rawa ni toboka tei siwata i 10-20 na kawago dua na kele. Na gauna ke sa 1-3 da rawa ni rawata dua na kele. Dau yavuni tu i Waisalima na ika ke, qai je kena baca vinaka na kauki.
Kawago are heavy fish, so they are good ones to sell by weight, say 4 kg at $2.50 per kg. In the 1990s people would catch 10-20 in one

stop, but now only 1-3 fish, so the population has dropped. You used to catch many by Waisalima, but now only small ones. The best bait is fish chunks or *koki* crab.

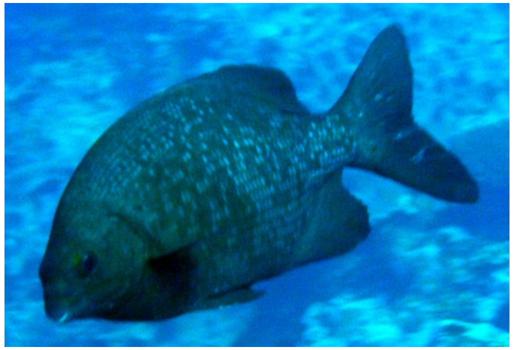
Sabutu
Lethrinus arythracanthus
Yellowfin Emperor
Kena balavu: 50 cm.
Yavuni: 10+. Bula i na: cakau levu, baji kai lili.
I sa bau: wadu, Δ↑.
Kania: ika lalai, qaqari, lumi. Vakasasa: dakai, siwa boto (baca qaqari). Vakariri: riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: 11-1. Luvena bula i na: baji kai lili.
Talanoa: Na ika ke dau bula tu i cakau. Ika vinaka ni volitaki. Ka qai kana vinaka. Large schools of small ones live close to the reef. They have thick flesh and are good to sell.

Sabutu jina
Lethrinus sp.
Kena balavu: 33 cm.
Yavuni: 2,3+,10+.
Bula i na: takali, baji kai lili, lomaloma. I sa bau: wadu, Δ↑. Kania: ika lalai, qaqari. Vakasasa: qoli lawa. siwa boto. siwa kolokolo. Vakariri: riri, vakalolo, vesa. Kena yaga: kana, volitaki. Yaloka: 10-1.

Sabutu babaloa
Lethrinus sp.
Kena balavu: 46 cm.
Yavuni: 1,2,3+,10+.
Bula i na: baji kai lili, yamotu, lomaloma. I sa bau: wadu. Δ↑.
Kania: ika lalai, lumi, obe. Vakasasa: siwa boto, siwa kolokolo, qoli lawa. Vakariri: riri, tavuteke, vesa. Kena yaga:, kana, volitaki. Yaloka: 11-1. Luvena bula i na: ruku ni cakau.

Sabutu volavola
Lethrinus sp.
Kena balavu: 36 cm.
Yavuni: 2,3+,10+.
Bula i na: takali, baji kai lili, yamotu.
I sa bau: wadu, Δ↑. Kania: ika lalai, nuku, qaqari. Vakasasa: siwa boto, siwa kolokolo, siwa nunu. Vakariri: vakalolo, tavuteke, kari. Kena yaga: kana, volitaki. Yaloka: 11-1. Luvena bula i na: baji kai lili.

Ikatu, matakiji, mataverevere, renua

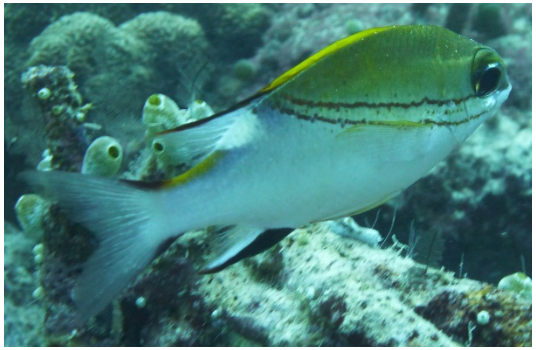


Renua
Kyphosis bigibbus
Drummer
Kena balavu: 50 cm.
Bula i na: cakau levu, cakau vanua, daveta.
Kania: ika lalai.
Vakasasa: siwa boto.
Vakariri: baovi. Kena yaga: kana, volitaki.

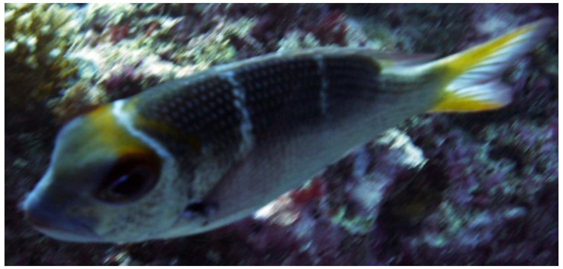
Renua
Kyphosus vaigiensis
Drummer
Kena balavu: 50 cm.
Yavuni: 3+,10+.
Bula i na: cakau levu, baji ni vi jirijiri. I sa bau: vica, Δ↓. Kania: lumi, nuku. Vakasasa: qoli lawa, dakai. Vakariri: riri, baovi. Kena yaga: kana, volitaki. Yaloka: 8. Luvena bula i na: Loma ni vi jirijiri.
Talanoa: Na ere lalai dau kani ira i so na ika lelevu ra dau lako tu vata i ira na nuqa. Many small ones are eaten by other bigger fish. They scool with *nuqa*.

Ika tu, tuni ika
Gnathodentex aurolineatus
Striped Large-Eye Bream
Kena balavu: 26 cm.
Yavuni: 1,10+.
Bula i na: cakau vanua, daveta, dela ni cakau.
I sa bau: wadu, Δ↑. Kania: nuku, manumanu lailai. Vakasasa: qoli lawa, siqa boto. Vakariri: riri, tavuteke, vesa. Kena yaga: kana, volitaki. Yaloka: 7-9.

Ikatu
Lethrinus amboinensis
Ambon Emperor
Kena balavu: 20 cm.
Yavuni: 10+. Bula i na: cakau levu, cakau vanua, nukunuku. I sa bau: wadu, Δ↑. Kania: ika lalai, qaqari, lumi. Vakasasa: siwa boto, siwa kolokolo. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki, baca. Yaloka: 10-1. Luvena bula i na: baji kai lili.



Mataverevere
Scolopsus bilineatu
Bridled monocle bream
Kena yaga: kana, volitaki, baca.



Matakiji
Montaxis heterodon
Redfin bream.
Kena balavu: 41 cm.
Yavuni: 10+.
Bula i na: cakau levu. I sa bau: iso, Δ↑. Kania: nuku, ika lalai, qaqari. Vakasasa: siwa boto. Vakariri: riri, tavuteke. Kena yaga: kana volitaki. Yaloka: 11-1.

Cama, ose, teu, kaboa

Cama
Parupeneus crassilabris
Doublebar goatfish
Kena balavu: 29 cm. Yavuni: 2. Bula i na: cakau levu, bajina. I sa bau: iso, Δ→. Kania: nuku, vujia. Vakasasa: dakai, siwa boto, yavirau. Vakariri: GAGA:C, baovi, kokoda. Kena yaga: kana,volitaki. Luvena bula i na: baji kai lili.

Cama
Parupeneus barberinus
Dash-dot goatfish
Kena balavu: 41 cm. Yavuni: 1,10+. Bula i na: cakau levu, cakau vanua, vi vujia. I sa bau: wadu, Δ→. Kania: nuku, vujia, lumi. Vakasasa: dakai, siwa boto, vucu. Vakariri: riri, suruwa lolo. Kena yaga: kana, volitaki, baca. Yaloka: 10.
Talanoa: Ika malua qai tobotobo rawarawa. A slow moving fish that is easy to catch.

Cama
Parupeneus sp.
Kena balavu: 32 cm. Yavuni: 1,2,3+,10+. Bula i na: cakau levu, cakau vanua, nukunuku. I sa bau: wadu, Δ↑. Vakasasa: qoli lawa, siwa boto, siwa kolo. Vakariri: baovi, riri. Kena yaga: kana, volitaki. Yaloka: 9-11. Luvena bula i na: nukunuku.
Talanoa: I tautau vata na sabutu. Dau je ika talega ni kokoda. Dau mino volitaki i na koro mini vake i Suva, dau volitaki na ere lalai vake talega na ere lelevu. I dau lako mai vilaselase me mai vasucu. Breeding time is similar to *sabutu*. They are easy to descale and the firm flesh makes it good for *kokanda*. In Kadavu there is no commercial market for small fish, not like Suva where they sell all sizes. It comes to the coral to give birth.

Cama
Parupeneus sp.
Goatfish
Kena balavu: 35 cm. Yavuni: 1,3+,10+. Bula i na: dela ni cakau. I sa bau: wadu, Δ↑. Vakasasa: qoli lawa. Vakariri: vakalolo. Kena yaga: kana, volitaki. Yaloka: 10-12.

Talanoa: Dau muria tu iso na ika. I rua jiko na mataqali renua, dua i lelevu ka dua i lalai. It goes alone, but follows other fishes. There are two types, one gets larger than the other.

Ose kula, cama kula.
Parupeneus cyclostomus
Gold saddle goatfish: yellow phase.
Kena balavu: 35 cm.
Yavuni: 2.
Bula i na: cakau levu, cakau vanua. I sa bau: vica, Δ↓. Kania: nuku, obe, lase mate. Vakasasa: vucu, siwa boto, qoli lawa. Vakariri: riri, kokoda, tavuteke. Kena yaga: kana, volitaki.

Ose kula
Mulloidichthys vanicollensis
Yellowfin goatfish
Kena balavu: 28 cm.
Yavuni: 10+. Bula i na: baji ni vi jirijiri, vi vujia. I sa bau: iso, Δ↑. Kania: vujia, nuku, manumanu lailai. Vakasasa: qoli lawa,moto. Vakariri: riri, tatavu. Kena yaga: kana, volitaki. Yaloka: 9-11.
Talanoa: E dau vakaluveni ga i loma ni kete i dau kana vinaka na luvena. The eggs have a nice taste.

Teu
Upeneus vittatus
Striped goatfish
Kena balavu: 25 cm.
Yavuni: 10+. Bula i na: dadala. I sa bau: wadu, Δ↑. Kania: soso. Vakasasa: qoli lawa, siwa boto. Vakariri: GAGA:C, riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: 10-12. Luvena bula i na: maqamaqa.
Talanoa: Toso malua tu ga. So na vanua i dau gaga. It swims slowly. Some places in Fiji, they can be poisonous to eat.

Kaboa
Plotosis lineatus
Striped catfish
Kena balavu: 16 cm.
Yavuni: 10+.
Bula i na: vi vujia, baji ni vi jirijiri, barani nuku. I sa bau: iso, Δ→. Kania: nuku, obe. Vakasasa: taraki, moto. Vakariri: GAGA:A, riri, tusala, baovi. Kena yaga: kana.
Talanoa: Dau tu va levu i vinukunuku ra qai dau muria tu ga nodra nana. O kia dau vilau toto talega, qai paisoni. Breed in sand near shore. Mothers dig holes and babies come out later. There is poison on the top and side fins; use scissors to cut these fins off.

Buse, daniva, evu, kabarara, kanace, kava, matu, saku, sevu, soqo, takataka, ula, vaya, voto ni moli

Buse
Hyporhamphus dussumieri
Dussimier's halfbeak
Kena balavu: 30 cm. Yavuni: 3+. Bula i na: cakau levu, vi vujia. I sa bau: wadu, Δ↑. Kania: vujia, vuso ni ua. Vakasasa: qoli lawa, siwa boto. Vakariri: tatavu, riri. Kena yaga: kana. Luvena bula i na: takali, vi vujia.
Talanoa: Ika maloku qai rawarawa ni siwavi. Me vicoka va totolo. If you want to use a spear, you have to shoot it fast or it might run away.

Daniva
Herklotsichthys quadrimaculatus
Goldspot herring
Kena balavu: 14 cm. Yavuni:10+. Bula i na: baji ni vi jirijiri, vi togo i gusunijiro. I sa bau: iso, Δ→. Kania: vuso ni ua. Vakasasa: qoli lawa, tataga. Vakariri: tavuteke, tatavu. Kena yaga: kana, volitaki, baca. Yaloka: 10-12. Luvena bula i na: vi vujia.

Evu

Kena balavu: 11 cm. Yavuni: 10+. Bula i na: lomaloma, jiro, vi vujia. I sa bau: vica, Δ↓. Kania: vuso ni ua, soso. Vakasasa: tataga, taraki. Vakariri: tusala, vakalolo, baovi. Kena yaga: kana. Luvena bula i na: lomaloma, jiro.
Talanoa: Dau yavuni va levu i vi jirijiri. Dau biu laivi na kena ulu, ni tuna me biu laivi na kena i wawa. Lives in groups in the mangroves. We usually cut off the head and if we cut it open we have to take everything out.

Kabarara
Terapon jarbua
Crescent-banded grunter
Kena balavu: 32 cm. Yavuni: 3+. Bula i na: baji ni vi jirijiri. I sa bau: wadu, Δ↑. Kania: lase bula, lase mate. Vakasasa: moto, siwa boto. Vakariri: riri. Kena yaga: kana.

Kanace
Mugil cephalus
Mullet

Kava
Liza vaigiensis
Diamond-scale mullet
Kena balavu: 30 cm. Yavuni: 10+. Bula i na: baji ni vi jirijiri, cakau vanua. I sa bau: wadu, Δ↑. Kania: vuso ni ua, soso. Vakasasa: qoli lawa, moto. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki, baca. Yaloka: 3-4.
Talanoa: Ika vari lelevu qai dau lade. A fish with proportionately large scales of about 1 cm in size.

Matu
Gerres sp.
Biddy
Kena balavu: 12 cm. Yavuni: 10+. Bula i na: vi vujia, baji ni vi jiri. I sa bau: wadu, Δ→. Kania: vujia, nuku. Vakasasa: qoli lawa, siwa kolo. Vakariri: riri, vesa. Kena yaga: kana, volitaki. Yaloka: 9-12. Luvena bula i na: Loma ni vi jirijiri.
Talanoa: Na baca vinaka ni siwa, ka dau rawata mai ke na ika lelevu. They make good bait on hooks to catch larger fish.

Saku
Tylosurus crocodilus
Crocodile needlefish
Kena balavu: 80 cm. Yavuni: 3+. Bula i na: takali, cakau vanua. I sa bau: wadu, Δ↑. Kania: ika lalai, momoci, vujia. Vakasasa: moto, qoli lawa, tala lawa. Vakariri: riri, tavuteke, tatavu. Kena yaga: kana.
Talanoa: Ika balavu, qai gusu balavu. A long fish with long mouth.

Sevou
Valamugil
Mullet
Kena balavu: 70 cm. Yavuni: 3+. Bula i na: cakau vanua, lomaloma, vi vujia. I sa bau: wadu. Kania: soso, vuso ni ua. Vakasasa: qoli lawa, tala lawa. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki. Luvena bula i na: baji ni vi jirijiri.
Talanoa: Iko na rawa ni dana nona qavota ni lamata cake mai na gauna i sa nunu ke. You can see its head come up above the surface after it dives.

Soqo

Kena balavu: 40 cm. Yavuni: 3+. Bula i na: cakau levu, takali, bajina. I sa bau: wadu, Δ↑. Kania: nuku, laselase. Vakasasa: qoli lawa. Vakariri: riri, vesa, tavuteke. Kena yaga: kana.

Talanoa: Ra dau yavuni. It moves in groups.

Takataka

Ponyfish?
Kena balavu: 20 cm. Yavuni: 3+. Bula i na: lomaloma, jiro. I sa bau: wadu, Δ↑. Kania: soso, momoci. Vakasasa: qoli lawa, siwa boto. Vakariri: riri, vakalolo. Kena yaga: kana. Luvena bula i na: jiro.
Talanoa: Ika rabaraba, qai mino ni vavari. It does not have scales like other fish.

Ula

Kena balavu: 10 cm.
Bula i na: Baji ni vi jirijiri.

Vaya
Thryssa baelama
Baelama Anchovy
Kena balavu: 12 cm.
Yavuni: 10+. Bula i na: vitogotogo, vi togo i gusunijiro, loma ni vi jirijiri. I sa bau: wadu, Δ↑. Kania: vuso ni ua. Vakasasa: qoli lawa. Tataga. Vakariri: riri, tavuteke, vakalolo. Kena yaga: kana, baca. Yaloka: 10-1. Luvena bula i na: baji ni vi jirijiri.
Talanoa 1: Ke na ika ni masi i Matasawalevu na gauna rai mino ni vigaci ke, kacei da kila sara ni lai valuveni. Ka dau rauta jiko ni dua na vula na nona mino. I rua na turaga maru vibatakina jiko na vaya ma ologa jiko mai, i dua vei ruka qai colata jiko mai va nai wau nai olo vaya na gauna ru sa valatakina ke qai kacabote nai oloolo vaya. Sa qai tu i vi vanua kora ga na vaya.
The most popular fish in Matasawalevu.They are in the lagoon for a month and then disappear for a month after spawning. Vaya are the totem fish of Matasawalevu. People in Matasawalevu say that when a village woman is pregant, and does not tell anyone, that the *vaya* will go away. They return when the woman tells of her pregancy.
Talanoa 2: Ira tukuna mai Matasawalevu ni ke va ke i dua i bukete lo jiko ira na mino ni rawata i dua na vaya, qai vakavo ga nisa kilai. Two men were arguing over who owned the *vaya*. One man tried to pick them all up, but then he fell down on the ground and spilled the water and *vaya* everywhere.

Voto ni moli
Scomberoides lysan
Double-spotted queenfish (juvenile)

Bula i na: Baji ni vi jirijiri.

Civicivi, mayawa ni takali, roqoroqovatu, saqa, toutou, tuna, utouto, walu

Civicivi
Caranx
Trevally

Bula i na: Baji ni vi jirijiri.

Mayawa ni takali
Carangoides plagiotaenia
Barcheek trevally
Kena balavu: 54 cm.
Yavuni: 10+.
Bula i na: takali, bajina, baji kai lili. I sa bau: vica, Δ→. Kania: vujia, nuku. Vakasasa: dakai, qoli lawa, vucu. Vakariri: GAGA:C, riri, tavuteke. Kena yaga: kana, volitaki.

Talanoa: I rua jiko na mataqali ika kene i dua i tu i takali ka dua i jiko i vanua na sarika i tautau vata kei na mayawa io i jere lailai toka ga vei ruka. O kia i toto sara mai vei ruka na ta tei na jila vake i lauji iko. I mada se dau levu, na gauna ke sa mino so ni levu. Ika tobotobo rawarawa, so na gauna me da vana vake i dua dau coco tu mai nomu i dakai i tolu tei va na mayawa. Da yavalata ga na wai ra dau situba sara mera lai vuni tui vi jirijiri tei na vi cakacakau, kacei saraga na vanua vinaka ini rawa ni da tagavi ira ke.

You must remove the rough skin. The fish can be poisonous, especially when it pokes you. When there is a splash or any movement in the water they usually hide themselves next to the coral and this is a good time to catch them using a hand net (*taraki*). They are easy to catch, just disturb the surface and spook them to escape towards the coral or mangrove where nets await them.
There are two kinds: *takali* and *vanua*, *sarika* is similar but smaller. Mayawa pelvic fins are like sharp needles and more painful than the spine or *ta* of the *jila*. Sometimes you can catch more than one with one spearthrust, but there not so many now as in the past.

Roqoroqovatu
Trachimotus blochii
Snubnose pompano
Kena balavu: 99 cm.
Yavuni: 3+,10+.
I sa bau: iso, Δ→. Kania: ika lalai, qaqari, nuku. Vakasasa: siwa boto, qoli lawa, dakai. Vakariri: riri, tavuteke, vakalolo. Kena yaga: kana, voliaki. Luvena bula i na: bajina.

Talanoa: Ika sau levu ni volitaki, i rauta ni ($50. Ni dua na kilo).
They sell for a high price, as much as $50 per kg.

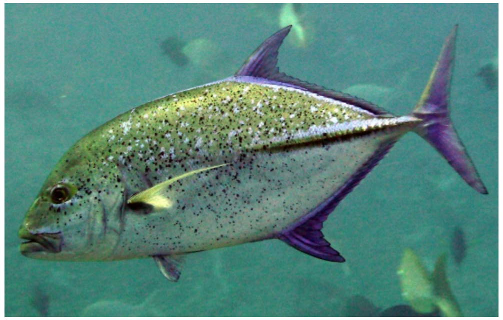
Saqa
Caranx ignobilis
Giant trevally
Kena balavu: 120 cm.
Yavuni: 1,2,3+,10+.
Bula i na: takali, cakau levu, daveta. I sa bau: wadu, Δ↑. Kania: ika lalai, lase bula. Vakasasa: dakai, siwa boto, qoli lawa. Vakariri: GAGA:C, riri, tavuteke, baovi. Kena yaga: kana, volitaki. Luvena bula i na: takali.

Talanoa: Dau je magiji tale ga na ika ke me je kena i lava na suli, vata na uvi. Dau jiko na turaga va bibi i Nakasaleka, vake i rawa mai na ika ke dau kau me je kena. I ra vai tataba tu na ika ke na saqa: saqa, ika ni sevusevu, civicivi, takataka.

Saqa are special event food for *magiji* (feasts – *magiti* in Bauan) and *soqo* (meetings) in Nakasaleka along with *uvi* (breadfruit) and *suli* (taro). *Saqa* is a chiefly food and if a chief is in the village, a *saqa* will be given to him. The *saqa* chase the *vaya* in lagoons where they can both be caught in the nets. Four kinds of *saqa*, from biggest to smallest: *saqa*, *ika ni sevusevu*, *civicivi*, and *takataka*.

ZA19 **Ogo**

Kena balavu: 50 cm. Yavuni: 3+. Bula i na: takali. I sa bau: vica, Δ↓. Kania: lase bula, lumi. Vakasasa: siwa boto, qoli lawa. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki. **Talanoa:** I dau vikaji. This one bites.

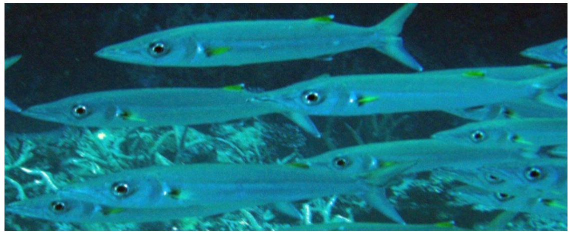


Saqa ni takali
Caranx melampygus
Bluefin trevally
Kena balavu: 92 cm.
Yavuni: 10+.
Bula i na: takali, bajina.
I sa bau: wadu, Δ↑.
Kania: ika lalai, qaqari, lumi. Vakasasa: siwa boto, qoli lawa. Vakariri: GAGA:C, riri, baovi. Kena yaga: kana, volitaki, valagi. Yaloka: 3, 8-10. I bula o kia ina 50 m. na kena nubu. This kind is common in Kadavu at depths down to at least 50 metres.

Saqa
Caranx sp.
Trevally
Kena balavu: 33 cm.
Kania: ika lailai.
Vakasasa: siwa boto, qoli lawa, vucu. Kena yaga: kana, volitaki.

Saqa jina
Carangoides oblongus
Coachwhip Trevally
I sa bau: baji ni vi jirijiri

Saqa balavu
Caranx sp.
Trevally



Toutou
Sphyraena fosteri
Bigeye Barracuda
Kena balavu: 55 cm.
Yavuni: 10+.
Bula i na: takali, cakau vanua. I sa bau: iso, Δ↑. Kania: ika lalai, vujia. Vakasasa: siwa boto, siwa sina, qoli lawa. Vakariri: riri. Kena yaga: kana, volitaki. Yaloka: 5. Luvena bula i na: baji ni vi jirijiri.
Talanoa: Na ika ke i vake toka na oqo ia lailai vei ruka na toutou ika kana vinaka. I je ika totola ni lako. Dau je i kata toka ni vaya vata i so tale na ika lalai.
Toutou are like *oqo*, but smaller. They chase the *vaya* and get caught in the nets. *Toutou* are quick to swim away when you raise a speargun. They are easy to slice for good lunch food.

Tuna
Thunnus albacores
Kena balavu: 119 cm.
Yavuni: 10+. Bula i na: takali. I sa bau: iso, Δ↑. Kania: ika lalai, vuso ni ua. Vakasasa: siwa boto, vakasavuba. Vakariri: tavuteke, baovi. Kena yaga: kana, volitaki. Luvena bula i na: takali.
Talanoa: I na gauna i mada i mino ni ra dau kania va levu na tuna baleta ni je ika ni Dakunituba. Na gauna ke da dau gaca tu ga i na makete i Suva, io sa mino so ga i na levu sara.
Many years ago, few people ate tuna because tuna lived outside the reef. More recently tuna were often found in the Suva market, but today they are not so common there.

Utouto
Aprion viriscens
Green jobfish
Kena balavu: 74 cm.
Yavuni: 1,2,10. Bula i na: cakau levu, bajina. I sa bau: wadu. Kania: ika lalai, vujia. Vakasasa: siwa boto. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki.

Vilu
Carangoides bajad
Orange-spotted trevally
Kena balavu: 90 cm. Yavuni: 1,2. Bula i na: cakau levu, takali, jiro. I sa bau: wadu, Δ↑. Kania: ika lalai, laselase, momoci. Vakasasa: siwa boto, qoli lawa, dakai. Vakariri: riri, vakalolo, tavuteke. Kena yaga: kana, volitaki.

Walu
Scomberomorus commerson
Narrow Barred Spanish Mackerel
Kena balavu: 124 cm.
Yavuni: 10+.
Bula i na: takali, daveta. I sa bau: vica, Δ↓. Kania: ika lalai.
Vakasasa: siwa boto, dakai. Vakariri: tavuteke, baovi.
Kena yaga: kana, volitaki. Yaloka: 12-2.

Talanoa: Na ika ke sa bau dua toka na ika kana vinaka vake i tavuteke qai valolo, ia i dua toka na ika dre kaukaua. Dau tu na kenai tukuni ni ra dau muria cake mai na ika lalai da dau siwata, kora kacei ra qai dau lade mai loma ni waqa kora ga ra lade tale i wai, bera ga na liga, da mino mada ga ni tara rawa nona bui ni sa lade lesu tale i wai.

Walu are a popular fish to eat and just one fish can feed many people. They fight hard when hooked on a handline. People have stories about *walu* jumping into boats, as they follw smaller fish caught on lines and how *walu* can jump out of boats after they have been landed. One man dove in after an escaping *walu*, but only touched the tail of the escaping fish.

Salala

Vacamacala taumada

Na ika ke na salala i dau bula tu i na waitui vicurumaki, ka ra dau yavuni me rauta tu ni le dua na drau. Dua toka na baca maleka, vabibi me je baca bula ka dau rawata sara mai na ika lelevu.

These fish swim in fast currents in large groups, often in the 100s. They may follow tides into rivers. *Salala* or fusiliers are good bait fish, when used as chunks on hooks, or as live bait with hooks placed inside to attract larger fish. Some people call them *ereni*, which means good bait.

Salala
Caesio sp.
Fusilier
Kena balavu: 27 cm.
Yavuni: 10+.
Bula i na: takali, lomaloma, bajina. I sa bau: iso, Δ↑. Kania: ika lalai, vuso ni ua Vakasasa: qoli lawa, siwa boto. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki.

Salala
Caesio tere
Blue and yellow Fusilier
Kena balavu: 33cm. Yavuni: 10+. Bula i na: cakau levu, yamotu, bajina. I sa bau: wadu, Δ↑. Kania: lumi, uraura. Vakasasa: qoli lawa. Vakariri: baovi. Kena yaga: kana, volitaki, baca.

Talanoa: Na gauna ni driwadriwa kacei na nodra gauna ni valuveni, na vula toka ko Octova. They give birth in the winter months of September and October.

F4 ?
Pteroceasio pissang
Ruddy Fusilier
Kena balavu: 27 cm. Bula i na: takali. I sa bau: wadu, Δ↑. Kania: nuku, vujia. Vakasasa: qoli lawa. Vakariri: vakalolo, riri. Kena yaga: kana, volitaki. Yaloka: 11-1.

Salala
Pteroceasio tile.
Bluestreak Fusilier
Kena balavu: 30 cm. Yavuni: 10+. Bula i na: takali, bajina, cakau levu. I sa bau: Δ→. Kania: nuku, obe, vuso ni ua. Vakasasa: qoli lawa, siwa boto. Vakariri: tavuteke. Kena yaga: kana, volitaki.

Baji lumi, kakarawa, kalia, kamotu, lauwi, sovi ni kie, ulavi, ulurua

Vacamacala taumada

I 25% dau kania na yate ni ika kene, i so dau kania droka, me ra dau koda mai waqa me jei na sigalevu. I ra na ika ke ra dau kana lase mate, ra qai dau curu i nodra qara ra qai mama tu ke na kedra kakana. I dua na ere qaqa i jiko i nona i jilojilo tei na i tagitagi ni ika. I levu na ika nira kakana tu ga jilo ma sara, ia na ika ke na kakarawa i mino, o ikia i kajia qai dau lai dadavo tu me kania tale i na nona tilo macedru. I kia i qaqa vana vatu.

Na gauna ra dau via moce ke sa ra qai dau biuta mai na nodra weli me vake tu na taunamu. Ra tukuna na dau nunu ni ika rawarawa ni da vana i na bogi. Io i so tukuna ni je laba baleta ni ra moce tu da qai vanai ira.

Members of this group of fish all have a special organ inside, about 25% of the fish length, called the *yate*. Everyone wants to eat the *yate*, some eat it raw in the boat for lunch. In the throat is an organ called the *tilo ma cedru*. It is hard like a rock and deals with the coral that these fish take in. Most fish eat food and swallow it but parrotfish bite off food and digest it in the *tilo ma cedru*.

They are an easy fish to catch. At night these fish cover themselves with a white jelly like a mosquito net and sleep in holes in the reef in piles of fish. Some people say it is wrong to spear them at night while they sleep. It is like murder. Spear diving at night with torches is illegal now in Kadavu.

*Na ika ke i vaituvatuva na nona bula i dau lako curuma iso na vivi sau me vake na nona roka vata na kenai bulibuli. **JP**: se, **IP**: luve ni ika, **TP**: ika luve ni qase.*

*Note: These fish go through changes in shape and colour as they grow. Terms used are: **JP**: juvenile phase, **IP**: intermediate phase **TP**: terminal or adult phase.*

Baji lumi
Calotomus carolinus
Stareye parrotfish
Kena balavu: 47 cm.
Yavuni: 3+,10+.
Bula i na: cakau levu, cakau vanua. I sa bau: wadu, Δ↑. Kania: nuku, cakau mate. Vakasasa: qoli lawa, dakai, vucu. Vakariri: vakalolo, vesa. Kena yaga: kana, volitaki, baca.

Talanoa: Dau mai wawa vasucu tu i na yamotu. *Bajilumi* in breeding season stay close to *yamotu* (coral patches) and wait for the right time.

Kakarawa
Chlorurus bleekeri
Bleeker's parrotfish
Kena balavu: 42 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu, bajina. I sa bau: wadu, Δ↑.

Kania: nuku, lumi. Vakasasa: qoli lawa, dakai. Vakariri: riri, baovi, kokoda. Kena yaga: kana, volitaki. Yaloka: 2-4. Luvena bula i na: laselase.

Talanoa: Kakarawa: roka karakarawa vata na drokadroka. Kamotu: roka lokaloka vata na loaloa volavola. *Kakarawa* are the colours *karakarawa* (blue or blue-green) and *drokadroka* (green), *kamotu* are *lokaloka* (purple) and *loaloa volavola* (black with white spots, stripes, or markings).

Kakarawa
Chlorurus sp.
Parrotfish
Kena balavu: 43 cm.
Yavuni: 1,3+,10+.
Bula i na: cakau levu. Bajina, yamotu. I sa bau: iso, Δ→. Kania: nuku, lumi, vujia. Vakasasa: qoli lawa, vucu. Vakariri: vakalolo, tavuteke, vesa. Kena yaga: kana, volitaki. Yaloka: 10-12.

Kakarawa
Scarus frenatus
Bridled parrotfish
Kena balavu: 31 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu, cakau vanua.
I sa bau: wadu, Δ↑.
Kania: lumi. Vakasasa: qoli lawa, dakai, vucu. Vakariri: baovi, tavuteke. Kena yaga: kana, volitaki.

Talanoa: I na gauna i mada dau tu na kenai tukuni, ni ru ma visau ulu na kaka vata na kakarawa. Na kakarawa i tautauvata tu vata na kaka na roka i jiko vua. Roka karakarawa, drokadroka, damudamu. Na ika kora i vake na kakarawa, me vake na kamotu, ra dau volia valevu mai colo, baleta ni rairai vinaka, qai va lewe.
In the olden days the parrotfish changed heads with the parrot and that is why we call this fish *kakarawa* and the parrot *kaka*. The *kakarawa* colour is the most similar to the bright blue, green, and red colours of the *kaka*. Thus the name, as compared to similar shaped fish, such as *kamotu*. People who live inland like to buy *kakarawa* because of the nice colour on the body.

Kakarawa
Scarus niger
Swarthy parrotfish
Kena balavu: 40 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu, cakau vanua, bajina. I sa bau: wadu, Δ↑. Kania: nuku, vujia. Vakasasa: qoli lawa, dakai, vucu. Vakariri: tavuteke, baovi, riri. Kena yaga: kana, volitaki. Yaloka: 9-12. Luvena bula i na: yamotu.

Talanoa: Ra dau mai va luveni i vi cakacakau, kora ra qai dau mai gaca tale. When they reproduce, they put eggs in the coral and come back later to check on them.

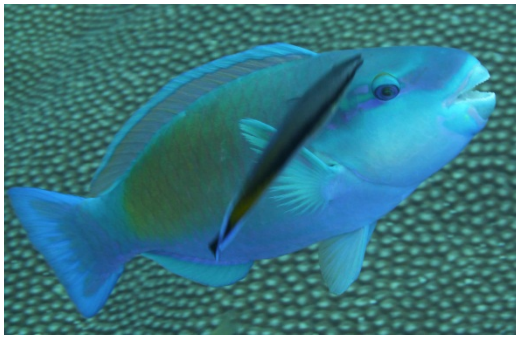
Kakarawa
Scarus sordidus
Kena balavu: 28 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu, cakau vanua. I sa bau: wadu, Δ↑. Kania: lumi, vujia, lase mate. Vakasasa: qoli lawa, dakai, vucu. Vakariri: riri, vakalolo, kokoda. Kena yaga: kana, volitaki.

Kakarawa
Scarus schlegeli TP
Yellowbar parrotfish
Kena balavu: 35 cm.
Yavuni:2,3+,10+.
Bula i na: cakau levu, cakau vanua. I sa bau: wadu, Δ↑. Kania: nuku, lase mate. Vakasasa: qoli lawa, dakai, vucu.
Vakariri: vakalolo, riri, vesa. Kena yaga: kana, volitaki. Yaloka: 1-3.

Kakarawa
Scarus spinus
Greensnout Parrotfish
Kena balavu: 43 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu. Bajina. I sa bau: iso, Δ↑. Kania: lumi, nuku. Vakasasa: qoli lawa, dakai, vucu. Vakariri: tavuteke, qinu. Kena yaga: kana, volitaki. Yaloka: 1-3. Luvena bula i na: nukunuku.

Kakarawa
Scarus oviceps
Dark-capped parrotfish TP
Kena balavu: 35 cm.
Yavuni:1,3,10+.
Bula i na: cakau levu, cakau vanua, yamotu. I sa bau: wadu, Δ↑. Kania: nuku, vujia, cakau mate. Vakasasa: qoli lawa, dakai, vucu. Vakariri: vakalolo, tavuteke. Kena yaga: kana, volitaki, baca. Yaloka: 9-12.

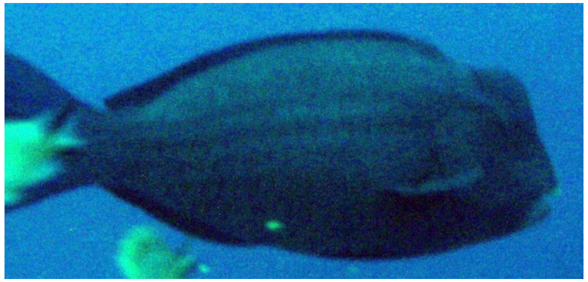
Talanoa: Ra dau maroroya vinaka ni luvedra na ika ke. Dau jiko ga vata i kia na luvena i loma ni qara sa qai dau wavoki tu i gusu ni qara na tamana. Ra dau vasavasavatakina na duka ra dau kabita tu na lase. They go in groups in breeding season, keeping small ones in the middle surrounded by females and flanked by males. They clean all the dirt from the reef and eat things that hurt the reef.



Kakarawa
Chlorurus sp.
Parrotfish
(with cleaner wrasse)
Kena balavu: 38 cm.
Yavuni: 1,3+,10+.

Bula i na: cakau levu, bajina. I sa bau: wadu, Δ→. Kania: nuku, lumi, lase mate. Vakasasa: qoli lawa, dakai, vucu. Vakariri: riri, vesa. Kena yaga: kana, volitaki.

Talanoa: I tautauvata tu kei na kakarawa na nodru roka. The colour and shape of mouth distinguish *kakarawa*.

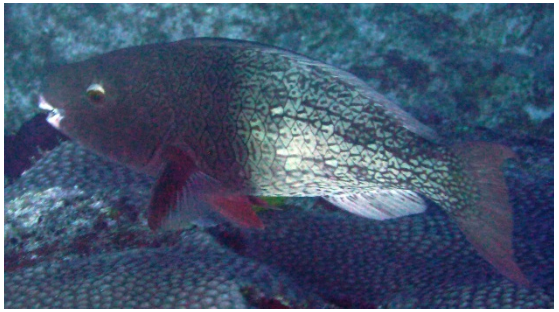


Kalia
Bolbometopon muricatum
Bumphead Parrotfish
Kena balavu: 135 cm.
Yavuni: 1,3+,10+.
Bula i na: takali, daveta. I sa bau: vica. Kania: nuku, lumi, bulewa. Vakasasa: dakai. Vakariri: baovi, riri. Kena yaga: kana, volitaki. Yaloka: 7-9.

Kamotu
Scarus sp.
Kena balavu: 44 cm. Yavuni: 1,10+. Bula i na: cakau vanua, cakau levu. I sa bau: iso, Δ↑. Kania: nuku, cakau mate, lumi. Vakasasa: qoli lawa, dakai, vucu. Vakariri: tavuteke. Kena yaga: kana, volitaki. Yaloka: 10-1.

Kamotu
Scarus sp.
Parrotfish
Kana dela ni wai.
Surface feeding

Kamotu
Scarus schlegeli IP
Yellowbar parrotfish IP
Kena balavu: 23 cm.
Yavuni: 10+.
Bula i na: cakau levu, cakau vanua, yamotu. I sa bau: iso, Δ↑. Kania: lumi, lase mate, obe. Vakasasa: qoli lawa, dakai. Vakariri: vakalolo. Kena yaga: kana, volitaki. Yaloka: 7-11. Luvena bula i na: dela ni cakua.



Kamotu damu
Scarus frenatus
Bridled parrotfish IP
Kena balavu: 37 cm.
Yavuni: 1,2,10+.
Bula i na: cakau levu, daveta, bajina.

I sa bau: iso, Δ↑. Kania: lumi, nuku.Vakasasa: qoli lawa, dakai, vucu. Vakariri: baovi, tavuteke. Kena yaga: kana, volitaki. Yaloka: 9-12.

Kamotu dromodromo
Scarus dimidiatus
Yellow-barred parrotfish
Kena balavu: 35 cm.
Yavuni: 1,3+,10+.
Bula i na: cakau levu, bajina.
I sa bau: wadu, Δ↑.
Kania: nuku, lumi, lase mate. Vakasasa: qoli lawa, dakai, vucu. Vakariri: vakalolo, tavuteke, riri. Kena yaga: kana, volitaki, baca. Yaloka: 11-1.

Talanoa: Ra dau lako cake mai i na 1-2 mita mera mai valuveni kora kacei ra qai dau lesu tale i cakau levu. When they have eggs, they are found in 1-2 metres of water on the main reef. Babies live in the breaks on the main reef.

Kamotu loaloa
Scarus sordidus IP
Bullethead parrotfish
Kena balavu: 27 cm.
Yavuni: 1,2,3+,10+. Bula i na: cakau levu, laselase, bajina. I sa bau: wadu, Δ↑. Kania: nuku, vujia, lumi, Vakasasa: qoli lawa, dakai vucu. Vakariri: baovi. Kena yaga: kana, volitaki. Yaloka: 2-4.

Lauwi
Cetoscarus bicolor TP
Bicolor parrotfish
Kena balavu: 44 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu, cakau vanua, baji kai lili, I sa bau: wadu, Δ↑. Kania: nuku, cakau mate. Vakasasa: qoli lawa. Dakai, vucu. Vakariri: suruwa lolo, vakalolo. Kena yaga: kana volitaki. Yaloko: 3-6.

Sovi ni kie, soni ni kie.
Cetoscarus bicolor IP
Bicolor parrotfish
Kena balavu: 48 cm.
Yavuni: 2,3+.
Bula i na: cakau levu, yamotu, bajina. I sa bau: iso. Kania: nuku, lumi. Vakasasa: qoli lawa, dakai, vucu. Vakariri: tavuteke, suruwa lolo, vakalolo. Kena yaga: kana, volitaki. Yaloka: 10-1.

Talanoa: I mada se je kera ila na soni ni kie, i daidai sa je sovi ni kie. Soni ni kie: Na kena balebale ni kau laivi na voto ni kie. Na sovi ni kie i via vake tu na roka ni kie. *Soni ni kie* is the older name, but today most people use *sovi ni kie*. In Kadavu, *kie*, is the name for the *Pandanus* plant, (*voivoi* in Bauan) used for making mats. *Soni* is action of removing the *voto ni kie* (spine strip) from the *kie* before boiling the leaves. After this fish is cooked the scales form a dark / light pattern that resembles the cross hatch pattern of a woven mat.

Ulavi

Hipposcarus longiceps

Pacific longnose parrotfish

Kena balavu: 43 cm.

Yavuni: 1,2,3+,10+.

Bula i na: cakau levu, bajina, yamotu. I sa bau: wadu, Δ→. Kania: lumi, lase mate. Vakasasa: qoli lawa, dakai, vucu. Vakariri: vakalolo, tavuteke. Kena yaga: kana, volitaki. Yaloka: 8-11.

Ulurua

Chlorurus microhinus TP

Steephead parrotfish

Kena balavu: 52 cm.

Yavuni: 1,3+,10+.

Bula i na: cakau levu, nukunuku, cakau vanua. I sa bau: wadu, Δ→. Kania: nuku, lumi. Vakasasa: qoli lawa, dakai, vucu. Vakariri: riri, tavuteke. Kena yaga: kana volitaki, baca. Luvena bula i na: yamotu.

Ganogano

Nabukelevu name for *kamotu*.

Note: Nabukelevu is the western-most district of Kadavu where a dialect of Western Fijian is spoken, in contrast with the Eastern Fijian dialects used in the the other Kadavu districts.

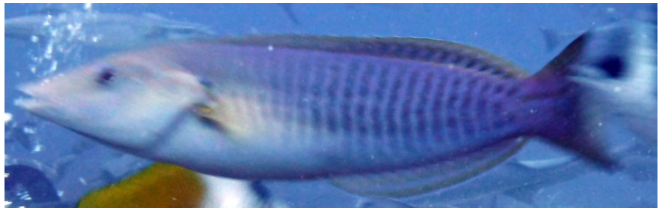
Baba, babari, belo, draunikura, drevu, labe, varaniu, varivoce

Baba

Kena balavu: 35 cm. Yavuni: 3+. Bula i na: cakau levu, cakau vanua. I sa bau: wadu, Δ↓. Kania: ika lalai, laselase, vuso ni ua. Vakasasa: qoli lawa, motu. Vakariri: tatavu, tavuteke, riri. Kena yaga: kana.
Talanoa: Ika maloku qai yavuni. Ika gusu balavu qai dau vikaji. Quiet mannered fish that goes in groups. Very long mouth that gives a painful bite.

Baba
Aulostomus chinensis
Trumpetfish
Kena balavu: 60 cm.
Bula i na: cakau levu, cakau vanua. I sa bau: wadu, Δ→.
Kania: ika lalai.
Kena yaga: kana, volitaki.
Talanoa: Na baba i dau lako tu vaka malua, i toso i mada ka rawa ni toso i muri me vakatagatakina na nona bui. These fish go backwards and forwards by using their tail without turning around.

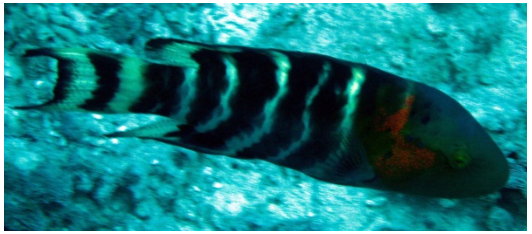
Baba ni verata
Oxychelinius digrammus
Lined cheek wrasse
Kena balavu: 26 cm. Yavuni: 1,10+. Bula i na: laselase,bajina. I sa bau: wadu, Δ↑. Kania: nuku cakau, obe. Vakasasa: siwa boto, vucu. Vakariri: riri, vakalolo, tatavu. Kena yaga: kana, baca. Yaloka: 9-12. Luvena bula i na: laselase.
Talanoa: E ra dau kania na momoci. It eats small prawns.



Baba ni verata, drevu
Hologymnosus doliatus IP
Pastel ring wrasse IP
Kena balavu: 30 cm. Yavuni: 1. Bula i na: bajina, cakau vanua, nukunuku. I sa bau: Kania: nuku. Vakasasa: siwa boto, dakai. Vakariri: riri. Kena yaga: kana, volitaki, baca. Yaloka: 9-12.
Talanoa: I na gauna e dau vakayaloka kene, iko rawa ni gaci ira valevu i na vanua caka levu. I ika vinaka ni baca me dau musu laivi mai na lewena. They are found on the reef in the coral during breeding season, then they move outside the reef. They make good bait for hooks with their firm flesh.

Belo
Epibulus insidiator
Slingjaw wrasse
Kena balavu: 30 cm.
Yavuni: 1,2,10. Bula i na: cakau levu, cakau vanua, yamotu. I sa bau: iso, Δ↓. Kania: cakau mate, obe. Vakasasa: dakai, siwa boto, vucu. Vakariri: tavuteke, vakalolo. Kena yaga: kana, baca.
Talanoa: I rawa ni vakabalavutakina na gusuna. It extends its nose and mouth at times.

Draunikura
Chelinus undulatus JP
Napolean wrasse
Kena balavu: 21 cm.
Yavuni: 1,2.
Bula i na: bajina, yamotu, I sa bau: wadu, Δ↑. Kania: lase mate, vujia, nama. Vakasasa: siwa boto, siwa kolokolo, siwa nunu. Vakariri: vakalolo, tavuteke. Kena yaga: kana, volitaki. Yaloka: 9-11. Luvena bula i na: bajina.



Draunikura
Hemigymnus fasciatus
Barred thicklip
Kena balavu: 56 cm.
Yavuni: 1,2.
Bula i na: takali, baji kai lili. I sa bau: vica. Kania: ika lalai, obe, lase bula. Vakasasa: siwa boto, qoli lawa. Vakariri: riri, baovi. Kena yaga: kana, volitaki. Yaloka: 9-1. Luvena bula i na: baji kai lili.
Talanoa: E ra dau vigaci dredre, ka da rawa ni kauti ira ga mai ni vakayagataki na siwa**.** You do not often see this fish but you can easily catch them using a fishing line.

Drevu (A)
Anampses meleagrides JP
Yellowtail wrasse
Kena balavu: 25 cm.
Yavuni: 2,3+.
Bula i na: lomaloma, baji ni vi jirijiri. I sa bau: iso, Δ↑. Kania: ika lalai, nuku.
Vakasasa: siwa boto. Vakariri: riri. Kena yaga: kana, volitaki.
Talanoa: I ika sisisi roka vinaka qai dau vikaji. Very smooth skin and they can bite you.

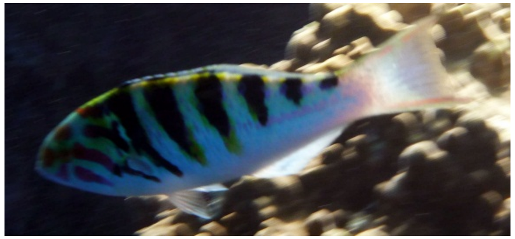
Drevu
Thalassoma lunare
Crescent wrasse
Kena balavu: 21 cm.
Yavuni: 3+,10+.
Bula i na: cakau levu,

bajina. I sa bau: vica, Δ↑. Kania: ika lalai, obe, lase mate. Vakasasa: qoli lawa. Vakariri: baovi, riri. Kena yaga: kana.

Talanoa: I so rai tukuna vake ni vake na i bulibuli ni pallmall**.** Some people call it, pall mall, for its cigarette-like shape.

Drevu
Halichoeres hortulanus IP
Checkerboard wrasse IP
Kena balavu: 28 cm.
Yavuni: 1,2,10+.
Bula i na: bajina, cakau levu, nukunuku. I sa bau: iso, Δ→. Kania: nuku, cakau mate. Vakasasa: siwa boto, vucu. Vakariri: tatavu, riri. Kena yaga: kana, volitaki. Luvena bula i na: nukunuku.

Talanoa: I dau vunitakini kia i loma ni nuku. Ika varivari dredre. They often hide in the sand. It is hard to get the scales off.



Drevu
Thalasoma hardwicke
Sixbar Wrasse
Kena balavu: 46 cm.
Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua, yamotu. I sa bau: wadu, Δ→. Kania: qaqari, lumi. Vakasasa: siwa boto, siwa kolo. Vakariri: vakalolo, riri, tatavu. Kena yaga: kana, volitaki, baca.

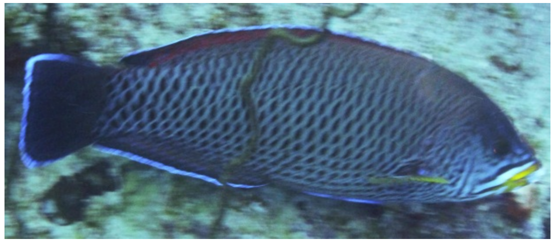
Talanoa: Na luvena i dau tinana jiko ga. Small ones are seen following a big one which must be the mother.

Drevu (A)
Parracirrhites arcatus
Arc-eye hawk fish
Yavuni: 1. Bula i na: cakau levu, yamotu, bajina. I sa bau: iso, Δ↑. Kania: lumi, ika lalai. Vakasasa: vucu. Vakariri: GAGA:C, baovi, riri. Kena yaga: kana, volitaki. Yaloka: 8

Drevu dromodro
Melacanthus oualansis
Fiji fangblenny
Kena balavu: 20 cm.
I sa bau: vica. Kania: vujia, obe.
Vakariri: baovi

? (A)
Nemateleotris magnifica
Firefish
Bula i na: cakau levu. I sa bau: iso. Kania: ika lalai, nuku, bulewa. Vakasasa: qoli lawa. Vakariri: baovi, vakalolo. Kena yaga: kana.

Talanoa: I ra valuveni i loma ni qara. Young ones live in caves.

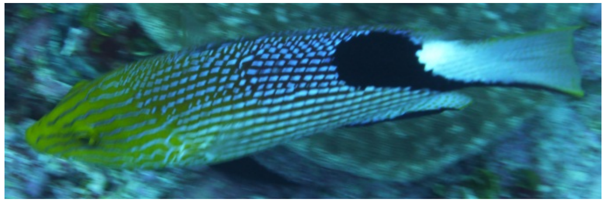


Drevu ni cakau nubu, labe
Anampses sp.
Wrasse
Kena balavu: 32 cm.
Yavuni: 1,2.
Bula i na: nukunuku, cakau levu. I sa bau: iso, Δ↑. Kania: nuku, lumi, obe. Vakasasa: qoli lawa, siwa boto. Vakariri: baovi, riri. Kena yaga: kana, volitaki. Yaloka: 10-12.
Talanoa: I dau tu vata i ira na yavuni kakarawa, ina jiko ga ke i dua na labe. Often seen with a group of *kakarawa*, but only one *labe*. They bite hard.

Labe
Anampses caeruleopunctatus IP
Blue-spotted wrasse
Kena balavu: 39 cm.
Yavuni: 1,2,3+.
Bula i na: cakau levu, cakau vanua. I sa bau: iso. Kania: nuku. Vakasasa: qoli lawa, vucu. Vakariri: riri, baovi, tavuteke, Kena yaga: kana, volitaki. Yaloka: 8-1.

Labe, baba
Gomphosus varius
Bird wrasse
Kena balavu: 17 cm.
Yavuni: 1,3+.
Bula i na: cakau vanua, ruki ni cakau, baji kai lili. I sa bau: iso, Δ↓. Kania: nuku. Vakasasa: qoli lawa. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki.
Talanoa: Na baba i gusu balavu mo qarauna me kua ni kaji iko. *Baba* is green and extends its snout and will try and bite you when you take it out of the water in a net.

Labe, babe ni verata
Kena balavu: 17 cm.
Yavuni: 1,2. Bula i na: yamotu, cakau vanua, dela ni cakau. I sa bau: wadu, Δ↑. Kania: ika lalai, vujia, qaqari. Vakasasa: siwa boto, siwa kolokolo. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki, baca. Luvena bula i na: bajina.



Varaniu
Bodianus loxozonus
Blackfin hogfish
Kena balavu: 32 cm.
Yavuni: 1,2,3+,10+.
Bula i na: bajina, cakau levu, baji kai lili. I sa bau: wadu, Δ↑. Kania: ika lalai, nuku, laselase. Vakasasa: siwa boto. Vakariri: riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: 1-3.

Varivoce
Chelinus undulatus
Napolean wrasse
Kena balavu: 160 cm.
Yavuni: 1,3+.
Bula i na: cakau levu, takali, daveta. I sa bau: vica, Δ↓. Kania: ika lalai, vuso ni ua, laselase. Vakasasa: dakai. Vakariri: vakalolo, tavuteke, riri, miji. Kena yaga: kana, volitaki. Yaloka: 8-12.

Talanoa: Na raunikura ni sivia i 70 cm., sa je varivoce. Sa tubu jiko vakamalua na kedraiwilwili baleta ni sa vakatabui jiko ina tukuna jiko na kena levu mai na dali dau tu i nona taku. I mada sera dau vana na qase na varivoce rauta ni ya 2-3 na kena dali i sa dredre sara i daidai.

Drau ni kura that grow past 70 cm become *varivoce*. It is illegal now to kill *varivoce* and the population is growing. In the past, these big slow moving fish were easy to spear. One rope-like bump grows on top of the head as they mature. Two ropes is a well grown fish and three ropes is full grown. Our fathers used to catch them with 2 and 3 ropes but no more. Varivoce breeds in passages after the time of the kawakawa.

Donu, droudrouwa, kawakawa, senigaragara, seravua, teiteimolo

Vacamacala taumada

Ke na ika vakamareqeti i na tikina ko Nakasaleka, baleta ni dau mai valuveni jiko i na nodra daveta na ika ke na kawakawa. Na vula ko Julai ki na Okosita na gauna ra dau sota vata mai na kawakawa mai na vi yasai Kadavu mera mai vakaluveni i daveta, ra dau mai valatoka na tagane i na qara ra toka ke na yalewa, na vanua kui ra dau tiko ke mera vakayaloka ke, dau biuta mai na nona yaloka na yalewa kora sa qai soto vata na nodru wai sa qai ciri va ra kui na vanua ga sa qai tauke na yaloka kaca bote, sa qai lako mai na luve ni ika.

Na tabana ni qoliqoli ru sa dau cakacaka jiko vata kei na jikina ko Nakasaleka me baleta na qarauni vinaka ni ika ke. Na ika ke dau gaga ina so na vanua.

These fish are an important part of the diet of Nakasaleka people. Known as groupers in English, the different kinds live all over the reef and lagoon. At certain times of year, some kinds come together in some reef passages to reproduce in what is called a spawning aggregation. Here the males fight to make territories in or near a reef passage with strong currents. When the time is right, males swim to join with the females to mix sperm with eggs. The current spreads the fertilized eggs all over the reef and lagoon where after a month the larvae settle on the bottom to become small fish.

Nakasaleka people have worked together with marine conservation organizations to help protect the spawning areas of these fishes with some success. Note that some types of groupers become poisonous to eat at certain times of year in certain places.

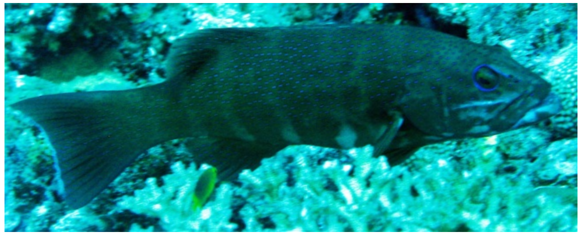
Donu
Plectropomus laevis
Blacksaddle coral grouper
Kena balavu: 82 cm.
Yavuni: 1,2.

Bula i na: cakau levu bajina. I sa bau: iso, Δ→. Kania: ika lalai, nuku. Vakasasa: dakai, siwa boto. Vakariri: GAGA:C, baovi, riri. Kena yaga: kana, volitaki. Yaloka: 8-11.

Donu:
kala / colour #2
Talanoa: Ra dau vasucu i na vula ko Julai ki na vula ko Seviteba. Ira dau sarava tale tu ga na saravanua. Na ika ke i dau gaga sara va levu vake ko mino ni kila na jila tei ko variriga va baci, i so ra dau kania ia i so ra mino sara ga ni dau kania, dau tukuni tu vake mo variriga vata kei na sede, tei na niu vake i veveka na sede tei loaloa na niu kacei i gaga tei vake sa buta tu me vigaci

ga vake rova na lago i mino ni gaga vake mino ni rova kacei i gaga. Dau tukuna ko ira noda qase ni se bera niko kania na ika ke mo tatau rawa ruka nomu vitivani.
They gather in spawning aggregations between July and September. These large fish are often poisonous to eat. Some people do not eat them at all, others use different tests such as boiling the fish with a real silver coin in the pot to see if it tarnishes black or brown as a sign of poison. But, today in Fiji it is hard to find a real silver coin. Another method to detect poison is to leave the fish laying out and watch to see if flies land on it. People say that if no flies land on the fish it is poisonous. People say that before you eat this fish, you should kiss your wife and family goodbye as you may not see them again!

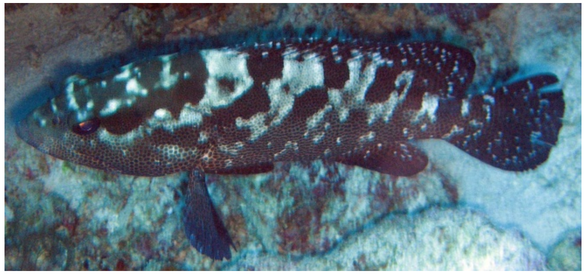
Droudrouwa
Plectropomus areolatus
Squaretail coral grouper
Kena balavu: 73 cm.
Bula i na: cakau levu, bajina. I sa bau: iso, Δ→. Kania: ika lalai, qaqari, obe. Vakasasa: dakai, siwa boto. Vakariri: GAGA:C, baovi, riri. Kena yaga: kana, volitaki. Yaloka: 2-4.
Talanoa: Dau visautakina na kena roka, ia i so na vanua i dau gaga. This one changes colour after you catch it. Caught in some places it can be poisonous.



Droudrouwa
Plectropomus maculatus
Spotted coral grouper
Kena balavu: 72 cm.
Yavuni: 1. Bula i na: takali, bajina. I sa bau: wadu, Δ↑. Kania: ika lalai, nuku, vujia, Vakasasa: dakai, siwa boto, vucu. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki. Yaloka: 8.

Droudrouwa damu
Plectropomus leopardus
Leopard coral grouper
Kena balavu: 71 cm.
Yavuni: 1,2,3+.
Bula i na: cakau levu, takali, bajina. I sa bau: vica, Δ↓. Kania: ika lalai, qaqari, uraura. Vakasasa: dakai, siwa boto. Vakariri: GAGA:C, riri, tavuteke. Kena yaga: kana, volitaki. Yaloka: 7-11.
Talanoa: Niko sa toboka rawa i dua kacei sa ko vadeitakina jiko nina levu tale ko na rawata. Da dau rawata mai va levu ni da laki (*jig*) ke i dua na mataqali siwa vou, ka dau ika dre qaqa tale ga. Na roka damudamu da dau siwata va levu, kia i roka kuvui dau vanai va na dakai ni nunu. Dau vayagataki na tua ni nona balu me jei toci ni kie.

Use a jig to catch these fish, but they are strong and hard to pull up on a hand line. When you catch one, you will often catch more. There is a red kind in the deep sea that is best caught by handline and a brown one that can be speared on a free dive. The cheekspine can be used to slice *kie* (voivoi, pandanus) for mats.



Kawakawa jina
Epinephelus polyphekadion
Camouflage grouper
Kena balavu: 74 cm.
Yavuni: 1.
Bula i na: yamotu daveta, cakau levu. I sa bau: iso, Δ→. Kania: ika lalai, sulua. Vakasasa: dakai, siwa boto. Vakariri: riri, vakalolo, tavuteke. Kena yaga: kana, volitaki, baca. Yaloka: 7-8.
Talanoa: Na ika ke i dau kana qaqari valevu. These fish eat many small crabs.

Kawakawa balotu
Anyperodon leucogrammicus
Slender grouper
Kena balavu: 44 cm.
Bula i na: daveta, baji ni vi jirijiri. I sa bau: iso, Δ→, Kania: ika lalai, vuso ni ua. Vakasasa: siwa boto, dakai. Vakariri: riri. Kena yaga: kana, volitaki. Yaloka: 9-11.

Talanoa: Na vuni kena va i lani tu na kawakawa balotu baleta ni roka vata tu na balotu ni niu, io i balavu toka ko kia mai vei ira na vo ni kawakawa. Kawakawa balotu is named because it's colour and shape resemble a coconut leaf stem in the water.

Kawakawa damu
Cephalopholis urodeta
Flagtail grouper
Kena balavu: 40 cm.
Bula i na: cakau levu, loma ni vi jirijiri. I sa bau: vica, Δ↓. Vakariri: baovi. Kena yaga: kana, baca.

Kawakawa matanisiga
Epinephelus caeruleopunctatus
White spotted grouper
Kena balavu: 52 cm.
Yavuni: 1,10+. Bula i na: cakau levu, daveta. I sa bau: iso, Δ↓. Kania: ika lalai, lumi. Vakasasa: dakai, siwa boto, vucu. Vakariri: riri. Kena yaga: kana, volitaki. Yaloka: 8-9.
Talanoa: Na ika maloku qai dau lako tu ga va malua, rawarawa sara nona vivana dau vatakila na vasucu ni ika ke i na gauna i mira ke na rau ni tavola. It moves slowly, often sitting on corals in the same place, sometimes showing a large belly. It breeds when the *tavala* tree's leaves turn brown.

Kawakawa matanisiga
Epinephalus howlandi
Black saddle grouper
Kena balavu: 50 cm.
Yavuni: 1.
Bula i na: cakau levu, bajina. I sa bau: iso, Δ→. Kania: ika lalai, qaqari. Vakasasa: siwa sina, siwa boto, siwa ilo. Vakariri: GAGA:C, riri, tavuteke. Kena yaga: kana, volitaki, baca. Yaloka: 7-11.
Talanoa: Na ere lelevu I dau gaga. Big ones can be poisonous to eat.

Senigaragara
Epinephelus merra
Honeycomb grouper
Kena balavu: 21 cm.
Yavuni: 1. Bula i na: cakau levu, bajina. I sa bau: wadu, Δ↑. Kania: ika lalai, lumi. Vakasasa: siwa boto, qoli lawa. Vakariri: GAGA:C, baovi, riri. Kena yaga: kana.
Talanoa: Na ika vinaka me volitaki, qai ika lewe kamikamica. Good one to sell and tasty to eat.

Seravua
Epinephalus fuscoguttatus
Brown-marbled grouper
Kena balavu: 91 cm.
Yavuni: 1. Bula i na: cakau levu, yamotu, baji kai lili. I sa bau: vica, Δ→. Kania: GAGA:C, ika lalai, qaqari, lumi. Vakasasa: dakai, siwa boto, vucu. Vakariri: tavuteke, riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: 8-11. Luvena bula i na: yamotu.
Talanoa: Na ika ni vanua nubu, dau kakana tu i vi cakau. Ika dredre toka ni vivana baleta ni dau gu dredre. So na vanua i gaga, ka je ika wate levu, ni dua i kania mai ko rawa sara ga ni kila. Na seravua i je ika vuku qai dredre baci na sikota i rawarawa toka na kawakawa ni da sikota, ia niko siwata sa dua na ika vacei toka na yavia.
It lives in deep water, often sitting under rock shelves. A hard fish to bring in when you spear it. It can be poisonous at times. *Seravua* is smarter and harder to catch than kawakawa. Eating this fish can give you a strong smell that other people notice.

Teiteimolo
Cephalopholis argus
Peacock grouper
Kena balavu: 40 cm.
Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua. I sa bau: iso, Δ→. Kania: ika lalai, lumi. Vakasasa: dakai, siwa boto. Vakariri: GAGA:C, baovi. Kena yaga: kana, volitaki. Yaloka: 8-11.
Talanoa: Na ika ke i dau vikana valevu, i mada tale ga se ra jere lelevu na gauna ke sa jere lalai sobu, na kena lelevu e rauta ni 50 cm. A popular fish to eat. In the past they were much bigger, over 50 cm.

Quro ni jiro, sevaseva

Quru ni jiro
Plectorhinchus gibbosus
Blubberlip
Kena balavu: 70 cm.
Yavuni: 1,10+.
Bula i na: bajina. I sa bau: iso, Δ↑. Kania: ika lalai, sulua. Vakasasa: vucu, qoli lawa. Vakariri: riri, baovi. Kena yaga: kana, volitaki.

Sevaseva (A)
Plectorhinchus vittatus
Oriental sweetlips
Kena balavu: 40 cm. Yavuni: 1,2.
Bula i na: baji kai lili, yamotu. I sa bau: iso, Δ→. Kania: lumi, qaqari. Vakasasa: vucu, dakai. Vakariri: GAGA:C, riri, tavuteke. Kena yaga: kana, volitaki. Yaloka: 9-12.

Sevaseva
Plectorhinchus chaetonoides
Many-spotted sweetlips
Kena balavu: 58 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu, yamotu, bajina. I sa bau: iso, Δ↓. Kania: ika lalai, nuku, laselase. Vakasasa: dakai. Vakariri: GAGA:C, riri, baovi. Kena yaga: kana, volitaki. Yaloka: 8-10.

Talanoa: Dau mino ni siwaji, rawa ga ni vi vana. Never caught on a hook and line, only by spear.

Corocoro, misijeke, taikuru

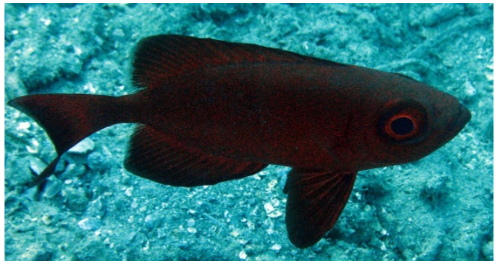
Corocoro matalevu
Myripristis bendti
Big-scale soldierfish
Kena balavu: 17 cm.
Yavuni: 10+.
Bula i na: cakau levu, cakau vanua, yamotu. I sa bau: iso, Δ↑. Kania: lumi, vuso ni ua, obe. Vakasasa: vucu, siwa boto. Vakariri: tatavu, riri. Kena yaga: kana, volitaki. Luvena bula i na: ruku ni cakau.

Corocoro
Myripristis violacea
Violet soldierfish

Corocoro balavu
Neoniphon sp.
Squirrelfish
Kena balavu: 16 cm.
Yavuni: 3. Bula i na: cakau levu, laselase. I sa bau: wadu, Δ↑. Kania: nuku, obe. Vakasasa: vucu. Vakariri: GAGA:C, baovi, tatavu. Kena yaga: kana, volitaki.

Talanoa: Corocoro balavu, dau balavu qai vilau toto, bula i vi cakau. Dau bula valevu i loma ni qara. Good to eat but the dorsal spines are sharp and toxic. This fish stays in a hole in the reef.

Corocoro balavu
Neoniphon sp.
Squirrelfish
Kena balavu: 20 cm.
Yavuni: 1,2,3+,10+.
Bula i na: laselase. I sa bau: wadu. Kania: vujia, lumi. Vakasasa: vucu, qoli lawa. Vakariri: GAGA:C, tatavu, riri. Kena yaga: kana, volitaki, baca. Yaloka: 10-12. **Talanoa:** Corocoro balavu i mata lailai, na corocoro matalevu i lekaleka. *Corocoro balavu* is longer with smaller eyes than *corocoro matalevu*.



Misijeke
Pricanthus hamrur
Crescent-tail Bigeye
Kena balavu: 23 cm.
Yavuni: 1,10+. Bula i na: cakau levu, lomaloma. I sa bau: vica, Δ↓. Kania: ika lalai, qaqari. Vakasasa: vucu, siwa boto. Vakariri: vakalolo, tavuteke, riri. Kena yaga: kana, volitaki , baca. **Talanoa:** Ika watelevu io nagauna sa buta ke sa mino ni wate, qolivi rawarawa. Has a bad smell when you catch it that goes away when you cook it. Common and easy to catch.

Taikuru
Sargocentron spiniferum
Sabre squirrelfish
Kena balavu: 27 cm.
Yavuni: 1,10+.
Bula i na: cakau levu, cakau vanua. Bajina. I sa bau: iso, Δ↓. Kania: vujia, ika lalai. Vakasasa: siwa boto (baca qaqari), siwa kolo. Vakariri: vakalolo, tatavu, riri. Kena yaga: kana, volitaki. Yaloka: 11-1. Luvena bula i na: daku ni tuba.
Talanoa: Taikuru: I rua jiko na kena mataqali. Kia dau ve vulavula jiko nona bui. Kacei i balavu. Kia i dromodromo jiko nona bui ka cei i lekaleka vei ruka.
Taikuru: there are two kinds. The larger one does not have the white tail of the smaller type. Handle with care for the sharp cheek spine. Scales are hard to remove.

Taikuru
Sargocentron caudimaculatum
Tailspot squirrelfish
Yavuni:1,2,3+.
Bula i na: cakau levu, cakau vanua, bajina. I sa bau: wadu, Δ↑. Kania: ika lalai, lumi, lase mate. Vakasasa: dakai, siwa boto. Vakariri: riri. Kena yaga: kana, volitaki. Yaloka: 7-9.
Talanoa: I jiko i na nona baba. I dau vilau toto sara. E varuvari dredre. It is hard to remove this scales of this fish and watch out for the sharp cheek spine.

Jivijivi, tabace

Vacamacala taumada

Na jivijivi i tauri na vosa jivi na kena i balebale totolo, i dua na ika vuki totolo mai vei ira na vo tale ni ika (Bau: tivitivi). Da dau rawaji ira na levu na gauna ni tataga i ika vaikanakana qai dau maleka ni tavu. Ia na gauna ke sa mino so ni da kania baleta ni sa jiko na dakai ka sa rawa mai ke na ika lelevu.

I mada se dau 30 cm. na kena lelevu na gauna ke sa 15 cm. ga i mada tale ga ra dau bula tu i votogotogo na gauna ke sa mino.

Na gauna i mada dau tukuni vake me dau musu laivi nona gusu na jivijivi ni se bera nira, kania na gone vake i mino na manuka nodra taliga na gone vake tale ga o ira na bukete ni na sucu mai na luvedra na manuka tale ga na nodra taliga i muri, so ra kaya ni vinaka me kua ni kau mai baleta ni ika rairai vinaka qai dau vasavasavatakina na cakau, ka ra dau sarava tale ga na saravanua.

Serekali: Ko ra jivijivi na ika ni tavu ki Naboujini.

Ra dui toka vi jijivi.
Jivi ko buqu tara ki loqi.
Taura mai nai matau tokitoki.
Matau tokitokitoki e.

The word *jivijivi* comes from *jivi*, which means quick changes in direction, as this is how these fish swim (Bauan: tivitivi). Most often caught in nets, they can be good to eat with soft skin and flesh. People grill them or wrap them in leaves to barbeque in the fire. Nowadays, people do not bother much with eating *jivijivi* because they can use a spear gun to get big fish.

These fish, known as butterflyfish in English, are related, but are different bright colours. Most of them found today are about 15 cm. but in olden days they were often 30 cm. There used to be some in the mangroves but not now.

Many people say that these fish should not be eaten by children and pregnant women as this will cause sores or cuts behind the ears, just where the ears meet the skull of pregnant women, their babies, or of small children. The sores take some time to heal and treatments used include not eating more *jivijivi*, the sick person biting the cheek of a *jivijivi*, local ointments, and ointments from the health centre. Some people say not to kill these fish because they clean the reef and look like hibiscus flowers in the water. These are good fishes for the dive tourists to see.

Lullaby: *Jivijivi* from Naboujini are good fish for barbeque

Do not complain.
You can go to grandmother in the corner
You can take a fishing hook.
A fishing hook.

Jivijivi
Chaetodon kleini
Blacklip butterflyfish
Kena balavu: 13 cm. Yavuni: 1,2,10+.
Bula i na: cakau levu, cakau vanua, baji kai lili. I sa bau: wadu, Δ↑.
Kania: lumi, laselase, vujia.
Vakasasa: qoli lawa, vucu.
Vakariri: riri, tatavu. Kena yaga: kana.

Jivijivi
Chaetodon lunulatus
Redfin butterflyfish
Kena balavu: 16 cm. Yavuni: 2,3+.
Bula i na: baji ni vi jirijiri, laselase.
I sa bau: wadu, Δ↑. Kania: vujia, lase mate. Vakasasa: qoli lawa, tataga. Vakariri: baovi, tatavu.
Kena yaga: kana. Luvena bula i na: vitogotogo, laselase.

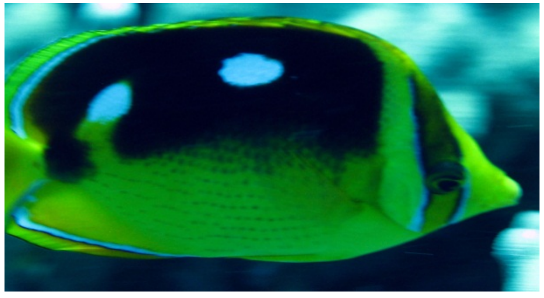
Jivjivi dromodromo (A)
Chaetodon lunula
Racoon Butterflyfish
Kena balavu: 16 cm. Yavuni: 10+.
Bula i na: cakau levu, cakau vanua, bajina. I sa bau: iso, Δ↑.
Kania: nuku, lumi, lase mate. Vakasasa: vucu, dakai, tataga. Vakariri: riri, tatavu. Kena yaga: kana.
Yaloka: 9-10.

Jivijivi (A)
Chaetodon lineolatus
Lined Butterflyfish
Kena balavu: 18 cm.
Yavuni: 2,3+.
Bula i na: cakau levu, cakau vanua. I sa bau: iso, Δ↑.
Kania: nuku, vujia. Vakasasa: vucu, qoli lawa. Vakariri: baovi, riri.
Kena yaga: kana. Luvena bula i na: daveta.
Talanoa: I kuli qaqa, ia i ra bula vakalevu i vitogotogo, vake ra via kania na bukete io me musu laivi nona gusu. These ones have hard skin after cooking. Small ones live in the mangrove.

Jivijivi
Chaetodon mertenzi
Yellowback butterfly fish.
Kena balavu: 22 cm.
Yavuni: 10+.
Bula i na: cakau levu, yamotu, laselase.
I sa bau: iso, Δ↑. Kania: lumi, nuku, lase mate. Vakasasa: dakai, qoli lawa, moto. Vakariri: riri, vakalolo. Kena yaga: kana, volitaki. Luvena bula i na: laselase.

Jivijivi (A)
Chaetodon ornatissimus
Ornate butterfly
Kena balavu: 16 cm. Yavuni: 2.
Bula i na: cakau levu, cakau vanua.
I sa bau: wadu, Δ↑. Kania: nuku, laselase. Vakasasa: vucu, qoli lawa. Vakariri: riri, tatavu. Kena yaga: kana.

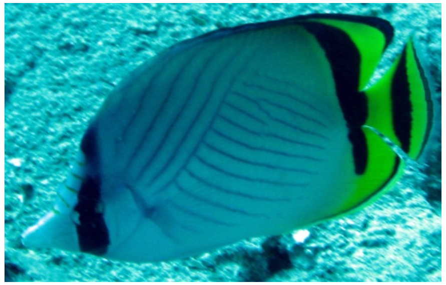
Jivijivi
Chaetodon pelewensis
Dot and dash butterflyfish
Kena balavu: 16 cm. Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua, ruku ni cakau. I sa bau: iso, Δ↓. Kania: nuku. Vakasasa: qoli lawa. Vakariri: tatavu. Kena yaga: kana.



Jijijivi (A)
Chaetodon quadrimaculatus
Fourspot butterflyfish.
Kena balavu: 16 cm.
Yavuni: 2. Bula i na: cakau levu.
I sa bau: iso, Δ↑. Kania: lumi, obe. Vakasasa: qoli lawa. Vakariri: baovi, riri. Kena yaga: kana.

Jivijivi
Chaetodon rafflesi
Latticed butterflyfish
Kena balavu: 13 cm. Yavuni: 3+.
Bula i na: cakau levu, bajina.
I sa bau: wadu, Δ↑. Kania: laselase. Vakasasa: vucu, qoli lawa. Vakalolo. Kena yaga: kana.

Jivijivi
Chaetodon ulietensis
Pacific double-saddle butterflyfish.
Kena balavu: 19 cm.
Yavuni: 2,3+.
Bula i na: yamotu, bajina.
I sa bau: iso, Δ↑.
Kania: lumi, soso, vujia. Vakasasa: qoli lawa. Vakariri: tavuteke. Kena yaga: kana, volitaki.
Talanoa: Na jivijivi ke i kana vinaka duadua vei ira na vo ni jivijivi. This one has more tender and tasty flesh then other *jivijivi* types.



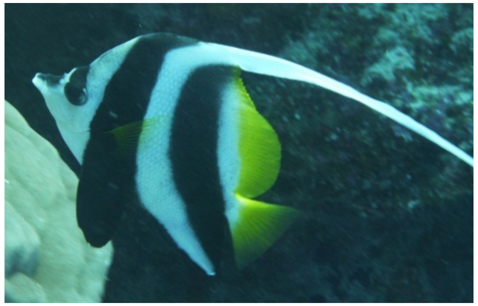
Jivijivi
Chaetodon vagabundus
Vagabond butterflyfish.
Kena balavu: 18 cm. Yavuni: 2.
Bula i na: cakau levu, cakau vanua. I sa bau: wadu, Δ↑.
Kania: nuku, lumi. Vakasasa: qoli lawa, vucu. Vakariri: tavuteke, baovi. Kena yaga: kana, volitaki, wainimate. Yaloka: 10-11.

Jivijivi
Forcipiger longirostris
Long nose butterflyfish
Kena balavu: 21 cm.
Bula i na: cakau levu, yamotu.
I sa bau: iso, Δ→.
Kania: nuku, obe, bulewa.
Vakasasa: qoli lawa, vucu.
Vakariri: GAGA:C, riri. Kena yaga: kana.
Talanoa: Vake i lauji iko na ika ke ina vuce na vanua i lauta qai toto. Contact with the dorsal spines of this fish will cause painful swelling within one minute.

Jivijivi
Chaetodon baronessa
Triangular butterflyfish

Jivijivi
Chaetodon reticulatus
Reticulated butterflyfish

Jivijivi
Chaetodon ephippium
Saddled butterflyfish



Jivijivi
Heniochus acuminatus
Kena balavu: 14 cm.
Yavuni: 10+.
Bula i na: cakau levu. I sa bau: iso, Δ→, Kania: vujia, nuku.
Vakasasa: qoli lawa, vucu.
Vakariri: riri, tatavu. Kena yaga: kana, volitaki, baca.
Talanoa: I rua jiko na mataqali ika ke, i dua vei ruka i levu jiko na roka dromodromo, ka je ika vinaka ni tatavu. Voleka i nona ulu i jiko ke i dua na ere vake toka na vuji ni toa na kena ila kacei na lawe.
I na gauna i mada ra dau vagatakina na marama me ciqi toka, nodra ulu e na gauna ni meke. There are two kinds. The other has more yellow stripes. Barbeque them in the fire. At special events like a *meke*, ladies with the title, *Bulou*, can wear in their hair a chicken feather that arches back, like the top or dorsal fin of this fish.

Jivijivi
Heniochus chrysostomus
Pennant bannerfish
Kena balavu: 26 cm. Yavuni: 2.
Bula i na: dela ni cakau, lomaloma. I sa bau: wadu, Δ↑. Kania: lumi. Vakasasa: qoli lawa, vucu. Vakariri: tatavu. Kena yaga: kana, volitaki. Yaloka: 8-10.

Talanoa: Da dau gaci ira va levu ina loma ni taceba, kacei na cakau lelevu. This one is found among large branching corals.

Jivijivi (A)
Zanclus cornutus
Moorish idol
Kena balavu: 17 cm. Yavuni: 1,2,3+.
Bula i na: cakau levu, cakau vanua, baji ni vi jirijiri, yamotu. I sa bau: wadu, Δ↑. Kania: nuku, lumi, obe.
Vakasasa: qoli lawa, vucu, tataga.
Vakariri: riri, tatavu, vakalolo. Kena yaga: kana. Yaloka: 8-9.
Talanoa: Nai yavuni levu ira dau lako mai i lomaloma mera mai tuke. In mid-June, big schools used to come in through the breakers from over the reef.

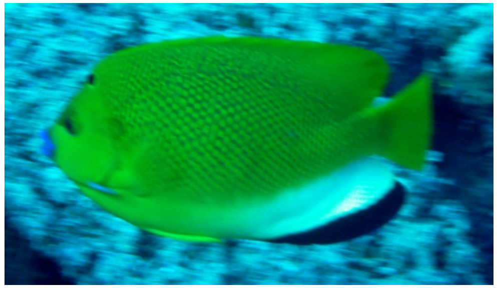
Tabace
Platax boersii
Golden Spadefish (juvenile)
Kena balavu: 21 cm. Yavuni: 10+.
Bula i na: lomaloma. I sa bau: iso, Δ→. Kania: nuku. Vakasasa: siwa boto. Dakai. Vakariri: GAGA:C, riri, tatavu. Kena yaga: kana.
Talanoa: Na ika ke ra dau Sarava va levu na saravanua, vake da na via kania i dua na ere i jiko i nona wawa

me biu laivi i mada ni se bera ni riri. A fish that the tourists like to see. You must remove the throat to get the poison out.

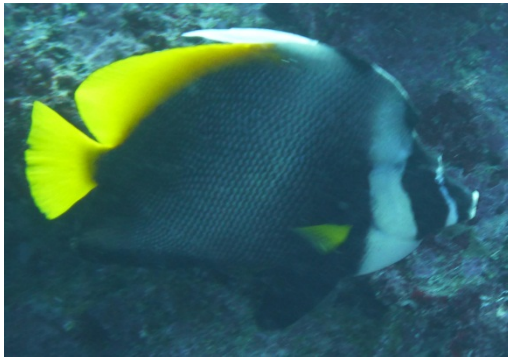
Tabace
Acanthurus triostegus
Convict surgeonfish
Kena balavu: 15 cm.
Yavuni 10+.
Bula i na: cakau levu, cakau vanua, takali. I sa bau: wadu, Δ↑. Kania: nuku, vujia. Vakasasa: qoli lawa, vucu, tala lawa. Vakariri: riri, tatavu, vesa. Kena yaga: kana, volitaki, baca. Luvena bula i na: baji kai lili.
Talanoa: I dau valuveni e na vula ko Epereli, ka ra dau qai vigaci ina maji levu ina dela ni cakau levu. They lay eggs in April and are not common close to shore.

Tabace loaloa, jivijivi
Ctenochaetus scopas
Brushtail tang
Kena balavu: 14 cm. Yavuni:3+.
Bula i na: cakau levu, cakau vanua, baji ni vi jirijiri. I sa bau: iso, Δ→. Kania: nuku, vujia, obe. Vakasasa: qoli lawa, vucu. Vakariri: riri, tatavu. Kena yaga: kana. Luvena bula i na: yamotu.
Talanoa: Ira bula vakalevu i na cakau. They live amid the corals.

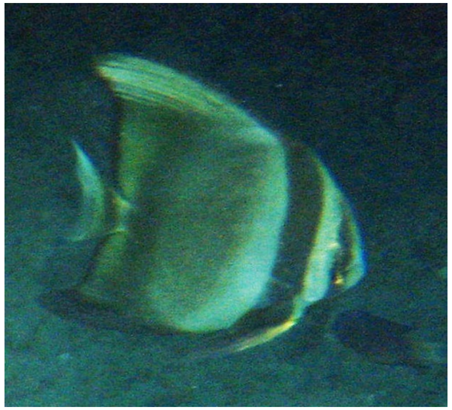
Lati ni daveta



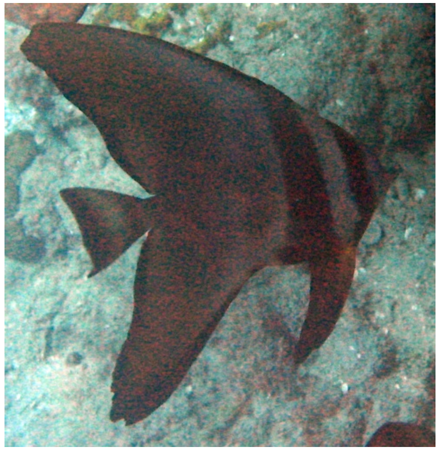
Jivijivi, lati ni daveta
Apolemichthys trimaculatus
Three-spot angelfish
Kena balavu: 15 cm.
Bula i na: laselase, cakau levu, cakau vanua.
I sa bau: wadu, Δ↑.
Kania: bulewa, lumi, manumanu lailai. Vakasasa: vucu. Vakariri: riri, vesa, baovi. Kena yaga: kana. Yaloka: 10-12.
Talanoa: I rawarawa ni vicoka. Nona i ta i jiko i nona balu. They are easy to spear, but they have a sharp point on the cheek. The flesh is hard when cooked and sticks to the skin.



Lati ni daveta
Heniochus singularis
Singular bannerfish
Kena balavu: 20 cm.
Yavuni: 10+.
Bula i na: cakau levu.
I sa bau: iso, Δ↑.
Kania: laselase, obe.
Vakasasa: qoli lawa, vucu. Vakariri: tatavu. Kena yaga: kana.



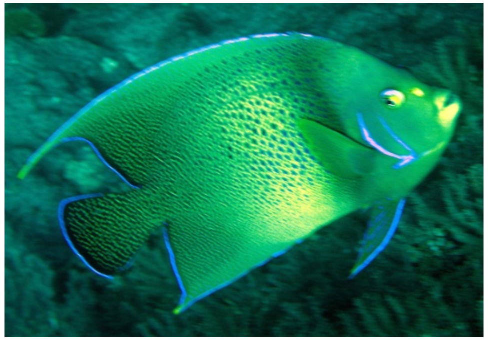
Lati ni daveta
Platax sp.
Spadefish
Kena balavu: 30 cm.
Bula i na: cakau levu, yamotu.
I sa bau: iso, Δ↑.
Kania: lase mate. Vakasasa: qoli lawa. Vakariri: baovi. Kena yaga: kana, baca.
Talanoa: Na ika kana vinaka qai uro, qaqa tale ga na kena tua, i dau vayagataki me jei leu ni vivili. Their long hard bones are good and strong for toothpicks to get shellfish flesh out from shells.



Lati ni daveta
Platax sp.
Spadefish
Kena balavu: 34 cm. Yavuni: 3+.
Bula i na: lomaloma.
I sa bau: isoΔ↑.
Kania: lumi, lase, nuku.
Vakasasa: siwa boto, dakai.
Vakariri: vakalolo. Kena yaga: kana, volitaki. Yaloka: 10-12.
Talanoa: Na ika rawarawa ni vicoka baleta ni raraba vinaka qai ika gu qaqa baleta. When you spear them it is hard to pull them close because they are wide and flat.

Lati ni daveta
Pomacanthus imperator
Emperor Angelfish
Kena balavu: 38 cm.
Yavuni: 2,3+,10+.
Bula i na: cakau levu, daveta.
I sa bau: iso, Δ↑. Kania: vujia, lumi, nuku. Vakasasa: vucu. Vakariri: riri, tatuva. Kena yaga: kana, volitaki. Yaloka: 1.
Talanoa: Ni da tavuna dau qai kacabote mai nona kete. Acid comes out after you BBQ them.

Lati ni daveta (A)
Pomacanthus imperator (juvenile)
Emperor angelfish
Kena balavu: 8 cm.
Yavuni:1. Bula i na: cakau levu.
I sa bau: iso, Δ→.
Kania: nuku. Vakasasa: dakai,
Vakariri: riri, tatuva. Kena yaga: kana, volitaki. Yaloka: 11-1.
Talanoa: Ni se lalai se roka karakarawa, io ni sa lelevu sa visau tale nona roka. This the juvenile stage of the *lati ni daveta* or *P. imperator* shown above.



Lati ni daveta (A)
Pomacanthus semicirculatus
Semicircle angelfish
Kena balavu: 46 cm.
Yavuni: 2. Bula i na: bajina.
I sa bau: iso, Δ↓.
Kania: nuku, laselase.
Vakasasa: dakai, siwa boto.
Vakariri: vakalolo, riri. Kena yaga: kana, volitaki.
Talanoa: Dau vuni i qara va ke i levu na rorogo i wai. Me da sikota va vinaka baleta ni gagata tu nona balu. Niko nunu jiko rawa ni lako sara mai nomu yasa. This fish is said to make a high pitched rhythmic noise or song, which spear divers can follow to find them under reefs. They have a sharp cheek spine which must be avoided when handling. They are curious and will approach divers.

Lati ni daveta (A)
Pygoplites diacanthus
Kena balavu: 20 cm. Yavuni: 1.
Bula i na: bajina, baji kai lili, laselase. I sa bau: iso, Δ↑.
Kania: obe, bulewa. Vakasasa: dakai, vucu. Vakariri: riri, vesa.
Kena yaga: kana, volitaki, baca.
Talanoa: Dau lakovi ira na dau nunu jiko. They are curious and will approach divers.

Ciri, dukiduki, guru, quru, drumani

Ciri
Chromis sp.
Blue chromis
Yavuni:10+.
Bula i na: cakau levu, Loma ni vi jirijiri, laselase.
I sa bau: wadu, Δ↑.
Kania: lumi, manumanu lailai. Vakasasa: tataga, qoli lawa. Vakariri: baovi, tusala. Kena yaga: kana, volitaki.

Ciri
Abudefduf sexfasciatus
Scissortail seargent
Kena balavu: 12 cm.
Yavuni: 1,10+.
Bula i na: laselase.
I sa bau: wadu, Δ↑.
Kania: lumi, nuku.
Vakariri: baovi, vakalolo.
Talanoa: Ra dau bula vata ga na ere lalai vata na ere lelevu i vi laselase. They are found in branch coral, where babies stay next to adults.

Dukiduki
Amblyglyphidon curacao
Staghorn damsel

Guru dromodromo
Amblyglyphidon aureus
Golden damsel
Kena balavu: 10 cm.
Yavuni: 10+.
Bula i na: laselase.
I sa bau: iso, Δ↓. Kania: lumi, lase bula. Vakasasa: vucu , taraki. Vakariri: baovi, tusala. Kena yaga: kana, baca. Luvena bula i na: laselase.

Guru
Dascyllus sp.
Kena balavu: 15 cm.
Yavuni: 2,3+.
Bula i na: laselase, cakau vanua. I sa bau: iso, Δ↑.
Kania: nuku, vuso ni ua.
Vakasasa: vucu. Vakariri: baovi, tusala. Kena yaga: kana, baca. Luvena bula i na: laselase.
Talanoa: Je baca vinaka ni siwa. Good baitfish.

Guru
Chromis sp.
Kena balavu: 11 cm.
Yavuni: 10+.
Bula i na: laselase, bajina.
I sa bau: iso, Δ↑.
Kania: bulewa, nuku.
Vakasasa: vucu. Vakariri: baovi. Kena yaga: kana.
Luvena bula i na: laselase.
Talanoa: Dau vasavasavavatakina na lase. They clean the coral.

Guru
Amphiprion chysopterus
Orange finned anemonefish
Kena balavu: 9 cm.
Yavuni: 1.
Bula i na: laselase.
I sa bau: vica. Kania: nuku. Vakariri: tusala, baovi. Kena yaga: kana.
Luvena bula i na: laselase.

Quru kedra na matai
Amphiprion sp.
Anemonefish with anemone
Kena balavu: 15 cm.
Yavuni:1.
Bula i na: cakau levu, yamotu, lomaloma.
Kania: obe, vujia, bulewa.
Talanoa: Dau yadrava na drumani. This fish guards the *drumani*.

Drumani
Anemone
Kena balavu: 31 cm.
Bula i na: cakau levu, yamotu. I sa bau: vica, Δ↓.
Kania: ika lalai.
Vakasasa: nunu. Vakariri: riri. Kena yaga: kana.
Talanoa: Ra dau moce ke na ika lalai. Small fish sleep in the *drumani*.

Dusidusi, nene, ujimate, uviuvi

Dusidusi, ose ni waitui
Corythoichthys sp.
Pipefish
Kena balavu: 15cm. Yavuni: 1. Bula i na: vi vujia, vi togo i gusunijiro. I sa bau: Δ↓. Kania: manumanu lailai. Vakasasa: qoli lawa.
Talanoa:
"Ni ko kaiya me dusi ki na koro, i na dusi sara ki na koro
Kevake ko kaiya vua me dusi tale
I na dua na vanua i na dusia sara na vanua kacei."

Saying while holding the tail of a *dusidusi*:
"If you want it to point to the village, it will point to the village. If you want it to point anywhere, it will point there."

Jidrai
Mudskipper
Kena balavu: 16 cm. Yavuni: 1,2 3+. Bula i na: vitogotogo, jiro, lomaloma. I sa bau: wadu, Δ↑. Kania: soso, momoci. Vakasasa: taraki, tataga, tomika. Kena yaga: baca, kana.
Talanoa: Dau je baca vinaka. Good bait.

Nene
Cheilodipterus sp.
Cardinalfish
Kena balavu: 23 cm.
Yavuni: 10+.
Bula i na: laselase, vi vujia, cakua vanua. I sa bau: wadu, Δ↑. Kania: vujia, qaqari. Vakasasa: qoli lawa, vucu, siwa boto. Vakariri: riri, baovi, tusala. Kena yaga: kana.
Talanoa: I rua jiko na mataqali ika i nene i dua i balavu ka dua i lekaleka. Na ika rawarawa ni qoliva ina taraki. There are two kinds of nene, the other is shorter and wider. They are easy fish to catch in the net.

Nene
Pempheris oualensis
Sweeper
Yavuni:1,10+.
Bula i na: cakau vanua.
I sa bau: wadu. Kania: nuku, qaqari. Vakasasa: qoli lawa. Vakariri: baovi, riri. Kena yaga: kana.

Ujimate

Synodus variegatus

Lizardfish

Kena balavu: 16 cm. Yavuni: 1. Bula i na: nukunuku, cakau vanua. I sa bau: vica, Δ→. Kania: nuku, qaqari. Vakasasa: siwa boto, siwa kolo, qoli lawa. Vakariri: tatavu, tusala. Kena yaga: kana, volitaki, baca. Luvena bula i na: nukunuku.

Talanoa: Dau mino nira kania na ika ke na tagane, kenai karua dau musu laivi nona ulu, baleta i va ke tu nai bulibuli ni gata. Men are not allowed to eat this fish. No one eats the head of this fish - it looks like a snake.

Uviuvi

Parracirrhites fosteri

Freckled hawkfish

Yavuni: 1. Bula i na: laselase. I sa bau: iso, Δ↑. Kania: nuku, qaqari. Vakasasa: siwa boto, vucu. Vakariri: vakalolo, riri. Kena yaga: kana. Yaloka: 9-12.

Vaka tawa ni toka

Parapercis sp.

Kena balavu: 20 cm. Yavuni: 1. Bula i na: nukunuku. I sa bau: vica, Δ↓. Kania: nuku. Vakasasa: siwa boto. Vakariri: riri, Kena yaga: kana.

Novu, toa

Vacamacala taumada

Dau gaga nona i leu ka jiko i nona taku. I rawa ni lauji iko vake ko butuka, qoli tei ko cokai kia. Na gauna ke sa rawarawa ni sa tu na valeniwai vata na wainimate. I mada ra dau vagatakina ga na buka qawa me vararagi na vanua i lauta na toa tei na novu me taba ina wai katakata. I so ra dau tava tale va levu na vanua i lau me lako laivi mai ke na dra baci, ke ina vukea me kua ni vuce levu me kua ni toto valevu. Dau musu laivi nona lawe ni se bera ni dau riri. I dau bula talega i na vitogotogo. I so talega i ra bula tu i cakau.

These fish have very poisonous dorsal spines that cause intense pain if contacted. Injuries occur when people step on them while wading, taking fish out of nets, or trying to spear them. Today people can go to the health centre to get an injection if they get stung. In the past stings were treated with heat, by exposing the injury to boiling water, fire, burning coals, and burning or cutting the flesh to get the stinger out. With these heat cures it can still take weeks for the swelling to go down. Many of these fish are eaten, but the poison spines are cut off before boiling the fish and the skin is scrubbed off. These fish live in the mangroves and on the reefs.

Novu (A)
Antennarius sp.
Frogfish
Kena balavu: 15 cm.
Yavuni: 1.
Bula i na: Loma ni vi jirijiri, cakau vanua, vi vatuvatu.
I sa bau: vica, Δ↓.
Kania: nuku. Vakasasa: moto. Vakariri: GAGA:A, riri. Kena yaga: kana. Luvena bula i na: Loma ni vi jirijiri.
Talanoa: Ra bula i votogotogo ka so i bula i cakau. Lives in the mangroves and mud.

Novu
Scorpaenopsis diabolis
Devil scorpionfish
Kena balavu: 24 cm.
Yavuni: 1.
Bula i na: cakau levu, vi vatuvatu, nukunuku.
I sa bau: vica, Δ↓.
Kania:, qaqari, ika lalai, vuso ni ua.
Vakasasa: moto, vucu, taraki. Vakariri: GAGA:A, riri, vakaloa. Kena yaga: kana, volitaki.
Luvena bula i na: vi vatuvatu.

Talanoa: Dau karivaki kora sa qai riri me visomi na kena wai baleta i je wai ni ramusu, dau vagataki talega nona tua ni balu. The cheek bone of this fish is used for medication. It is made into a powder and brewed as a tea known as *mica*. Drink this as a cure for disclocated joints.

Toa ni waitui (A)
Pterois volitans
Common lionfish
Kena balavu: 27 cm.
Yavuni: 1.
Bula i na: cakau vanua, cakau levu, yamotu.
I sa bau: vica, Δ ↓.
Kania: ika lalai, nuku.
Vakasasa: vucu, tataga. Vakariri: GAGA:A, riri. Kena yaga: kana, volitaki. Yaloka: 1.

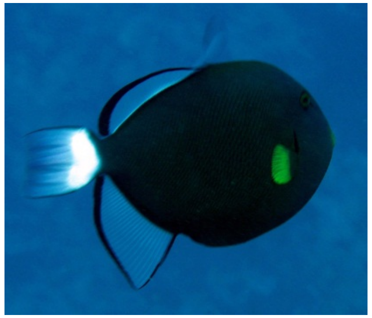
Toa ni waitui
Pterois antennata
Spotfin lionfish
Kena balavu: 27 cm.
Yavuni: 1.
Bula i na: bajina, cakau levu, laselase. I sa bau: vica, Δ→. Kania: ika lalai, lumi. Vakasasa: vucu, taraki. Vakariri: GAGA:A, riri. Kena yaga: kana. Yaloka: 10. Luvena bula i na: laselase.

Talanoa: Waro i dua tale na kena I cavuji ni toa ni waitui. *Waro* is another name for the *toa ni waitui*.

Cumu, gau

Cumu
Balistoides conspicillum
Kena balavu: 32 cm.
Yavuni: 1,2,3+.
Bula i na: cakau levu, cakau vanua, bajina.
I sa bau: wadu, Δ↑.
Kania: lase mate, lumi. Vakasasa: siwa boto, vucu. Vakariri: tavuteke, vakalolo. Kena yaga: kana, volitaki.
Talanoa: Na cumu i dau kudrukudru jiko ina gauna da rawata mai kene. Kara kila sara na dau siwa nina mino ni katoa na siwa, baleta ni ra sa vitalanoa takini keda jiko tei viwalitaki jiko mai vei ira inakoro. *Qau* make *kudrokudro* noises when caught. Women fishing in a boat will imitate this noise when the fishing is poor, to show that they think someone in the village is talking about them or making fun of them, which causes the poor fishing results.

Cumu, ravi
Cantherhines dumerli
Barred filefish
Kena balavu: 23 cm.
Yavuni: 1. Bula i na: cakau levu, cakau vanua, yamotu.
I sa bau: vica, Δ→. Kania: bulewa, qaqari. Vakasasa: qoli lawa, vucu. Vakariri: baovi, suruwa lolo. Kena yaga: kana. Yaloka: 10-12.
Talanoa: Na ika kana vinaka na kena yate qai kuli gaga. Dau mino ni vikana na kena kuli. You must remove the skin. It is a good fish to barbeque; the yate (liver) is good to eat raw.



Cumu (A)
Melichthys sp.
Triggerfish
Kena balavu: 34 cm. Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua, laselase. I sa bau: iso, Δ↓.
Kania: laselase, vujia, momoci.
Vakasasa: siwa boto, qoli lawa. Vakariri: baovi. Kena yaga: kana, yaya ni cakacaka.
Talanoa: I gaga, mino ni dau vikana, qai mino ni dua i vinakata. Do not eat it - may be poisonous and it is ugly too! An old woman felt sorry for it, because no one wants it.

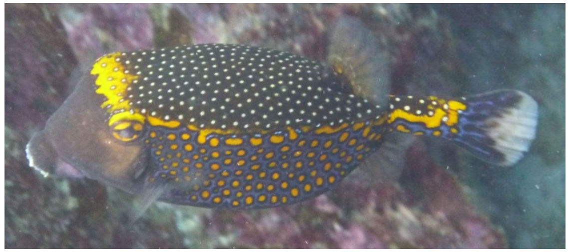
Ravi (A)
Aluterus scriptus
Scrawled filefish
Kena balavu: 42 cm.
Yavuni: 1.
Bula i na: cakau levu, cakau vanua. I sa bau: iso, Δ→.
Kania: lase mate, laselase. Vakasasa: moto, vucu, yavirau. Vakariri: riri, tavuteke, kokoda. Kena yaga: kana, volitaki.

Qau
Balistoides viridescens
Titan triggerfish
Kena balavu: 60 cm.
Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua, daveta.
I sa bau: iso, Δ→.
Kania: ika lalai, nuku.
Vakasasa: dakai, vucu, siwa boto. Vakariri: suruwa lolo, vakalolo.
Kena yaga: kana, volitaki, takali. Yaloka: 10-11.
Talanoa: Na ika ke dau vikaji sara na gauna i dau valuveni kene baleta i dau rewarewa qai dau vi kaji. Kia dau kelia na qara qai valutu yaloka, ia na gauna i valutuyaloka jiko kene na yalewa na tagane dau yavoki tu ga i nona yasa. Dua na turaga ma vikaji nona taliga na gauna ma toso voleka mai ke na vanua i vasucu jiko ke na qau. Dau tukuni ni o sa vana mai na qau mo sikota vinaka da qai kaji iko. Sa mino so ni levu na qau i na gauna ke.
When these fish breed between November and February, they find a place with no current and then dig a hole in the sand. In the center, they lay a clump of eggs. The female stays close to the hole and the male guards the perimeter. One man, who came close to one, had a piece of his ear bitten off by a *qau* defending its nest. When you spear it you must pull it in right away to prevent it lodging in the coral with its dorsal and anal fins. Some people say not to take many of these fish now, because there are fewer of them these days.

Qau
Pseudobalistes flavimarginatus
Yellowmargin triggerfish

Qau
Pseudobalistes fuscus
Blue triggerfish
Kena balavu: 51 cm.
Yavuni: 1,2,3+.
Bula i na: cakau levu, cakau vanua, takali.
I sa bau: iso, Δ→.
Kania: nuku, vujia.
Vakasasa: dakai, vucu, siwa boto. Vakariri: baovi, riri. Kena yaga: kana, volitaki. Yaloka: 8-9. Luvena bula i na: baji kai lili.
Talanoa: I ika kuli qaqa, i dau ukuuku ni vale. I ika vinaka ni jopusui. They have hard skin and fins that can be dried and used as decoration. The flesh is good to be sliced up for chop suey.

Gugu, sokisoki, vusevuse



Gugu
Ostracion meleagris
Spotted boxfish (male)
Kena balavu: 20 cm.
Yavuni: 1,2,3+.
Bula i na: cakau levu, cakau vanua, bajina. I sa bau: vica, Δ↓. Kania: lumi, obe, sici. Vakasasa: dakai, vucu. Vakariri: tatavu, riri. Kena yaga: kana, volitaki. Yaloka: 11-1.
Talanoa: I kuli qaqa, qai mino ni gaga, ra dau biuta mai i dua na domo i na gauna i vayaloka ke. It has tough skin, but is not poisonous. When speared they make a noise in their throat like crying.

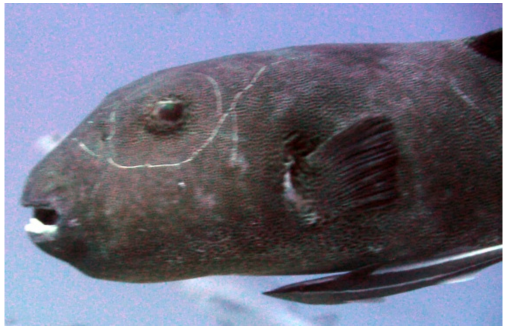
Sokisoki (A)
Diodon liturosus
Black-blotched porcupinefish
Kena balavu: 54 cm. Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua, loma ni vi jirijiri. I sa bau: iso, Δ→.
Kania: nuku, lase mate.
Vakasasa: dakai. Vakariri: riri, vakalolo.
Kena yaga: kana, volitaki. Yaloka: 5-7.
Talanoa: Na kaukawa ni nona baji i dau vorota ke na qa ni vivili me kania na kena le. I dau gaga i na gauna ni balolo. *Sokisoki* use strong teeth to crack *vivili* shells and eat them, leaving piles of shells to show where they have been. *Sokisoki* are often toxic to eat at *balolo* time in November-December.

Sokisoki
Deodon hystrix
Porcupinefish
Kena balavu: 55 cm. Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua, bajina. I sa bau: iso, Δ→.
Kania: qaqari, nuku.
Vakasasa: dakai, moto, vucu.
Vakariri: riri, miji.
Kena yaga: kana, volitaki.
Luvena bula i na: vi vujia.
Talanoa: Nisa dau buta, sa qai rawa nida kauta laivi mai na kena tua. I dau jei leu vinaka talega ni vivili. You can remove the spines when cooking or eating it. The spines are good eating tools for getting small snail flesh out from their shells.

Serekali:
T: Lai ya vosi? **S:** Au lai qoli.
T: Na yava nomu ika ni qoli? **S:** Na sokisoki.
T: Tagi mada vosi? **S:** Mi—a—u.

Lullaby:
Q: where do you go little cat? **A:** I go down to the sea to fish.
Q: what fish did you catch little cat? **A:** Sokisoki.
Q: how do you cry? **A:** m-e-ow.

Vusevuse (A)
Arothron hispidus
White-spotted puffer
Kena balavu: 41 cm.
Yavuni: 1,2,3+.
Bula i na: cakau levu, baji ni vi jirijiri, vi vatuvatu.
I sa bau: vica, Δ↑. Kania: nuku, ika lalai, lumi. Vakasasa: qoli lawa, dakai. Vakariri: GAGA:A. Yaloka: 8-12.
Talanoa: I vakasucu i na vanua cecere. They give birth in shallow water.



Vusevuse
Arothron caeruleopunctatus
Blue-spotted puffer
Kena balavu: 48 cm.
Yavuni: 1,2,3+.
Bula i na: cakau levu, baji ni vi jirijiri, nukunuku.
I sa bau: iso, Δ↓.
Kania: qaqari, lase mate, bulewa. Vakasasa: vucu, siwa boto, qoli lawa. Vakariri: GAGA:A, riri. Kena yaga: kana. Yaloka: 9-12.

Vusevuse
Arothron nigropunctatus
Blackspotted puffer
Kena balavu: 44 cm.
Yavuni: 1,2.
Bula i na: cakau levu, cakau vanua, yamotu. I sa bau: iso, Δ→. Kania: vujia, ika lailai, qaqari. Vakasasa: qoli lawa, vucu. Vakariri: GAGA:A, riri. Luvena bula i na: vi vatuvatu. Yaloka: 8-11.
Talanoa: I ika gaga sara na ika kene, i jiko ga na tamata ira kila na jila me kua ni gaga. Very poisonous fish, only expert people know how to remove poison safely for eating.

Vusevuse
Canthigaster valentini
Kena balavu: 30cm.
Yavuni: 1.
Bula i na: cakau levu, cakau vanua, maqamaqa.
I sa bau: vica, Δ↓. Kania: qaqari, nuku. Vakasasa: qoli lawa, vucu, dakai. Vakariri: GAGA:A. Kena yaga: kana, volitaki. Yaloka: 9-12.
Talanoa: I ika gaga. Sa jiko ga iso ra kila ma jila na ika ke. Na vusevuse i via roka vata tu na kawakawa. It is very poisonous. Only some expert people know how to remove the poison. *Vusevuse* is named for its vertical stripes like those of the *kawakawa*.

Vai

Vai roqo
Manta birostris
Manta ray
Kena balavu: 287 cm.
Bula i na: takali.
I sa bau: iso, Δ→.
Kania: obe, vuso ni ia.
Vakasasa: mino.
Talanoa: Mino so ni gagata nona bati, vai ke i mino tu nona i rabo, qai maloku. I dua na gauna ma ra lai siwa i so na marama ni Tiliva, na gauna ra talaca ke nodra i kelekele qai tao na nona se na vai ke. Sa qai sakui taki ni ira tu mai Vabea lesu tale i Tiliva. I so ra dau tukuna tu ni je vai rogo baleta ni rawa ni rogoji iko na nona taba. Na vai ke dau jiko va levu i Bulia, i mada se lailai na gauna ke sa levu cake sara.

Manta rays have no sharp teeth or tail spine and they go slowly. One time in Tiliva, a manta ray pulled some women in a boat, perhaps it hit the anchor chain and was startled, catching up the anchor. The ray swam off, pulling the boat to Vabea and and back to Tiliva, where the men jumped in the boat and managed to spear and kill the ray. There are other stories about people being carried away in the manta ray's wings, giving it the name *vai roqo*. *Roqo* means to wrap around.

Manta rays come near Bulia when the winds are from the SE. In times past, one was spooked by a motor and flipped a boat. There used to be just one big one near Bulia, now there are many.

Vai curuqara (A)
Dasyatis kuhlii
Blue-spotted stingray
Kena balavu: 66 cm. Yavuni: 1.
Bula i na: cakau levu, cakau vanua, nukunuku.
I sa bau: vica, Δ↑.
Kania: ika lalai, obe, nuku.
Vakasasa: dakai, siwa boto.
Vakariri: riri, vesa.
Kena yaga: kana, volitaki. Luvena bula i na: nukanuka.

Talanoa: Na vai curuqara i mino ni kana vinaka, ia na vai dau tu i soso i kana vinaka sara vei ruka. So na gauna nida tunaka i dau toka i loma ni nona kete na luvena. Na ika ke na vai dau raboji keda va ke dai butuka, dau gaga ka paisoni ni da rabo. Ke dau vavuna na toto vata kei na vuce, ka sala muria na lako i valeniwai.
Vai curuqara lives on the reef, but does not taste as good as the *vai* that lives in the mud. Sometimes they have two live babies that can

be seen inside the stomach. They are dangerous if you step on them, as the sharp tail comes up and cuts you with poison. This causes intense pain and swelling. A trip to the health centre is advised.

Vai varoro

Ray

Kena balavu: 180 cm. Yavuni: 1. Bula i na: takali. I sa bau: vica, Δ↓.
Kania: nuku, ika lalai. Vakasasa: dakai, qoli lawa. Vakariri: vesa.
Kena yaga: kana, volitaki.

Talanoa: Me da garauna vinaka nona bui baleta ni dau vi ta. Be careful of the sharp tail spine.

Qio

Vacamacala taumada

I na gauna i mada dau tu na kena i talanoa, na Kalou vu ko Dakuwaqa nona ila. O kia na, Taveuni vake tale ga ko Matasawalevu. Na kenai tukuni i mada ni tabu vei ruka na koro ke meru kania na qio, vake ru na kania, na gauna ru lako ke i wai na kaji ruka na qio. Dua tale ga na ere i rawa ni kaji iko ke na qio vake ira vosa muritakini iko na Turaga.

Na daveta mai soso dau je kenai vatawa jiko na vu Sulua dau tukuni tu ni je nodra vu i Kadavu. Ia na vu mai Taveuni sa qai via mai tauri Kadavu, me je nona vanua. Sa qai tukuna vake na sulua, ru sa na vala vake i wini ko Dakuwaqa sa na je nona vanua ko Kadavu. Vake i lusi me je nona bobula na sulua, i na mino tale ga ni kaji ira na kai Kadavu i wai. Sa ru qai vala, ka lusi na vu ko Dakuwaqa.

I le va tale ga na turaga ni Vabea ratu lako i Suva qai tavuki na boto. Na qio qai kani iratou kora i mada dau tu na bete ra dau curumi jimoni tu, sa qai taroga i dua na marama ma mate na luvena, sa qai tukuna vua na bete. Sa mino niu jila rawa ke i dua na ere baleta ni ma kani au i mada o kia.

Talanoa: Dua na turaga ni Matasawalevu ma kaji kia na qio, qai kila jiko i muri ni ma mino ni rogoca na nodra vosa na turaga, ni ma tukuni vua me wawa tiko vata na turaga mai Waisalima, kia qai via lako ga i nona koro i Matasawalevu. Nona yaco ga mai Matasawalevu sa varau jiko na lako i wai, sa mai lako sara o kia vata kei ira, ke na soqo ni Vabogi va vawaji. Ra sa nunu jiko qai vana o kia i dua na ika qai sakuiva cake mai na ika na qio qai kaji ruka vata. Mani donumakini kia mai i dua na waqa. Sa qai kauji kia sara ina valenibula i Vunisea.

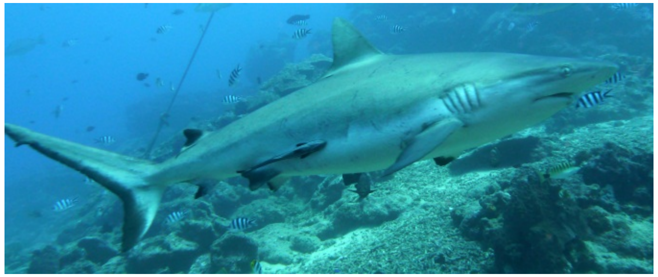
Soso passage used to be guarded by a *vu* octopus. The octopus kept four fingers on top of the sea and four fingers on the bottom of the sea. One day Dakuwaqa, a *vu* shark, came from Taveuni. The octopus said you cannot come through the passage to come into Kadavu. Dakuwaqa said, we will fight and if I win you must leave. They fought and octopus was about to squeeze shark to death. Shark said let me live and I will never eat Kadavu people.

Because of respect for Dakuwaqa, many people in Vanua Levu and Matasawalevu do not eat shark. If people do eat shark and go in the sea, the shark will bite them. Also people say that if you ignore the chief's word the sharks will bite.

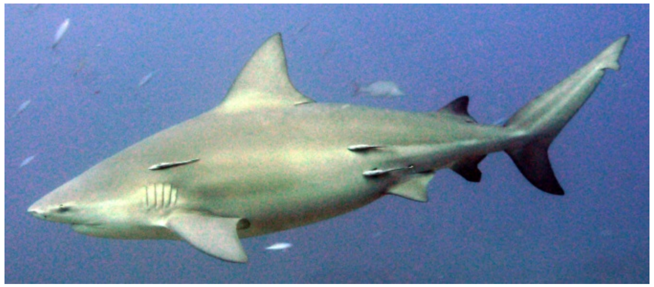
Once four Vabea men went to Suva and their boat tipped over. The sharks ate them. At the time, an old time priest in the village was possessed. The mother of one of the lost men (from Taveuni) asked the possession demon / *vu* why he ate her son. The reply was that he could do nothing about it because he ate me first.

Talanoa: A man from Matasawalevu, did not listens to the words of the chief where he stayed. The man wanted to spend time with his brother for a feast in another village and take leave of the chief, which was denied. When he arrived in the village he was among those chosen to go fishing to prepare for the feast. At that time they used only hand spears, so when you speared a fish, it was close to you. The man speared a fish and a shark came and attacked the man. The shark had the man’s leg in its mouth and the water was red with blood. The shark bit the man ten times but the man fought the shark and pushed hard on the shark's nose to get the shark off his leg. A witness said that the flesh was hanging off the man's leg, which was badly damaged. The men were fishing from a small boat and the man would have died if not for the fortunate arrival of a larger passenger boat on its way to the village. The captain and the passengers agreed to take the man straight to the hospital in Vunisea, which saved his life. Today he has raised a family and lives in good health, but the story is still told in Nakasaleka as a reminder to respect the chief's word or the sharks will bite.

Qio balavu
Negraprion acutidens
Sicklefin lemon shark
Kena balavu: 128 cm.
Bula i na: cakau levu, takali, daveta. I sa bau: wadu, Δ↑. Kania: ika lalai, nuku. Vakasasa: siwa boto, dakai. Vakariri: suruwa lolo. Kena yaga: kana, volitaki, baca, wainimate. Luvena: 9-11. Luvena bula i na: lomaloma.
Talanoa: Ni dau moce tu na qio, i rawa ni da vesuka nona bui. Kora da qai dreta cake mai i loma ni boto. Na lewe ni qio ke dau je wainimate ni da kania. Dau tukuni tu vakei kaji iko na qio, qai malumu nona baji, o kia na lako qai lesu tale mai vata nona baji vou qai qaqa me mai kata tale.
When the shark is sleeping you can sneak up and put a rope on its tail, then go back to the boat and pull it up. Eating this shark can cure human disease. The shark bites you once with weak teeth, then in just seconds it goes away and get strong teeth, before returning to bite you harder.



Qio saqa
Carcharhinus amblyrhinchos
Grey reef shark
Kena balavu: 183 cm. Yavuni: 1-10+.
Bula i na: cakau levu, takali, baji kai lili. I sa bau: wadu, Δ↑. Kania: ika lalai, saqa. Vakasasa: siwa boto, siwa sina. Vakariri: suruwa lolo. Kena yaga: kana, volitaki, wainimate. Luvena: 2-4 30 cm. i na kete.
Talanoa: Na bulubulu dau kania na se ni sinu. *Bulabula* eat the leaves of the sinu tree which have fallen in the water.



Qio leka
Carcharhinus leuca
Bull shark
Kena balavu: 172 cm. Yavuni:

1. Bula i na: takali. I sa bau: wadu, Δ↑. Kania: ika lalai, sulua. Vakasasa: siwa boto. Vakariri: suruwa lolo, vesa. Kena yaga: kana, volitaki. Yaloka: 11.

Talanoa: I so na kena balavu i rauta jiko ni 20 ft, na qio ke dau vadromuca na waqa, qai dau kajikajia tala na baba ni waqa. Da rawa ni musuka va lima na kena jiki me rawa ni vodo i na boto baleta ni sa rui levu.

This one is very dangerous. Once a 20 ft. shark was caught on a fishing line before crossing the reef where it first dove deep and then later pulled the boat to the shallows. To get it into the boat, the people cut the shark in 5 pieces and removed the intestine to load it.

Qio kaboa, qio ulivai

Nebrius ferrugineus

Tawny nurse shark

Kena balavu: 210 cm. Yavuni: 1,3+. Bula i na: cakau levu, takali, daveta. I sa bau: iso, Δ→. Kania: ika lalai, qaqari. Vakasasa: siwa boto, dakai. Vakariri: suruwa lolo, vesa. Kena yaga: kana, volitaki. Yaloka: 11.

Talanoa: O kia i vake na koli, ni da segata qai kaji. Na qio maloku qai vake nai bulibuli ni kaboa. After you spear them, they try and bite you like a dog. They swim slowly like a catfish.

Bakewa

Echeneis naucrates

Sharksucker

Kena balavu: 90 cm. Yavuni: 1,2,10+. Bula i na: takali. I sa bau: iso, Δ↑. Kania: drau ni ika. Vakasasa: siwa boto, dakai. Vakariri: riri, tavuteke. Kena yaga: kana, volitaki.

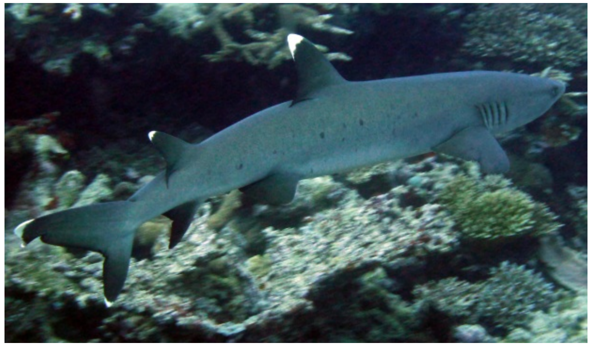
Talanoa: Na ika ke na bakewa i dau kana mai vei ira na ika lelevu me vake na qio, ika bula, saqa, dau kabiji ira qai domica nodra dra. Na ika ke na saqa dau wajituba i vi togotogo me vuni mai va na bakewa. I vake na qio na kena kuli, ia i je ika kana vinaka qai uro. Bakewa follows and sticks onto large fish, sharks, and turtles, to suck their blood. Fish like *saqa* go into the mangroves to scrape the *bakewa* off. Bakewa have skin like a shark, but they have oily flesh and more fat.

Qio kaboa

Stegostoma fasciatum

Zebra shark

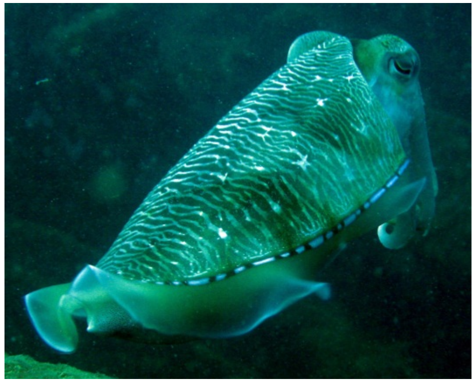
Kena balavu: 143 cm. Yavuni: 1. Bula i na: cakau levu, takali. Vakariri: baovi.



Qio jina
Triaenodon obeseus
White tip reef shark
Kena balavu: 173 cm.
Yavuni: 1. Bula i na: takali, cakau levu.
I sa bau: wadu, Δ↑.
Kania: ika lalai.
Vakasasa: dakai, siwa boto. Vakariri: suruwa lolo. Kena yaga: kana, volitaki, baca. Yaloka: 11-12.

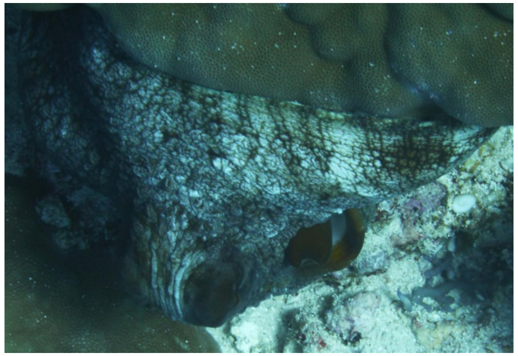
Qio
Kena balavu: 122 cm.
Bula i na: takali, daveta.
I sa bau: wadu, Δ↑.
Kania: ika lalai, sulua. Vakasasa: siwa boto, dakai, tala lawa. Vakariri: suruwa, lolo, tavuteke, baovi. Kena yaga: kana, volitaki. Yaloka: 11-1.
Talanoa: Na qio i dua na ika varetovaki, qai rewarewa vake da vasegata. Dua na ere dau rewarewa ke o kia ni dau bukete. Lewe levu na tamata dau siwata mai, musuka laivi nona bui, tekiteki toa me volitaki vei ira na kai Jaina. These can be dangerous and they are quick to anger when pregnant. They sleep in caves on the reef and some people catch them to sell the fins to Asian buyers.

Sulua



Sulua nunu (A)
Cuttlefish
Kena balavu: 28 cm.
Bula i na: takali. I sa bau: iso.
Kania: lase mate.
Vakariri: baovi. Kena yaga: kana, volitaki.
Luvena bula i na: barani nuku.
Talanoa: Dau vigaci i na vula ko me kina June, tautauvata ga na sulua, io i mino ga ni walu nona qaluka. Dau kau laivi nona tua ni se bera ni vikana.
Seen in May and June, these are similar to an octopus but have no tentacles. Remove the bone to cook.

Sulua
Octopus
Kena balavu: 20 cm.
Yavuni: 1,2.
Bula i na: cakau levu.
I sa bau: vica, Δ↓.
Kania: vujia, qaqari.
Vakasasa: dakai, tomika.
Vakariri: riri, vakalolo, baovi. Kena yaga: kana, volitaki. Yaloka: 7.



Talanoa 1: Dau riri vata na rau ni maoli baleta me malumu. Ni da via va matea na Sulua, mo vukica ga nona ulu. Me da qarauna ga ni dau lako mai na loa, ka dau kabita nomu ucu, taliga vata nomu mata. Ni dau damu na rau ni dabi, kacei nai vatakilakila ni sa levu tu na sulua, kacei mai na vula ko Noveba kina Tiseba.
Cook octopus in a pawpaw leaf bundle to make the flesh soft.
To kill an octopus you must turn the head inside out, but beware the tentacles that come up to try and cover your mouth, nose, and ears. You must be quick before they squirt out their black dye, which makes it hard to see. When the leaves of the *dabi* tree turn yellow from September to November is the time for octopus.
Talanoa 2: Dua na turaga ni Lagalevu ma lai nunu i Wasilalima, qai gaca i dua na sulua vana sara, qai sikoji kia na sulua ke. Mani vava tu nona taku, nona liga. Sa qai lako mai nona taliga vata nona ucu. Sa qai sasaga mai vanua na turaga ke, sa qai sotavi kia i dua na marama, sa qai vukea me luvata laivi na sulua.
Some years ago a man from Lagalevu went diving at Waisalima. He went to shoot a fish. A big octopus on the side of the reef jumped onto the man’s back and tried to wrap its tentacles around him and into his ears and nose. He pulled the octopus off his face and surfaced to swim to the beach with the octopus on his back, where a woman helped pull it off him.

Na sulua I jiko tala na kena I tukuni makawa vei ira na kai Kadavu, gaca na qio tabana. Octopus have a special history in Kadavu. See the shark section for the story.

Sulua nunu
Octopus
Kena balavu: 65 cm. Yavuni: 1,2. Bula i na: cakau levu, cakau vanua. I sa bau: iso, Δ↑. Kania: ika lalai, laselase. Vakasasa: moto. Vakariri: riri, vakalolo. Kena yaga: kana, volitaki. Yaloka: 8.
Talanoa: I bula i vi cakacakau qai liga leleka. Na sulua lelevu i bula i waitui levu. *Sulua nunu* has small arms and lives in shallows, unlike the large *Sulua*, which lives in the deeper sea.

Sulua qalo
Kena balavu: 40 cm. Yavuni: 1. Bula i na: takali, cakau vanua.
I sa bau: wadu, Δ↑. Kania: ika lalai. Vakasasa: vucu. Vakariri: riri.
Kena yaga: kana.
Talanoa: Dau virubi va na kacu, me malumu na kena lewe, kora qai riri. Rubi va na taba ni sinu. Beat it with a stick to soften the flesh before cooking.

Bola ni sulua nunu
Nautilus pompilus
Nautilus

Ika bula

Vacamacala taumada

Ika bula na kena ila va Kadavu io va Bau na kena ila na vonu. I na gauna i mada na ika bula na kedra ga na turaga tei na gauna i mate ke na turaga dau je kena magiji na ika bula. Ia na gauna ke sa tabu vakalawa me mate na ika bula baleta ni sa kawaboko jiko, vake ko toboka ko na vilewaitaki.

I Nakasaleka ina vula ko Noveba kina vula ko Tiseba kacei na guana ra dau lako ke i vinukunuku na ika bula mera laki vasucu va dau vagatakina ga nodra taba mera kelia ke nodra qara, kora kacei ra buluta tale vavinaka. Na gauna sa jirijiri ke na yaloka sa mai wawa tale tu na tinana i matavura kia ga na luvena i donui kia i na kania, vake i calati kia i bula. I va ilani tale ga na ika ke me ika tamata baleta ni dau tagi ni dua na ere toto i jili vua.

Ika bula is the name for sea turtles in Kadavu, but the Bauan term *vonu* is also used. In the past *ika bula* were considered chiefly food. If a chief was present then the meat was given to him. After a chief died a turtle would be caught and eaten. Today it is illegal to kill turtles in Kadavu or sell the meat. People in the village of Namuana in Kadavu are known for their ability to call turtles in from the sea.

In November and December in Nakasaleka, *ika bula* come up on the beach at night to dig holes and lay their eggs in one of the holes. *Ika bula* use their flippers to dig the holes and cover the eggs with sand, as neatly as possible to hide the spot. People say that the adult turtles wait in the sea for the night that the babies hatch out, when the mother or father may wait in the surf to eat the babies that come near them on the way to the shore. Some people call *ika bula*, *ika tamata* because if you catch them on land they will cry like a human.

Taku
Eretmochelys imbricata
Hawksbill turtle
Kena balavu: 150 cm.

Kania: vujia, nuku. Yaloka: 11-1.
Talanoa: Taku i dua na ere qaqa ka maroroya jiko na gacagaca ni manumanu ka dara jiko, i vake tu na qa ni ika bula. *Taku* have spaces between the plates of their smooth edged shells, known as *lalaqa*.

Tu vonu
Carretta carette gigas
Loggerhead turtle
Kena balavu: 116 cm. Yavuni: 1. Bula i na: takali, bajina, vi vujia.
I sa bau: iso, Δ→. Kania: vujia, lase mate. Vakasasa: dakai, qoli, siwa boto. Vakariri: baovi, kari. Kena yaga: kana, volitaki. Yaloka: 12-1.
Talanoa: Tu vonu dau levu tu nona ulu qai varovaroa tu na kena taku. *Tu vonu* have big heads and crested shells with jagged edges.

Ika jina
Chelonia mydas
Green sea turtle
Kena balavu: 120 cm. Yavuni: 1,2. Bula i na: takali, lomaloma. I sa bau: wadu. Kania: vujia, lumi. Yaya ni cakacaka

Baji tokelau
Talanoa: Na baji tokelau i dravia qai sisima vinaka na kena taku.
Baji tokelau have smooth topped shells with smooth edges.

Bonu, dabea, dadakulaci, niuniu

Bonu, boila

Kena balavu: 100 cm. Yavuni: 1. Bula i na: baji ni vi jirijiri, vitogotogo, ruku ni cakau. I sa bau: iso, Δ↑. Kania: ika lalai, qaqari, momoci. Vakasasa: taraki. Vakariri: baovi, vakalolo. Kena yaga: kana. Luvena bula i na: ruku ni cakau, baji ni vi jirijiri.

Talanoa 1: Boila va Bau, Bonu va Kadavu. Boila is Bauan for the Kadavu term Bonu.

Talanoa 2: Ika retovaki baleta ni dau vikaji. It has a bad temper and will bite you hard.

Talanoa 3: Rua na vimakubuni lako i cakau kauta mai i dua na bonu, saqa ru kania qai ru sova na kena tua kina vi kalebuci: ena bogi ni rusa moce tu sa qai lako mai na bonu vei ruka. Qai kaiya koi au na bonu ni yamotu levu. Kani au na vimakubuni. Sova noqu tua i vibucibuci. Buci e buci e. Ru qai situba na vimakabuni kina koro voleka. Qai muri ruka jiko yani na bonu. Ra qai lako mai na lewe ni koro ra qai vamatea na bonu.

One day this old lady and her grandchild decided to go to the reef and catch some fish. They caught something, but it was not a fish. It was a sea snake that we call *bonu*. They brought it home and cooked it to eat. The put the bone from the *bonu* near a tree near their house. When they went to bed that night they heard this song. "I am the *bonu* from the reef that this old lady and and her grandchild ate and put my bone next to the tree called *vibucibuci*." *Vibucibuci* means something that looks like grass, but is not grass. Well, when the old lady and her grandaughter heard this they ran away to the next village. But, the *bonu* came after them and the villagers said they were going to kill this *bonu* to help the old lady and her grandchild.

Dabea

Gymnothorax flavimarginatus

Yellow margin moray eel

Kena balavu: 162 cm. Yavuni: 1,2. Bula i na: cakau levu, takali. I sa bau: vica, Δ→. Kania: ika lalai, qaqari. Vakasasa: dakai, siwa boto. Vakariri: GAGA:B, baovi. Kena yaga: kana, volitaki. Luvena bula i na: daveta.

Dabea

Gymnothorax sp.

Moray eel

Talanoa: Ke i bau dua toka na ika uro qai kana vinaka na kena lewe. Dau tukuni tu me je vore ni waitui baleta ni tautauvata na kedrui kanakana. O kia i bula te vavale tu ga i na qara ni cakau. Na ika ke i dau gaga sara va levu, sa dodonu me vasavasavataki sara va vinaka ni se bera ni vi kana. Tukuni vake ni dua sa lai vavana me qarauni kia da qai kaji kia na dabea, ni sa dau vanai na ika mo kua ni jiko volekata na qara ni cakau baleta i rawa sara ga ni kajia na ika ka vamanuka takina iko tale i dredre ni vigaci na luvena, i dau luveni i na vula ko noveba. *Dabea* is also called pig of the sea (*vore ni waitui*), because when it is cooked properly it tastes like pork and has a high fat content. *Dabea* must be cleaned properly by an expert before cooking or it can be very poisonous. Some people do not eat it for this reason. *Dabea* live in holes and will come out and eat a fish right off a diver's spear, sometimes injuring the diver. You rarely see the young ones, but some say that they reproduce in November.

Sikamoko
Siderea sp.
Peppered moray
Kena balavu: 85 cm. Yavuni: 1. Bula i na: baji ni vi jirijiri, lomaloma. I sa bau: vica, Δ↓. Kania: ika lalai, momoci. Vakasasa: moto, taraki. Vakariri: tusala, qinu, riri. Kena yaga: kana. **Talanoa:** Dau vi kaji qai dau lako duadua tu ga. It can bite you hard. It travels alone.

Dadakulaci
Laticauda sp.
Banded Krait
Kena balavu: 154 cm. Yavuni: 1. Bula i na: cakau levu, bajina, vi vatuvatu. I sa bau: wadu, Δ↑. GAGA:A. Vakariri: mino. Luvena bula i na: vi vatuvatu.
Talanoa: Na dadakulaci i manumanu paisoni ni kaji keda. Dua na turaga ma kaji kia na dadakulaci rauta ga ni dua na miniti sa mate io vinaka na gauna ke ni sa tu voleka na valenibula, ka rawa nida cula i na cula ni gaga. Its bite is very poisonous. A fisherman got one in his net. He was bitten and died within minutes, but people who have been bitten have gone quickly to the health clinic for an injection and survived. *Dadakulaci* comes up on the shore at times, but it lives in the sea all over the reef and lagoon.

Niuniu
Myrichthys colubrinus
Banded snake eel
Kena balavu: 48 cm. Yavuni: 1. Bula i na: barani nuku, maqamaqa. I sa bau: iso, Δ→. Kena yaga: kana.
Talanoa: Na niuniu i dau cuva tu i loma ni nuku i tautauvata ga na dadakulaci na duidui ga o kia i ra lawelawe jiko nona taku, ka mino so ni dau vikaji gaga.
Niuniu looks somewhat like *dadakulaci* but *niuniu* is not poisonous and has a long dorsal fin down its back. *Niuniu* can go into the sand backwards using its tail.

Babale
Stenella sp.
Dolphin
Kena balavu: 150 cm. Yavuni: 2,10+.
Bula i na: takali. I sa bau: iso,Δ→.
Kania: ika lalai. Vakasasa: mino.
Vakariri: mino. Kena yaga: valagi.
Luvena bula i na: takali.
Talanoa: Na babale i dau vigaci i valevu na vula ko Julai kina Seviteba. Dau tukuni ni je ika maloku qai ika vuku. Dau tukuni tu ni dau vukei ira va levu na leqa i wai.
Babale are seen in Kadavu between July and September. No one catches them. People say that dolphins will help people in the water by towing them to shore. Babale make a BOOO noise.

Tovuto
Whale

Sasalu

Dri

Vacamacala taumada

I levu na tamata sa nodra i vurevure ni lavo jiko na dri. I duidui na kedrai sau, qai duidui tale ga na vanua da dani ira ke i volitaki ga vei ira na kai Jaina. I so vei keda i tukuna ni so na dri i mino ni dodonu me da vasosarani ira baleta ni tu na nodra i tavi kacei na kena vasavasavataki na cakau vata na lase.

Ni tu i wai na dri da gaca tu ni jere lelevu ni sa kau mai vanua sa jere lalai. I volitaki droka ka volitaki buta tale ga. Vake sa buta sa toso cake na kena i sau. I so na dri dau musu na kena taku kaso i loma vata na kena tutu baleta me rawarawa ni vasavasavataki na kena loma. Ni sa buebue mai na wai, biuta yani na dri qai viuliyakina me 30 na miniti butara sara biuta na vesa me mamaca.

Many people catch and sell *dri* regularly. Various types live in different places. Prices vary by type and market demand in Asia. Recent openings of more Chinese restaurants in Suva has increased local demand. Some people think that some *dri* should be left alone to do their job of cleaning the coral.

When first pulled from the sea, *dri* shrink as the water runs out of them. They can be sold wet or be cooked and dried to fetch a higher price. To dry them, first cut them open length ways, cross ways, or slice the ends, depending on the type, and remove sand or coral bits. Boil for about 30 minutes before drying them out in the sun. Some types take up to two months to dry. Commercial operators use drying houses for faster results.

Dri vatu

Kena balavu: 38 cm. Yavuni: 1.
Bula i na: cakau levu.
I sa bau: vica, Δ↓. Kania: nuku.
Vakasasa: tomika.

Dulu togo (dri tabau)

Kena balavu: 25 cm.
Yavuni: 1. Bula i na: cakau levu.
I sa bau: vica, Δ↓. Kania: nuku.
Vakasasa: tomika. Vakariri: riri.
Kena yaga: volitaki.

Greenfish
Stichopus chloronotus
Kena balavu: 28 cm.
Yavuni: 1.

Loaloa

Kena balavu: 37 cm. Yavuni: 1.
Bula i na: cakau levu, cakau vanua.
I sa bau: vica, Δ↓. Kania: nuku.
Vakasasa: tomika.

Loli ni cakau
Holothuria atra
Kena balavu: 35 cm.
Yavuni: 1.
Bula i na: cakau levu.
I sa bau: iso, Δ→.
Kania: nuku, manumanu lailai. Vakasasa: tomika. Vakariri: riri.
Kena yaga: volitaki.

Talanoa: Na loli ni cakau i jere lelevu vei ruka ni da tunaka vake i se vulavula kacei i rawa nida kania vake i damudamu kacei i mino ni rawa ni da kania. Ra dau vicamuni, kara viyacari vatakini ira me rawa nira valuveni.

Loli ni cakau lives on the reef and gets bigger than *loli ni vanua*. When you open them there is something white in their stomach that you can boil and eat, but do not eat it if it is red. They may be seen to chase each other. If they want to get pregant and have babies they rub together.

Loli ni vanua
Holothuria atra
Kena balavu: 29 cm.
Yavuni: 1. Bula i na: vujia.
I sa bau: vica, Δ↓. Kania: nuku, vujia. Vakasasa: tomika. Vakariri: riri.
Kena yaga: volitaki. Luvena bula i na: vi vujia.

Talanoa: I rua jiko na mataqali loli. Loli ni vanua ka dua tale na loli ni cakau. Loli ni vanua dau vigaci valevu ga i vi vujia vata na vinukunuku. Na loli ni cakau i dela ni cakau mai cakau levu tale ga. I ra dau dui tutu na loli ka mino nira kumukuminivata tu, dau vigaci valevu ni Sodugu na ua dau vuni na maji. I mada ra dau vagatakina na se damudamu ni loli me mate tei mateni ke na ika, me rawarawa nida toboki ira. Sa vatabui i na gauna kene.

Loli ni vanua are found in the sand and weeds closer to shore than the larger *loli ni cakau* on the reef. *Loli* stay spread apart from each other and are best harvested in the afternoon high tide. They fetch a low price, but are often harvested for sale. In the past when people saw a *loli* they might take it and rub it against a stone to release a red blood-like liquid that kills any fish in the area, making the fish easy to gather. However, today this practice is not done and is against the law.

Madrai togo

Kena balavu: 35 cm. Yavuni: 1. Bula i na: cakau levu, yamotu. I sa bau: vica, Δ↓. Kania: nuku. Vakasasa: tomika. Vakariri: riri. Kena yaga: volitaki, kana.

Melamela

Bohadschia graeffei

Kena balavu: 42 cm. Yavuni: 1. Bula i na: laselase, cakau mate. I sa bau: vica, Δ↓. Kania: nuku, vujia, lase mate. Vakasasa: tomika. Vakariri: riri. Kena yaga: volitaki. Luvena bula i na: nukunuku.

Talanoa: I so i vailana tu me tigerfish. I dua na kena mua i vake tu na senikau. I na yabaki 1994 ma levu duadua na melamela ma vigaci ke, dau vigaci jiko valevu i na vula ko Noveba vata kei na Tiseba. Me da dau qarauna na gauna da kauta mai kene baleta ni dau gaga na wai i vanatakina mai ka rawa ni vuce na vanua i tauma.
Also known as tigerfish, *melamela* wave their tentacles like a flower. These were very common until 1994 when big harvests cut the population down. Most common in November and December. Handle with care to avoid the sharp poison tips that can cause swelling for an hour after contact.

Sucu drau

Thelenota ananas

Prickly redfish

Kena balavu: 42 cm. Yavuni: 1. Bula i na: yamotu, cakau vanua, nukunuku. I sa bau: vica, Δ↓. Kania: nuku, lumi, soso. Vakasasa: tomika. Vakariri: riri. Kena yaga: volitaki.

Talanoa: Sucu drau i bula i vanua nubu ka dau kana ga i na siga. I dau mamaca dredre ka rawa ni taura e dua na vula na kena vakamamacataki. They live on the reef, not the sand, and feed in daylight. These ones take months to dry in the sun.

Tarasea ni cakau

Thelenota anax

Kena balavu: 20 cm. Yavuni: 1,2. Bula i na: cakau levu. I sa bau: vica, Δ↓. Kania: nuku. Vakasasa: tomika.

TenaTena

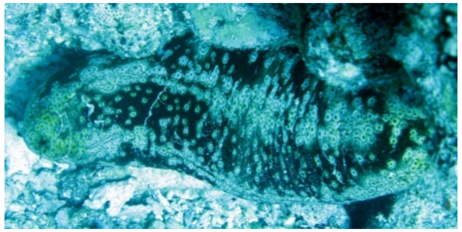
Kena balavu: 46 cm. Yavuni: 1. Bula i na: lomaloma, cakau vanua, nukunuku. I sa bau: vica, Δ↓. Kania: nuku, laselase, soso. Vakasasa: tomika. Vakariri: riri. Kena yaga: volitaki.

Talanoa: Na tenatena i dau mamaca dredre ka da dau musumusuka valalai qai riri me buta totolo e taura tale ga e dua na vula me vakamamacataki vinaka.
Tenatena, also known as abafish, must be sliced lengthwise before cooking and dried for months.

Tina ni valiki
Holothuria sp.
Sandfish
Kena balavu: 54 cm.
Yavuni: 1.
Bula i na: cakau levu.
I sa bau: vica, Δ↓. Kania: nuku. Vakasasa: nunu. Bula i na: cakau levu. I sa bau: wadu, Δ↑. Kania: nuku. Vakasasa: tomika.

Valiki (Dairo in Bauan)

Kena balavu: 50. Yavuni: 1,2. Bula i na: lomaloma, vi vujia. I sa bau: vica, Δ↓. Kania: soso, nuku. Vakasasa: nunu. Vakariri: riri. Kena yaga: kana, volitaki. Luvena bula i na: lomaloma.
Talanoa: Ni da tunaka i tu nona kete i so na bonu lalai kacei na luvena. Ni ra riri ira na vuvuce ni ko vasigana i na raqosa. I jei voli talega. When cooking they swell up and then shrink as they dry in the sun. Good to sell.



Vula ni cakou
Bohadschia argus
Kena balavu: 32 cm. Yavuni: 1.
Bula i na: cakau levu, nukunuku.
I sa bau: iso, Δ→.
Kania: nuku, manumanu lailai. Vakasasa: tomika. Vakariri: riri. Kena yaga: volitaki, kana. Luvena bula i na: nukunuku.

Talanoa: I vakatokaijiko me je vula, baleta ni dau sevu i na gauna ni cila ni vula. Nida tomika, I dau lako laivi mai na kena drega vulavula qai levu i ra dau kaiya ni je kena luvena. I vake talega nida tunaka nona kete, i dau lako laivi mai i so na bonu lalai qai so i nanuma ni je tamana. Vakasavasavatakina vinaka nise bera ni o variriga me volitaki yani. Vake na loaloa, io I mino gas ni nukunuku no na yago.
They are named *vula* because they are most plentiful during the full moon. When you pick these up some white sticky fluid comes out. Some people think that this is their babies. After you cut them open small white things like snakes come out that are called *bonu*. Many people think this is the father. Remove this along with any sand before cooking for sale**.** They are like loaloa, but with no sand stuck to the body.

Bula, lokoloko ni qio

Lokoloko ni qio, kalokalo

Linkia laevigata
Blue linka starfish
Kena balavu: 36 cm. Yavuni: 1. Bula i na: cakau levu, baki ni vi jiri, nukunuku.
I sa bau: wadu, Δ↑. Kania: nuku,laselase.
Vakasasa: tomika. Kena yaga: baca. **Talanoa:** Dau je baca ni kawa vinaka, i dau kania va levu na sabutu. Used as bait in *kawa* (fish traps). People collect them to barbeque and put chopped up pieces in traps to attract *sabutu*.

Lokoloko ni qio/kalokalo
Starfish
Kena balavu: 22 cm. Yavuni: 1.
Bula i na: cakau vanua, yamotu.
I sa bau: wadu, Δ↑. Kania: nuku. Vakasasa: tomika. Kena yaga: baca, yaya ni cakacaka.

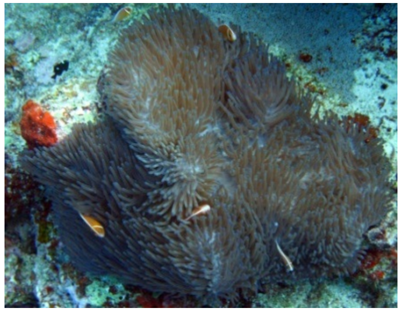
Lokoloko ni qio
Choriaster granulatus
Kena balavu: 30 cm. Yavuni: 1.
Bula i na: cakau vanua, bajina.
I sa bau: iso, ↑. Kania: nuku, lase mate.
Vakasasa: tomika, Kena yaga: baca, volitaki.

Bula
Acanthaster planci
Crown of thorns starfish
Kena balavu: 29 cm.
Yavuni: 2.
Bula i na: cakau levu, cakau vanua.
I sa bau: iso, Δ↑.
Kania: cakau, laselase.

Talanoa: Na bula dau kana lase. Na yabaki 2002 ma vinakati me vakawaboko taki kene, ke na vakasama ratu vatura mai i dua na otela. Dau tukuni vake va dai taya i wai i na bula tale io sa na rua, mino ni dua. I mada dau vamatei ga va na kacu. Dau tukuni vake nio sa butuka, mo vukica nona taku qai butuka tu, baleta me domica tale o kia nona voto kacei na mino ni vuce, tei toto tale.
Bula eats the coral. In 2002 there was a *bula* population surge. A local resort owner led a program to kill them using sharp sticks and then bury them on land. If you cut them up in the sea they grow arms back. Old people remember another year when there were many *bula* and people killed them with sticks. If you step on a *bula*, turn it over and step on the underside to suck out the poison. The wound will still be painful and swollen for weeks.

Baka, bosucu, bulewa, drodro, drumani, seasea

Baka ni waitui
Sea fan
Bula i na: cakau levu, bajina. Vakasasa: nunu. Kania: obe.
Kena yaga: vavalagi, volitaki, yaya ni cakacaka.
Talanoa: Dau jei ukuuku ni vale. This can be dried out in the sun and put in the house for decoration.



Drumani
Anemone
Kena balavu: 18 cm. Yavuni: 1.
Bula i na: yamotu, bajina, baji kai lili.
I sa bau: vica, Δ↓.
Vakasasa: tomika. Vakariri: baovi.
Kena yaga: kana, volitaki.
Talanoa: I rawa niko vakayagatakina nai sele mo ciciga mai kene na drumani. Ni dau kabita tu na yamotu tei na vatu. To harvest *drumani*, get your hands or a knife underneath to get them off the rock. Only certain types of coral host this sort of *drumani*. Look for *yamotu* and stones

Drumani
Reticulidia sp.
Nudibranch
Bula i na: cakau levu, cakau vanua, yamotu.

Bosucu
Chromodoris sp.
Nudibranch
Bula i na: cakau levu, cakau vanua. I sa bau: vica. Kena yaga: valagi.
Talanoa: I malumalumu, niko taura cake mai i na nomu liga. Ra da mai sarava na sara vanua. They are soft and hard to hold onto. They attract scuba divers to visit the reef.

Bulewa

Kena balavu: 23 cm.
Yavuni: 1.
Bula i na: cakau vanua, yamotu.
I sa bau: wadu, Δ↑.
Kania: nuku, Vakasasa: tomika.

Drodro (Bau: drose)
Cassiopea sp.
Jellyfish: upside down
Kena balavu: 10 cm. Yavuni: 1. Bula i na: takali, vi togo i gusunijiro, vi vujia. I sa bau: vica, Δ↓. Kania: vuso ni ua. Vakasasa: tomika, taraki. Vakariri: tusala, baovi, vakalolo. Kena yaga: kana. Luvena bula i na: vi togo i gusunijiro.
Talanoa: Ni tara na wai katakata i saqoqo. Ika rairai vinaka, qia dau meke. They shrink in hot water. A beautiful fish that performs a dance.

Seasea
Oligochaeta. Kena yaga: bait.
Talanoa: Dau je baca vinaka ni seasea, kabajia, sabutu, senigaragara. These worms can be dug out of the beach sand at low tide to use as bait on hooks for catching *kabajia*, *sabutu*, and *seingaragara*.

Cawaki, gasagasau

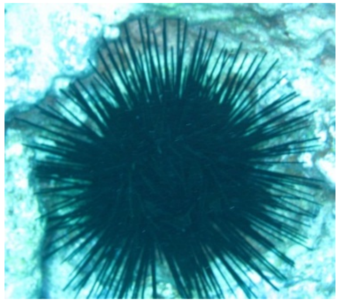
Vacamacala taumada

Vake ko butuka na bula, cawaki, tei na gasagasau, vukica na kena kete qai butuka tale me rawa ni domica laivi na paisoni. Ratu mataqali vata o iratou ke, i duatani ga na lokoloko ni qio.

If you step on one on the reef, turn it over and step on it again to suck the poison from the wound. *Gasagasau*, *cawaki* and *bula* are all related, but not *lokoloko ni qio*.

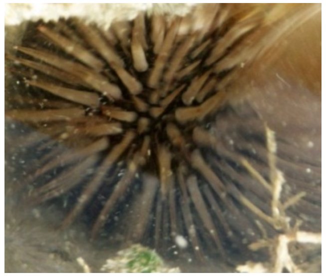
Cawaki (A)

Urchin
Kena balavu: 10 cm. Yavuni: 1,2,3+,10+.
Bula i na: vi vujia, maqamaqa.
I sa bau: iso, Δ→. Kania: nuku, vujia.
Vakasasa: tomika. Vakariri: tatavu, kokoda.
Kena yaga: kana, volitaki. Luvena bula i na: vi vujia.
Talanoa: Ra dau vigaci valevu ina vula o Jiulai vata na Okosita. I rawa ni o milamila tei drakusi i na gauna o tomika mai ke. I so ira tukuna meda kauta ga mai va lailai nisa je kena gauna, baleta me levu jiko ina visiga ni mataka. I dau vigaci ga na ere lalai yasani cawaki levu. Ida rawa ni gaca na vujia ina nona kete. Their season is July and August. You may get itchy or rashes when you gather them. Some people say not to take too many when the season comes to make sure they can reproduce for future years. You can see the small ones next to the big ones. Chewed up seagrass can be seen inside them.



Gasagasau (A)
Diadema setosum
Urchin
Kena balavu: 19 cm. Yavuni: 1,10+. Bula i na: dela ni cakau, bajina.
I sa bau: wadu, Δ↑. Kania: lumi, lase mate.
Vakasasa: tomika.

Talanoa: I na gauna ni draki vinaka i dau vigaci vaka levu. They are easier to find on cloudy days.



Gasagasau
Heterocentrotus sp.
Kena balavu: 14 cm. Yavuni: 1. Bula i na: bajina, cakau vanua.
I sa bau: wadu, Δ↑.
Kania: vujia, bulewa.

Civa, katavatu, vasua

Vacamacala taumada

Sa lailai sobu jiko ga nai wiliwili ni vasua vata na katavatu baleta ni sa rui kana vinaka. Ratu sa cakacaka vakaukauwa jiko na tabana ni qoliqoli me maroroi ina vi qoliqoli vakatabui so me rawa ni levu tale mai. Sa jili jiko na tei vasua mai makogai, ia i taura na gauna mena qai lelevu ina gauna rasa dau vakaluveni ka sana qai ciri tu na kena yaloka kina vivanua iso. Sa rui jere bibi na kena tei na vasua ina kena vanua dodonu qai matau. I na gauna me dau laki kau mai ke, ira vayagatakina na i sele me, cici laivi mai na kena lewe. Kevakene i sa maca jiko na nomu dra iko rawa ni kania na kaikoso me kokoda, me jili na moli vata na boro, i rawa ni vakalesuya tale mai na nomu dra i sa maca. Ni rauta na 20-30 na yabaki sa kora, ma se levu tu na vasua. *Vasua* and *katavata* stocks are under pressure, as their meat is good to eat. Fisheries programs to place vasua in Marine Protected Areas are helping to restock populations. Mako gai in Lomaviti is the broodstock source, but the clams take many years to grow. To breed, they release eggs and sperm in the sea to produce tiny larvae, which float with the current, and turn into tiny clams that get heavy and sink to the bottom, where they settle and grow. Thus, placing broodstock clams in the right current is important. *Katuvatu* are thicker and longer than *vasua*. When people harvest these, they bring the shell up if they can get it off. Otherwise they stick a knife in the shell opening to kill it before it closes up. Then they cut out the meat. Eating raw *vasua* or *kai kosa* for one day will bring the iron level in your blood up, giving you more energy and meeting the hospital blood count test. It is 20-30 years since there have been plenty of *vasua*.

Civa

Clam
Kena balavu: 33 cm. Yavuni: 1. Bula i na: cakau levu, yamotu.
I sa bau: iso. Kania: vuso ni ua.
Vakasasa: tomika. Vakariri: baovi, vakalolo. Kena yaga: kana, volitaki, yaya ni cakacaka.

Talanoa: Ira dau kaburakina na nodra yaloka. Kara qai kabita va kaukauwa sara tu na cakau. Dau cici na kena lewe qai kana vinaka. Io na kena qa i dau jili me jei bulukau teijei ukuuku. O ira na ere lailai, rai tu voleka ga vei ira na ere lelevu.

The eggs are released in a rush. These clams are hard to pry off the rocks so people find them at low tide and remove the flesh. Shells are used for buttons and decorations. Sometimes there are small pearls inside. Small ones live next to the big ones.

Katavatu (A)
Tridacna maxima.
Small giant clam
Kena balavu: 34 cm.
Yavuni: 1,2. Bula i na: cakau levu, yamotu.
I sa bau: wadu, Δ↑. Kania: manumanu lailai, vuso ni ua. Vakasasa: tomika. Vakariri: kokoda, baovi. Kena yaga: kana, volitaki, yaya ni cakacaka. **Talanoa:** I dau kania na manumanu lalai. I dau kaburakina na kena yaloka i na vi cakacakau. They eat plankton. They spread their eggs in the coral.

Vasua dina
Tridacna derasa.
Southern giant clam
Kena balavu: 37 cm.
Yavuni: 1. Bula i na: cakau levu, lomaloma, dela ni cakau, cakau vanua.
I sa bau: vica, Δ→. Kania: vuso ni ua, manumanu lailai. Vakasasa: tomika. Vakariri: kokoda, tavuteke, baovi, vakalolo. Kena yaga: kana, volitaki, yaya ni cakacaka.

Kai vatu

Kai girigiri, kai tava

Kena balavu: 8 cm. Yavuni: 1. Bula i na: lomaloma, nukunuku. I sa bau: wadu, Δ↑. Vakasasa: tomika. Vakariri: riri, kokoda. Kena yaga: kana. **Talanoa:** Kai savasava, kana vinaka qai kamikamica. Sweet taste and clean, not like other kai.

Kai koveniu
Anadara sp.
Kena balavu: 10 cm. Yavuni: 1.
Bula i na: cakau vanua.
I sa bau: wadu, Δ↑. Kania: vujia.
Vakasasa: tomika. Vakariri: vakalolo. Kena yaga: kana.

Kai koso
Anadara sp.
Kena balavu: 10 cm. Yavuni: 1,2.
Bula i na: lomaloma, vi vujia, cakua levu.
I sa bau: wadu, Δ↑.
Kania: soso. Vakasasa: nunu, tomika.
Vakariri: vakalolo, kokoda.
Kena yaga: kana.

Talanoa: Kana vinaka duadua vake i kokoda. Dana gaca ga valevu na kai koso i Matasawalevu. Ni dau jili i dua na sogo tei na lotu, i le levu dau via mai kana kokoda ga. I vinaka ni da kania na kokoda baleta ni va bulabula takina na dra qai dau vasokora talega na dra.
The hard shells were pierced and used as weights on fishing nets in the past. *Kai koso* are common near Matsawalevu and some people come to church and events here, so they can eat *kai koso*. It is good to eat this *kokoda* to increase the iron levels in your blood.

Kai talevu

Kena balavu: 10 cm. Yavuni: 1,2,3+.
Bula i na: takali, cakau levu, nukunuku.
I sa bau: vica, Δ↓. Kania: soso.
Vakasasa: tomika, lusu. Vakariri: vakalolo.
Kena yaga: kana.
Talanoa: Da lusugi ira mai na vivatuvatu lalai. Find them by digging up the small stones.

Kai vasavasa

Kena balavu: 10 cm. Yavuni: 3.
Bula i na: nukunuku.
I sa bau: wadu, Δ↑. Kania: nuku.
Vakasasa: tomika. Vakariri: tusala. Kena yaga: kana. Luvena bula i na: nukunuku.
Talanoa: Dau kabi qaqa i vivatuvatu. It sticks very tight onto rocks.

Siga wale

Kena balavu: 10 cm. Yavuni: 3.
Bula i na: nukunuku. I sa bau: wadu, Δ↑. Kania: nuku. Vakasasa: tomika. Vakariri: riri. Kena yaga: kana. Luvena bula i na: nukunuku.

Sici

Bulikula

Kena balavu: 10 cm. Yavuni: 1. Bula i na: daveta, cakau vanua, vi vujia. I sa bau: iso, Δ→. Kania: nuku. Vakasasa: nunu. Vakariri: riri. Kena yaga: volitaki, valagi. **Talanoa:** Dau je i ukuuku ni vale. Dau kaji toto. It is good to decorate the house. It gives a painful bite.

Drevula kata

Kena balavu: 6 cm. Yavuni: 3. Bula i na: vi vujia, lomaloma. I sa bau: wadu, Δ↑. Kania: nuku, soso. Vakasasa: tomika. Vakariri: vakalolo, riri. Kena yaga: kana. **Talanoa:** Dau lako tuga i dela ni nuku. It goes above the sand.

Gera

Kena balavu: 10 cm. Yavuni: 3+.
Bula i na: vi vujia, nukunuku.
I sa bau: wadu, Δ↑. Kania: nuku.
Vakasasa: tomika. Vakariri: ginu, vakalolo, riri. Kena yaga: kana. Luvena bula i na: vi vatuvatu, nukunuku.
Talanoa: Dau riri vata na waitui me rawa ni lako laivi na nuku i tu vua. Vinaka vei iko ni ko kania. Cook in sea water to get the sand out. Good for you to eat.

Gera & Jivikea

Kena balavu: 5 cm. Yavuni: 10+.
Bula i na: vi vujia.
I sa bau: wadu, Δ↑. Kania: manumanu lailai. Vakasasa: tomika. Vakariri: vakalolo. Kena yaga: kana. Luvena bula i na: vi vujia.

La

Kena balavu: 9 cm. Yavuni: 3.
Bula i na: cakau levu, dela ni cakau.
I sa bau: wadu, Δ↑. Kania: nuku, cakau.
Vakasasa: tomika. Vakariri: kari lolo, miji, kokoda. Kena yaga: kana.

Talanoa: Dau vagataki me je uma ni lawa i mada. In the past, the shells were used as raw material for fishing net weights.

Matakarawa
Trochus niloticus
Kena balavu: 13 cm. Yavuni: 1.
Bula i na: cakau vanua. cakau levu.
I sa bau: vica, Δ↓. Kania: nuku. Vakasasa: tomika. Vakariri: qinu. Kena yaga: kana.
Talanoa: Qai dau kau laivi mai na kena lewe na gauna sa buta kene.
Dig out the white flesh after cooking.

Sisici

Kena balavu: 5 cm. Yavuni: 3+. Bula i na: vi vatuvatu, lomaloma.
I sa bau: wadu, Δ↑. Kania: nuku, soso. Vakasasa: tomika. Vakariri: riri, vakalolo. Kena yaga: kana.
Talanoa: Dau kabita na vatu. It sticks to the rocks.

Tabe

Kena balavu: 7 cm. Yavuni: 3+. Bula i na: vi vatuvatu. I sa bau: iso, Δ→. Kania: soso. Vakasasa: tomika. Vakariri: riri, tusala. Kena yaga: kana. **Talanoa:** Qa qaqa vake na vatu. A hard shell, like a stone.

Tavui jina

Charonia tritonis

Kena balavu: 30 cm.
Yavuni: 1.
Bula i na: cakau levu.
I sa bau: vica, Δ↑.
Kania: laselase, cakau.
Vakasasa: tomika, nunu. Vakariri: riri, vakalolo. Kena yaga: kana.
Talanoa: Dau uvuca na turaga ni koro me rawa ni ra soqoni vata mai ke na lewe ni koro. Dau volitaki vei ira na kai valagi, ka jei ukuuku vinaka talega ni vale. The shell is used as a horn by the *turaga ni koro* in the village to call the people together. They are good to sell to white people and decorate the house.

Tavui sonasona

Kena balavu: 7 cm. Yavuni: 3+. Bula i na: cakau levu. I sa bau: wadu, Δ↑. Kania: manumanu lailai. Vakasasa: tomika. Vakariri: vakalolo. Kena yaga: kana.

Vula ni cau

Kena balavu: 10 cm. Yavuni: 1.
Bula i na: vi vatuvatu, nukunuku. I sa bau: wadu, Δ↑. Kania: nuku. Vakasasa: tomika. Vakariri: riri, vakalolo. Kena yaga: kana.

Talanoa: Kakana vinaka, dau mino so ni vigaci na siga, dau vigaci ga va levu na bogi. Good to eat when cooked. Easier to see and gather around midnight.

Vuro

Kena balavu: 15 cm. Yavuni: 1. Bula i na: vi vujia, I sa bau: wadu, Δ↑. Kania: soso, nuku. Vakasasa: tomika. Vakariri: tatavu, vakalolo. Kena yaga: kana. Luvena bula i na: vi vujia, jiro. **Talanoa:** Dau dredre ni jili mai tuba na kena lewe. Hard to get the flesh out.

Yaga

Lambis sp.

Kena balavu: 31 cm. Yavuni: 1,2,3+,10+.
Bula i na: nukunuku, cakau levu. I sa bau: wadu, Δ→.
Kania: nuku. Vakasasa: tomika. Vakariri: vakalolo, tavuteke. Kena yaga: kana volitaki.
Talanoa: Na yaga i dau kania na bula vata na gasagasau mai na nona bui qai vacobara yani kina bula me domica na nona yago. Na yaga ra dau tu yarurua. Dau je i voli vinaka vei ira na sara vanua.
Yaga eat *bula* and *gasagasau*. It puts a long tail out to drill into the *bula* and suck its body out from the inside. They are usually seen in pairs. A good one to sell to tourists.

Ko ira na sasalu ni waitui kada dana jiko ira, ke i ma tauri mai nai vola na Tropical Pacific Invertebrates ka ma vola ko Patrick L. Colin vata kei Charles Arnison e na yabaki 1995. Na i vola ke i sa jiko na kena i lavelave i na taumada i na vale va koro i Matasawalevu ke vake i gadrevi me vajikevi tale. Na i taba kora i jiko va nai vola sa toqai no ira me vakarawarawatakina ne kena. (Kena i tuvatuva 7)

The following creatures were identified from the book, Tropical Pacific Invertebrates by Patrick L. Colin and Charles Arnison, 1995. This book is available for review in the Matasawalevu Community Hall. The number of each picture in the book is included here for ease of reference (Chart 7).

Kena i tuvatuva 7 / Chart 7

#	Nakasaleka	Linnaean
720	Tadruku	*Polyplacophora* fam. Chiton
722	Tadruku	*Polyplacophora* fam. Chiton
771	Bucibuci	*Nassarius* cf. *coronatus*
792	Vuro	*Conus marmoreus*
808	Weji	*Bula ampulla*
935	Tina ni vasua	*Tridacna maxima*
939	Kai dawa	*Periglypta clathrata*
972	Mana	*Thalasina anomala*
977	Uga ni waitui	*Dardanus megistos*
997	Qaqari culacula	*Charybdis* sp.
999	Qaqari solosolo	?
1014	Kadara	*Grapsus* sp.
1016	Koki	*Ocypode cerathopthalma*
1017	Toto	*Uca* sp.
1062	Vavaba	*Panulirus pencilatus*
1071	Vavaba	*Scyllarides tumidus*
1096	Voce	*Lingula reevi*
1252	Drewe	*Euapta godeffroyi*

Tadruku

Acanthozostera sp.?

Chiton

Kena balavu: 12 cm. Yavuni: Bula i na: vi vatuvatu. I sa bau: wadu, Δ↑. Kania: nuku. Vakasasa: tomika. Vakariri: riri, kokoda. Kena yaga: kana.

Jio

Barnacle

Qari, taqalito, tuba, urau, vavaba

Urau
Panulirus
Lobster
Kena balavu: 52 cm.
Yavuni: 1,2.
Bula i na: ruku ni cakau, cakau vanua. I sa bau: iso, Δ↓.
Kania: ika lalai. Vakasasa: vucu. Vakariri: riri. Kena yaga: kana, volitaki. Yaloka: 3.
Talanoa: I rua jiko na mataqali urau. Raraba: kuvui na nona roka, qai lalai nona qaluka. Urau: damudamu, qai balavu nona qaluka. Dau volitaki ina otela. The smaller kind, *vavaba*, is more brown with less colour and shorter arms. People sell them to resorts.

Vavaba
Lobster
Kena balavu: 18 cm. Yavuni: 2. Bula i na: cakau levu. I sa bau: vica, Δ↓. Kania: nuku. Vakasasa: tomika. Vakariri: riri. Kena yaga: kana, volitaki.

Urau (A)
Squilla or *Lysiosquilla* sp.
Mantis shrimp
Kena balavu: 21 cm. Yavuni: 1. Bula i na: cakau levu. I sa bau: iso, Δ↓.
Kania: vujia, manumanu lailai. Vakasasa: vucu. Vakariri: riri. Kena yaga: kana, volitaki.
Talanoa: I dau levu ina gauna ni katakata na mataqali roka vulavula, damudamu, vata i so i via loaloa tu. They come out after some hot days. There is the red and white type and a black type, which used to be more common.

Qari
Scylla serrata
Mangrove or mud crab
Kena balavu: 29 cm. Yavuni: 1,2.
Bula i na: dadala vitogotogo.
I sa bau: wadu, Δ↑.
Kania: ika lalai, qaqari.
Vakasasa: qoli lawa, moto. Vakariri: riri, suruwa lolo. Kena yaga: kana, volitaki. Luvena bula i na: dadala.
Talanoa 1: Na luveni qari dau muria ga nonai qasiqasi na tinana. The babies follow the movements of the mother.
Talanoa 2: Dua na gauna ru sa gagaji tu i waitui na vitinani qari. Sa iga mai na tinana ni qasi jiko va baba na luvena, sa qai tukuna mai na tinana vua na luvena me qasi va dodonu. Tukuna ga mai ko luvena o kia i muria jiko ga nona i qasiqasi.
Once, the mother crab took her babies out into the water and tried to tell them to go straight, but she looked behind and they were going sideways. She called “why do you not go straight?,” they said

“we just follow the way you walk- you go this way sideways and we go this way sideways, you go that way sideways and we go that way sideways”.

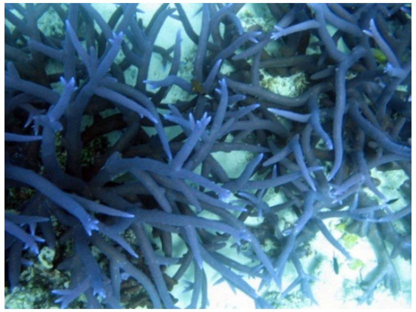
Taqalito

Kena balavu: 13 cm. Yavuni: 1,2. Bula i na: vi vatuvatu, vitogotogo. I sa bau: wadu, Δ↑. Kania: soso, nuku. Vakasasa: tomika. Vakariri: tatatavu, riri, kari lolo. Kena yaga: kana.
Talanoa: Qaqari gaga nona qa. Dau kaji toto. A sea crab with a hard shell and a nasty bite.

Tuba

Land crab
Kena balavu: 22 cm. Yavuni: 1. Bula i na: vi vatuvatu. I sa bau: wadu, Δ↑. Vakasasa: tomika. Vakariri: miji. Kena yaga: kana.

Bulewa, cakau, lase



Lase kata

Bula i na: cakau levu

Lase piqi

Bulewa

Talanoa: Paisoni jiko, i malumu tu vake na meteresi. Poison, when you stand on it. It goes down like a mattress.

Lase kata

Bula i na: cakau vanua. Kena yaga: yaya ni cakacaka.

Talanoa: E dau jili me boro vulavula na vatu. It can be made into white paint for rocks and houses.

?

Talanoa: I dau jiko vua i so na ere gagata, i da rawa ni manuka ke.
They have sharp points. When you step on them they leave a small indent in your foot that stings.

Lumi, nama, ravete, talitaliga, vujia

Lumi
Latin
Common
Talanoa: I tolu jiko na mataqali lumi: lumi coko, lumi karo, lumi wawa. Kinds of *lumi*: *lumi coko*, *lumi karo*, and *lumi wawa*.

Nama
Caulerpa racemosa
Bula i na: dela ni cakau, cakau vanua. I sa bau: iso, Δ↑.
Vakasasa: tomika. Vakariri: kokoda, miji. Kena yaga: kana, volitaki.
Talanoa: Na lagio i dua na manumanu mai na loma ni tauva. I dau lako sara mai waitui me mai kana nama. Ra dau tukuna na qase ni levu na nama, kacei sa voleka na dravuisiga.
Ladio bird flies to the reef to eat *nama* and returns to drop some into its hole each day. When the *nama* is plentiful, the dry season is coming.

Ravete ni waitui

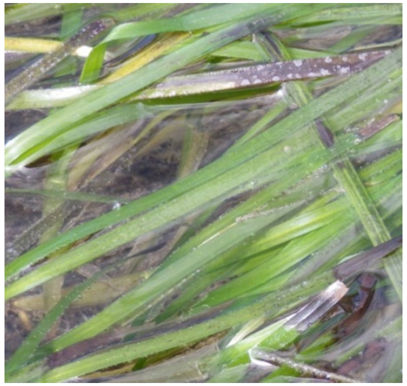
Kena balavu: 20 cm.
Bula i na: nukunuku, vi vujia.
Talanoa: Ke i rawa ni vamanukaji iko vake ko butuka. The raw sharp leaf edges cut your feet.

?

Talanoa: Sa mino jiko ni vigaci, me yalova yani na 2005. These were not seen until about 2005.

Talitaliga / taliga ni waitui

Bula i na: cakau levu, cakau vanua.



Vujia

Kena balavu: 20 cm.
Bula i na: barani nuku, baji ni vi jirijiri. I sa bau: wadu. Vakasasa: tomika.
Talanoa: Ke dau tukuni ni je co ni waitui. I mada se dua ga na mataqali vujia, na ere lalai i rauta toka ni 16 cm. na kena balavu. Na gauna ke i sa babalavu ka sa rauta ni 26 cm. Na vujia ke ra qai vigaci jiko ga i na loma ni yabaki 1980. Ke na kedra kakana vinaka na ika bula.
This kind of *vujia* appeared around 1980 to replace a shorter and much thinner *vujia* which was about 16 cm long. The new one gets to about 26 cm. This ocurred at the same time that many trees were cut down for firewood with axes, so soil erosion may have increased at this time. Turtles like to eat this plant.

References

Note: Sources used for identification of Linnaean and English names, and in some cases to link a Nakasaleka name to a Linnaean name. The knowledge base in this book comes from Nakasaleka people, not from these or other books.

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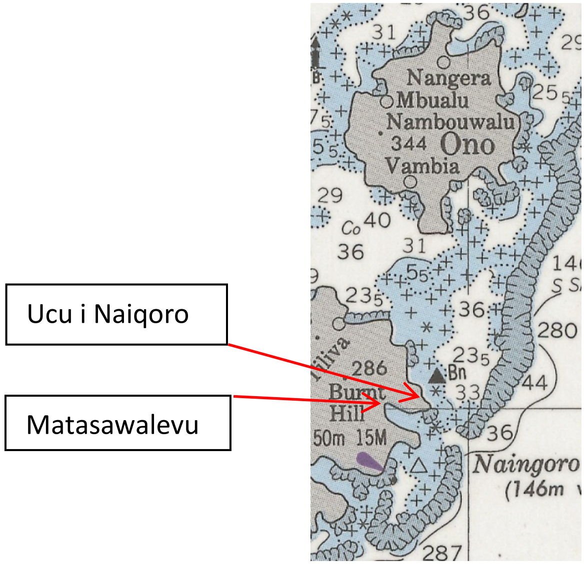
Index

Talanoa

Ni mate i dua na luve i Kadavu na nodra yalo ina lako mai kina ulu i Naiqoro. Ko Naiqoro na nona i jikojiko i dua na cakau toso na nona ila ko Taveta. I momoqili na kenai bulbuli i vake tu i dua na yamotu levu ko Taveta i dau vitosoyaki jiko ga donuyana kena ucu o Naiqoro, toso yani vacei i daveta, i mino ni vigaci tale ina dua na vanua. Sa vigaci sara vakavudua i na gauna ke me vakatauvatani i na loma ni 10-20 na yabaki sa kora. Ina gauna sa dau vigaci ke, i dau toso cake mai, i dau toso vakababa, qai dua na qa ni vasua i jiko i na dua na kena yasa qai mino ni wili rawa na ika lalai ra tu ke.



O koro ni yalo i dua na ulunivanua i volekaji raba, vake tale ga na kena ucu i Naiqoro, i tukuni nira dau laki tu ke na yalo taucoko sana ni tamata i dau mate. O tagitoka talega i dua na ulunivanua volekaji Matasawalevu. I tukuni nira dau mai dabe toka ina dela ni vatu na yalo mera qai sarava sobu tu na Kadavu balabalavu. I ciri ko beka ina nodra vakanavuma lesu na nodra koro vata nodra vuvalebaleta nira sa volekasara yani kina ucu i Naiqoro. Ra tu i kacei ra qai tagi toka.

Biu o tagitoka mera sa lako ki Naiqoro, ra donua yani i dua na vunikalu vate vinaka tei wate kamikamica na kena vua. Ira tu vadua nira sa wateva, kara sa via kila sara ga na yava i nate jiko mai kacei. Ni daidai sa jiko i kacei i dua na yavu na kena ila ko tutalevu.

Nira siviji tutalevu vata kei Matasawalevu, i dua na vatu i jiko ina nodra yasa i mani, ka vigaci tu ke na mawe ni nona laga o Taveta. Tarava yani o kavakawatuna, ni daidai sa jiko i kacei i dua na wavu lailai, ina nodra sa vakarau curuma yani na vitogotogo i nai lakolako ki Naiqoro. Nira sa curuma yani na vitogotogo, ra yalova yani nai i karua ni vanua, o qaraniucu i Taveta. Kei dua na ulunivanua lailai, qai rua toka na kena qara vake saraga nai bulibuli ni dua na ucu, ia i tukuni tu ni nona ucu o Taveta. I tu ga ina baji ni vitogotogo qai rawarawa sana wida gaca, vake iko lako jiko ina boto.

Ni siva o garaniucu i Taveta, ko curuma yani na loma ni vitogotogo, ko lajiva yani ki mata i Taveta. I dua na wai lailai i drodro jiko mai ina kedra maliwa na vatu kara tukuna tu na nemamu qase, ni je nona wai ni mata o Taveta. I rawa ga nida gaca i na gauna ni maji. Nida siviji matai Taveta, ida na yalova yani i dua na vitogotogo lailai, ke je kena ila o tiri lesi. Ni yalo daucoko i lako mai ki Naiqoro ina na musuka i dua na taba ni togo lailai nisa dau vigaci nisa ramusu tu na taba ni togolailai kemami sa dau kila sara ni dua na luve i Kadavu sa vakaleqai.

Toso vakalailai ga yani ki mada, sa jiko sara o tagitagi na gone. Ira tukuna tu na qase ni yalo taucoko ni yagone i dau mate, ira mai tagi tu i kacei, i se rogo jiko na tagi me yalova mai ni daidai. Nira biuji tagitagi na gone ga mai, kina kena ucu sara Naiqoro kana kaci “Taveta, au bau lele.” Na vikerekerei kacei i vakayalori jiko i na kena ucu i Naiqoro.

Nida lako i Lagalevu ida na curuma yani i dua na viqalau tei na vi kacukacu, I tukuni ni jiko i kacei i rua na vatu lelevu ka je kena ila jiko o na i qaqi i tukuni levake ko je tamata baci, na nomu yalo i na tu i na nodru vimama karu qaqi iko. Keo je tamata vinaka na nomu yalo i na dabe toko ina dela ni qai sarava cake toka na vula. Na ila ni vanua kacei ko vataqorovula.

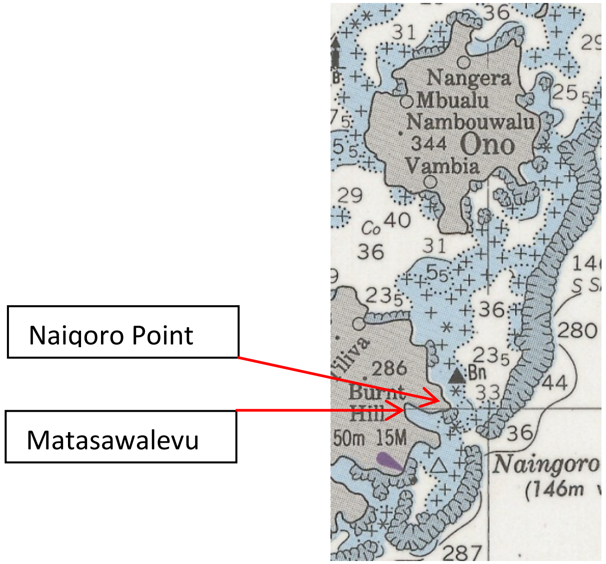
I na gauna au biu vuli mai ke, au mino tu ni via kila na nodrai tukuna na yalo. Dua na siga au qai lako i siwa i na noqu bavelo au qai gaci Taveta, dua na ere na noqu reto, baleta na ere ga au kila ni kacei na jimoni levu. Au gaca na waitu loaloa, qai dua na cakau bula i vitosoyaki tu vamalua qai dua na nuku rama vulavula vinaka i tu ke qai dua talega na qa ni vasua lailai vata kei na ika (Guru). Viu gaca na vasua ni matadola tu qai dua na guru i vavoki toka i na kena yasa sa dau tuburi au ga mai na reto baleta i mino ni dua na cakau i dau tu i kacei. O Taveta i dau vitosoyaki tu ga, i mino ni dau tu vakadua i na dua na vanua. Ra sa dau gaci kia talega o ira na noqu lewe ni koro, wili tale ga ke na wajiqu. Io na wajiqu i mino ni je yalewa ni Matasawalevu, ia ma se gaci Taveta sara ina yabaki sa kora (2010). O taveta i dau jiko ga i na yasayasa va Matasawalevu.

I dua na turaga ni Kavala nona ila ko Yabaki, i nanuma me lai gaci Taveta mada. I lako cake mai Naiqoro qai wali kia tu ina loli sigani me vake sara ga nai wate ni dua na tamata mate. Sa mai tucake tu ina kena ucui Naiqoro. Qai colata tu na nona malumu, qai lako vata na nona kaci "Taveta au bau lele." Rogoca o Taveta na nona kaci qai sauma mai, mua vesi tei mua kau (mua vesi, kenai balebale turaga mua kau tawa vanua) sauma yani o Yabaki mua vesi. Ni tucake tu o Yabaki sa gaca sara i dua na cakau satubu cake mai, i mino tale ni wawa ina nona sa samuji kia ina nona malumu. Baleta ni nanuma jiko o Yabaki ni dua beka na tamata o Taveta. I siri na saku i na nona sa gutugutuwa o Yabaki, qai mani taura mai o Taveta i rua na vatu qai koloci Yabaki ke. Nai matai ni vatu i kena ila jiko o mata iri, i toka volekaji malau, na kena i karua o Maniqiwa, i jiko nida sa siviji Lagalevu meda lako yani vacei i Jiliva. Sa qai vosa yalayala ko Taveta me kua tale ni dua wa yalo ni kai Kavala me lako mai Naiqoro me yalova mai ni daidai.

Salamisa Baselala Okotova 2011

Stories of Matasawalevu

This is Naiqoro Point here (see map). All the people of Kadavu, if we die, will know their spirits will come all over here to Naiqoro Point. Our souls will come here and there is a reef that used to move. The reef always stays here, around here and goes this way, goes this way, come this way, it moves (pointing at places on the map around Naiqoro Point and out to the reef). Taveta is the name of the reef. It used to move. It is maybe the size of this house, from that wall there in the kitchen to that side here and it is round. There is the shell of a clam on top. It is a medium sized empty clam shell with small fish going around. If you see it, we used to see it moving, it moves up and down and it moves sideways. At the moment, we have not seen it so many times in the past 10 or 20 years. It moves around the area here. Sometimes we meet him here, sometimes over here, sometimes just near to the passage, always inside the reef, it does not go outside the reef. It stays in here.



There is a mountain here on top of Raba (Creek). There is a mountain up this hill. The name is Koro ni Yalo. It means all our souls will come and stay there. The village is here. There is a hill behind the village, the name is Tagi Toka. If you come to this hill and you stay on top, you look right down to the end of Kadavu on the other side, if you come and sit here, by the rocks there. The souls come and sit there and they remember their village, their home, and they cry (*tagi*). They just sit there, they see Naiqoro Point and they just come and sit there to think about their family and village and then they cry. *Tagi toka*. When they leave here they come to the house, you can see the white house, a small one; the name is Tutaleva. There is a kind of fruit that is very sweet if we smell it. If they pass it and smell it then they go back. Tutaleva means we go back. So they go back to see what is there. That is the meaning of na Tutaleva. You go back and see – Hey what is this? They go back to where the house is, a small telephone house. Now they can look back to the fruit. Then they leave here and go past the village and go around this mangrove, here, on the other side. Taveta's footprint is near where people go past the village. The name of the bridge near the mangrove is Kavakawa Tuna (the second bridge along the path leaving the village to Lagalevu). When it (souls) leave that place it goes right down past the mangrove. On the second point is Garaniucu nei Taveta, or Taveta's nose. These are the two big hills that look like a nose, you can see it from the boat. When you go up to the area, when it is low tide, the water will come out there. The old people used to say that "that is the water that comes from the eyes of Taveta, tears, *mata i* Taveta. The water flows off the rock as the tide drops. When you leave that place, it goes up and past the mangrove. We call it Tiri Lesi. The meaning is that the souls will come and break one of the leaf stems, a small stem of the mangrove. Up a little bit here, near to Naiqoro Point, there is a small island. The name of the island is Tagitagi na Gone, which means crying children; we used to hear them crying there. Then they go to Naiqoro Point and they call "Taveta, *au bau lele*" (Taveta, come and take the soul), ask permission to Taveta if he can come and take him. This happens on the Point.

On the track to Lagalevu, there are two rocks, big rocks inside the original forest, not the pine forest. The big rocks are called Nai Qaqi. If you are a bad man, your spirit will come there and come between the two rocks and the rocks will crush you. The spirits that stay here will come and sit on top of rocks. They will sit there and watch the moon. In Fijian, *vatu qoro vula*, watch for the moon, it is very good.

When I left school, I did not want to know about old spirits. One time, I went to the reef to catch fish. I was paddling my canoe and I saw Taveta. I was really afraid. It is the devil down here, still alive and moving, I thought, it is Taveta. I could see it moving in the sea. In the black sea you can see the top of the reef with a very white sand. Sand on top and a clam shell with a black *guru* (damselfish) on top, every time you see it – just one black *guru* and an empty *vasua* (clam) shell, open. I was really afraid, because I had been there many times and there was no reef there. But, Taveta was there and moving. After that, I saw it a lot of times in different places. All the people in the village have seen it, including my wife. My wife is not from this village. The last time someone saw it was 2010, but at the moment we do not see it often. It comes and goes, disapearing. It moves around all this area.

Another story about Taveta. One live man from Kavala came and took *loli* (sea cucumber) from the sea and dried it on the rocks so that it smelled very bad. Then he took it and wiped it on his body so that he smelled very bad. He comes with his war club and stays on top of this point and he calls “Taveta *au bau lele*.” He asked Taveta to come, so that he can go. When Taveta moves up, he says “Hey, it is a reef rock” and he takes his war club and smashes it on the rock. When Taveta comes up he will ask “*moa vesi*” (chief) or *moa kau* (commoner)? The man said “moa vesi.” At the moment when you see that reef it has a crack where the war club hit. The man’s story is in a book somewhere. The man, Yabaki, hit it and ran away. Taveta said “all the people of your village will not ever come here.” Their souls no longer come here, but instead go to a place in Kavala. I heard from the old people that the small island beside Malau by Mike’s place and the island west of Lagalevu are the stones that Taveta took and threw at Yabaki, as he was running back to Kavala. The first island is called Mata Iri and the second one past Lagalevu is Maniqiwa.

Salamisa Baselala
October 2011

Tagi Maucia: Na senikau mai Taveuni Tagi Maucia i tubu volekata sana na vatu qoro vula. Ka cei na vatu levu ra dau lai dabe jiko ke na yalo mera sarava na vula. Na Tagi Maucia ke i se vulavula, ia mai Taveuni i se damudamu. I tukuni ni Tagi Maucia i bula ga mai uluiqalau (Taveuni) vata kei Matasawalevu ka mino ni bula tale ina dua na vanua. Nai talanoa baleta na Tagi Maucia, i tukuni ni dua na turaga ma kau cake ki uluiqalau, ia na nona wai ni mata ra lai vu mai ke na Tagi Maucia qina mai Matasawalevu mara lako ga mai Taveuni. Ina loma ni 2 na yabaki sa kora mara lako mai Suva i dua nai lala va didike ka mani vigaci ke na Tagi Maucia. Sa jei vajinajina levu nio Matasawalevu vata kei Nakaugasele mara lako mai i Taveuni. Sa jere levu na nemamu redeu takina i dua na jina levu ke. Na 'Taveu" ni cavuji vakavanua o Matasawalevu, i kilai tu ke ina Kadavu balabalavu, io i mada jiko vei ruka o takalai Nakasaleka (Nakaugasele). O ira na nemamu qase maramada mai Nakaugasele, sara qai lewa mera lako cake mai i dua nakena i wase (Mataswalevu) me yacova mai ni daidai.

Na nemamu koro Marawa ma jiko mai Taveu, kora ra qai gole cake sara i na i karua ni nodra koro (koro makawa) me yacova na nodra lako mai na Kaulotu i ka cei ma tukuwa na noqu qase ni mara tara ke i dua na nodra vale ni lotu. Sara qai nanuma mera toki sobu mai ra ke me voleka i wai vata kei na ika. Na gauna kacei 1850 se je gauna ni vivaluvaluti. I viti taucoko se je gauna baci qai voravora. Io nira sa yalo mai na kaulotu sa lutu nai wau, nai sele, sa visau sara mai na bula. Ira dau bula tuga vakalevu ina vi ulunivanua na tamata ina gauna kacei me rawa nira taqomakini ira, mai na nodra meca, ka dredre vakalevu talega na bula nira yawa mai waitui. Cira na kaylotu mai Viti o David Cargil vata kie William Cross, kau mino ga ni kila na nodra ila na ma kaulotu mai kai. Sa qai mai tara i dua na vale ni lotu i ra ke me yalova mai na siga ni daidai. Salamisa Baselala, Okotova 2011.

Tagi Maucia flower and vine stem

Tagi Maucia: The flower from Taveuni, Tagi Maucia, it grows near to the *vatu qoro vula* where the spirits sit on the big rocks to watch the moon. It has a white flower. They say that the Tagi Maucia only grow in Taveuni and up here. The story about the name is about one chief who was taken up to the high mountain of Taveuni. The chief cried and the tears from his eyes fell on one part of the tree and it grows. The flower comes from his tears. The people od Matasawalevu come from Taveuni. People came from Suva 2 years ago and saw the flower and told us that Tagi Maucia is there. We know that people of Matasawalevu and Nakaugasele came from Taveuni. We did not know the story of Tagi Maucia or that the flower was growing up there. It was a surprise to us.

Matasawalevu people are called *Taveu* by others in Kadavu. The chief of Nakaugasele is senior to the Tui Taveu who is the chief of Matasawalevu. The first settlement on arrival from Taveuni was Nakaugasele. Our people later left there to come here to Matasawalevu. Our old village was up Taveu Creek. It was in here until the missionaries came. They went up on this hill, so we left Taveu to go up there when the missionaries came and settled up there and according to my father built a church up there. After that they came down here to be near water and fish. This might have been in the 1850s. Before this time, there was a lot of fighting in Fiji all over. There was cannibalism and things like that. It was a very bad time. Missionaries came and stopped the fighting and cannibalism. People used to live right in the bush on top of the hills to be safe. It was difficult and far from the ocean. The missionaries that came to Fiji included David Cargil and William Cross, but I do not know the names of the missionaries that came here, as they just visited. The people from Matasawalevu built the church.

Salamisa Baselala, October 2011.

Tagi Maucia vine growing around a tree