

Socio-economic Study of Ebiil MPA

2010

Noelle Wenty Oldiais, Adelle Lukes
Isechal, Dawnette Eulyhma Olsudong, and
Supin Wongbusarakum

Conducted and supported by Palau International Coral Reef Center (PICRC), the David & Lucile Packard Foundation, Capacity Enhancement Project for Coral Reef Monitoring (CEPCRM), and The Nature Conservancy (TNC)



Lead author: Noelle Wenty Oldiais

Co-authors: Adelle Lukes Isechal, Dawnette Eulyhma Olsudong, Supin Wongbusarakum

TNC Advisor: Supin Wongbusarakum

Hard and/or electronic copies can be requested from:

Palau International Coral Reef Center

PO BOX 7086

Koror, Palau 96940

Phone: (680) 488-6950

Fax: (680) 488-6951

Cover photo: Ngerchur and Ngerkeklau Islands of Ngarchelong

Cover photo credit: Noelle Wenty Oldiais

TABLE OF CONTENTS

1	Acknowledgements.....	4
2	Executive summary.....	4
3	Introduction.....	5
4	Assessment objectives.....	6
5	Methods.....	7
	Secondary data	7
	Household surveys	7
	Key informant interviews	7
6	Results.....	8
	Demographics.....	8
	Marine resource dependency	11
	Management effectiveness	15
	Threats	21
	Monitoring awareness	21
	Tourism development and management	21
7	Discussion.....	22
8	Conclusion and Recommendations.....	22
9	Intellectual property rights.....	23
10	References.....	24
11	Appendices.....	24-107
	Appendix 1: Copy of household survey.....	25
	Appendix 2: General statistics for all survey questions.....	36
	Appendix 3: Key informant interview questions.....	68
	Appendix 4: Key informant interviews with answers.....	70
	Appendix 5: Team members and affiliations.....	107
	Appendix 6: Indicators.....	107

1. ACKNOWLEDGEMENTS

We wish to extend our thanks and gratitude to the communities of Ngarchelong for participating in the 2010 socioeconomic survey as well as the Ngarchelong State Office and the Northern Reef Management Office for their great support. Our appreciation goes to Palau Historic Prevention Office for helping with the Palauan translations for the household questionnaire as well as Charlene Mersai for her advice and support. Also, we are very grateful for the support, training and guidance from Dr. Supin Wongbusarkum throughout this study as well as Dr. Christy Loper for helping with the development of the socioeconomic assessment database. We would also like to acknowledge the David & Lucile Packard Foundation, Capacity Enhancement Project for Coral Reef Monitoring (CEPCRM), a collaboration project between Palau International Coral Reef Center (PICRC) and Japan International Cooperation Agency (JICA), and The Nature Conservancy (TNC) for supporting this study. Last but not least, we are very thankful for all the team members who contributed all their efforts to ensure that this process was achieved.

2. EXECUTIVE SUMMARY

In 2005-2006, Palau International Coral Reef Center (PICRC) designed and conducted a socioeconomic study to generate information that would help the management of Ebiil Conservation Area (this report uses “Conservation Area” and “Marine Protected Area (MPA)” interchangeably). The purpose of the study was to better understand how the Ngarchelong people perceived the effectiveness of Ebiil’s management. The study surveyed approximately 67 randomly selected households which was 30% of all households in Ngarchelong State. The results showed that 91% of those surveyed supported the MPA as a management tool, and that 63% preferred a permanent type of closure with 60% supportive of additional MPAs. Also, 55% of those who were surveyed agreed that Ebiil MPA helped improve the availability of seafood. It was found that there were concerns with equitable distribution of economic benefits. Only twenty-two percent of the households saw economic benefits of Ebiil and 52% saw conflicts arising from different resource user groups of the MPA. The management, in general, was perceived as being poor with illegal entry, illegal fishing, and/or poor management as the top threats with increasing surveillance/enforcement as the most popular recommendations for improvement.

With these results, PICRC again designed and conducted another socioeconomic study as part of the efforts to support adaptive management of Ebiil and the use of MPAs as a marine management tool in 2010. In this study, household surveys and key informant interviews were used to collect data. This census survey targeted the marine resource users of Ngarchelong despite their place of residency in Palau. Before starting every survey, surveyees were asked if they considered themselves as marine resource users of Ngarchelong. Two hundred seventy-nine (279) households were covered in this study showed that 95%, of the Ngarchelong’s head of households supported Ebiil being a legislated MPA with 77% supporting the idea of having additional MPA(s). However, the perception of additional MPA(s) had shifted from being a permanent closure on the 2005-2006 study to being temporary in 2010 with an average of 5 years as the suggested closure time. According to this study, 77% agreed that Ebiil

helped improve the availability of seafood. The results also showed that 86% agreed that there are economic benefits of Ebiil and that 66% perceived that these benefits were equally shared. This was a positive shift from the 2005-2006 study. However, the threats still remained the same as the 2005-2006 study, illegal entry, illegal fishing and/or poaching in Ebiil, with the same suggestions to the management which included strengthening surveillance/enforcement.

In conclusion, even though the perception of Ebiil MPA was more on the positive side, the management still needed to improve its effectiveness by strengthening the surveillance and/or enforcement to address its threats of illegal entry, illegal fishing, and/or poaching in Ebiil. At the time of this study, the State of Ngarchelong and the Northern Reef Management Office were working on improving these issues by designating Ebiil to the Protected Area Network (PAN). By being a PAN site, Ebiil management would be given an opportunity to access technical and financial support from the national government which may help address these weaknesses and threats.

3. INTRODUCTION

Ngarchelong is the northernmost state in Babeldaob, Palau, where Ebiil Conservation Area also known as Ebiil Marine Protected Area (MPA) is located. In 2000, the channel, a known grouper spawning aggregation site, was initially placed under a form of traditional moratorium called *bul*, that was imposed and enforced by traditional chiefs and placed restrictions on entry and harvest. In that same year, Ngarchelong State Government enacted the Ebiil Conservation Area Act of 2000² which designated Ebiil channel and its surrounding reefs as a conservation area to complement the *bul*. In 2002, the 15 sq km Ebiil MPA, had its closure extended for 2 more years and later on in 2003 Ebiil was established as a permanent closure.

In 2009, Ngarchelong State, through an Ebiil management planning team, began a management planning process to develop the Ebiil Conservation Plan. The plan was endorsed by both elected and traditional leaders in 2010 and articulated the management goal of the MPA to:



Figure A: Ebiil MPA⁷

“Allow for the conservation and effective management of the natural resources of Ebiil, including its special spawning aggregations and exceptional coral habitats, for the continued benefit of the present and future generations of Ngarchelong, Palau, and the world.”⁷

To support this goal, the following 5 objectives were created to guide management activities:

1. Manage activities within the Ebiil Conservation Area to maintain economically important fish and invertebrate populations at current or increasing levels by end 2012.
2. Minimize violations within the Conservation Area by building the capacity of the State Government to effectively undertake surveillance and enforcement activities, reducing infractions to near negligible levels by the end of 2011.
3. Promote the awareness and understanding among the community, managers, and other stakeholders of 1) Conservation Area rules and provisions, 2) the status and changes of marine resources at the site, and 3) the impact of human activities and management actions.
4. Maintain the coral reef habitats and marine biodiversity at Ebiil Conservation Area at current levels to ensure a healthy ecosystem and to appeal to tourists as an attractive dive site.
5. Develop and implement components of a Sustainable Financing Program for the Conservation Area (including the promotion of dive tourism) that successfully meets roughly 25% of the Conservation Area’s operating costs by 2012.¹

The objectives of this socioeconomic study were developed to provide information to assess these management objectives. The information also may be useful in the adaptive management of other MPAs in Palau.

4. ASSESSMENT OBJECTIVES

To clarify the focus of the 2010 study, assessment objectives were created to help guide and link the study to the Ebiil Conservation Area Three Year Management Plan⁷ and the previous socioeconomic assessment of 2005-2006¹. The assessment objectives are listed below.

1. To examine marine resource dependency for household consumption and income.
2. To determine the perceived management effectiveness of the Ebiil MPA by examining:
 - a. awareness and perception of Ebiil MPA status and purpose
 - b. perception of positive and negative changes related to the closure
 - c. awareness and perception of current enforcement and laws of the Ebiil MPA

- d. level of support for Ebiil MPA and additional legislated MPAs in Ngarchelong
3. To examine the greatest perceived threat(s) to the Ebiil MPA and suggested solutions
4. To determine awareness of biological and social monitoring results.
5. To explore the possibility of tourism development and management in the Ebiil MPA and related financial benefits.

5. METHODOLOGY

Secondary data, household surveys, and key informant interviews were the field data collection methods that were decided to be used for this study.

Secondary Data

The secondary data included the following:

- Ebiil Conservation Area Three Year Management Plan 2009⁷;
- Letter from traditional leaders of Ngarchelong to High Chief Ibedul, High Chief Reklai and the rest of Palau's traditional leaders regarding the traditional closure and associated restriction of Ebiil Channel⁶;
- NSGPL No: 87 – an act to create Ebiil Conservation Area ²;
- NSGPL No: 03-002- act to amend the extension of the closure of Ebiil Conservation Area to December 2005³;
- NSGPL No. 04-007- act to amend the extension of the closure of Ebiil Conservation area to be permanent ⁴;
- Resolution No 13-19 - resolution recognize Ebiil Conservation Area to be under Protected Areas⁵;
- MPA Ebiil Assessment Study Community Reporting. (2006)⁶.

These information were collected to support this 2010 socio-economic assessment.

Household Survey

Based on the assessment objectives, questions were developed for Ngarchelong household survey. The drafting of the household questionnaire was in English, and then translated into Palauan. An assessment team was composed of PICRC staff and people of Ngarchelong who could read and write both English and Palauan (please see Appendix 5 for the list of all members). The questionnaire was pretested and revised multiple times by the team members before it was finalized.

Once the survey was finalized, the Ngarchelong household list from the 2005 study was then updated with the help of the Northern Reef coordinator of Ngarchelong and the assessment team before the data collection began. The survey was conducted targeting those Ngarchelong households who used the coastal and/or marine resources (eat, buy, and/or sell coastal and/or marine resources) in or from

Ngarchelong regardless of their state of residence in Palau. The target included all household resource users in Ngarchelong, Koror, Airai, and other states in Palau. Head of households, who were at least 18 years of age and could speak for a household, were targeted to participate in the survey. Before each surveys, head of households were asked if they considered their households as marine resource users of Ngarchelong before they continued on. In pairs (except for a few who could conduct the surveys alone), the assessment team, with the help of added members from PICRC and guides (see Appendix 5), surveyed 279 Ngarchelong households who considered themselves as coastal and/or marine resource users of Ngarchelong in Palau.

Household data were entered on Excel and imported to IBM SPSS Statistics 19 for analysis.

Key Informant Interview

Questions and topics to discuss with key informants were also developed. Key informants were selected with the help of the Northern Reef coordinator and the assessment team. The selection focused on their experience and knowledge on at least one of the following assessment topics: governance, fishing, and traditional leadership. A total of 15 key informants were selected, 2 from the Ngarchelong Sate Government, 11 fishers and invertebrate harvesters from the 8 villages of Ngarchelong, and 5 community leaders from the 8 villages of Ngarchelong (most traditional leaders were interviewed as fishermen as well).

The key informant interviews were conducted in Palauan and tape recorded. They were then translated to English and type- written on word document for data analysis.

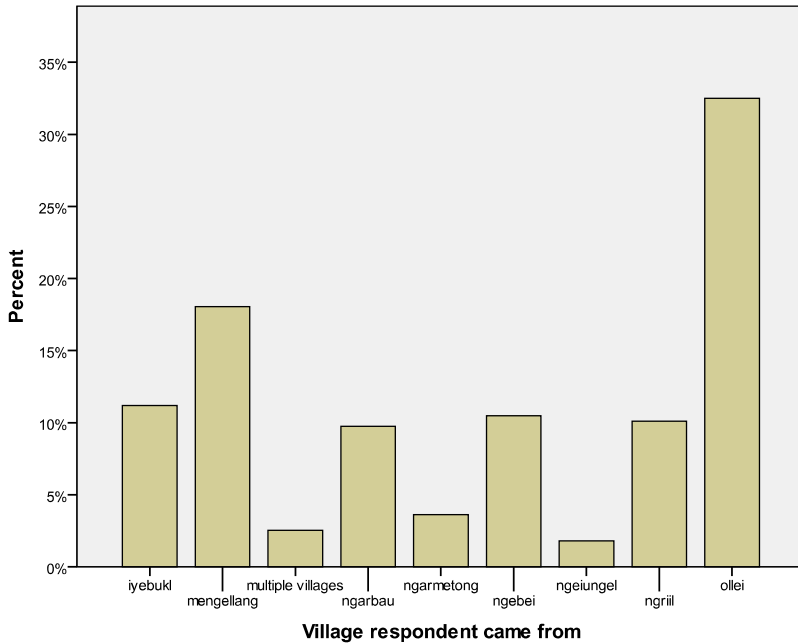
6. RESULTS

The results showed that the total number of individuals who use the marine resources of Ngarchelong based on the 279 households is 1,753. Full summary statistics for all household survey questions are available in Appendix 2.

Demographics

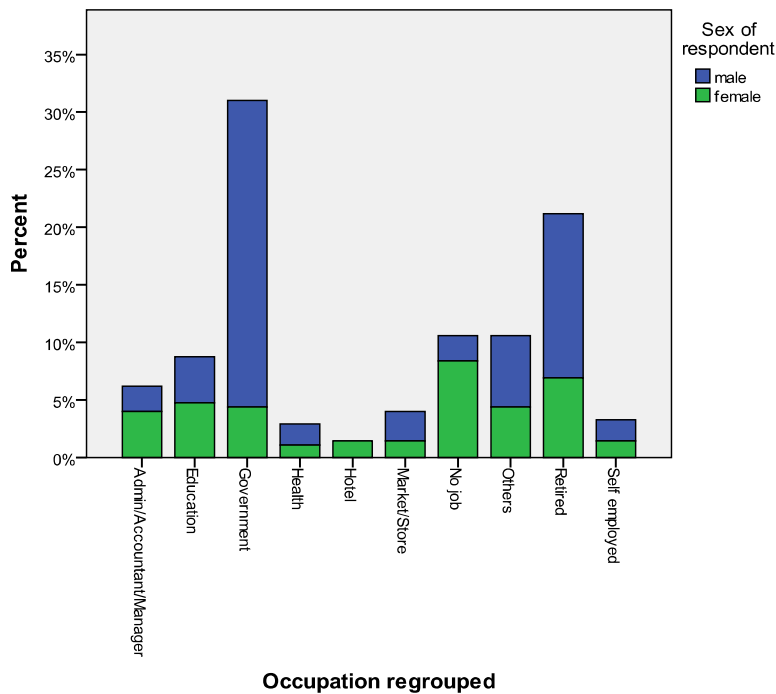
The State of Ngarchelong is composed of 8 villages. Households in the village of Ollei and households who identified themselves as from Ollei but lived outside of the state of Ngarchelong, represented more than 30% of all households surveyed. Ollei village households were more represented than those of the other villages followed by the Mengellang village with a little over 15% (Chart 1).

Chart 1: Village respondents came from



Eighty-nine percent of the total respondents were 40 years and older and over 60% were male. Looking at occupation on Chart 2, 31% worked for the government (86% of whom are male), 21% were retired, and 11% are unemployed and almost 80% of the unemployed were female.

Chart 2 : Occupations vs. sex of respondents



The average household number was 4.5 people with 82% having up to 2 minors (aged 17 or younger). Twenty-seven percent of the households had at least one member who attended or completed elementary or high school, while 73% had a household member who had attended or completed college or university.

In addition to the level of education attained by a member of a household, level of income was examined and showed that 60% of the households earn less than \$1001 a

month (Table 1). Among cash income generating sources (Table 2), salary from jobs accounted for 81% of all responses, followed by fishing (22%), farming (15%), pension and/or social security (14%), and money sent by relatives (12%). On the contrary, fishing represented the most mentioned sources for household consumption, 72%, followed by farming, 66% (Table 3). This showed how dependent households were of fishing for subsistence.

Table 1: Income Level

Income Levels	Frequency	Percent	Cumulative Percent
<\$500	78	29.1	29.1
\$500-\$1000	83	31.0	60.1
\$1001-\$1500	49	18.3	78.4
\$1501-\$2000	25	9.3	87.7
\$2001-\$2500	20	7.5	95.1
>\$2500	13	4.9	100.0
Total	268	100	

Table 2: Livelihood sources- Household Cash Income

		Responses	
		N	Percent
Household Cash Income Sources ^a	Salary from employment	226	37.5%
	Fishing for income	61	10.1%
	Farming for income	41	6.8%
	Hunting for income	6	1.0%
	Livestock for income	21	3.5%
	Money received from relatives	34	5.6%
	Handicrafts for income	25	4.1%
	Private business for income	39	6.5%
	Pension/Social security for income	124	20.6%
	Others for cash income	26	4.3%
Total	603	100.0%	

a. Dichotomy group tabulated at value 1.

Table 3: Livelihood sources- Household Use or Consumption

		Responses	
		N	Percent
Activities For Household Use or Consumption	Fishing for HH use or consumption	156	40.1%
	Farming for HH use or consumption	142	36.5%
	Hunting for HH use or consumption	43	11.1%
	Livestock for HH use or consumption	19	4.9%
	Handcrafting for HH use or consumption	27	6.9%
	Other HH uses or consumption	2	.5%
Total		389	100.0%

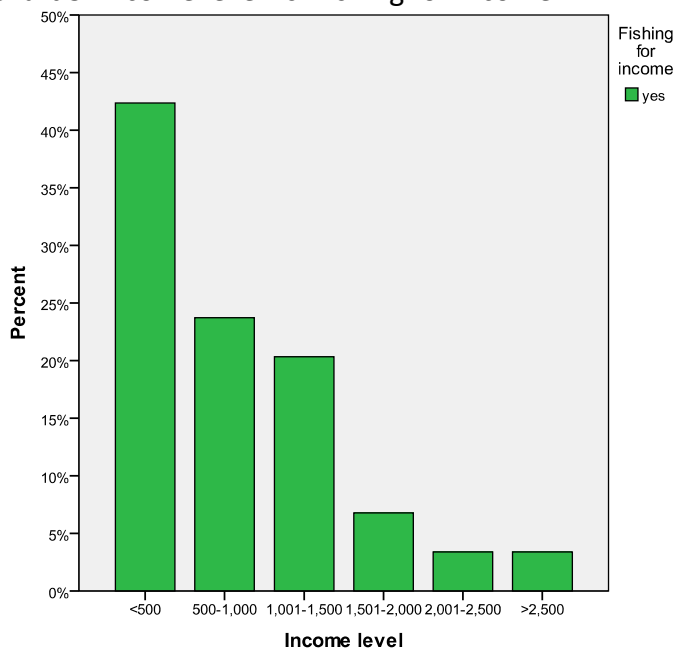
a. Dichotomy group tabulated at value 1.

Marine resource dependency

Fishing and collecting invertebrates as a source of income and consumption

When examining the dependency of marine resources for household income and consumption, 60% of the Ngarchelong households currently had at least one person who fished and/or collected marine invertebrates. They were predominantly male. Fishing was identified as a significant source of both income and subsistence of all households, relative to other income sources like farming or hunting. Also, fishing ranked third after salaried jobs and pension/social security benefits as sources of income for all households. These three income sources alone were mentioned by 60% of all households. Larger proportion of households who earned less income fished more for cash than those who had higher income as seen on Chart 3.

Chart 3: Income level vs. Fishing for income



Besides being one of the top three sources of income generating sources, fishing was also identified as the most important source of household subsistence. Seventy-two percent of all households mentioned fishing as a source of subsistence and almost all the households (87%) fished for both income and consumption. A question was asked regarding household consumption and sale of the five most important types of household fish. While 81% were consumed, less than 20% was used for sale and consumption and even a smaller percentage, 2%, exclusively for sale. Invertebrates use had a similar trend to that of the fish.

Frequency of fishing and collecting invertebrates by households

It was seen that a great number of the households indeed depended on the marine resources; however, for both fishing and invertebrate harvesting, more than half of the Ngarchelong households fished only 1-3 times per month or less frequently (Chart 4 and 5). Furthermore, it was examined that 40% of the households had no fisher or harvester while 53% had 1 to 2 people. Regarding gender, 47% of the households had only 1 male fisher or invertebrate harvester while 45% of the households had no male fisher or invertebrate harvester. Twenty-one percent of households had only 1 female fisher or harvester and 76% had no female fisher or invertebrate harvester.

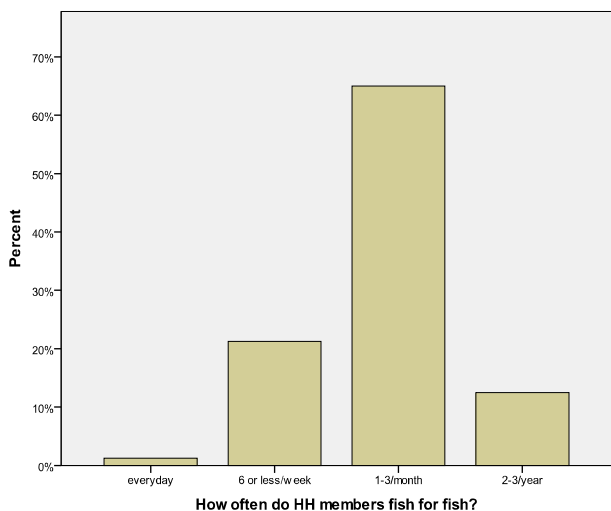


Chart 4: How often household members fish for fish

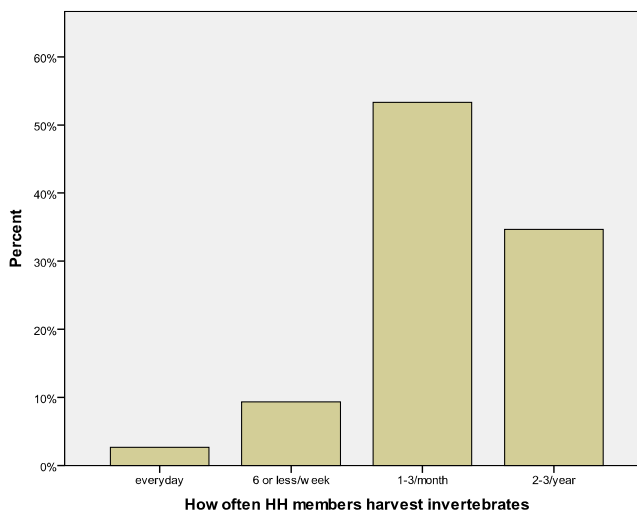


Chart 5: How often household member harvest invertebrates

To examine this further, cross tabulations between number of household members with those who fished for consumption as well as occupational groups with those who fished were done. The result showed that larger households were more likely to fish for consumption than smaller households (Table 4). However, this could simply mean larger household had members working for income therefore they would not be fishing for income but for consumption. Among the different occupational groups, it seemed that people, who worked in government or were self-employed, fished more than those with other occupations, 80% and 88% respectively (Table 5). These might be related to the fact that most people who worked for the government were male. A high percentage of unemployed people did not fish. However, as mentioned before, this group was mostly represented by women.

Table 4: Number of people per household vs. Fishing for consumption

			Fishing for consumption		Total
			no	Yes	
Number of people per household	up to 2 people	Count	26	16	42
		% within Number of people per household	61.9%	38.1%	100.0%
	2-4 people	Count	48	58	106
		% within Number of people per household	45.3%	54.7%	100.0%
	5-6 people	Count	36	57	93
		% within Number of people per household	38.7%	61.3%	100.0%
	7 people and more	Count	13	25	38
		% within Number of people per household	34.2%	65.8%	100.0%
Total		Count	123	156	279
		% within Number of people per household	44.1%	55.9%	100.0%

Table 5: Occupation vs. Do you fish now?

			Do you fish now?		Total
			No	yes	
Occupation	Admin/Accountant/Manager	Count	8	9	17
		% within Occupation	47.1%	52.9%	100.0%
	Education	Count	14	10	24
		% within Occupation	58.3%	41.7%	100.0%
	Government	Count	17	68	85
		% within Occupation	20.0%	80.0%	100.0%
	Health	Count	3	5	8
		% within Occupation	37.5%	62.5%	100.0%
	Hotel	Count	2	2	4
		% within Occupation	50.0%	50.0%	100.0%
	Market/Store	Count	5	6	11
		% within Occupation	45.5%	54.5%	100.0%
	No job	Count	22	7	29
		% within Occupation	75.9%	24.1%	100.0%
	Others	Count	16	13	29
		% within Occupation	55.2%	44.8%	100.0%
	Retired	Count	37	20	57
		% within Occupation	64.9%	35.1%	100.0%
	Self employed	Count	1	7	8
		% within Occupation	12.5%	87.5%	100.0%
Total		Count	125	147	272
		% within Occupation	46.0%	54.0%	100.0%

Management effectiveness

Awareness and perception of Ebiil MPA status and purpose

To determine the perceived management effectiveness of Ebiil MPA, first, the awareness and perception of the status of Ebiil MPA and its purpose were examined. A great percentage of the respondents were aware of the purpose of the Ebiil being an MPA. Nearly fifty percent of the respondents mentioned that because Ebiil was a “fish aggregation site”, it served its purpose for being an MPA and 34% mentioned, “conservation/future purposes or to increase marine resources because Ebiil was a fish aggregation site” as another purpose. This showed that there was a great awareness of Ebiil’s purpose of being an MPA among the respondents during the time of this study. However, 11.1% of the respondents mentioned that they did not know the purpose of Ebiil being an MPA.

Besides the awareness of the status and purpose of Ebiil MPA, the benefits were also questioned. Twenty-nine percent of the respondents mentioned that “spillover or to increase resources” was the top benefit followed by 9% stating that it was for “future purposes” however; 34% mentioned that there were no benefits of Ebiil being an MPA. An interesting finding is that over 95% of those who saw benefits of Ebiil MPA were from the households of higher income earning bracket (over \$2,000 USD per month).

Perception of positive and negative changes

The second examination was on the perceptions of positive and negative changes related to the closure of Ebiil MPA. According to the key informants the general perception of the surrounding reefs of Ebiil was that fish had increased in numbers and coral recovery had been positive however, clams remained low in numbers. The results showed that 53% of the respondents fished while only 22% collected marine invertebrates. Compared to 10 years ago, 70% of the respondents now fished less and 65% harvested less invertebrates.

Those who fished were asked to compare the ways of fishing now and 10 years ago. When asked about the time needed now to catch the same amount of fish compared to 10 years ago, 80% of the respondents mentioned that they now needed more time. In addition to this, 59% of people who fished still fished at the same location while 33% did not and 8% at both same and new locations. Among the respondents who changed the locations of their fishing, 72% said it was because of “less fish”. The results continued on to the frequency of fishing and it showed that 70% of those who fished now fish less often compared to 10 years ago. When asked about the main reason that they now fish differently, 27% mentioned “less fish” as the main reason followed by “occupied with other things” (23%). Key informants however explained that the fish number had slowly increased near the borders of Ebiil but not so much at the rest of the reefs of Ngarchelong.

The different fishing methods were also examined in this study. According to the key informants, most fishing methods such as line fishing, troll fishing, and spear gun fishing were still practiced. However, throw-spear fishing and net fishing were practiced by very few people but they began to disappear

long before the year 2000. Throw-spear fishing was used by many as a type of fishing activity on its own but in recent years a few fishers would use throw-spears to catch turtles only or sometimes the spears are accompanied with net fishing. A number of fishers said throw-spear fishing was not practiced much recently because there were less fish. However, a few would say people preferred other methods such as using spear guns or that throw-spear fishing took a lot more effort and comparatively yield less than before. Another method that was not seen much anymore was traditional trap fishing. This involves setting up a fish trap underwater and leaving it for days to capture fish. Many key informants said that this method was long gone because few people knew how to make and set it up due to the fact that it was technical and time consuming. One mentioned that yellowfin surgeonfish was one of the main targeted species for trap fishing, and in recent years, the number had declined. It was explained that this declined number of the targeted species could have been the reason why trap fishing was no longer practiced much. Another contribution factor that was mentioned was the change in wind and current patterns. Others say that it was not the decline of fish per se but people were not very interested in it anymore. On a better note, the interviews also showed that line fishing were increasingly becoming the most practiced fishing method with both males and females.

For those who collected invertebrates, 70% said that they now needed more time to collect the same amount of invertebrates compared to 10 years ago and 65% stated that they now harvested less often. Thirty-five percent of the people mentioned “occupied with other things” as the main reason for collecting differently, followed by 23% on “less invertebrates”. When examining the different methods of harvesting, a relatively new technique involving harvesters to collect sea cucumbers into a basket container and wait for the stomach contents to be expelled was getting very popular. This method allowed for collection at any time rather than the past practice of reef gleaning during low tide only.

Other changes included the perceived number and size of fish and invertebrates. The respondents perceived both fish and invertebrates smaller in size and less in number compared to 10 years ago (Table 6).

Table 6: Fish and invertebrates number and size

	Percentage of responses			
	Fish		Invertebrate	
	Number	Size	Number	Size
Less/smaller	91	81	86	83
More/bigger	4	4	7	4
About the same	6	15	6	13
N (responses)	1059	1072	639	566

Despite the negative changes that may need more time to recover, the majority of the respondents said there were positive changes from Ebiil MPA. The positive changes from Ebiil MPA included having

economic benefits (82%) which were perceived equally shared by 66% of the responders. Having only 22% perceiving that there were economic benefits in 2005-2006, this study shows a much greater positive change. Fifty-two percent of the respondents of the 2005-2006 study perceived that there were conflicts between different user groups such as locals, outsiders, tourist, researchers, students, and poachers entering Ebiil. According to most key informants in this 2010 study, there were not much awareness and understanding of the importance of having other groups enter Ebiil such as researchers at that time. At the time of the 2010 study, the management had become more organized and procedures and laws have been in place. Because of this, people had become more aware and conflicts had decreased. However, there were still a few key informants that believed that studies such as monitoring in Ebiil should stop. Other positive changes included 75% of the respondents agreeing that Ebiil MPA helped improve the availability of seafood, a 22% increase since 2005-2006; helped increase awareness of the importance marine conservation; helped people to worry less about the future of marine life, helped benefit the well-being of families; and helped benefit the future generations. These positive changes can be found on Table 7 statement c, d, f, l, m, and n.

Table 7: Changes from Ebiil MPA

Statements	Agree	Disagree	Don't know
a. Imported foods make my household members go fishing less. (N=278)	51.8% (N=144)	46.0% (N=128)	2.2% (N=6)
b. * I support Ebiil being legislated MPA. (N=279)	95.0% (N=265)	2.9% (N=8)	2.2% (N=6)
c. There are economic benefits from the Ebiil. (N=269)	85.5% (N=230)	5.2% (N=14)	9.3% (N=25)
d. Economic benefits from the Ebiil are equally shared in Ngarchelong. (N=277)	66.4% (N=184)	14.1% (N=39)	19.5% (N=54)
e. Since the closure of Ebiil, my household has to travel further away to fish. (N=277)	46.6% (N=129)	47.3% (N=131)	6.1% (N=17)
f. Ebiil helps improve the availability of seafood for my family. (N=279)	74.6% (N=208)	17.6% (N=49)	9.9% (N=22)
g. Because of the closure, my household fishes less for food. (N=277)	15.5% (N=43)	80.1% (N=222)	4.3% (N=12)
h. Because of the closure, my household fishes less for sale. (N=277)	16.6% (N=46)	77.6% (N=215)	5.8% (N=16)
i. Because of the closure, my household buys more fish and other seafood to eat. (N=277)	15.5% (N=43)	80.1% (N=222)	4.3% (N=12)
j. Because of the closure, some of our household members had to find another way to make a living. (N=279)	11.8% (N=33)	83.9% (N=234)	4.3% (N=12)

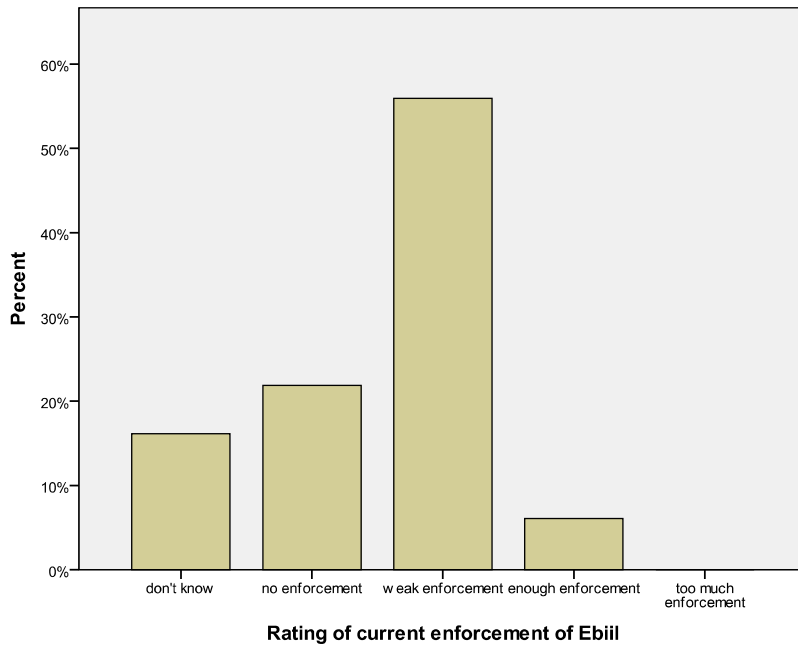
Statements	Agree	Disagree	Don't Know
Table 7: Changes from Ebiil MPA (Continuations)			
k. My family has become more aware of the importance of marine conservation because of Ebiil MPA. (N=278)	84.2% (N=234)	11.2% (N=31)	4.7% (N=13)
l. Ebiil helps me worry less about the future of our marine life. (N=278)	86.1% (N=242)	7.9% (N=22)	5.0% (N=14)
m. Ebiil MPA benefits the well-being of my family. (N=278)	84.9% (N=236)	11.2% (N=31)	4.0% (N=11)
n. Ebiil MPA benefits the future generations. (N=278)	95.7% (N=266)	1.1% (N=3)	3.2% (N=9)
o. I support additional legislated MPAs in Ngarchelong like Ebiil. (N=277)	78.0% (N=216)	17.7% (N=49)	4.3% (N=12)

Furthermore, the closure of Ebiil did not seem to influence the way people fished for food or for sale, or the amount of other seafood caught to eat nor the way they made a living (Table 7g-j). However, the proportion of people who fished (53%) and had to travel farther away to fish since the closure of Ebiil (56%) was higher than that of those who did not fish (36%). According to the survey, 84% of Ngarchelong households had become more aware of the importance of marine conservation because of Ebiil MPA (Table 7k).

Awareness and perception of current enforcement and laws

To further determine the perceived management effectiveness of Ebiil MPA, the awareness and perception of current enforcement and laws were examined. When asked how the current enforcement effort was for Ebiil MPA, 56% respondents said the enforcement was weak (Table 8). The people who fished were apparently more critical about the enforcement. Thirty-eight percent of the people who fished said there was no enforcement, compared to 9% of people who did not fish. The people who did not fish were not as well aware of the level of enforcement as people who fished (28% vs. 5%).

Table 8: Rating of current enforcement of Ebiil



According to a number of key fisher informants, fewer outsiders were entering Ebiil illegally because few violators were recently caught and fined. However, those who were still illegally entering Ebiil, did so primarily at night and usually during bad weather when nobody else was out. They also highlighted the appreciation towards the *bul* on Ebiil and how both the *bul* and the MPA were integrated and supported each other. However, there was still an issue that needed to be addressed and resolved between a few of the Ngarchelong's traditional leaders and State Government on Ebiil's *bul* and it being an MPA. This issue was really on who has the right to make decisions regarding Ebiil. Despite this, most traditional leaders and the state government of Ngarchelong had been working together by implementing the *bul* and the legislated regulations. A question about the regulations of Ebiil MPA followed the enforcement question. According to Table 9, most respondents were aware of the regulations of no entry (96%) and no fishing or collecting (91%) within the MPA. Slightly more than half were aware of regulations on littering and vessel grounding, and 72% were aware of the penalty for violation of law. Almost all respondents did not witness or heard of violations about littering or vessel grounding regulations. This showed that there was a good awareness of the regulations of Ebiil MPA among the respondents. The respondents also suggested better laws on "enforcement and patrol of Ebiil" and again suggested that "better enforcement" was needed for the management. In addition, many traditional leaders suggested that both traditional leaders and the state government of Ngarchelong should assist and support each other for the betterment of the management of Ebiil MPA.

Table 9: Awareness of Ebiil regulations

Regulations	Percentage of people who are aware of the regulations	Percentage of respondents mentioning no violation (N=279)	Average of violations experienced by the respondents
No entry	97 (N=264)	43	1.83 (N=264)
No fishing, no collecting	91 (N=267)	57	1.27 (N=267)
No littering	58 (N=267)	96	.09 (N=267)
No vessel grounding	56 (N=267)	92	3.99 (N=267)
Penalty for violation of law	69 (N=279)	n/a	n/a

Support for Ebiil MPA and additional MPAs

Lastly, the respondents were asked of their level of support for Ebiil MPA and additional legislated MPAs in Ngarchelong. A very high percentage, 95%, supports Ebiil as a legislated MPA. In addition to this, there was a 78% of the respondents who supported additional legislated MPAs however, 77% of these people said that the new MPA(s) should be temporary and 42% suggested a closure of 5 years. Compared to the 2005-2006 study, 60% supported additional MPAs however, more than half, 63%, supported a permanent closure. The top 3 suggested new areas for MPAs in this study were “Bengall reef, seagrass area of Ngetmel, and Ngebard reef of Ngarchelong. The most repeated reasons for having additional MPAs were (1) because area(s) was or are habitat(s) for marine resources, (2) for conservation purposes and (3) to increase resources. To conclude the second assessment objective, which was to determine the perceived management effectiveness of Ebiil MPA, the management was effective however; a lot of work was still needed to be done regarding the current enforcement of Ebiil MPA.



Figure B: General overview of Bengall reef (a), Ngetmel seagrass (a), Ngebard reef (c)

Threats

After examining the management effectiveness, the greatest perceived threat(s) to the Ebiil MPA and suggested solution was the next objective. According to the respondents, the top two perceived threats to Ebiil MPA were “illegal fishing, illegal entering and/or poaching” (47%) and “weak enforcement” (15%). When asked about suggestions, 75% suggested that Ebiil MPA needed “better enforcement and/ or laws”. This was very much connected with the perception of the current enforcement. In addition, it was very similar to the 2005-2006 study which showed that 76% identified “illegal entry or fishing and/or poor management” as the major threat and recommended by 55% of the respondents to improve surveillance and enforcement.

Awareness of Ebiil studies

The next assessment objective was to determine the awareness of biological and social studies from the people of Ngarchelong. This objective was specifically for PICRC’s needs to understand how informed the communities were of the different studies that have occurred in Ngarchelong. According to the survey, only 33% were aware of these Ebiil studies. Out of the 33%, only 9% were aware of the results of the social assessment given in 2007 and 8% were aware of the results of the biophysical assessment given in the same year.

Tourism development and management

The fifth assessment objective was to explore the possibility of tourism development and management in the Ebiil MPA and related financial benefits. According to the survey, 72% of the respondents supported tourism in Ebiil and even greater percentage supported tourism in Ngarchelong (98%). More than 15% of the respondents saw potential financial benefits to their households from tourism activities as seen on Table 10.

Table 10: Household financial benefits in Tourism Activities

Tourism Activities	Responses	
	N	Percent
Boat operation in tourism activity	141	59.2%
Water activity guide in tourism	129	54.2%
Land activity guide in tourism	160	67.2%
Motel/hotel in tourism activity	161	67.6%
Restaurant in tourism activity	118	49.6%
Food market in tourism activity	164	68.9%
Handicraft market in tourism activity	136	57.1%
Other tourism activity	37	15.5%

7. DISCUSSION

In order to implement, evaluate and adapt management strategies of the Ebiil Management Plan, it is crucial to understand the perceptions of the marine resource users of Ngarchelong. The 2005-2006 study identified four indicators that needed attention and with this 2010 assessment, the changes were able to be tracked. First, a greater perception on the distribution of benefits was not equal. That perception had gradually changed from 22% of having equal economic benefits distribution to 66% five years later. Second, many perceived that there was a conflict between different users groups (52%) and this had gradually decreased according to the 2010 key informants. It was explained by most key informants that the management had become more organized with the rules and regulations for Ebiil and the Ngarchelong people had now been more aware of them since then. Another reason that might have contributed to these two positive changes in attitudes was the community discussions through meetings from the Northern Reef Planning Team which was created in 2008. The team, composed of people from Ngarchelong, had the responsibility to create a management plan for the Northern Reefs which included one for Ebiil MPA. Part of their role was to consult with the Ngarchelong communities about these plans. Through these consultations in discussions and meetings, the different communities began to feel that they were part of the process of the management of Ebiil MPA and became more aware of its purpose and importance. Third, the threats in the 2005-2006 study were very similar in what were found in this study. "Illegal fishing, illegal entering, poaching, and poor management or weak enforcement" were all threats that were either mentioned as the top or the second threat on both studies. The last indicator was also a common one that was shared on both studies which was the management's need to improve in the area of enforcement and surveillance. The Ngarchelong State Office and the Northern Reef Management Office were both working to address this, however, funding was limited. In 2008, the Ngarchelong State Office designated Ebiil MPA to the Protected Area Network (PAN). This was to help the management of Ebiil MPA by providing technical and financial support. Ebiil as a PAN site was still in the process of receiving its funds at the time of this study and once it is disbursed, the management can continue on to address and strengthen its weakness on Ebiil.

8. CONCLUSION AND RECOMMENDATIONS

Through this 2010 survey, we now know that the Ngarchelong household marine users greatly depended on fishing for both consumption and income. We also know that there was a strong perception that the top five important household fishes and invertebrates have declined in both number and size compared to 10 years ago. In addition to this, Ngarchelong marine users now needed more time to catch the same amount of fish as well as to collect invertebrates compared to 10 years ago. Even though the closure of Ebiil did not seem to have a big influence on the way people made a living or the way they fished, there was still a great percentage of fishers now traveling further away to fish. Most key informants-fishers however explained that fish number have increased in the reefs near the borders of Ebiil MPA but not so much in the rest of Ngarchelong's reef.

Even with these negative changes that had been identified, there were also positive changes as well. It was determined that there was a high awareness of the status and purpose of Ebiil MPA as well as a high support for Ebiil as an MPA with many perceived positive changes because of the MPA. Some of these positive changes included economic benefits from Ebiil and that it also helped improve the seafood availability for Ngarchelong families. Also, it was seen as a benefit for the well being of the people as well as for the future generation.

With “illegal fishing, illegal entering, and/or poaching” as the greatest threat to Ebiil MPA and the current enforcement perceived as “weak”, the management still needed some improvement. One of the objectives of the Ebiil management plan was “to develop and implement components of a sustainable financing program”¹ which included the promotion of dive tourism. This also needed attention as well because a great percentage of the people of Ngarchelong supported tourism in both Ebiil and the rest of Ngarchelong which was also a potential financial benefit to the people.

It is recommended that this socioeconomic monitoring program for Ebiil be implemented to ensure that the management of Ebiil MPA continues to be effective. As this study has been compared to the 2005-2006, the changes in perception were tracked and new perception had arisen. Since the first study, the management and effectiveness of Ebiil MPA had improved. The perception of seafood availability had increased since then as well as the distribution of Ebiil benefits. Also, the support for additional MPA(s) had still stood firm however the perception had shifted from the MPA(s) being permanent in 2005-2006 to being temporary closed for 5 years in 2010. These are the major indicators that were continued to be monitored to track changes in perception in this study and are recommended to be continued to be monitored in the next one. Other indicators that are recommended are the number and size of fish and invertebrates as well as their uses. Conservation and management of marine resources are practiced for the people of Ngarchelong therefore it is crucial to understand their perceptions of the resources that they own. Monitoring these indicators will enable the management to evaluate how their conservation effort through Ebiil is developing and whether adaptive management is needed. In addition, the perception of threats and enforcement should also be monitored to see how the management’s efforts in these areas have progressed. Furthermore, it advised to continue to have regular consultations with the community members as well as develop an active awareness program. A monitoring plan is available and is recommended to be used for the next study that should take place between the year 2013 and 2015.

9. INTELLECTUAL PROPERTY RIGHTS

This report is the property of Palau International Coral Reef Center and the data itself is sensitive and should not be shared without the permission from the Ngarchelong State Office, the Northern Reef Office as well as Palau International Coral Reef Center. However, the summary results are not sensitive and can be included in this final report. The hard copies of the household surveys and electronic copies of the key informant interviews will be kept with Palau International Coral Reef Center for confidentiality.

10. REFERENCES

¹Mersai, Charlene. "MPA Ebiil Assessment Study Community Reporting. Palau International Coral Reef Center", 2006.

²Ngarchelong State Assembly. "NSGPL No: 87: Bill for an act to establish Ebiil Channel of Ngarchelong State to be Conservation Area and for other purposes". (February 2000).

³Ngarchelong State Assembly. "NSGPL No: 03-002: An act to amend Ngarchelong State Public Law No. 87 so that the number of years the Ebiil Channel and surrounding reefs designated as Conservation area is extended to December 2005". (November 2002).

⁴Ngarchelong State Assembly. "NSGPL No: 04-007: An act to amend Ngarchelong State Government Public Law No. 03-002, Section 1, 2, and 6, and for related purposes so that the number of years the Ebiil Channel and surrounding reefs be designated as conservation area of the State permanently". (November 2003).

⁵Ngarchelong State Assembly. "Resolution No: 13-19: To endorse and ratify the Protected Area Network (PAN) regulations dated April 11, 2008 signed and approved by the Minister of Resources and Development and the President of the Republic of Palau and to recognize the Ebiil Conservation Area under PAN". (August 2008).

⁶Ngarchelong traditional leaders, "Bul ra Ebiil Channel" (Letter regarding traditional restriction on Ebiil Channel)". (c1999-c2000).

⁷Northern Reefs Management Office, "Ebiil Conservation Area Three Year Management Plan 2010-2012". (September 2009).

11. APPENDICES

Appendix 1: Copy of household survey

Appendix 2: Basic statistics for all survey questions

Appendix 3: Key informant interview questions

Appendix 4: Key informant interviews with basic answers

Appendix 5: Team members and affiliations

Appendix 6: Indicators

Appendix 1: Copy of the household survey: **Ebiil Household Survey** Survey # _____

Date: _____ Hamlet of Interview: _____ Interviewer: _____ Note Taker: _____
 ID# _____

ABOUT YOURSELF

1. Ng sebechek el loker er a rekim? (May I ask for your age?) _____
2. **{Diak mongui}** **{(Do not read just check)}**: Sechal (Male) Redil (Female)
3. Kau ke bechiil? (Are you married?) *{(widow and divorce = no)}* Choi (Yes) Diak (No)
4. Ke chad el ker el hang? (Which village are you from?) _____
5. a) Kom tela el chad a kiei er a blim el 18 a rekmiu el mo er bab? (How many people in your household, including yourself, are 18 and older?) _____
 b) Tela ngariou er a 18 a rekrir? (How many are under 18 years old?) _____
6. Ngera urerem? (What is your job?) _____
7. *Ngera ikel kmal uchul a kerrekerngel a blim el ngii a udoud, kall me a lechub eng usbechel er a blai lokiu a ngidi el chad el kiei er a blim? *{molilt}* (What are the main livelihood sources for your household for both cash income generation and household consumption/use?) *{Check all that apply}*

Osisebel a udoud (Sources of household livelihood) {Molilt (Check all that applies)}	7. Osisebel a udoud (Household cash income)	8. Usbechel er a blai me a lechub eng kall (Household use & consumption)
1) Ureor (salary from employment)		
2) Nga er a chei- uldimokl er a omelai el cheled (fishing-including collecting invertebrates)		
3) Nga er a sers (farming)		
4) Omeruu/omdechchem/omoes el charm er a beluu el kall (hunting edible land animals)		
5) Okerullel a charm el kall (livestock)		
6) Ngesu el udoud el ngar er a ikrel a delengcheklem el diak el uldimukl er a udoud er a siukang (money received from relatives that are not in household but not including customary contributions)		
7) Klalo el mekedmokl el lokiu a chim -storyboard, oruikl, olbiungel me a lmuut el bebil (handicrafts)		
8) Ousiobai- stoang (Private business owners – stores)		
9) Pension/social security		
10)Nga er ngii a ngodech (Others, please specify)		

9. Ngera sel kot me a ongerung el uchul a sisebellel a udoud el me er a blim? *{Mlechesii a LAMBANG el lokesiur er sel kot me a ongerung er a question #7}* (Which of the above provides the 1st and 2nd highest income for your household?) *{Write the NUMBER from question 7 that corresponds to the answers.}*
 1st _____ 2nd _____
10. Ngera kot el nga er bab el skuul el blo er ngii me a lechub eng tilobed er ngii a rechad er a blai? (What is the highest level of education that your household members have attended or completed?)
 Elementary High school Daingak (University or college)
11. Elechang eak mo oker el kirel a kerrekerngiu er a ta el buil? Ak mo masech a daitai el klungel a udoud e kau a ouchais el kmo a delengcheklem ng rubet er a ngerang. (What is the monthly income level of your household?)

1. Ngar reiou er a (less than) \$500 <input type="checkbox"/>	5. \$2,001 to \$2,500 <input type="checkbox"/>
2. \$ 500 to \$1,000 <input type="checkbox"/>	6. Ngar babe er a (more than) \$2,500 <input type="checkbox"/>
3. \$1,001 to \$1,500 <input type="checkbox"/>	7. Diak el soam el longer (do not wish to answer) <input type="checkbox"/>
4. \$1,501 to \$2,000 <input type="checkbox"/>	

ABOUT FISHING AND PERCEIVED BIOLOGICAL CHANGES

Elechang aika el bo kuker, a ker el kirel a rechad rokui el kiei er a blim el kirel a omenged. (These next questions are about the members of your household regarding fishing.)

12. Tela resechal me a redil el kiei er a blim a blechoel el nga er a chei a ngikel me a cheled *{A cheled er tia el survey a mo uldimukl er a re ua chreburkl, chemang, semum me a ngodech el lou kai el kall er a daob}*? (How many males and females in your household regularly fish or harvest marine invertebrates?)

Sechal (Male) _____

Redil (Female) _____

13. Ng bekord el tela el klebesei a lousbech er ngii a rechad er a blim el nga er a chei a ngikel er elecha el taem? (On average, about how often do your household members fish for fish these days?)
1. Bek el sils (Every day)
 2. Elolem me a lechub eng mekesai er a elolem er a ta el sandei (6 or less per week)
 3. Tang el mo edei er a ta el buil(1-3 times per month)
 4. Erung el mo edei er a ta el rak (2-3 times a year)
 5. Diak a nga er a chei (No one fishes for fish)
 6. Diak kudengei (Don't know)
14. Me mocholt aikel eim el meklou a ututelel el ngikel er a blim. Eak mo oker el kirel a teletelel e mo omekesiu er elecha el taem me a teruich er rak er a mla me mong. (First please tell me the 5 most important types of fish for your household to eat and to sell. Then I will ask questions about how they are now compared to 10 years ago)

14a. Bedengel a ngikel (Type of fish)	14b. Tiang klou a ultutelel kirel a? (Are they important for the following?) 1 = kall er a blai (household consumption) 2 = oteruul (sale) 3 = ngiil lerung (both)	14c. Ng mla mo uangerang a ildisel er elecha el taem? (What do you think about how many there are now?) 1 = mekesai (less) 2 = betok (more) 3 = osisiu (same) 4 = diak kudengei (don't know)	14d. Ng mla mo uangerang a meklungel er elecha el taem? (What do you think about their size now?) 1 = mekekerei (smaller) 2 = meklou (bigger) 3 = osisiu (same) 4 = diak kudengei (don't know)
1			
2			
3			
4			
5			

Elechang eak kuk mo oker a ker el di kirem el kirel a tekoi er a chei. (I will now ask you questions about yourself and your fishing habits.)

15. Kau ke nga er a chei a ngikel er elecha el taem? (Do you yourself fish for fish now?)
Choi (Yes) Diak (No)

{Alsekum eng "diak" e bo er a #22} (If "no", please skip to #22)}

16. Sel momekesiu er a teruich el rak er a mla me mong me a elecha el taem, ng mla mo uangerang a klungel el taem a mousbech er ngii el melai aikal di osisiu el idisel a ngikel el mul masech? (Compared to 10 years ago, how much time do you now need to catch the same amount of fish that you mentioned?)
1. Mekesai (Less)
2. Betok (More)
3. Osisiu (Same)
4. Diak kudengei (Don't know)

17. Kau ke dirk ke nga er a chei er a ikel basio el blem nga er a chei er ngii er a teruich el rak er a mla me mong? (Do you still fish at the same locations you did 10 years ago?)
Choi (Yes) Diak (No) *{Bo er a #19 (Skip to #19)}*

18. Alsekum eng choi, eng ngerang aika el basio? (If yes, what are these locations?)

19. Alsekum eng diak, eng ngera uchul? (If no, what is the reason?)

20. Sel momekesiu er a teruich el rak er a mla me mong me a elecha el taem, eng mla mo diak kom sal nga er a chei a ngikel, ng mla mo mekudem, me a lechub eng dirk ke osisiu? (Comparing to 10 years ago, do you now go fishing for fish less often, more often or about the same?)
1. Diak kom sal nga er a chei losiik a ngikel (Less often)
 2. Mla mo mekdudem a taem el om nga er a chei losiik a ngikel (More often)
 3. Di osisiu er a teruich er rak er a mla me mong (About the same) *{Bo er a #22} ({Skip to #22})*
21. Alsekum eng mla mo mekesai me a lechub eng betok el taem el om nga er a chei a ngikel, ngera sel kmal uchul meng mla mengodech a om nga er a chei? (If you now go fishing less or more than you used to, what is the main reason that you now fish differently?)

Aikal el ker el kuk bo kuker a di osisiu er ika el mla mo merek eng ding kuk kirel a cheled. *{A cheled er tia el survey a mo uldimukl er a re ua chreburkl, chemang, semum me a ngodech el lou kai el kall er a daob.}* (These next questions are similar to the previous ones but about marine invertebrates.)

22. Ng uangera el idisel a klebsei a lousbech er ngii a rechad er a blim el nga er a chei a cheled er elecha el taem? (About how often do your household members harvest invertebrates these days?)
1. Bek el sils (Every day)
 2. Elolem me a lechub eng mekesai er a elolem a ta el sandei (6 or less per week)
 3. Tang el mo edei er a ta el buil(1-3 times per month)
 4. Erung el mo edei er a ta el rak (2-3 times a year)
 5. Diak a nga er a chei (No one harvest invertebrates)
 6. Diak kudengei (Don't know)
23. Me mocholt aikel eim el meklou a ututelel el cheled er a blim. Eak mo oker el kirel a teletelel e mo omekesiu er elecha el taem me a teruich er rak er a mla me mong. (Please tell me the most 5 important types of invertebrates for your household to eat and to sell. Then tell me how they are now compared to 10 years ago.)

20a. Bedengel a cheled (Type of invertebrates)	20b. Tiang klou a ututelel kirel a? (Are they important for the following?) 1 = kall er a blai (household consumption) 2 = oteruul (sale) 3 = ngii lerung (both)	20c. Ng mla mo uangelang a idisel er elecha el taem? (What do you think about how many there are now?) 1 = mekesai (less) 2 = betok (more) 3 = di osisiu (same) 4 = diak kudengei (don't know)	20d. Ng mla mo uangelang a meklungel er elecha el taem? (What do you think about their size now?) 1 = mekekerei (smaller) 2 = meklou (bigger) 3 = osisiu (same) 4 = diak kudengei (don't know)
1			
2			
3			
4			
5			

Elechang eak mo oker a a ker el di kirem el kirel a tekoi er a chei el melai a cheled. (I will now ask you questions about yourself and your collection habits of marine invertebrates.)

24. Kau ke nga er a chei a cheled? (Do you yourself harvest invertebrates?)
Choi (Yes) Diak (No)

Alsekum eng “diak” e bo er a #28 (If “no”, skip to #28)

25. Sel momekesiu er a teruich el rak er a mla me mong, ng mla mo uangerang a klungel el taem a mousbech er ngii el ngara chei aika el di osisiu el idisel a cheled el mul masech? (Compared to 10 years ago, how much time do you now need to collect the same amount of invertebrates that you mentioned?)
1. Mekesai (less)
 2. Betok (more)
 3. Osisiu (same)
 4. Diak kudengei (Don’t know)

26. Sel momekesiu er a teruich el rak er a mla me mong, me a elecha el taem, eng mla mo diak kom sal nga er a chei a cheled, ng mla mo mekudem, me a lechub eng dirk ke osisiu? (Comparing to 10 years ago, do you now collect marine invertebrates less often, more often or about the same?)

1. Diak kom sal nga er a chei losiik a cheled (Less often)
2. Mla mo mekudem a taem el om nga er a chei losiik a cheled (More often)
3. Di osisiu er a teruich er rak er a mla me mong. (About the same) *{Bo er a #28} (Skip to #28)*

27. Alsekum eng mla mo mekesai me a lechub eng betok el taem el om nga er a chei a cheled, ngera sel kmal uchul meng mla mo mengodech a om nga er a chei? (If you now collect invertebrates less or more than you used, what is the main reason that you now collect differently?)

PURPOSE OF EBIIL LEGISLATED MPA

28. Ngera sel me a lechub eng ikel kmal uchul a Ebiil a chelsimr el basio er a omengeriomel el lokiu a llach? (What is/are the main purpose(s) of Ebiil being a legislated marine protected area?)

1. _____
2. _____
3. Diak kudengei (Don’t know)

29. Ngera aikel tebelong el kot el meklou ututelel el klungiolel a Ebiil el me er a blim? (What are the two most important benefits of Ebiil MPA for you household?)

1. _____

2. _____
3. Diak a klungiolel (No benefits)

PERCEPTION OF CHANGES AND BENEFITS

30. Ak mo menguiu a bebil er a tekoi e kau a mo ouchais el kmo ke kongei, diak kom kengei, me a lechub eng diak modengei. A bebil er a ikang a mo omekesiu a tekoi er elecha el taem me a uchei er a lemechesimr a Ebiil el mo basio er a omengeriomel er a 2000. (I’m going to read some statements and ask you whether you agree, disagree, or you don’t know. Some of the statements will compare the current situation of different things with how they were before the closure of Ebiil in 2000.)

Statements	Kongei (Agree)	Diak kem kengei (Disagree)	Diak kudengei (Don’t know)
a. Kall er a ngodech el beluu el mei a uchul me a rechad el kiei er a blik a mla mo diak sa el nga er a chei. (Imported foods make my household members go fishing less.)			
b. *A kuldubech er a lechul a chesmerel a Ebiil el ngii a basio er a omengeriomel, el lokiu a llach. (I support Ebiil being legislated MPA.)			
c. Nga er ngii a klungiolel me a keruull er a Ebiil. (There are economic benefits from the Ebiil.)			
d. A klungiolel me a keruull er a Ebiil a tabesul el mo er a rebek el chad er a Ngarchelong. (Economic benefits from the Ebiil are equally shared in Ngachelong.)			
e. Se er a lemechesimr a Ebiil, a rechad er a blik a omekall el mo er cheroid el mo er a chei. (Since the closure of Ebiil, my household has to travel further away to fish.)			
f. A Ebiil a olngeseu el lomdois a kall er a daob el me er a telungalek er ngak. (Ebiil helps improve the availability of seafood for my family.)			
g. Tial chesmerel a Ebiil, a uchul me a rebebil er a rechad er a blik a mla mo diak el sa el nga er a chei el me odoim er a blai. (Because of the closure, my household fishes less for food.)			
h. Tial chesmerel a Ebiil, a uchul me a rebebil er a rechad er a blik a diak el sal nga er a chei el mo olterau. (Because of the closure, my household fishes less for sale.)			
i. Tial chesmerel a Ebiil, a uchul meng mla mo klou ocheral a ngikel me a cheled el me odoim er a blai. (Because of the closure, my household buys more fish and other seafood to eat.)			
j. Tial chesmerel a Ebiil, a uchul me a rechad er a blik a kirir el losiik a ngodech el teletael er a omengerker. (Because of the closure, some of our household members had to find another way to make a living.)			
k. A Ebiil el ngii a chesimr el basio er a omengriomel, a uchul me a rechad er a blik a mla mo melechesuar el kmo ng klou a ultutelel a dongeriomel er a debed. (My family has become more aware of the importance of marine conservation because of Ebiil MPA.)			
l. A Ebiil a ngosukak el mo diak sal suebek a renguk er a ngar medak el taem			

el kirel a kereker me a klungiolel. (Ebiil helps me worry less about the future of our marine life.)			
m. A chesmerel a Ebiil, a nga er ngii a klungiolel el me er a telungalek er ngak. (Ebiil MPA benefits the well-being of my family.)			
n. A chesmerel a Ebiil, a nga er ngii klungiolel el mo er a rechad er a ngar medak el taem. (Ebiil MPA benefits the future generations.)			
o. A kuldubech er a uldasu el mo melutk er a bebil er a basio er omengeriomel el di ua Ebiil er a debel a Ngarchelong loku a llach. (I support additional legislated MPAs in Ngarchelong like Ebiil.) {Alsekum eng “diak el kengei” me a lechub eng “diak lodengei”, e bo er a #34} ({If answer is “disagree” or “don’t know”, skip to #34})			

31. Alsekum ke oldubech, e ngeral basio er a chesl a debel a Ngarchelong a obom moldubech er ngii? (If you agree with statement “o”, which area(s) in Ngarchelong would you support?)

32. Ngerang meke oldubech er tia me a lechub ng ika el basio er a chesl a debel a Ngarchelong el mo mechesimr el ua Ebiil? (Why would you support this area to be an additional legislated MPA?)

33. Sel momdasu, tiang me a lechub ngika el basio ng kirel di merekong el di chelsimr me a lechub eng mo meterkokl a temel el basio er a omengeriomel?
(Do you think the new additional MPA(s) should be permanent or temporary?)

1. Mereko el di chelsimr (Permanent)
2. Meterekokl a temel (Temporary) El tela el rak? (For how many years?) _____

THREATS, ENFORCEMENT AND REGULATIONS

34. Ngera ikel tebelong el tekoi me a lechub eng omeruul el mo tomelii a Ebiil el ngii a basio er a omengeriomel el loku a llach? (What are the top 2 greatest threats to Ebiil MPA?)

1. _____
2. _____
3. Diak modengei (Don’t know)

35. Ngera sebeded el mo remuul el mo merrob aika el blam basech el tekoi el ngii a melmall er a Ebiil? (What would be the solution for these threats?)

1. _____

2. _____

3. Diak modengei (Don't know)

36. Ka molbodeb er a omengkar me a otutel a llechul a Ebiil er elecha el taem. Ak mo masech a teletael e ke ngiltii a chimong. (How is the current enforcement effort for Ebiil? Please choose one answer.)

Molebodeb a llach (Rate enforcement)	Molilt (Choose one)
1) Diak a omengkar me a otutel a llach (No enforcement)	
2) Kmal mechitechut a otutel a llach (Weak enforcement)	
3) Ungil a klisichel a otutel a llach (Enough enforcement)	
4) Ng kuk kmal mesisiich a otutel a llach (Too much enforcement)	
5) Diak modengei (Don't know)	

37. *Ngera uldesuem el kirel a llechul a Ebiil? Ak mo omasech a llach e kau a ouchais el kmo ke medengi aika el llach e ouchais el kmo ng mla mo tela a idisel a taem el blam mesterir a rechad me a lechub ke mla remenges a chisir a rechad el melmall aikal llach er elecha el mla mo merek el rak. (I'm going to read you the regulations of Ebiil. Tell me if you are aware of them and how many times you have seen or heard people violate them in the past year).

Llach (Regulations)	Medengalii a llach: Choi/diak (Awareness: yes/no)	Idisel a taem (# of times)
1) Diak a mo soiseb (No entry)		
2) Diak a omenged me a omelai el cheled (No fishing, no collecting)		
3) Diak a omekesbas (No littering)		
4) Diak a oba bilas el mo ngmasech er a chelmoll (No vessel grounding)		
5) Ngar er ngii a belsel a chad el mo tomelii a llach (Penalty for violation of law)		

38. Ngar er ngii a ngodech el llach el soam el mo mes el kirel a Ebiil? (Are there any other rules and regulations you wish to see in Ebiil?) Choi (Yes) Diak (No)

Alsekum eng nga er ngii, em sodii. (If yes, please explain.)

39. Ngar er ngii a ngodech el udesuem el sebechel el smisichii a orretel a Ebiil el ngii a basio er a omengeriomel el loki a llach? (If you have any suggestions to improve the management of Ebiil MPA, please tell us.)
-
-

TOURISM

40. Kau ke oldubech a klekangkodang a le bo er ngii er a chelsel a Ebiil? (Would you support tourism in Ebiil MPA?)
 Choi (Yes) Diak (No) Diak kudengei (Not sure)
41. Ke oldubech a klekangkodang er a ngodech el basio er a Ngarchelong? (Would you support tourism in other areas in Ngarchelong?)
 Choi (Yes) Diak (No) Diak kudengei (Not sure)

{Alsekum eng diak er a #40 me a #41, e bo er a #43. (If no to both, skip to #43)}

42. Ngeral lomeruul me a lechub eng teletael er a klengangkodang a soam a rechad er a blim a bo loruul e oureor er ngii e mesuk a udoud? Ak mo masech a teletael e kau a ouchais el kmo ko mo er ngii lomeruul, ng diak, me a lechub eng diak modengei (What tourism activities would your household like to participate in order to benefit financially? I will read you a list and you tell me if you think your household will participate, won't participate, or you don't know at this point.)

Omeruul/Teletael (Tourism activities)	Choi (Yes)	Diak (No)	Diak kudengei (Don't know)
1) Tekoi er chert- lengiil el chert, omekall a chert (boat operation-rent out, driver)			
2) Annai er a klekangkodang er a daob (Water activity guide)			
3) Annai er a klekangkodang er a beluu (Land activity guide)			
4) Lengiil el blai (Motel/hotel/ bed and breakfast/home-stay)			
5) Restorangd (Restaurant)			
6) Makit er a kall (Food market)			
7) Makit er a klalo el meketmokl er a chim (Handicraft market)			
8) Ngera ngodech (Others), Please specify _____			

AWARENESS OF BIOLOGICAL AND SOCIAL MONITORING ACTIVITIES

43. Ngar er ngii a klaodengei er kau el kirel a omesubel a klengar er a doab me a omesubel a uldesuir a rechad el kirel a Ebiil? (Are there biological and social monitoring activities in Ebiil?)

Choi (Yes) Diak (No) Diak kudengei (Don't know)

{Aleskum eng "diak" me a lechub eng "diak kudengei" e bo er a # 46 (If "no" or "don't know", skip to #46)}

44. Ke medengei a kekka er a omesubel a uldseuir a rechad el mlo cholt er 2007? (Do you know the results of Ebiil MPA Assessment Study that were given in 2007?)

Choi (Yes) Diak (No)

{Aleskum eng "choi"}: Ak mo masech a kekka er tia el omesub e kouchais el kmo ng merang me a lechung eng diak. {If yes}: (I will read you some results of this study and you will tell me if they're true or false.)

Kekka er a omesub (Results of studies)	Merang (True)	Diak el merang (False)
1) Betok el chad a oldubech er a tekoi er a omengesimr el debed el mo basio er a omengeriomel el loki a llach eleng ungil teletael el dousbech er ngii el mengriomel e mengdmokl er a orretel a debed. (Most people support MPA as a management tool.)		
2) Betok el chad a kmo a omengesimr el basio er a omengeriomel er a debed a ungil a lak a ulebengelel. (More people want MPAs to be permanent.)		
3) A melmall er a Ebiil a tirkel chad el mo soiseb er a chelsel a Ebiil (Illegal entry is the biggest threat.)		
4) Betok el chad a omtok er tial chesmerel a Ebiil el ngii a basio er a omengeriomel el loki a llach. (Many people are against Ebiil being a legislated MPA.)		

45. Kau ke medengei a kekka er a survey er a chelsel a Ebiil el mo cholt er a 2007 (Do you know the results of the Biophysical Survey that were given in 2007?) Choi (Yes) Diak (No)

{Aleskum eng "choi"}: Ak mo masech a kekka er tia el omesub e kouchais el kmo ng merang me a lechung eng diak. {If yes: I will read you some results of this study and you will tell me if they're true or false.}}

Kekka er a omesub (Results of studies)	Merang (True)	Diak el merang (False)
1) Ng mla mo betok a temekai, tiau, me a mokas er a chelsel a Ebiil. (Grouper population in Ebiil is increasing.)		
2) A idisel a ngikel er a Ngebard a diak lora el mo betok el ua Ebiil.		

(Fish population in Ngebard is not increasing like Ebiil.)		
3) Ng merael mo betok a merand er a chesel a Ebiil. (Coral cover is increasing in Ebiil.)		
4) A kim er a chesel a Ebiil a merael mo mekesai. (Clam population in Ebiil is decreasing.)		

46. Ngerang a ungil teletael el momdasu er ngii eng ungil a dousbech er ngii lolecholt a kekka ra omesuib? Ak mo masech a teletael e kau a ouchais er a kot me a ongerung el ungil teletael. (What is the first and second best way to inform you about the results of studies? I will read you a list)

Teletael (Ways)	<i>{Mlechesii a kot me a ongerung} ({Write 1st and 2nd})</i>
1) Presentation er a bek el hang (Presentation in the villages)	
2) Okiu a TV (Television)	
3) Okiu a radio (Radio)	
4) Okiu a omerous el babier er a obliil (Pamphlets distributed at homes)	
5) Okiu a Governor me a State (Through the Governor and the State)	
6) Ngera ngodech (Others, please specify):	

Ke kmal mesaul er a temem!! (Thank you very much for your time and cooperation!!)

Appendix 2: Basic statistics for all survey questions

Ebiil Household Survey, Final

Survey # _____

Date: _____ Hamlet of Interview: _____ Interviewer: _____ Note Taker: _____

ID# _____

ABOUT YOURSELF

1. Ng sebechek el loker er a rekim? (May I ask for your age?) _____

Age groups					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	29 and younger	7	2.5	2.5	2.5
	30-39	25	9.0	9.0	11.5
	40-49	74	26.5	26.6	38.1
	50-59	92	33.0	33.1	71.2
	60 and over	80	28.7	28.8	100.0
	Total	278	99.6	100.0	
Missing	System	1	.4		
Total		279	100.0		

2. {*Diak monguii*} {(Do not read just check)}: Sechal (Male) Redil (Female)

Sex of respondent					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	173	62.0	62.0	62.0
	female	106	38.0	38.0	100.0
	Total	279	100.0	100.0	

3. Kau ke bechiil? (Are you married?) {(widow and divorce = no)} Choi (Yes) Diak (No)

Marital status of respondent					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	70	25.1	25.1	25.1
	yes	209	74.9	74.9	100.0
	Total	279	100.0	100.0	

4. Ke chad el ker el hang? (Which village are you from?) _____

Villages	Frequency	Valid Percent
Iyebukl	31	11.2
Mengellang	50	18.1
Multiple villages	7	2.5
Ngarbau	27	9.7
Ngarmetong	10	3.6
Ngebei	29	10.5
Ngeiungel	4	1.4
Ngetmel	1	.4
Ngruil	28	10.1
Ollei	90	32.5
Total	277(N)	100.0

5. a) Kom tela el chad a kiei er a blim el 18 a rekmiu el mo er bab? (How many people in your household, including yourself, are 18 and older?) _____

# people in HH 18 and older					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	25	9.0	9.0	9.0
	2	86	30.8	30.8	39.8
	3	74	26.5	26.5	66.3
	4	56	20.1	20.1	86.4
	5	19	6.8	6.8	93.2
	6	9	3.2	3.2	96.4
	7	3	1.1	1.1	97.5
	8	3	1.1	1.1	98.6
	9	1	.4	.4	98.9
	10	1	.4	.4	99.3
	13	1	.4	.4	99.6
	15	1	.4	.4	100.0
	Total	279	100.0	100.0	

b) Tela ngariou er a 18 a rekrir? (How many are under 18 years old?) _____

# people in HH under 18					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	71	25.4	25.4	25.4
	1	86	30.8	30.8	56.3
	2	73	26.2	26.2	82.4
	3	25	9.0	9.0	91.4
	4	18	6.5	6.5	97.8
	5	5	1.8	1.8	99.6
	7	1	.4	.4	100.0
	Total	279	100.0	100.0	

6. Ngera urerem? (What is your job?) _____

Occupation regrouped					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Admin/Accountant/Manager	17	6.1	6.2	6.2
	Education	24	8.6	8.8	15.0
	Government	85	30.5	31.0	46.0
	Health	8	2.9	2.9	48.9
	Hotel	4	1.4	1.5	50.4
	Market/Store	11	3.9	4.0	54.4
	No job	29	10.4	10.6	65.0
	Others	29	10.4	10.6	75.5
	Retired	58	20.8	21.2	96.7
	Self employed	9	3.2	3.3	100.0
	Total	274	98.2	100.0	
Missing	999	5	1.8		
Total		279	100.0		

7. *Ngera ikel kmal uchul a kerrekerngel a blim el ngii a udoud, kall me a lechub eng usbechel er a blai lokiu a ngidi el chad el kiei er a blim? {molilt} (What are the main livelihood sources for your household for both cash income generation and household consumption/use?) {Check all that apply}

Household Cash Income Generating Activities				
Total responses for income generating activities		Responses		Percent of Cases
		N	Percent	
	Job salary	226	37.5%	81.3%
	Fishing	61	10.1%	21.9%
	Farming	41	6.8%	14.7%
	Hunting	6	1.0%	2.2%
	Livestock	21	3.5%	7.6%
	Money from relatives	34	5.6%	12.2%
	Handicraft	25	4.1%	9.0%
	Private business	39	6.5%	14.0%
	Pension or social security	124	20.6%	44.6%
	All other activities	26	4.3%	9.4%
Total		603	100.0%	216.9%
Activities for Household Use and Consumption				
Total responses for activities for household consumption and use		Responses		Percent of Cases
		N	Percent	
	Fishing	156	40.1%	72.2%
	Farming	142	36.5%	65.7%
	Hunting	43	11.1%	19.9%
	Livestock	19	4.9%	8.8%
	Handicraft	27	6.9%	12.5%
	All other activities	2	.5%	.9%
Total		389	100.0%	180.1%

9. Ngera sel kot me a ongerung el uchul a sisebellel a udoud el me er a blim? *{Mlechesii a LAMBANG el lokesiur er sel kot me a ongerung er a question #7}* (Which of the above provides the 1st and 2nd highest income for your household?) *{Write the NUMBER from question 7 that corresponds to the answers.}*

1st _____

2nd _____

Highest income for HH					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	employment	186	66.7	66.7	66.7
	fishing	6	2.2	2.2	68.8
	farming	2	.7	.7	69.5
	money received	2	.7	.7	70.3
	handicrafts	1	.4	.4	70.6
	private business	9	3.2	3.2	73.8
	pension/ss	66	23.7	23.7	97.5
	others	3	1.1	1.1	98.6
	market	4	1.4	1.4	100.0
	Total	279	100.0	100.0	

2nd highest income for HH					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	employment	28	10.0	15.5	15.5
	fishing	31	11.1	17.1	32.6
	farming	13	4.7	7.2	39.8
	hunting	1	.4	.6	40.3
	livestock	1	.4	.6	40.9
	money received	15	5.4	8.3	49.2
	handicrafts	9	3.2	5.0	54.1
	private business	16	5.7	8.8	63.0
	pension/ss	43	15.4	23.8	86.7
	others	15	5.4	8.3	95.0
	market	9	3.2	5.0	100.0
	Total	181	64.9	100.0	
Missing	no response	98	35.1		
Total		279	100.0		

10. Ngera kot el nga er bab el skuul el blo er ngii me a lechub eng tilobed er ngii a rechad er a blai? (What is the highest level of education that your household members have attended or completed?)

Elementary

High school

Daingak (University or college)

Education level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	elementary	16	5.7	5.7	5.7
	high school	58	20.8	20.8	26.5
	university/college	205	73.5	73.5	100.0
	Total	279	100.0	100.0	

11. Elechang eak mo oker el kirel a kerrekerngiu er a ta el buil? Ak mo masech a daitai el klungel a udoud e kau a ouchais el kmo a delengcheklem ng rubet er a ngerang. (What is the monthly income level of your household?)

Income level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	<500	78	28.0	29.1	29.1
	500-1,000	83	29.7	31.0	60.1
	1,001-1,500	49	17.6	18.3	78.4
	1,501-2,000	25	9.0	9.3	87.7
	2,001-2,500	20	7.2	7.5	95.1
	>2,500	13	4.7	4.9	100.0
	Total	268	96.1	100.0	
Missing	don't know	1	.4		
	do not wish to answer	10	3.6		
	Total	11	3.9		
Total		279	100.0		

ABOUT FISHING AND PERCEIVED BIOLOGICAL CHANGES

Elechang aika el bo kuker, a ker el kirel a rechad rokui el kiei er a blim el kirel a omenged. (These next questions are about the members of your household regarding fishing.)

12. Tela resechal me a redil el kiei er a blim a blechoel el nga er a chei a ngikel me a cheled {*A cheled er tia el survey a mo uldimukl er a re ua chreburkl, chemang, semum me a ngodech el lou kai el kall er a daob?*} (How many males and females in your household regularly fish or harvest marine invertebrates?)

Sechal (Male) _____

Redil (Female) _____

# Male who fish in household					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	125	44.8	45.0	45.0
	1	131	47.0	47.1	92.1
	2	17	6.1	6.1	98.2
	3	3	1.1	1.1	99.3
	4	2	.7	.7	100.0
	Total	278	99.6	100.0	
Missing	no answer	1	.4		
Total		279	100.0		

# Female who fish in household					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	212	76.0	76.3	76.3
	1	57	20.4	20.5	96.8
	2	9	3.2	3.2	100.0
	Total	278	99.6	100.0	
Missing	no answer	1	.4		
Total		279	100.0		

13. Ng bekord el tela el klebesei a lousbech er ngii a rechad er a blim el nga er a chei a ngikel er elecha el taem? (On average, about how often do your household members fish for fish these days?)

How often do HH members fish for fish?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	everyday	2	.7	1.3	1.3
	6 or less/week	34	12.2	21.3	22.5
	1-3/month	104	37.3	65.0	87.5
	2-3/year	20	7.2	12.5	100.0
	Total	160	57.3	100.0	
Missing	no one fishes	115	41.2		
	no answer	4	1.4		
	Total	119	42.7		
Total		279	100.0		

14. Me mocholt aikel eim el meklou a ututelel el ngikel er a blim. Eak mo oker el kirel a teletelel e mo omekesiu er elecha el taem me a teruich er rak er a mla me mong. (First please tell me the 5 most important types of fish for your household to eat and to sell. Then I will ask questions about how they are now compared to 10 years ago.

Top 6 Fishes	Frequency	Percent
Keremlal	144	12.5
Ngiaoch	118	10.2
Tiau	95	8.2
Chum	64	5.5
Kelsebuul	61	5.3
Mesekuuk <i>(is included because of how close it is to the 5th fish)</i>	59	5.1
Others	614	53.2
Total	1155	100
Missing		
Do not eat/sell fish (N=279)	13	4.7

\$importantfish Frequencies				
		Responses		Percent of Cases
		N	Percent	
Use of 5 most important fish ^a	HH consumption	940	81.3%	353.4%
	sale	21	1.8%	7.9%
	both	195	16.9%	73.3%
Total		1156	100.0%	434.6%
a. Group				

	Percentage of responses	
	Fish	
	Number	Size
Less/smaller	91	81
More/bigger	4	4
About the same	6	15
N (responses)	1059	1072

Elechang eak kuk mo oker a ker el di kirem el kirel a tekoi er a chei. (I will now ask you questions about yourself and your fishing habits.)

15. Kau ke nga er a chei a ngikel er elecha el taem? (Do you yourself fish for fish now?)

Choi (Yes) Diak (No)

Do you fish now?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	130	46.6	46.9	46.9
	yes	147	52.7	53.1	100.0
	Total	277	99.3	100.0	
Missing	no answer	2	.7		
Total		279	100.0		

{Alsekum eng "diak" e bo er a #22} ({If "no", please skip to #22})

16. Sel momekesiu er a teruich el rak er a mla me mong me a elecha el taem, ng mla mo uangerang a klungel el taem a mousbech er ngii el melai aikal di osisiu el idisel a ngikel el mul masech? (Compared to 10 years ago, how much time do you now need to catch the same amount of fish that you mentioned?)

Time needed now to catch same amount of fish compared to 10yrs.ago					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	don't know	2	.7	1.4	1.4
	less	17	6.1	11.6	12.9
	more	117	41.9	79.6	92.5
	same	11	3.9	7.5	100.0
	Total	147	52.7	100.0	
Missing	skip	129	46.2		
	no answer	3	1.1		
	Total	132	47.3		
Total		279	100.0		

17. Kau ke dirk ke nga er a chei er a ikel basio el blem nga er a chei er ngii er a teruich el rak er a mla me mong? (Do you still fish at the same locations you did 10 years ago?)
 Choi (Yes) Diak (No) {Bo er a #19 (Skip to #19)}

Do you fish at same location as 10 yrs.ago?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	49	17.6	33.3	33.3
	yes	86	30.8	58.5	91.8
	yes/no	12	4.3	8.2	100.0
	Total	147	52.7	100.0	
Missing	55	1	.4		
	skip	128	45.9		
	no answer	3	1.1		
	Total	132	47.3		
Total		279	100.0		

18. Alsekum eng choi, eng ngerang aika el basio? (If yes, what are these locations?)

(Answers were not able to be extracted due to many different types/names/habitats/locations of areas.)

19. Alsekum eng diak, eng ngera uchul? (If no, what is the reason?)

Reasons for changing fishing locations	Frequency	Percent
less fish	36	59.0
occupied	2	3.3
expensive	3	4.9
no transportation	2	3.3
degraded reef	2	3.3
It's conservation area now	5	8.2
others	11	8.0
Total	61	100
Missing		
skip	211	
no answer	7	
Total	218	
Total	279	

20. Sel momekesiu er a teruich el rak er a mla me mong me a elecha el taem, eng mla mo diak kom sal nga er a chei a ngikel, ng mla mo mekudem, me a lechub eng dirk ke osisiu? (Comparing to 10 years ago, do you now go fishing for fish less often, more often or about the same?)

How often do you fish?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less often	102	36.6	69.9	69.9
	more often	20	7.2	13.7	83.6
	about the same	24	8.6	16.4	100.0
	Total	146	52.3	100.0	
Missing	skip	130	46.6		
	no answer	3	1.1		
	Total	133	47.7		
Total		279	100.0		

21. Aleskum eng mla mo mekesai me a lechub eng betok el taem el om nga er a chei a ngikel, ngera sel kmal uchul meng mla mengodech a om nga er a chei? (If you now go fishing less or more than you used to, what is the main reason that you now fish differently?)

Reasons for fishing differently	Frequency	Percent
Fish a lot	9	6.3
Occupied	33	22.9
Lack of trans	10	6.9
Less fish	39	27.1
Expensive	29	20.1
Old/sick/tired	12	8.3
Others	12	8.3
Total	144	100
Missing		
Skip	154	
No answer	5	
Total	159	
Total	279	

Aikal el ker el kuk bo kuker a di osisiu er ika el mla mo merek eng ding kuk kirel a cheled. {*A cheled er tia el survey a mo uldimukl er a re ua chreburkl, chemang, semum me a ngodech el lou kai el kall er a daob.*} (These next questions are similar to the previous ones but about marine invertebrates.)

22. Ng uangera el idisel a klebsei a lousbech er ngii a rechad er a blim el nga er a chei a cheled er elecha el taem? (About how often do your household members harvest invertebrates these days?)

How often HH members harvest invertebrates					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	everyday	2	.7	2.7	2.7
	6 or less/week	7	2.5	9.3	12.0
	1-3/month	40	14.3	53.3	65.3
	2-3/year	26	9.3	34.7	100.0
	Total	75	26.9	100.0	
Missing	don't know	2	.7		
	no one fishes	196	70.3		
	no answer	6	2.2		
	Total	204	73.1		
Total		279	100.0		

23. Me mocholt aikel eim el meklou a ututelel el cheled er a blim. Eak mo oker el kirel a teletelel e mo omekesiu er elecha el taem me a teruich er rak er a mla me mong. (Please tell me the most 5 important types of invertebrates for your household to eat and to sell. Then tell me how they are now compared to 10 years ago.)

Top 5 Invertebrates	Frequency	Percent
Ngims	136	18.4
Cheremrum	121	16.4
Sekesaker	83	11.2
Kim	78	10.6
Ngduul	62	8.4
Others	259	35.0
Total	739	100.0
Missing		
Do not eat/sell invertebrates (N=279)	59	21.1

\$invertuse Frequencies				
		Responses		Percent of Cases
		N	Percent	
invertuse ^a	HH consumption	663	90.0%	302.7%
	sale	13	1.8%	5.9%
	both	61	8.3%	27.9%
Total		737	100.0%	336.5%
a. Group				

	Percentage of responses	
	Invertebrate	
	Number	Size
Less/smaller	86	83
More/bigger	7	4
About the same	6	13
N (responses)	639	566

Elechang eak mo oker a a ker el di kirem el kirel a tekoi er a chei el melai a cheled. (I will now ask you questions about yourself and your collection habits of marine invertebrates.)

24. Kau ke nga er a chei a cheled? (Do you yourself harvest invertebrates?)

Choi (Yes) Diak (No)

Do you harvest invertebrates now?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	215	77.1	77.9	77.9
	yes	61	21.9	22.1	100.0
	Total	276	98.9	100.0	
Missing	no answer	3	1.1		
Total		279	100.0		

Alsekum eng “diak” e bo er a #28 (If “no”, skip to #28)

25. Sel momekesiu er a teruich el rak er a mla me mong, ng mla mo uangerang a klungel el taem a mousbech er ngii el ngara chei aika el di osisiu el idisel a cheled el mul masech? (Compared to 10 years ago, how much time do you now need to collect the same amount of invertebrates that you mentioned?)

Time needed now to harvest same amount of invertebrates compared to 10yrs. ago					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	don't know	4	1.4	6.7	6.7
	less	5	1.8	8.3	15.0
	more	42	15.1	70.0	85.0
	same	9	3.2	15.0	100.0
	Total	60	21.5	100.0	
Missing	skip	216	77.4		
	no answer	3	1.1		
	Total	219	78.5		
Total		279	100.0		

26. Sel momekesiu er a teruich el rak er a mla me mong, me a elecha el taem, eng mla mo diak kom sal nga er a chei a cheled, ng mla mo mekudem, me a lechub eng dirk ke osisiu?(Comparing to 10 years ago, do you now collect marine invertebrates less often, more often or about the same?)

How often harvest inverts now compared to 10yrs. ago?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less often	39	14.0	65.0	65.0
	more often	9	3.2	15.0	80.0
	about the same	12	4.3	20.0	100.0
	Total	60	21.5	100.0	
Missing	skip	217	77.8		
	no answer	2	.7		
	Total	219	78.5		
Total		279	100.0		

27. Alsekum eng mla mo mekesai me a lechub eng betok el taem el om nga er a chei a cheled, ngera sel kmal uchul meng mla mo mengodech a om nga er a chei? (If you now collect invertebrates less or more than you used, what is the main reason that you now collect differently?)

Reasons for collecting differently	Frequency	Percent
Harvest more	7	13.5
Occupied	18	34.6
Less inverts	12	23.1
Expensive	3	5.8
Tiered/old	4	7.7
Depend on market	2	3.8
Hard to harvest	2	3.8
Others	4	7.7
Total	52	100
Missing		
Skip	230	
No answer	1	
Total	231	
Total	283	

PURPOSE OF EBIIL LEGISLATED MPA

28. Ngera sel me a lechub eng ikel kmal uchul a Ebiil a chelsimr el basio er a omengeriomel el loki u a llach? (What is/are the main purpose(s) of Ebiil being a legislated marine protected area?)

Reasons	Frequency	Percent
Fish aggregation site	196	49.2
Conservation + increase fish/fish agg.site + future+protection	45	11.3
Biodiversity	7	1.8
Funding	3	0.8
Increase resources+ less resources/overharvesting	92	23.1
Others	7	1.8
Do not support	4	1.0
Don't know	44	11.1
Total	398	100
Missing		
No answer	251	
Total	251	
Total	649	

29. Ngera aikel tebelong el kot el meklou ututelel el klungiolel a Ebiil el me er a blim? (What are the two most important benefits of Ebiil MPA for you household?)

Benefits	Frequency	Percent
Spillover/increase	87	29.1
Future	26	8.7
Children	6	2.0
General public only	9	3.0
Pride	12	4.0
Financial	7	2.3
If closure continues	1	0.3
Assurance	13	4.3
Tourist	9	3.0
Fish habitat	14	4.7
Conservation	7	2.3
For consumption	10	3.3
Others	3	1.0
No benefits	95	31.8
Total	299	100
Missing		
Don't know	15	
No answer	244	
Total	259	
Total	558	

PERCEPTION OF CHANGES AND BENEFITS

30. Ak mo mengui a bebil er a tekoi e kau a mo ouchais el kmo ke kongei, diak kom kengei, me a lechub eng diak modengei. A bebil er a ikang a mo omekesiu a tekoi er elecha el taem me a uchei er a lemechesimr a Ebiil el mo basio er a omengeriomel er a 2000. (I’m going to read some statements and ask you whether you agree, disagree, or you don’t know. Some of the statements will compare the current situation of different things with how they were before the closure of Ebiil in 2000.)

Statements	Kongei (Agree)	Diak kem kengei (Disagree)	Diak kudengei (Don’t know)	No answer
a. Kall er a ngodech el beluu el mei a uchul me a rechad el kiei er a blik a mla mo diak sa el nga er a chei. (Imported foods make my household members go fishing less.)	144 51.6%	128 45.9%	6 2.2%	1 0.4%
b. *A kuldubech er a lechul a chesmerel a Ebiil el ngii a basio er a omengeriomel, el lokiu a llach. (I support Ebiil being legislated MPA.)	265 95%	8 2.9%	6 2.2%	0 0
c. Nga er ngii a klungiolel me a keruull er a Ebiil. (There are economic benefits from the Ebiil.)	230 82.4%	14 5.0%	25 9.0%	10 3.6%
d. A klungiolel me a keruull er a Ebiil a tabesul el mo er a rebek el chad er a Ngarchelong. (Economic benefits from the Ebiil are equally shared in Ngachelong.)	184 65.9%	39 14%	54 19.4%	2 0.7%
e. Se er a lemechesimr a Ebiil, a rechad er a blik a omekall el mo er cheroid el mo er a chei. (Since the closure of Ebiil, my household has to travel further away to fish.)	129 46.2%	131 47%	17 6.1%	2 0.7%
f. A Ebiil a olngeseu el lomdois a kall er a daob el me er a telungalek er ngak. (Ebiil helps improve the availability of seafood for my family.)	208 74.6%	49 17.6%	21 7.5%	0 0
g. Tial chesmerel a Ebiil, a uchul me a rebebil er a rechad er a blik a mla mo diak el sa el nga er a chei el me odoim er a blai. (Because of the closure, my household fishes less for food.)	43 15.4%	222 79.6%	12 4.3%	2 0.7%
h. Tial chesmerel a Ebiil, a uchul me a rebebil er a rechad er a blik a diak el sal nga er a chei el mo olterau. (Because of the closure, my household fishes less for sale.)	46 16.5%	215 77.1%	16 5.7%	2 0.7%
i. Tial chesmerel a Ebiil, a uchul meng mla mo klou ocheral a ngikel me a cheled el me odoim er a blai. (Because of the closure, my household buys more fish and other seafood to eat.)	43 15.4%	222 79.6%	12 4.3%	2 0.7%

j. Tial chesmerel a Ebiil, a uchul me a rechad er a blik a kirir el losiik a ngodech el teletael er a omengerker. (Because of the closure, some of our household members had to find another way to make a living.)	33 11.8%	234 83.9%	12 4.3%	0 0
k. A Ebiil el ngii a chelsimr el basio er a omengriomel, a uchul me a rechad er a blik a mla mo melechesuar el kmo ng klou a ultutelel a dongeriomel er a debed. (My family has become more aware of the importance of marine conservation because of Ebiil MPA.)	234 83.9%	31 11.1%	13 4.7%	1 0.4%
l. A Ebiil a ngosukak el mo diak sal suebek a renguk er a ngar medak el taem el kirel a kereker me a klungiolel. (Ebiil helps me worry less about the future of our marine life.)	242 86.7%	22 7.9%	14 5.0%	1 0.4%
m. A chesmerel a Ebiil, a nga er ngii a klungiolel el me er a telungalek er ngak. (Ebiil MPA benefits the well-being of my family.)	236 84.6%	31 11.1%	11 3.9%	1 0.4%
n. A chesmerel a Ebiil, a nga er ngii klungiolel el mo er a rechad er a ngar medak el taem. (Ebiil MPA benefits the future generations.)	266 95.3%	3 1.1%	9 3.2%	1 0.4%
o. A kuldubech er a uldasu el mo melutk er a bebil er a basio er omengeriomel el di ua Ebiil er a debel a Ngarchelong lokiua llach. (I support additional legislated MPAs in Ngarchelong like Ebiil.) <i>{Alsekum eng “diak el kengei” me a lechub eng “diak lodengei”, e bo er a #34} (If answer is “disagree” or “don’t know”, skip to #34)}</i>	216 77.4%	49 17.6%	12 4.3%	2 0.7%

31. Alsekum ke oldubech, e ngeral basio er a chesl a debel a Ngarchelong a obom moldubech er ngii? (If you agree with statement “o”, which area(s) in Ngarchelong would you support?)

New areas to be MPA	Frequency
Bengall	25
Ngetmel	18
Ngebard	15
Mangrove areas	13
Ngerael	12
<i>Note: too much areas/locations/habitats were named therefore percentages can not be extracted</i>	

32. Ngerang meke oldubech er tia me a lechub ng ika el basio er a chelsel a debel a Ngarchelong el mo mechesimr el ua Ebiil? (Why would you support this area to be an additional legislated MPA?)

Reasons	Frequency	Percent
Conservation purpose(s)	50	24.2
To increase b/c of decrease resources/decreased resources	43	20.9
Because area is a habitat for resources/many resources at habitat	72	35.0
Because the area(s) is near shore	7	3.4
For future purposes	7	3.4
To have an MPA at the west coast	3	1.5
Tourists	4	2.0
Others	20	9.7
Total	206	100
Missing		
Don't know	3	
Skip	62	
No answer	8	
Total	73	
Total	279	

33. Sel momdasu, tiang me a lechub ngika el basio ng kirel di merekong el di chelsimr me a lechub eng mo meterkokl a temel el basio er a omengeriomel? (Do you think the new additional MPA(s) should be permanent or temporary?)

New MPA should be permanent or temporary?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	permanent	48	17.2	23.5	23.5
	temporary	156	55.9	76.5	100.0
	Total	204	73.1	100.0	
Missing	skip	63	22.6		
	no answer	12	4.3		
	Total	75	26.9		
Total		279	100.0		

How long if MPA is temporary? (in years)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.25	1	.4	.9	.9
	.50	3	1.1	2.7	3.6
	1.00	13	4.7	11.7	15.3
	1.50	1	.4	.9	16.2
	2.00	12	4.3	10.8	27.0
	2.50	1	.4	.9	27.9
	3.00	16	5.7	14.4	42.3
	4.00	6	2.2	5.4	47.7
	5.00	45	16.1	40.5	88.3
	6.00	1	.4	.9	89.2
	7.00	1	.4	.9	90.1
	10.00	8	2.9	7.2	97.3
	20.00	2	.7	1.8	99.1
	50.00	1	.4	.9	100.0
	Total	111	39.8	100.0	
Missing	Don't know	13	4.7		
	skipped	112	40.1		
	no response	43	15.4		
	Total	168	60.2		
Total		279	100.0		

THREATS, ENFORCEMENT AND REGULATIONS

34. Ngera ikel tebelong el tekoi me a lechub eng omeruul el mo tomelii a Ebiil el ngii a basio er a omengeriomel el lokiu a llach? (What are the top 2 greatest threats to Ebiil MPA?)

Threats	Frequency	Percent
Illegal fishing/entering/poaching	163	47.4
Weak enforcement	52	15.1
Irresponsible fishing	20	5.8
If Ebiil opens	10	2.9
Human activities/bad behaviors	13	3.8
Carelessness/ignorance	9	2.6
Overharvesting	11	3.2
People violating the laws	7	2.0
Outsiders fishing in Ngarchelong waters	7	2.0
Fishing at night/fishing with flash lights	13	3.8
Speed boat	5	1.5
Others	34	9.9
Total	344	100
Missing		
Don't know	32	
No answer	175	
Total	207	
Total	551	

35. Ngera sebeded el mo remuul el mo merrob aika el blam basech el tekoi el ngii a melmall er a Ebiil? (What would be the solution for these threats?)

Solutions	Frequency	Percent
Better enforcement/laws	221	74.9
Awareness	17	5.8
Equipments	10	3.4
Fund (for better enforcement)	8	2.7
Open Ebiil	5	1.7
Others	34	11.5
Total	295	100
Missing		
Don't know	28	
No answer	33	
Total	61	
Total	356	

36. Ka molbodeb er a omengkar me a otutel a llechul a Ebiil er elecha el taem. Ak mo masech a teletael e ke ngiltii a chimong. (How is the current enforcement effort for Ebiil? Please choose one answer.)

Rating of current enforcement of Ebiil					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	don't know	45	16.1	16.1	16.1
	no enforcement	61	21.9	21.9	38.0
	weak enforcement	156	55.9	55.9	93.9
	enough enforcement	17	6.1	6.1	100.0
	Total	279	100.0	100.0	

37. *Ngera uldesuem el kirel a llechul a Ebiil? Ak mo omasech a llach e kau a ouchais el kmo ke medengi aika el llach e ouchais el kmo ng mla mo tela a idisel a taem el blam mesterir a rechad me a lechub ke mla remenges a chisir a rechad el melmall aikal llach er elecha el mla mo merek el rak. (I'm going to read you the regulations of Ebiil. Tell me if you are aware of them and how many times you have seen or heard people violate them in the past year).

Regulations	Percentage of people who are aware of the regulations	Percentage of respondents mentioning no violation (N=279)	Average of violations experienced by the respondents
No entry	96 (N=264)	44	1.83 (N=264)
No fishing, no collecting	91 (N=267)	57	1.27 (N=267)
No littering	58 (N=267)	96	.09 (N=267)
No vessel grounding	56 (N=267)	92	3.99 (N=267)
Penalty for violation of law	72	n/a	n/a

38. Ngar er ngii a ngodech el llach el soam el mo mes el kirel a Ebiil? (Are there any other rules and regulations you wish to see in Ebiil?) Choi (Yes) Diak (No)

Are there any regulations you wish to see in Ebiil?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	197	70.6	70.6	70.6
	yes	82	29.4	29.4	100.0
	Total	279	100.0	100.0	

Aalsekum eng nga er ngii, em sodii. (If yes, please explain.)

Other rules or regulations	Frequency	Percent
Better enforcement/patrol	46	45.5
Temporary closure	5	5.0
Allow tourism entry	7	6.9
No entry at all	4	4.0
Good enough	10	9.9
Mark boundaries	2	2.0
Make it permanent MPA	2	2.0
Have equipments	2	2.0
Aquaculture	3	3.0
Traditional penalty	2	2.0
No studies to be done	1	1.0
Others	17	16.8
Total	101	100
Missing		
No answer	178	
Total	178	
Total	279	

39. Ngar er ngii a ngodech el udesuem el sebechel el smisichii a orretel a Ebiil el ngii a basio er a omengeriomel el loki u a lach? (If you have any suggestions to improve the management of Ebiil MPA, please tell us.)

Suggestions	Frequency	Percent
Better enforcement	121	65.4
Have equipments	10	5.4
Funding	7	3.8
Awareness	5	2.7
Work together	3	1.6
Temporary closure	1	0.5
Permanent closure	1	0.5
Follow rules	2	1.1
Assistance from National Government	2	1.1
Others	33	17.8
Total	185	100
Missing		
No answer	94	
Total	94	
Total	279	

TOURISM

40. Kau ke oldubech a klekangkodang a le bo er ngii er a chelsel a Ebiil? (Would you support tourism in Ebiil MPA?)

Choi (Yes)

Diak (No)

Diak kudengei (Not sure)

Support tourism in Ebiil					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	73	26.2	26.2	26.2
	yes	201	72.0	72.0	98.2
	not sure	5	1.8	1.8	100.0
	Total	279	100.0	100.0	

41. Ke oldubech a klekangkodang er a ngodech el basio er a Ngarchelong? (Would you support tourism in other areas in Ngarchelong?)

Choi (Yes)

Diak (No)

Diak kudengei (Not sure)

Support tourism in Ngarchelong					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	4	1.4	1.4	1.4
	yes	274	98.2	98.2	99.6
	not sure	1	.4	.4	100.0
	Total	279	100.0	100.0	

{Alsekum eng diak er a #40 me a #41, e bo er a #43. (If no to both, skip to #43)}

42. Ngeral lomeruul me a lechub eng teletael er a klengangkodang a soam a rechad er a blim a bo loruul e oureor er ngii e mesuk a udoud? Ak mo masech a teletael e kau a ouchais el kmo ko mo er ngii lomeruul, ng diak, me a lechub eng diak modengei (What tourism activities would your household like to participate in order to benefit financially? I will read you a list and you tell me if you think your household will participate, won't participate, or you don't know at this point.)

Boat operation in tourism activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	127	45.5	47.4	47.4
	yes	141	50.5	52.6	100.0
	Total	268	96.1	100.0	
Missing	i don' know	5	1.8		
	skip	6	2.2		
	Total	11	3.9		
Total		279	100.0		

Water activity guide in tourism

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	142	50.9	52.4	52.4
	yes	129	46.2	47.6	100.0
	Total	271	97.1	100.0	
Missing	i don' know	2	.7		
	skip	6	2.2		
	Total	8	2.9		
Total		279	100.0		

Land activity guide in tourism

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	112	40.1	41.2	41.2
	yes	160	57.3	58.8	100.0
	Total	272	97.5	100.0	
Missing	skip	6	2.2		
	no answer	1	.4		
	Total	7	2.5		
Total		279	100.0		

Motel/hotel in tourism activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	109	39.1	40.4	40.4
	yes	161	57.7	59.6	100.0
	Total	270	96.8	100.0	
Missing	i don' know	3	1.1		
	skip	6	2.2		
	Total	9	3.2		
Total		279	100.0		

Restaurant in tourism activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	153	54.8	56.5	56.5
	yes	118	42.3	43.5	100.0
	Total	271	97.1	100.0	
Missing	i don' know	2	.7		
	skip	6	2.2		
	Total	8	2.9		
Total		279	100.0		

Food market in tourism activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	106	38.0	39.3	39.3
	yes	164	58.8	60.7	100.0
	Total	270	96.8	100.0	
Missing	i don' know	3	1.1		
	skip	6	2.2		
	Total	9	3.2		
Total		279	100.0		

Handicraft market in tourism activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	135	48.4	49.8	49.8
	yes	136	48.7	50.2	100.0
	Total	271	97.1	100.0	
Missing	i don' know	1	.4		
	skip	6	2.2		
	no answer	1	.4		
	Total	8	2.9		
Total		279	100.0		

Other tourism activity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	219	78.5	85.5	85.5
	yes	37	13.3	14.5	100.0
	Total	256	91.8	100.0	
Missing	i don' know	1	.4		
	skip	6	2.2		
	no answer	16	5.7		
	Total	23	8.2		
Total		279	100.0		

AWARENESS OF BIOLOGICAL AND SOCIAL MONITORING ACTIVITIES

43. Ngar er ngii a klaodengei er kau el kirel a omesubel a klengar er a doab me a omesubel a uldesuir a rechad el kirel a Ebiil? (Are there biological and social monitoring activities in Ebiil?)

Choi (Yes) Diak (No) Diak kudengei (Don't know)

Are there biological and social monitoring activities in Ebiil?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	152	54.5	54.5	54.5
	yes	91	32.6	32.6	87.1
	dont' know	36	12.9	12.9	100.0
	Total	279	100.0	100.0	

{Aleskum eng "diak" me a lechub eng "diak kudengei" e bo er a # 46 (If "no" or "don't know", skip to #46)}

44. Ke medengei a kekka er a omesubel a uldesuir a rechad el mlo cholt er 2007? (Do you know the results of Ebiil MPA Assessment Study that were given in 2007?)

Choi (Yes) Diak (No)

Do you know the results of 2007 of Ebiil MPA assessment study?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	66	23.7	72.5	72.5
	yes	25	9.0	27.5	100.0
	Total	91	32.6	100.0	
Missing	skip	188	67.4		
Total		279	100.0		

{Aleskum eng "choi"}: Ak mo masech a kekka er tia el omesuub e kouchais el kmo ng merang me a lechung eng diak. {(If yes)}: (I will read you some results of this study and you will tell me if they're true or false.)

Most support MPA as management tool					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	3	1.1	12.0	12.0
	true	22	7.9	88.0	100.0
	Total	25	9.0	100.0	

Missing	skip	253	90.7		
	no answer	1	.4		
	Total	254	91.0		
Total		279	100.0		

More want MPAs to be permanent					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	9	3.2	37.5	37.5
	true	15	5.4	62.5	100.0
	Total	24	8.6	100.0	
Missing	skip	254	91.0		
	no answer	1	.4		
	Total	255	91.4		
Total		279	100.0		

Illegal entry is the biggest threat					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	3	1.1	12.5	12.5
	true	21	7.5	87.5	100.0
	Total	24	8.6	100.0	
Missing	skip	254	91.0		
	no answer	1	.4		
	Total	255	91.4		
Total		279	100.0		

Many are against Ebil being a legislated MPA					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	13	4.7	50.0	50.0
	true	12	4.3	46.2	96.2
	55	1	.4	3.8	100.0
	Total	26	9.3	100.0	
Missing	skip	252	90.3		
	no answer	1	.4		
	Total	253	90.7		
Total		279	100.0		

45. Kau ke medengei a kekka er a survey er a chelsel a Ebiil el mo cholt er a 2007 (Do you know the results of the Biophysical Survey that were given in 2007?) Choi (Yes) Diak (No)

Do you know the results of 2007 biophysical survey?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	64	22.9	74.4	74.4
	yes	22	7.9	25.6	100.0
	Total	86	30.8	100.0	
Missing	skip	192	68.8		
	no answer	1	.4		
	Total	193	69.2		
Total		279	100.0		

{Aleskum eng “choi”: Ak mo masech a kekka er tia el omesuub e kouchais el kmo ng merang me a lechung eng diak. (If yes: I will read you some results of this study and you will tell me if they’re true or false.)}

Grouper population in Ebiil is increasing					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	6	2.2	28.6	28.6
	true	15	5.4	71.4	100.0
	Total	21	7.5	100.0	
Missing	skip	257	92.1		
	no answer	1	.4		
	Total	258	92.5		
Total		279	100.0		
Fish population in Ngebard is not increasing like Ebiil					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	4	1.4	19.0	19.0
	true	16	5.7	76.2	95.2
	55	1	.4	4.8	100.0
	Total	21	7.5	100.0	
Missing	skip	257	92.1		

	no answer	1	.4		
	Total	258	92.5		
Total		279	100.0		
Coral cover is increasing in Ebiil					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	2	.7	10.5	10.5
	true	17	6.1	89.5	100.0
	Total	19	6.8	100.0	
Missing	skip	258	92.5		
	no answer	2	.7		
	Total	260	93.2		
Total		279	100.0		
Clam population in Ebiil is decreasing					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	false	5	1.8	31.3	31.3
	true	10	3.6	62.5	93.8
	5555	1	.4	6.3	100.0
	Total	16	5.7	100.0	
Missing	55	1	.4		
	skip	260	93.2		
	no answer	2	.7		
	Total	263	94.3		
Total		279	100.0		

46. Ngerang a ungil teletael el momdasu er ngii eng ungil a dousbech er ngii lolecholt a kekka ra omesub? Ak mo masech a teletael e kau a ouchais er a kot me a ongerung el ungil teletael. (What is the first and second best way to inform you about the results of studies? I will read you a list)

1st best ways to inform about studies					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	presentation	111	39.8	39.8	39.8
	television	72	25.8	25.8	65.6

	radio	16	5.7	5.7	71.3
	pamphlets	34	12.2	12.2	83.5
	governor/state	34	12.2	12.2	95.7
	others	12	4.3	4.3	100.0
	Total	279	100.0	100.0	
2nd best ways to inform about studies					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	presentation	35	12.5	12.7	12.7
	television	65	23.3	23.6	36.2
	radio	40	14.3	14.5	50.7
	pamphlets	63	22.6	22.8	73.6
	governor/state	57	20.4	20.7	94.2
	others	16	5.7	5.8	100.0
	Total	276	98.9	100.0	
Missing	no answer	3	1.1		
Total		279	100.0		

Ke kmal mesaul er a temem!! (Thank you very much for your time and cooperation!!)

Appendix 3: Key informant interview questions

Target KI group 1: Ngarchelong State Government staff (Governor and Northern Reef coordinator)

1. Have there been efforts to target resources to reduce poaching and illegal fishing? If yes, what are they? (info related to previous recommendation and Obj 2c)
2. Has the state government done any type of study or activity to identify ways the community benefits from the closure of Ebiil? What was conducted? What are the results? (info related to related to previous recommendation and Obj 2a)
3. Has the state government done any awareness raising activities related to the purpose of Ebiil, in and outside the state? What are the activities? (info related to related to previous recommendation and Obj 2a)
 - a. If none of the above happened, why not? (info related to previous recommendation and Obj 2)

Target KI group 2: fishers and harvesters of marine life (at least 5 fishers and 5 harvesters)

1. How would you describe the impacts of Ebiil MPA status on people who fish or harvest marine life? (Obj 2b)
2. Please explain if you have noticed any other important changes, since the closure of Ebiil in 2000, with any type of marine life (Specify the same types you biologically monitored for comparison. Don't forget corals). Ask about quantity, size, health and any other parameters you monitor in the biological study and believe these KI could also notice/experience during their fishing and harvesting activities. (Obj. 2b)
3. **What are some of the fishing methods that are practiced now?**
This was asked instead of the original question which was: Since the closure, is there any change in the way the community fishes or harvest marine life? If yes, what is it? (Obj 2b). This is because key informants related most of their changes to way before the closure of Ebiil.
4. What fishing methods are still being practiced?
5. Since the closure, is there any change in the way outsiders come to fish in Ebiil. Please explain. (Obj 2c)

Target KI group 3: community leaders; traditional leaders; respected elders; people who live in the community, are knowledgeable about the local situation and changes, and who are able to represent the community. (1 person per village)

1. What kinds of economic, social and cultural **benefit** do you think the Ebiil MPA has on the Ngarchelong communities? (Obj 2b) distribution of sources, relation of different people in the community-bring people together or conflicts (interactions), believes-attitudes that guide who you are
 - a. When we did a similar survey 5 years ago, people were concerned that Ebiil did not benefit different groups equally (fairly) and there were conflict among **different groups of people** who used resources. Did you share that opinion? If yes, could you elaborate on the issues in the past and tell us how the situation is today? Is there any change? In what way? Are there any particular groups that receive more benefits than others? Why do you think that happens? What do you think should be done to make it more equitable? (Obj 2)
 - b. What do you think about the effectiveness of Ebiil MPA management since the closure in 2000? The old survey also found out that people said the Ebiil management was poor back then. Did you agree with that then? How is the management today? What are some of the important changes you have seen? What causes these changes? (Obj 2)
2. Some people in your community do not want to support MPA. Would you be able to explain the reason? (Obj 2c)
 - a. Are there any ways besides MPA that you think would work well or better to conserve the natural resources of Ngarchelong and support the well-being of the communities? (info related to Obj 2)
3. What is your opinion about tourism development in Ebiil. How will it change the way people live here? What types of benefits or problems do you think we may face with tourism? (Obj 5)
4. As a traditional leader of the Ngarchelong community, would you mind commenting on the legislated Ebiil MPA. How similar is it to the traditional *bul*? Do traditional leaders like yourself supported the Ebiil MPA? If yes, how? Do you think the State Government needs more of your support? In what ways? (info related to Obj 2)

Target Key Informants--Ngarchelong

Target Group 1: State government

Ngarchelong State Government staff 1

Ngarchelong State Government staff 2

Target Group 2: Fishers and harvesters of marine life

Fisherman 1—also a Traditional leader

Fisherman 2

Fisherman 3

Fisherman 4

Fisherman 5

Fisherman 6—also a traditional leader

Fisherman 7—also a state employee

Fisherwoman 1

Fisherwoman 2

Fisherwoman 3

Target Group 3: Community leaders; traditional leaders; respected elders; people who live in the community, are knowledgeable about the local situation and changes, and who are able to represent the community. (1 person per village)

Traditional leader 1

Traditional leader 2

Traditional leader 3

Traditional leader 4

Traditional leader 5—also a Fisher

Definitions:

TL-Traditional leaders

CA-conservation area, Ebiil, MPA

Bul- traditional restriction, in this case, traditional restriction on Ebiil

GROUP 1

<p>Have there been efforts to target resources to reduce poaching and illegal fishing? If yes, what are they? (info related to previous recommendation and Obj 2c)</p>	
<p>Government staff 1</p>	<p>The State with <i>Klobak</i> (traditional leaders) of Ngarchelong have come together and agreed that the TL will “<i>omul</i>” and give the power to the State to have a planning team to create a management plan for the whole Northern Reef which Ebiil is included. Ebiil’s work is done so now we’re looking at the whole northern reef. With this, the state has a boat that will be used to patrol or monitor. There’s one boat that PCS had and the agreement was that we’ll take the boat after so that has been done however the engine is broken so we’re waiting for the parts. There are waiting for 30K for another boat.</p>
<p>Government staff 2</p>	<p>Patrolling is a part of the conservation but these days we don’t have money to patrol every day unannounced but we do go out. In the past week we’ve gone out 3 times. We now have conservation officers to go out voluntarily without pay. That is the only missing part; we are just waiting for the money to have the conservation officers start working. In August, we might get the framework and how to disperse the money.</p>

<p>Has the state government done any type of study or activity to identify ways the community benefits from the closure of Ebiil? What was conducted? What are the results? (info related to related to previous recommendation and Obj 2a)</p> <p><i>Ngar ngii a omesuub/activity el blal ruii a State el sebechel mo ocholt aikel klungiolel a Ebiil el mo ra rechad ra beluu? Ngera kekka er tial omesbuub/activity?</i></p>	
<p>Government staff 1</p>	<p>There are studied that has been done by PCS through their studies and monitoring-underwater beauty, fish abundance. Also the perceived number of visitors to a particular site in order to not stress the resources. According to PCS, PICRC, the recovery of corals are, sites for tourists are now abundant with fish. BTA made some recommendations on sites and what number of visitors should be allowed in one site. The sites have been identified and are available at the office.</p>
<p>Government staff 2</p>	<p>No. We haven’t done anything as a state government besides what has been done in the past with Northern Reef.</p>

<p>Has the state government done any awareness raising activities related to the purpose of Ebiil, in and outside the state? What are the activities? (info related to related to previous recommendation and Obj 2a) <i>Ngarnгии a osischakl/activty el blal ruul a State el kirel a moktek er tial Ebiil ra chelsel a Ngarchelong ma ikrel? Ngera ikal osischakl/activity?</i></p>	
Government staff 1	<p>We haven't invited any experts to help the people understand but through meetings, we touch some issued that we think are part of the awareness which is also part of the management plan. We let the people know why we're doing studies. These have been done since he took office in April 2009.</p>
Government staff 2	<p>We have not done any awareness but we rely on Northern Reef Office now for those things. The people are now getting tired of us doing these meeting and so they are fully aware now they're just waiting for the work to start-patrolling and enforcing. They're actually asking us when we are going to start implementing the work.</p>

<p>If none of the above happened, why not? (info related to previous recommendation and Obj 2) <i>Ngerang meng dirkak el bo er ngii?</i> Are there any thoughts about having an awareness meeting in Koror since there are quite a number of Ngarchelong locals residing in Koror?</p>	
Government staff 1	<p>Yes, we've actually done that already. We've done it twice so far in Koror and we had all the different community groups attended including fishermen. There is a big awareness here in Koror and that is why there's a big support because they understand. The only problem with the management now is that we have not received our equipments and the money that's suppose to help us fund the work needed to be done. Once that is out, we can have the rangers start working.</p>
Government staff 2	<p>Right now the system is that the TLs are the "police" of the state. The state is responsible for enforcement and patrol. There will be tickets that will be given out and laws will be made. For now the TL's penalizations are just complimenting the work but later on the TL's will take their hands off it. We want to make laws that will require permits to go fishing and registration of boats.</p>

The TLs will continue with their *bul* of the whole Ngarchelong reef. Later on *Bengal* will be a CA for clams. Today, we have some people with their clam farms in *Bengal*.

Those people who are against Ebiil are those who are selfish. And there is nothing that can be done and so we continue to ignore those. Before there were laws but no awareness and that is why a lot of people had different ideas about it such as wanting to open it for trochus harvest.

There are people who think that the people of Ngarchelong need to be informed about going inside Ebiil to do research-fish count but there is no way we can inform every single person. We need to ignore those because there is nothing we can do. The right channel is to go through the State or Governor. Maybe because they think that the Governor should not make any calls of these things. But as the representative of the government, I have the right and responsibilities to make these choices and decisions. But some people want to have that power. We understand that not all people would support or understand how these things work. We are lucky that it started with Ebiil being a member of PAN. Bengal should be replenished for wild clams and I want to see it go back and so it might be a CA later. The *bul* of clams is established for 5 years and after that we'll see how it goes. For many occasions of Palau, Ngarchelong is always responsible for providing clams but we found ourselves looking for them far and in the deep. We have signed an agreement with Blue Marline for tourism. Tourism is now open for Ebiil and the rest of Ngarchelong reef. The diving fee is \$20 per head. We have sport fishing, snorkeling, and diving. Survey of tourist spots has been done. *Skoki* (airplane) and the *diall* (shipwreck) have not been found but we now have the coordinates for those. We want to have a permit that will cover 3 to 4 days. We might have \$10 for snorkeling and \$20 for dive. But we do not have the capability to make the permits so we will probably ask someone to make them for us.

GROUP 2

<p>How would you describe the impacts of Ebiil MPA status on people who fish or harvest marine life? (Obj 2b) <i>Ka mouchais el kmo tial chesmerel a Ebiil ngerang ng mla rulii el mererkau el chad er a omenged?</i></p>	
<p>Fisherman 1</p>	<p>He now sees a whole lot of fishes at the entrance (Ebiil channel). He went with people from PCS. <i>Otord</i> (steephead parrotfish) and many other fish were seen above him. He doesn't just see it as a benefit to him but it's good because it's a place that protects clams and other fish. In the beginning some people said it was too big and he was one of them but when he actually looked at the whole reef of Ngarchelong he realized it was very small. It's not even ¼ or 1/3 of the reef of Ngarchelong. He told legislators to make laws and if there is a custom need for any resources we could open it only for that and then close another place. Only for a specific occasion. There are still people who drive across Ebiil even though it's a no entry. Fish will aggregate there and they come out. Fishes that were tagged in Ebiil were found in Ngardmau and elsewhere outside. This means they aggregate and they go out to find food. There are many fish surrounding Ebiil. You even find fish inside reef of Ollei. <i>Semum</i> (trochus) were planted there and so when it was time to harvest there was about 27 tons. <i>Ibuchel</i> (sea urching) were also planted but they move from one place to another. He doesn't want ebiil to open at all.</p>
<p>Fisherman 2</p>	<p>Fish are now decreasing. I believe that Ebiil produces a lot of fish. The study that was done with the Australian researcher proved that the fish that were tagged in Ebiil were found outside of Ebiil even at <i>Oketol, btii a rikl</i> and <i>Ngaraard</i>. So the fish do reproduce in Ebiil and they come outside the boundaries. But if fish are still decreasing, it may also be because there is a lot of fishing activities going on now more than the fish reproduction. The fish are still decreasing but I believe that Ebiil is helping with the increase of production but very small. I do not fish near Ebiil so he does not know if fish population is increasing there. I only do troll fishing but hears that there are more fish around Ebiil. <i>Meiai, ngelngal, chai, mahi, keskas</i> are the fish that I always catch with trolling. I do not notice any</p>

	<p>particular fish that's increase. I see the whole population of fish is declining. For example, before, people here would fish for <i>meyas</i>(rabbitfish) with nets every day. But these days, not a lot of people practice net fishing yet when we do get <i>meyas</i>(rabbitfish), there are a few of them. It's not like before when there were so many fishermen. So I do not understand why the fish is still declining.</p> <p>You hardly find clams these days. Now when we go out to look for clams, we hardly can fill up a cooler. He just started collecting mangrove crabs so he cannot tell if they are declining or not however land crabs are now declining. Before, this area (pointing to the left side of the port) used to have a lot of crabs every time it rains. The surface has only a low level of land and so the rain would fill up the crab holes and this causes them to come out. But today, we cannot see that much of the crabs.</p> <p>The corals for sure are dying (declining). These are the homes of fish so if these are declining, the fish are declining as well. Before this area (in front of Ollei port) had so many fish and invertebrates and today, all the corals are dead except for one area that has one or two corals. Fish and corals are working together. The biggest change to the reef is after 1990 after typhoon Mike. Before you can harvest one ton of <i>Otord</i> (steephead parrotfish) around a big coral in Ngerael. And there are many of them so you can go to one and another. After the typhoon, all the corals were destroyed. Sand is now seen at where these big and small corals were. Today, we see a few that are coming back but we see a lot of lobsters now.</p>
Fisherman 3	<p>The idea of Ebiil is working. I spear turtles, practice net fishing, spear fishing, troll fishing. <i>Chesengel</i> and <i>ngiaoch</i>(longnose parrotfish) and turtles are some of the resources that I've seen a lot in Ebiil when I pass by. <i>Tiau</i> and <i>mokas</i> (groupers) are now seen around the boundaries of Ebiil but the size has not increased.</p>
Fisherman 4	<p>Things are still the same. The amount and size of fish are still the same.</p>
Fisherman 5	

<p>Fisherman 6</p>	<p>He sees the impact. The areas near Ebiil always have fish because he thinks that the fish aggregate in Ebiil and they spread and migrate outside. Long time ago, there were not a lot of fishing boats. So when you dive in, you can see that there are a lot of resources but after 20 years you can tell that everything is declining. There are many boats and fishermen now so we can see that declining change. This is why the fishermen reported to the TL about the problem of fish decline. And this is when the TL had the <i>bul</i> and told the fishermen to be patrollers.</p>
<p>Fisherman 7</p>	<p>The areas near Ebiil have more fish, when we go further the fish becomes fewer. This means fish are coming out from Ebiil. When we go in Ebiil, there are many fishes there. Before when you jump in, <i>Otord</i>(steephead parrtofish) would flee away. It doesn't happen like that today. According to my observation, fishes are increasing in Ebiil. There is <i>maml</i>(Humphead wrasse) outside of Ebiil now. <i>Tiau</i>(grouper) is also increasing outside. When it's open season people would go to Tmechrur because that's where <i>Tiau</i>(grouper) are plentiful even at Tnger. <i>Kemedukl</i>(Bumphead parrotfish) probably escapes to Ebiil because no one fishes there. A lot of people fished in Ebiil because that was the place to be. Ebiil is just the channel. The reefs around there have names but today we now call everything Ebiil</p>
<p>Fisherwoman 1</p>	<p>These days there are no inverts because we harvest. <i>Ngims</i> still exist but <i>eremurm</i> and <i>sekesaker</i> (seacucumbers) are decreasing. If we continue to always get it will become smaller so we'll need to have to wait until they rejuvenate. And if we continue it will decrease.</p> <p>It's good to have an MPA for invertebrates. It should be permanent and will have time to go in to harvest.</p> <p><i>Keiukl</i> (West)-no <i>sekesaker</i> (seacucumbers) <i>Ngims</i> (seacucumbers) -we can have sections for MPAs in the reef</p> <p>We still have <i>ngims</i>, <i>cheremrum</i>,(seacucumbers)</p>

	<p>Few-<i>kim</i>(clam), <i>cheremrum</i>(seacucumbers)</p> <p>She fishes near the shore and sometimes she goes out. Before there were a lot of fish near Ebiil and now, there is not many fish near the Ebiil.</p>
Fisherwoman 2	
Fisherwoman 3	
Fisherwoman 4	

Please explain if you have noticed any other important changes, since the closure of Ebiil in 2000, with any type of marine life (Specify the same types you biologically monitored for comparison. Don't forget corals). Ask about quantity, size, health and any other parameters you monitor in the biological study and believe these KI could also notice/experience during their fishing and harvesting activities. (Obj. 2b)

Ng er ngii a blam ues el mlengodech er a chelsel a daob er se er a lemechesimr a Ebiil er a 2000? A merand ng mla mo uangerang? Cheled? Ngikel?

Fisherman 1	<p>There are fish surrounding Ebiil but haven't noticed them really close to the shore. Corals are now increasing. Before he never believed that corals were beautiful and resourceful. He used to never care and would break them when he fishes. There should be buoys on sections where you have a lot of corals. He then learned that the stuff that comes out of corals is when they spawn. He also used to fish in coral city and used to just kick the corals but now he is very careful now that he's educated about corals. We should only open Ebiil for specific occasions for the State. When he went in Ebiil he was surprised that <i>maml</i> (humphead wrasse) were just sleeping around and he can go close and even lobsters would come out. He used to get a whole lot of <i>maml</i> (humphead wrasse) when it wasn't even open (it must be a whole lot now that Ebiil is a conservation area) he believes that fish are coming from Ebiil.</p>
Fisherman 2	
Fisherman 3	The growth of corals there have picked up in Ebiil and

	<p>outside the boundaries. Corals have increased in the <i>melkesokl</i> outside of Ebiil towards Tnger (name of a reef area).</p> <p>Invertebrates (sea cucumber) are declining except maybe for <i>oruer</i> (clams) because they are stuck in the rocks but giant clams have declined so much.</p> <p>We still have a lot of <i>ngims</i> and <i>eremrum</i> (seacucumbers).</p> <p><i>Sekesaker</i> (seacucumbers) is less now not as before.</p> <p>Mangrove crabs are also declining in numbers</p>
Fisherman 4	<p>Corals around Ebiil has increased. <i>Ngiaoch</i> (pacific longnose parrotfish) , <i>Otord</i> (steephead parrotfish), <i>tiau</i> (grouper) have increased a bit. Reefs near Ebiil have more fish. Before Ebiil had a lot of fish and then it slowly decreased and when it closed, you hear people saying that the fish are now increasing a bit. The idea of Ebiil is working but we should find ways to decrease the size of Ebiil CA to maybe just the channel. It's too big and it takes a lot of area. <i>Semum</i> (trochus) around Ebiil are still in good numbers.</p>
Fisherman 5	
Fisherman 6	<p>In the CA we see many types of fish because no one fish for them but of course we know there are poachers. But to him, recently, when he went to dive with some tourists, he can tell the resources are increasing in Ebiil compared to the last time he was there which was before the closure. The fish are increasing near Ebiil and they are now slowly coming in towards the shore mainly on the patch reefs. They believe that conserving one area helps because it is where the fish can aggregate, grow, and spread outside the CA boundary. The corals have now recovered. There are big changes. Before, fishermen were never interested in corals; you just focus of the fish. But now, when he goes out with tourists, he now realizes the beauty and the importance of corals. He sees the corals that were damaged in the 1998 bleaching and the typhoon back in the 90's are now growing back.</p> <p><i>Otord</i>(steephead parrotfish) is now increasing in</p>

	<p>number as well as in size. Habitats of fish were greatly damaged due to the typhoon back in the 90's. In front of the Ollei port, there used to be so many big corals. After the typhoon, they were all gone. Now they are slowly recovering.</p>
Fisherman 7	<p>Corals are now increasing near Ebiil. Before they used to be able to spot trochus from the boat and now it's not possible because the reef is now covered with corals. You would have to dive in to find trochus.</p> <p>There are a few clams now. Inverts are found in seagrass beds near shore not anywhere near Ebiil.</p> <p>There are those big inverts such as <i>mermarch</i>, <i>bakelungal</i> (seacucumbers) that are found near Ebiil but they've always been there because they are not targeted.</p>
Fisherwoman 1	<p>Before 2000, there were fish but after that, there is not many fish. It does mean we conserve so there are fish. Before there were <i>kemeduk</i> (bumbhead parrot fish) at <i>uet</i> (big tidal pools) but now we don't have. She doesn't know why there is no fish. Ebiil does not seem to affect resources but sees it as site for tourists to visit. She does not see benefits towards her as a fisherwoman.</p> <p>Everything is decreasing. We probably can find resources in ebiil but outside she doesn't really see much.</p> <p>It's the weather; the heat probably affects the decrease of resources.</p> <p>Corals – new corals are now seen.</p> <p>There are a few clams near ebiil.</p> <p>All resources are depleting because of the heat. She doesn't know what we can do to help increase the number of resources.</p>
Fisherwoman 2	
Fisherwoman 3	
Fisherwoman 4	

What are some of the fishing methods that are practiced now?

Ngera bebil ra teletael er a chei el dirk louruul er ngii a rechad ra beluu?

This was asked instead of the original question which was: Since the closure, is there any changes in the way the community fishes or harvest marine life? If yes, what is it? (Obj 2b). This is because key informants related most of their changes to way before the closure of Ebiil.

Fisherman 1

Women do not do line fishing. Only when there is a fishing derby then that's when you find men and women doing line fishing. The women who do line fishing are the ones who are married to fishermen.

Many troll fish for sama- Kerngab, ngelengal, chai, mahi.

***Omalech* (spear fishing) -*elsel a teuachel* (in the deep). Boats would be roaming while the fishermen spears the fish and comes up to the boat because there are so many sharks now and it's not safe anymore. The feeding shark activity has now triggered sharks to act differently so it's not safe to hold on to a fish in the water for that long because the shark will come for it. Before you can hold on to the fish and if a sharks comes towards the fish you sort of just brush it away and it leaves. Tiger sharks are now coming up close to the shore so we have to try and kill them even though there is a law against killing sharks, he rather does it then get hurt.**

***Burch-* for turtles. We do not have those activities like before when you go out and spear fish. Before we used to that when we were kids and spear fish on the reef. Kids these days do not even do that. Only when you *mengesokes* (type of net fishing) at night. No one walks and spears these days. It's not the number of fish that changes the way people spear but it's the types of activities that we're into now. They are now interested in watching tevelvisions.**

I was never interested in line fishing because it was boring.

***Dirrek el ngarngii a melebed, melebed a kelat*(mullet). *Melebed a chum*(blue-spined unicornfish) *ma ngiaoch*(pacific longnose parrotfish) *ra ikrel*.**

***Bidekiil a dirrek el ngar ngii. Kelsebuul*(golden-lined**

	<p>spinefoot) <i>ma meyas</i>(Dusky rabbitfish), <i>terekrik</i>.</p> <p><i>Bub- diak a omub</i>. No one knows how to make them now. They make them out of leaves. But now they use “<i>chami</i>”. <i>Diak a mengaus a besebes</i>. <i>Chami</i> is not good because if a <i>mesekuuk</i> (yellowfin sturgeonfish) stays in they do not become <i>melaok</i> like <i>besebes</i>. In a <i>besebes</i> they eat the <i>yumd</i> with the <i>besebes</i>. <i>Diak a ungil kelel ra chami</i></p> <p><i>Cheremrum ma ngims</i> (seacucumbers)-Women usually do it. Men hardly do it. We now put the inverts in a basket and connect foams to it so it floats. This way, they can get rid of the stomach contents while they sit in the water. This makes it easier because they do not need to wait for the low tide in the early morning (no stomach content yet) and they can get as many as they want anytime of the day. This is useful for the market. (this is a concern of overharvesting).</p> <p>There are no harvesting clams except for December.</p> <p><i>Ngims</i> (seacucumbers) duplicates because if you cut it in half they regenerate. <i>Makit</i> is on the weekends so people would prepare during the week.</p> <p>We now have <i>eremrum</i> (seacucumbers) now which is a good number</p> <p><i>Sekesakr</i> (seacucumber) are not found in <i>keiukl</i> (West side) just the (East side).</p> <p>But there are still <i>chemang</i>(mangrove crab). Even at the mangroves near the port. He gets his <i>chemang</i>(mangrove crab) there.</p>
<p>Fisherman 2</p>	<p>Fishing with the line has now taken over. Before when we used to have this “co-up” (fish storage) we used to compete with <i>Peleliu</i> and these were mainly fish from spear guns and there were a few that would fish with a line. After typhoon <i>mike</i>, we started practicing fishing with lines. Maybe we’re lazy now and we’re looking for the easy way but here (<i>Ollei</i>), we do line fishing. At the other side, they are still fishing with spear guns. Women at the other side (<i>Ngarchelong</i>) usually do line fishing</p>

but the women at Ollei hardly fish with lines but those who do are the ones who are married to fishermen.

Troll fishing is still practiced.

Not a lot of people at Ollei use spear guns to fish.

Traditional spear fishing are for those who *mengesokes* and those who go out for turtles. There are only a few times where I would go out with a spot light to spear fish. Long ago, you would see men and women, young and old spear fishing. It was the number one activity in Ollei. But so far today, I only see a few who would go out to spear fish. I don't see a lot who spear. Before a lot of people would just come out here with their lights to spear. Today, if you step down here, you wouldn't be able to see any fish (no fish). Even back then, you can do this during the day time because you would sink in and who knows maybe it's because of Baudista's light that you do not see any fish near by. These two sides of Ollei port used to have so many *Meyas* (dusky rabbitfish). Even at *bkul a rsaol* and those areas where it's deep, you need a good weather to go in to spear. But today's weather is always *ongos* (wind-east), you can not see anything because of the wind. And I believe that if there are fish but maybe these (changes such as wind directions) are some of the reasons that there are less fish.

Net fishing is still practiced but only done by a few people. Comparing before and today, there are not of fish caught now. *Kelsbeuul*(golden-lined spinefoot) and *meyas* (dusky rabbitfish) can be caught near the mangroves if the tide is good but not is not quiet done like before.

Bidekill is still the same method as net fishing however the technique is different in that you do not press on it.

Trap fishing is not very much practiced anymore. But trap fishing stopped a long time ago. Trap fishing is so difficult and technical and different ways to fix in and to deploy it. It needs a experienced person to use it.

Collecting inverts are usually done by women. Men sometimes help. We now have *ikes* (floating baskets)

	<p>that are used. When the tide is high, you dive to collect the inverts. Before you would have to wait for the low tide to get the inverts. With these baskets, the men can collect them faster and bring them to the near shore to have them discharge their stomach contents. With these baskets, you can collect a whole lot compared to before when you have to rely on the low tide which will take you a longer time to collect and glean before the tide comes back in.</p> <p>Clams are very few now. Before, collecting clams used to be done by only one person. These days, you would have a team to seek clams and you wont even be able to fill up a cooler. With only a few clams left now, there is a ban of collection until December unless you have a clam farm.</p>
<p>Fisherman 3</p>	<p>Troll fishing-<i>chai</i>, <i>orwidel</i> (bluefin trevally) but not as before when you can actually spear them (traditional way). You only spear when you do net fishing but chasing after the fish is no longer practiced. Before they would just spear near shore because there were many fish. Today we can not do that.</p> <p>There are many people who fish with lines and is very common now. Women would join their husbands to fish with lines.</p> <p>Troll fishing is still very popular</p> <p>Not a lot of people fish with spear guns.</p> <p><i>Omengesokes</i> (<i>Kelsebuul</i> (golden-lined spinefoot) is decreasing in numbers and in size.</p> <p>Not a lot of people fish with spear guns because there are less fish.</p> <p><i>Omub</i> (trap fishing) is not practiced anymore because it's a bit complicated with the process.</p> <p>Collecting inverts.</p> <p><i>Sekesaker</i> (seacucumbers) is are still harvested but not as before where they used to be big. <i>Ngims</i> and <i>cheremrum</i> (seacucumbers) are now collected with <i>ikes</i> (floating baskets). So there is no such thing as going out early in the morning or at night. With these <i>ikes</i></p>

	<p>(floating basket), they can collect anytime. There are no negative effects to this method. If you cut <i>ngims</i> (seacucumber) in half, you'll have two and will grow back.</p>
<p>Fisherman 4</p>	<p>Fishing with lines is very popular these days but spear gun fishing is declining. This started after Ebiil was established. There are times when both men and women fish but usually its men.</p> <p>Troll fishing is still practiced.</p> <p>People still use spears to catch turtles but not usually for fish. You would only see it when one is fishing with nets. Net fishing is still practiced however trap fishing is something I'm not too sure about. Collecting inverts are usually done by women because they depend on it for market.</p>
<p>Fisherman 5</p>	
<p>Fisherman 6</p>	<p>A lot of people practice line fishing more than fishing with a spear gun. Women and men do line fishing. Women usually go out to fish with lines with their husbands or a guy that can drive a boat for them. There is still fishing with spear guns but not so much anymore; maybe because they rather stay dry. This practice did not decline not so long ago. This is why we know how to fish with a line. It started with fishing with a spear gun because this is when you see the reef and which directions the fish are going and where their eating. So now when you fish with a line, you know where to go.</p> <p>Traditional spear fishing is still practiced but only in the near shores. But not a lot of people used the traditional spear fishing because it's better than using a spear gun. You have a better chance of getting a fish with a spear gun than a traditional spear. Before, during my time, we would all go out and spread on the reef to fish with the traditional spear which worked well. You hardly fine people who chase after fish, they usually go when it's low tide and spear fish under corals or other areas where fish can get stuck at. They rather use gill nets so they can catch many at one throw.</p>

	<p><i>Melebed</i> is also still practiced as well as <i>omuked</i>. The people are already telling us that the fish are declining due to gill net fishing and fishing at night with a flash light. With gill net, they can capture up to 300 pounds of <i>kelsebuul</i> and sometimes they're pregnant at one time and fishing with a flash light at night causes overfishing. These are what the people have told us (the state) and so we have drafted in the management plan regarding banning of gill net fishing and fishing at night with a flash light (for maybe 3 years). We will present this to the people because this is what they said but we'll see if they'll agree to make it a law. Commercial fishing also causes the decline of fishing. The solution is to ban these fishing methods and these are from the people.</p> <p>There are only a few people who practice trap fishing because they do not know how to and they're not interested in it.</p> <p>Harvesting inverts are usually done by females. Inverts are now decreasing because of environmental habitat. For example, when they were building the Ollei port, they had to dredge it and that changed the way the current was flowing which affected the seagrass habitat for the invertebrates. The habitant area that has been damaged equals the number of invertebrates that are gone. There is not a need to <i>omul a ngims</i> (conserve this specific type of seacucumber)but if people think it should be done for other inverts then it should be done. Because <i>ngims</i>(seacucumber) will never die out. The problem is with the environmental habitat. Even if you ban harvesting invertebrates when the habitat is damaged, there is no point. Over harvesting is not the problem, it's the habitat. Before harvesters will wait for the "<i>bor</i>" (low tide in the early morning-inverts have no stomach contents yet) to harvest but now we can harvest anytime with the basket. These baskets full of inverts will be tied onto something for a couple of hours in the water while they release their stomach contents.</p>
<p>Fisherman 7</p>	<p>The types of fishing are still the same, the techniques are different in terms of what to use on your troll fishing-for example, we do not use "<i>orumk</i>" which is when you line is filled with so many weights. The fishing with hooks still remains the same.</p>

	<p><i>Omalech</i> still exists but the way it's made changes but the fishing gun is still the same.</p> <p>Spear fishing-before people go on traditional boats and spear <i>kemedukl</i> (bumbhead parrotfish) and other fishes but now, people do not exercise that. This type of fishing stopped long ago before Ebiil became an MPA. he thinks that maybe because of the law that banned harvesting <i>kemedukl</i> (bumbhead parrotfish)l might have something to do with why people do not spear fish.</p> <p><i>Yebed/mengesokes</i>- a lot of people still practice this. The mesh changes size. The fish is still decreasing and he thinks that climate change has something to do with it.</p> <p><i>Omub</i>- only 2 people practice this. And <i>meseukuuk</i> (yellowfin sturgeon fish-target for trap fishing) is decreasing now. Before when the wind is <i>ongos</i> (for 6 months), everyone would set up their traps because they know that <i>meseukuuk</i>(yellowfin sturgeon fish /<i>chum</i> (blue spine unicornfish) will be passing by. This was seasonal-the type of weather back then. We don't find these type of practice maybe because of the weather. It used to be 6 months el <i>ongos</i> and then 6 months el <i>ngebard</i>.</p> <p><i>Ngims</i>(<i>seacucumbers</i>) , before they would cut it half and take the intestine but today, people just cut it open for the intestine and then leave it so it remains big. However, when you keep cutting it, it multiplies but you'll have many smalls ones.</p> <p><i>Cheremrum</i>(<i>seacucumber</i>) is decreasing because they take the whole thing.</p> <p>We still find a lot of <i>mermarch</i> (<i>seacucumbers</i>) because we don't eat them.</p> <p><i>Sekesaker</i> (<i>seacucumbers</i>)is decreasing because you take the whole thing.</p> <p>Women fish for inverts but they hardly practice line fishing. those who do are usually married to fishermem.</p> <p><i>Tuich</i>-no one hardly practice this but those who come from Koror or elsewhere practice this method.</p>
Fisherwoman 1	<p>I- Women usually fish. There are some who fish outside and some fish inside.</p> <p>People usually sell at <i>makit</i> (market) in ngarchelong not outside.</p> <p><i>Omurch</i> (traditional spear fishing)-harldy</p>

	<p><i>Omuub</i>(traditional trap fishing)-not so much</p> <p><i>Keiukl</i> (West side) -<i>oru</i>er(clam)</p> <p><i>Ngduul</i> (mangrove clams)- getting smaller not necessary few</p> <p>Size estimation might be another option but not for <i>ngduul</i>(mangrove clam)-. Should have open and close season for inverts by months.</p> <p><i>Ibuchel</i> (sea urchin)-found in <i>uet ra kloul debes</i> (tidal pool), near Choll village. There are a few now.</p> <p><i>Bakelungal</i> (seacucumber)- plentiful in the outer reef, because nobody is collecting</p> <p><i>Semum</i> (trochus)-by season.</p> <p><i>Rekung</i> (land crab)-is decreasing. no <i>bul</i> (traditional restriction) for land crab</p> <p>The community will probably agree to season or to designate an MPA if these resources are depleting and they see it.</p>
Fisherwoman 2	
Fisherwoman 3	
Fisherwoman 4	

Since the closure, is there any change in the way outsiders come to fish in Ebiil. Please explain. (Obj 2c)

Se er a lemechesimr a Ebiil nga er ngii a mla mengodech er a teletelir, a rechad er a ngodech el beluu el me nga er a chei er a Ebiil?

Fisherman 1

There are still outsiders going in. They get a lot of gas so that is why they can escape and come back. But for us. We only have enough to go to ebiil and come back. When they caught that one guy (back in 2009), people are now a bit scared. Now the koror governor wrote to ngarchelong and aimeliik stating that their people who live in koror will not get any benefits. But this is a *bul* of the traditional leaders. Ibedul and Reklai should talk to us. This is our traditional custom. If people come and ask to go fishing they can ask the traditional leaders and they can allow it because this is the culture. You do not bring outsiders (governors) to come and revoke the traditional way. The governor has no power against the traditional leaders. We work with the governor because he can provide the enforcement. They can provide gas for those who caught a poacher. Poachers will never stop. It's usually when the weather is bad and that is when they go in ebiil. It will never end.

Fisherman 2

I hardly see anyone go inside Ebiil but I do hear about it from people but I do not believe them. It is easy to mistake someone for being inside Ebiil. If I do not see with my own eyes then I will believe it. The management of Ebiil will only become better if you have a strong enforcement of the law. Before a lot of people went in because there was not any enforcement. But today, when poachers are found, they will be kicked out of Ebiil. Today it seems like we're going back to the beginning. When this first started, a lot of us supported it but there were those who do not understand it so they did not support it. So there were people who supported it and there were those who didn't. Today, they all understand but there are those who are angry because they were caught and were punished yet they themselves still see poachers and they are not being punished like how they were. Another thing is that they demand enforcement. And for those who still hold that anger still go in Ebiil. And they complain that we jail ourselves and we let others go in. The solution is to have people enforce. Buoys need to be redeployed. For those who know, know that there should be a buoy there so they do not go in but for those who do not

	<p>know, we'll just pass through without knowing. And you cannot argue with someone who does not know. And a lot of people do not know of these buoys because they do not travel around that area as much as fishermen. They know about Ebiil but they do not know the boundaries.</p> <p>For marketing resources, you have those who can produce fish and farming products. However, for those who are not married would usually just sell farm products.</p>
Fisherman 3	<p>Before people would go in Ebiil but now they are more scared because they have seen boats taken away by the people that have entered before.</p> <p>There were some people who were against Ebiil before but now they have a common understanding about it as us. They have changed their minds. The research that was done by the Australian guy showed that the fish that were tagged in Ebiil were found outside of the boundaries.</p> <p>Ebiil helps fishermen and will be a source of income. Summer camps in Ngarchelong also visit Ebiil for educational purposes. I just wish that the work for Northern Reef can be done already by having some CAs alternately close and open for trochus. They should consider Ebiil to open for throchus only when it's seasons because after 5 years, they will die. When it's open for a week, checking each boat for any fishing equipments should be done. So at the end, we sometimes have to sort of steal by going inside Ebiil or moving the buoys so that we can collect trochus.</p> <p>His fishing techniques depend on the season for a particular fish.</p>
Fisherman 4	<p>I believe that there are still outsiders going inside Ebiil. This illegal entry is increasing because of lack of enforcement.</p>
Fisherman 5	
Fisherman 6	Nobody goes inside Ebiil now because we spot boats

	<p>from Todai and we phone to any organizations to ask if they made any trips to Ebiil. If not, we will go out to see.</p> <p>What do you think about the people who believe that the resources in Ebiil are not distributed equally? People thought this way because there was no enforcement of the laws. Now, they know there are enforcement being practiced so they do not want to take any risks. There are some who do not support Ebiil. They are not from Ngarchelong. For market, we usually sell fish and farm products. But sometimes I get busy so we wont sell any fish. Some people only sell some particular products. Some may just sell farm products or fruits and there are some who sell both. There are a few people who sell their products outside of Ngarchelong because they want to sell them everyday and in Ngarchelong the market is only open 3 times a week.</p>
<p>Fisherman 7</p>	<p>There are still people entering Ebiil but there's a few of them now. Usually it's those who are married to people from Ngarchelong or have children from Ngarchelong but it the <i>bul</i> in Ngarchelong clearly states that only people of Ngarchelong are allowed to fish in Ngarchelong. Peple who go to Ebiil are from Ngarchelong and outsiders. And they usually go at night when the weather is bad. It only takes a few hours to fish because it's a conservation area (a lot more fish, less time needed). The report (Yim-at Ollei Abai) states that there are fish but they are wild. Comparing to Ngerumkaol the fish there are not wild. This means that there are people who fish inside of Ebiil. In the beginning, the enforcement was not strong and that is why there were a lot of poachers. Now, we are picking up and we do not see much anymore. Poaching is now decreasing.</p>
<p>Fisherwoman 1</p>	<p>She doesn't know much about people going inside Ebiil</p>
<p>Fisherwoman 2</p>	
<p>Fisherwoman 3</p>	

Fisherwoman 4	

	Other useful information
Fisherwoman 3	<p>She collects <i>ngduul</i> (mangrove clams) and <i>irimid</i>(seacucumber). <i>Irimd</i>(seacucumber) are still high in numbers and for <i>ngduul</i> (mangrove clams), some areas have bigger and for some there are smaller. <i>Sekesaker</i>(seacucumber) are found in the same areas as jellyfish but you can still find them. <i>Eremrum</i>(seacucumber) are still high in numbers as well as <i>ngims</i>(seacucumber). <i>Ibuchel</i>(sea urchin) are collected by seasons. Clams are now in <i>bul</i> because there are so few now. <i>Ngduul</i> (mangrove clams) can decrease if the market continues. In the market of Mengelang, there are mostly farm products. Whatever a person has, is brought to the market. No one goes to <i>bor</i> now because they are lazy to walk. People use <i>ikes</i> now. <i>Ngims</i>(seacucumber) can continue to increase but will probably be empty all the time. The problem with <i>ngims</i>(seacucumber) is not the number but they are always empty because the intestines have been taken out by a previous harvester. Inverts can still be found except for clams.</p>
Fisherowman 2	<p>Do you think one day inverts will vanish? <i>Omomdasuo ea ikal eled ng modiak ra tara klebesei?</i></p> <p>Inverts will not vanish but getting smaller</p> <p>Do you think we should make farm or some sort of <i>bul</i> in the future for inverts? <i>Omomdasuo eng kired el meruul a sers malechub ekede omul aikal eled el kirel a ngar medad el taem?</i></p> <p>There are still a lot of available inverts, there is no need to farm or have <i>bul</i> for them in the future.</p> <p>Do you sell market here or at Koror? <i>Kau ke olterau a makitengem ertiang malechub eke mora Oreor?</i></p> <p>I sell my products here and everyone who sells at market usually sell both <i>odoim</i> and <i>ongraol</i>.</p> <p>Do you believe that there are still illegal entry in Ebiil? <i>Kou merang el kmo ngdirk ngarngii a rechad el mo soiseb ra Ebiil?</i></p> <p>There are still illegal entry in Ebiil and is mostly done at night.</p> <p>Are there women who use lines to fish? <i>Te ngarngii a redil lousbech a kereel el mengereel?</i></p> <p>Not most women fish with lines but those who go, usually are</p>

	<p>accompanied by their husbands. Spear gun fishing, line fishing, spear fishing (with nets), net fishing, are still practiced except for trap fishing.</p>
<p>Fisherwoman 4</p>	<p>Ebiil has no affect to her collection of inverts. She fishes with her husband when he goes out to fish and there are not that much fish. There is no need to <i>omul</i> inverts because it depends on the ocean. Inverts are not a problem in terms of collections. She does not know any women who fish but there are still people who spear fish, use spear guns, nets, and not so much with the trap fishing. <i>Ngims</i>(seacucumber) and <i>eremrum</i>(seacucumber) are good for those people who sell at markets. She thinks that there are still people who go in Ebiil to poach but she doesn't know if it's becoming less. As for the management of Ebiil she doesn't know if it's getting better or not but she hasn't seen much of anything. She knows of only one person who sells products outside of Ngarchelong, in Ngaraard. The number of invertebrates will remain the same for a long period of time however fish will become less. She can tell because before it doesn't take long to fish but now it's different (takes so much time). At the market, she sells both fish and farm products. Most households sell both <i>odoim</i> and farm products.</p>

<p>Fisherman 5</p>	<p>The most common harvested inverts are <i>ngduul (mangrove clam)</i>, <i>oruer(clam)</i>, <i>ngims(seacucumber)</i>, <i>eremrum(seacucumber)</i>. These are still high in numbers. I fish with lines but there are not so much fish now. The places that are nearby where we think we can fish for fish such as <i>chudech(orange-striped emperor)</i> have no fish at now. We have to drive out to go fish. Before there were <i>chudech (orange-striped emperor)</i>near shore so you can just stay put and fish but now there are not so many. Fish near the borders of Ebiil might be plentiful but nearby are not. I've been in Ebiil before and there are a lot there but I only fish nearshore so I wouldn't know how it's effecting the reefs near Ebiil. I used baskets to collect <i>ngims(seacucumbers)</i> and <i>cheremrum(seacucumbers)</i> and no one goes to bor. We all use this new technique.</p> <p>I only hear from older <i>rubak</i> that there are people going inside of Ebiil but they are not from here (Ngarchelong) because no one here would go to Ebiil and want to fish there because it's a good CA for the people.</p> <p>I usually sell both ocean and farm products.</p> <p>In the future, inverts will not perish but will get smaller in size. For <i>ngduul(mangrove clam)</i> there are particular places where you have big ones and there are other places where they are small in size.</p> <p>On Saturday she goes out to collect inverts and sells them on Wednesdays. That one day of harvest is enough for the whole week. In one week, she can make about 20 zip locks of <i>ngims(seacucumbers)</i>, 30 for <i>cheremrum, irimd(seacucumbers)</i> is about 20. I do not collect <i>sekesaker (seacucumbers)</i>but I hear that it's declining in numbers.</p>
<p>Fisherman 3</p>	<p>He sells his catch raw.</p> <p>There are some households who sell both fish and farm products and some just sell either one.</p>
<p>Fisherman 4</p>	<p>*I only sell my catch when he has a lot but usually doesn't.</p> <p>*For market, people usually sell both <i>ongraol (starch)</i> and <i>odoim (protein)</i>.</p>

GROUP 3

<p>What kinds of economic, social and cultural benefit do you think the Ebiil MPA has on the Ngarchelong communities? (Obj 2b) distribution of sources, relation of different people in the community-bring people together or conflicts (interactions), believes-attitudes that guide who you are</p> <p>Ngera ikel kora klungiolel a Ebiil el mues el klungiael el mo er a rechad er a Ngarchelong?</p>	
<p>Traditional leader 1</p>	<p>The people of Ngarchelong do not benefit from Ebiil being an MPA. The only people who know of benefits and probably benefit from Ebiil themselves are the people who work for the government as well as those who study in Ebiil. I don't understand why the <i>bul</i> is on the whole reef of Ngarchelong to be used by only the people of Ngarchelong. The study that has been done is enough. We could have told them what was in there and what kind of fish can be found elsewhere. The reason why everybody else knows of Ebiil is because of this continuous study of Ebiil. The study needs to be stopped.</p>
<p>Traditional leader 2</p>	<p>There are benefits of Ebiil if there will be patrolling. We need people to watch. These benefits are equally shared to the people. They would reproduce in Ebiil and then come out.</p>
<p>Traditional leader 3</p>	<p>People in Ngarchelong are affected by Ebiil. The rules and regulations are not being followed. We cannot control it now. We established a <i>bul</i> for it for the future but we now cannot control the people because of gas price. The way people are is very different. The lifestyle cannot be afforded. People who go in are not from Ngarchelong. Poachers are still going in. some people go to the port (Ollei) and discuss about going it just to get some catch and come back. And we're here sleeping around because there is no security</p>
<p>Traditional leader 4</p>	<p>When the talk about having Ebiil becoming an MPA first started with the traditional leaders, a lot of fishermen disagreed with this idea even though they knew that Ebiil holds a lot of fish. This is because they knew what Ebiil can provide to them especially for those who targeted bump head parrot fish. The traditional leaders thought that they need to think of the benefit of the people of Ngarchelong instead of just a few who are benefiting from Ebiil's resources whom are the fishermen who target bump head parrot fish. So in the beginning, there were a lot of conflicts and today, there is not much of that because people are more educated and aware that Ebiil provides for everybody</p>

	<p>in Ngarchelong which then mean that the distribution of the resources are even. But now they support it. People go around Ebiil to fish because there are more fish that come out from Ebiil. People are now independed and they report themesleves. Before they would just say “erei eng kuk ngara chei” (never mind he’s just fishing). Now they call to report people who enter. Now the benefits are equally shared.</p>
<p>Traditional leader 5</p>	<p>Yes Ebiil benefits the people. Even when we are now looking at the whole Northern Reef as a possible site for tourism. This means that boats will be needed and the locals can provide such resources to tourism. When this topic was being discussed, he mentioned that for sport fishing, when a fish swallows the bait, they should take in the fish instead of putting it back in the water because it’s just going to die. The boat driver should be the one to check and make that call. The leaders see that the economic value-tourists can dive or cast and release. Catch and release activities should be in an area where there’s a lot of fish so that the tourist can later advertise to others. There will now be a dive shop at Oketol and will be renting that area for \$1,200 per month. And for the tourists, they will be charged \$20 per head (for State revenue?). The resources in the water such as fishes and lobsters will benefit Ngarchelong (for tourism attraction). This does not only benefit one person but everyone who lives in Ngarchelong and for the State.</p>

When we did a similar survey 5 years ago, people were concerned that Ebiil did not benefit different groups equally (fairly) and there were conflict among different groups of people who used resources. Did you share that opinion? If yes, could you elaborate on the issues in the past and tell us how the situation is today? Is there any change? In what way? Are there any particular groups that receive more benefits than others? Why do you think that happens? What do you think should be done to make it more equitable? (Obj 2)

Sera ki moruul er a omesuub er 2005, a rechad er a beluu a mle bekikl el mo a Ebiil a diak el tabesul a klungiolel el mo er a rechad el rokui. Kau ng uaisei a uldesuem el dirrek?

<p>Traditional leader 1</p>	<p>Those who enter Ebiil are those who know the benefits however I like the idea that students go in as well. Ebiil should be a tourist attraction and these studies should stop. Once tourism starts, that's when people of Ngarchelong will reap the benefits of Ebiil.</p>
<p>Traditional leader 2</p>	<p>There are people who enter and will always enter until there are people who patrol because there are no funds. People who study in Ebiil are those who are looking for the benefits. Those people think that way because maybe they are not aware of how this study (management of Ebiil) is. There should really be people on the watch. The management was bad then and is still bad now unless enforcement is practiced. There are looking for a director now and there are conservation officers who are now in training</p>
<p>Traditional leader 3</p>	<p>The reason for <i>bul</i> is to reserve it. No one is allowed to go in and we (TL) do not know how you guys (PICRC) are able to go in. Was it through the governor? The Governor does not own Ebiil and does not have the right to give you the authority to go in because it doesn't belong to him. He's supposed to run budget and follow rules and regulations not to give permissions. Do you think the Governor should be responsible for this? What about the TL? What are our responsibilities? The governor should do what is being told by the TLs. He should be asking permission from us not dictating. The reason behind giving Ebiil to the State is because with my understanding, the money that comes to Ngarchelong has to have some process to it. The Governor was elected to tell us that the money is in and what works needs to be done so the money can be dispensed. Doesn't know how the State got involved in 2000.</p> <p>The State shouldn't be involved because it is not a State property. The reason why they're involved is because they hold the money for the State of Ngarchelong. That budget goes to them and that is why we (TLs) asked them to patrol/enforce because we (TLs) have no money to do so. And he has the money but it does not belong to him (them). We should always be with the state. We now have learned that you guys are using it to get grants and it's not getting anything from us. Many times others would try to introduce tourism. I do not know where the money you (PICRC) get for Ebiil goes to. The TLs would probably ask you guys were and</p>

	<p>what you use the money for. At least give us our share. Now you guys are saying you own what and this is the reason nothing is improved. The money that comes in is taken by you guys and is stuck in Marine Resource (office) and we need to get permission from the Governor to access them, this is why nothing can be done.</p> <p>I don't know why you guys use those meshes for clam farms. We can use bamboos to make them and can be used for 6 months.</p>
<p>Traditional leader 4</p>	<p>In the beginning there were conflicts between different users because a lot of people were confused and didn't know where to go for permission to get inside. Today, we all know we have to go to the Governor and the State to ask permission to go inside Ebiil. It's more organized now.</p> <p>There are still people who are not afraid to enter and some people feel bad about it because they see it as we let them go in but now they report.</p> <p>A lot of people were confused as I said in the beginning. Now there is a list of people who can enter.</p> <p>Laws have been made and we are more organized now.</p>
<p>Traditional leader 5</p>	<p>It is not a problem to have all these types of groups (education and research) to enter Ebiil. He supports these kinds of activities. These are learning activities and when they (children) are asked about it they would tell how it was. The fact that they are telling what they say is the value of this (Ebiil). That is why it's good to have people go in because they will see the importance of it. Some people say the resources are not equally shared but no one is stopping them to ask permission to go in (educational purpose). This kind of thinking is jealous because those who went in did not take anything. They went to see it and they are the people who advertise it (Ebiil). He should not be mad if he shows me how he's doing something because he knows you will go to someone and tell how good he is in something-advertising, which benefits me. Those who study take in good lessons and in return Ebiil is advertised to others by the people who study it. We know that jealousy will never go away and it goes the same to poachers. There are people who say negative things because he/she wants the benefits for</p>

	<p>himself/herself. Let people go in to see so that they can spread the word about Ebiil so that it will have more visitors. You don't have to see it as something that "I" will benefit from, the state will benefit from it which I am included in.</p> <p>There is no way we can change the minds of those who think differently about Ebiil – those who think that the benefits are not equal. The best way is to just leave them alone. 80% support Ebiil, less than 20% are those who do not support and the rest are those who claim that they do not know, they don't know if they know or do not know. We should let those people the way they are because they will never change.</p>
--	---

<p>What do you think about the effectiveness of Ebiil MPA management since the closure in 2000? The old survey also found out that people said the Ebiil management was poor back then. Did you agree with that then? How is the management today? What are some of the important changes you have seen? What causes these changes? (Obj 2)</p> <p><i>Ngera ulesuem el kirel a orretel a Ebiil er sera lemechesimr a 2000 el me er elechang ? Sel survey er a 2005, a mlo ochotii el kmo a rechad a omesu el kmo ng mechitechut a orretel a Ebiil? Kau kulumdsu el waisei el direkl? Ng mla mo wangerang ngii'l orretel a Ebiil? Ngera kora changes el blam ues?</i></p>	
<p>Traditional leader 1</p>	<p>I do not agree with the <i>bul</i> for the whole reef of Ngarchelong. The State should always work with the TLs but the studies should stop.</p>
<p>Traditional leader 2</p>	<p>The management is still the same as before because we still do not have enforcement. We are now just waiting for the conservation officers to take up their jobs.</p>
<p>Traditional leader 3</p>	<p>You people (PICRC and other organizations) who violate the laws should be the ones to tell us how many times has this been done and then we can look at what still needs to be done. If you guys dive there and are here asking people who don't go in there, what road should we take to get the answers? Enforcement is worst than when the TLs first established the <i>bul</i> because there is no money. The <i>bul</i> is more just to scare people.</p>

<p>Traditional leader 4</p>	<p>Laws have been made but now we just need the enforcement which we are waiting for PAN to distribute the money. The management was bad then because people were just asking for permission from anybody to go in. The management is much better now. We only need enforcement now. We only use fishermen to report. Today, <i>a rubak a omul</i> (traditional leaders make <i>bul</i>) even though it is a legislated MPA. They give out penalty. But in the future, the State will take over.</p>
<p>Traditional leader 5</p>	<p>At that time, the management was not good in terms of enforcement. They cannot enforce the laws. Because first of all, there is no money that can pay anyone to patrol and enforce the laws. Rangers in Koror have the money to pay people to patrol. Here in Ngarchelong, even if we have the rangers, they have other responsibilities at home (they hear dogs barking from their homes and they come back to land instead of patrolling). Today, the management is improving. We knew there should be rangers but the problem was the lack of funding. Now we have the state boat and new machines coming, so it is getting better. So we can alternate rangers. We now have those officers that are now in training and we're waiting for money from PAN.</p>

<p>Some people in your community do not want to support MPA. Would you be able to explain the reason? (Obj 2c) <i>Bebil er a rechad a diak el sorir lodubech er tial chesmerel a Ebiil.</i> <i>Omomdsau eng sebechem el smodii sei?</i></p>	
<p>Traditional leader 1</p>	<p>These people have other wants and agendas.</p>
<p>Traditional leader 2</p>	<p>Those people who do not support Ebiil probably do not know the benefits of Ebiil. They do not think of the future. Today fish are declining so we should think about these things. It was not like before where we had so much fish.</p>
<p>Traditional leader 3</p>	<p>People who do not support the <i>bul</i> are not from Ngarchelong.</p>
	<p>He knows of two or three people who are against it and</p>

Traditional leader 4	they are fishermen. They know what they can benefit from Ebiil and that is why they're against it. <i>Tirkel melai</i> (those who hunts these fish) <i>a kemedukl</i> (bumphead parrotfish), <i>maml</i> (humphead wrasse), <i>tiau</i> (grouper) know a <i>blil aikal ngike</i> (habitat for these fish). Those who are against are those fishermen who know the area.
Traditional leader 5	Those who do not support Ebiil are those who want to have all the benefits. They only see the benefits for themselves and not for everyone in Ngarchelong. We cannot change their minds so we should just let them be. Those are the people who think of themselves only and they only say "I" "I". They do not use the word "us". They do not think of what can be done for our Sate. If you only think of yourself, who's going to want to help you when you are in need.

<p>Are there any ways besides MPA that you think would work well or better to conserve the natural resources of Ngarchelong and support the well-being of the communities? (info related to Obj 2)</p> <p><i>Nga er ngii a ngodech el teletael el sebeched el mo okiu ngii el diak el tial MPA el sebeched el losbech er ngii el mengeriomel er a debel a Ngarchelong e mo ungil er a rechad er a beluu?</i></p>	
Traditional leader 1	My vision is to fine a higher price for those who violate the law. The " <i>bul</i> " is a good thing that should be alongside with the work being done with "MPAs" or conservation ideas.
Traditional leader 2	There is no other way to conserve other than MPAs and <i>bul</i> . That is why it's not a mixture of American and tradition. That is why we make laws based on American way and have the <i>bul</i> to implement it. These two work together. Ebiil is under the State but the <i>bul</i> makes it easier and faster for the work to proceed (in terms of punishment). With the American way, we still need to go to the court. If anyone goes in Ebiil today, we (TL) will do the punishment/penalty. The penalty has risen from \$100 to \$500. When the conservation officers start working they will implant this by giving out tickets and we (TL) will step down.

<p>Traditional leader 3</p>	<p>The State needs to release the money for enforcement/patrol for Ebiil that belongs to the TL's of Ngarchelong but there is no money. Maybe if the TL's get involved than maybe it'll be better because we've been involved in it before and we can arrest/penalized someone because Ebiil belongs to us. Now you guys don't even ask permission from us and we are under the impression that the State is in charge because our money is suppose to go to enforcement but this is not being followed. It's mismanagement. That's the problem.</p> <p>The reason why we're silent because we're inside the <i>oblil</i> (legislature government) with the responsibility of taking care of Ngarchelong and there is no way we can do this without money. And it's hard to find someone to pay 5 TLs so for management wise, we gave it to the State to take care of it with the money but there is no result. You people go count fish and do not even ask permission from us but we believe the money is supposed to be managed by the State.</p> <p>The <i>bul</i> is the only way we can conserve. You would not need to go through complications of courts but through traditional meeting house for men. Once the lowest pay for the people reaches 25,000 a year, then we will be happy to know that things are doing well. But as of now when we know that people are depending on marine resources for food and income, we want to conserve it. Children these days eat American and Palauan food. For us older people we can live with just Palauan food but the idea of this is to conserve our food so that it will always be available for us because it is decreasing.</p>
<p>Traditional leader 4</p>	<p>We can have more MPA and have time to open but we should leave Ebiil as it is. There is no other way.</p>
<p>Traditional leader 5</p>	<p>Long ago, there was the practice of raising a sort of flag that would identify that there is a <i>bul</i> of the traditional leaders. There was no need to have a meeting to discuss anything. If it's up, you do not complain, you just do as the "<i>bul</i>" is set for. That is why at the traditional men house, you find a lot of paintings such as sharks. This represents the fact that it just sits around but when it bites, it hurts. Same as for the traditional men, they can just sit at where they are and penalize someone who's elsewhere. That is why in the traditional men houses,</p>

	<p>the ceiling is low when you first enter because it forces you to bow your head down. They do not need to tell you. Whether you like it or not, you will still bow down. There were only the actions and the laws. And now, we have learned the phrase “why” or “I have the right”. We are now mixed Palauans instead of full and we claim we’re Palauans. People these days can't even speak without saying an English word or a Japanese word and they claim that the Palauan terms consist of only a few words. This is not true. People just do not know these terms. He uses the example of how we explain the days-today, tomorrow, day after tomorrow, yesterday, day after yesterday. In Palauan, we have terms for all the days ahead and before. We do not have to repeat any word such as “day” –day after tomorrow. So Palauans have a lot of terms and phrases, we just don't know them. This goes back to those who do not see the benefits of Ebiil. It is sad for them. They do not ask so they can find out. We should not bother with these people because they do not know. But no one is stopping them to finding out what is inside. They can ask permission from the Governor to go in. It's not hard. Again, leave them alone. We do not have to bother with little things such as those people and leave the bigger job which is thinking of the benefits for everybody.</p> <p>There is no other way than MPA or <i>bul</i> because these can be applied to today's world. We cannot use the practice from before. However, that is “<i>klechibelau</i>”(the Palauan way/tradition/culture).</p>
--	---

<p>What is your opinion about tourism development in Ebiil. How will it change the way people live here? What types of benefits or problems do you think we may face with tourism? (Obj 5) <i>Ngera ulesduem el kireal a tekoi er a klekangkodang er a chelsel a Ebiil? Nga er ngii a bol ngedecherii a teletelel a klengar er a rechad el kiei er tiang? Ngera kora klungiolel ma kngtil/mondai el bo dechelbangel el kirel a klengangkodang?</i></p>	
<p>Traditional leader 1</p>	<p>I support tourism and I do not see any problems with it but we need to think about the problems that might affect the resources.</p>

<p>Traditional leader 2</p>	<p>There is no other way of income but tourism. This is the big thing these days. We stay put and they (tourists) come in. Tourism promotes the islands. I support tourism to develop in Ebiil and do not see any problems with it.</p>
<p>Traditional leader 3</p>	<p>I think that it's a good idea however the people are not ready. They cannot do this. The people would get affected by it because foreigners will have to come in to run things and we the locals will rip the disadvantages. I want it but it's better to conserve the place. The people are not cable to do this tourism work. We won't be able to control it. Take Koror for example, they now have big buses to drive people around and the taxi drivers are left behind. It's not the time to do this. If tourism comes to Ngarchelong such as diving, having people pay things such as scuba tanks at Ngarchelong only.</p>
<p>Traditional leader 4</p>	<p>Contract people to work for tourism development and support private companies or people to help with the development. Hire local people to go do these. WE will have to limit number of tourists. One day we can say 100 people are allowed to one area. For example, 100 are allowed to Ebiil and/or another 100 to soft corals.</p>
<p>Traditional leader 5</p>	<p>Tourism will benefit Ngarchelong. It's revenue to the State. Problems may rise once we get into it but it is a learning process. We will know when there is an evaluation so as time goes on, we might across some problems but we'll deal with it then. But right now, we cannot tell until we try. This is revenue to the state; it will not only benefit one person. The state will provide for those who live in it. They will help when there is a need.</p>

(For traditional leader) As a traditional leader of the Ngarchelong community, would you mind commenting on the legislated Ebiil MPA. How similar is it to the traditional *bul*? Do traditional leaders like yourself supported the Ebiil MPA? If yes, how? Do you think the State Government needs more of your support? In what ways? (info related to Obj 2)

Kau el rubak er a beluu, nga er ngii a ulesuem ma lechub eng comment er kau

<p><i>el kirel tial Ebiil el chelsimr el basio er a omengeriomel el loku a llach er a Ngarchelong? Sel momes er ngii eng di uai a “bul”. A rubak er a beuu toldubech er tial MPA? A State a omomdasu er ngii e tousbech er kemiu el lolduech er tial tekoi?</i></p>	
<p>Traditional leader 1</p>	<p>The State and the TLs should work together because the State can provide equipments while the TLs assist them.</p>
<p>Traditional leader 2</p>	<p>The <i>bul</i> does not cooperate with the national laws. For example what Koror state is requesting. Ngarchelong will not abide or listen to Koror State because the <i>bul</i> is done by the TL not Ngarchelong state. TL always works with the State and the State needs their support. MPA and <i>bul</i> is similar. <i>Bul</i> happens when something becomes less. .</p>
<p>Traditional leader 3</p>	<p>Once the state got involved with Ebiil, everything got worst because you guys know each other and you pay them some money so you guys can get in to “<i>oldechelakl er ngii</i>” (destroy it-get resources) and we (TLs) don’t know about it because you guys hide this fact. We do not violate our traditional practice so we want to hold on to our culture. Right now we’re just waiting for the plan regarding enforcement that will be done by the new conservation officers. Personally, I think that the State should enforce/patrol while we (TLs) should penalize because it’s faster and money is not spent. The penalty whether its money or things will go to the State because they’re in charge of the system.</p>
<p>Traditional leader 4</p>	<p>CA is American and <i>bul</i> is Palauan. <i>Bul</i> can specify a time to open. We can alternate the reefs to open and close. With a <i>bul</i>, we can open when the resources increase. <i>Bul</i> some areas and open some but Ebiil to remain close because that’s where fish aggregate. CA- conserve for whatever reasons to increase number or size or there is no resources so we have to bring it back by closing it. But they are the same.</p>
<p>Traditional leader 5</p>	<p>MPA or CA is an English practice. However, this will require you to go to court to make a ruling. With <i>bul</i>, when the traditional leaders say something, it will be done. It is much harder (penalty is higher) and faster to penalize someone than go through many days in court.</p>

	<p>With such practices such as MPA or CA, there can be conservation officers to patrol but with a <i>bul</i> it's more of the punishment part of it. It's more like partnering up; they (State) would patrol and catch poachers while we (traditional leaders) will lay down the punishment. The state needs the support from the traditional leaders. The state is to report to the traditional leaders and they would punish. If we follow the national law, the poacher would be penalized with only \$100. The traditional leaders do not have any boundaries. If the legislation decides to take the traditional leaders out of the office, Ngarchelong will be divided. Traditional leaders might take things slowly but those who are slow will make you become patient. He sees <i>bul</i> and MPA as two organizations working together. They both need each other. One cannot stand alone.</p>
--	--

<p style="text-align: center;">Other useful information</p>	
<p>Traditional leader 1</p>	<p>*households usually provide both <i>ongraol</i> and <i>odoim</i> to the market *I just ask that we the people handle things ourselves. We do not need studies to tell us what to do. These only advertise Ebiil to others to come in. Grants should be handled by us and maybe with the help of other organizations. Organizations have these grants and they are not coming towards us.</p>
<p>Traditional leader 2</p>	<p>*He practices trap fishing. There are less people who practice this because there are so many methods and techniques in fishing. Traps for fishing were considered icebox in the olden days. Line fishing is still practices-women and men. In the farms, you hardly see women in them not like before. These days, we have rice and for those who farm or have taro patches have DH working in their patches or farms.</p> <p>Households usually have fish and farm products sold at markets. *We are now only waiting for the conservation officers then the TL will step aside. The state will be responsible for enforcing and penalizing with the \$500 ticket. Before \$100</p>

	<p>can't even afford a lawyer and that is why practice <i>bul</i>. For the whole NR, they would still need to think about how they will manage the resources. They might have to close some sections of the reef and have others that are open</p>
<p>Traditional leader 4</p>	<p>At the market, you can sell anything you want to sell. There are times where you go to the market and it's just <i>ongraol</i> (starch) and some time just fish. It depends on the seasonal time of the product. Usually local food.</p> <p><i>Melemau</i> (parrotfish)- Many near Ebiil because they probably aggregate in ebiil. We don't find them at <i>ngebard</i>.</p> <p><i>Mokas</i> (grouper)- group of people go out to fish. Gas is expensive so one goes to fish on his/her own; not in groups.</p> <p><i>Ngiaoch</i> (pacific longnose parrotfish)- <i>betook ra chelmoll</i> (more at the outer reefs) not in the deep.</p> <p><i>Kelsebuul</i> (lined rabbitfish)/<i>meyas</i> (dusky rabbitfish)- <i>meral mo mekesai e mekerei</i> (They are getting smaller and becoming less)</p> <p>Before a <i>rechad sel lomuked, eng di one time</i> (fishermen use gillnet only once) and that's it. And they start stepping on the sides of it and it gets murky because they are pregnant and the eggs come out. Now we don't do that. We just take the fish.</p> <p>There is only one person who comes and sells at Koror. But a lot of people sell with in Ngarchelong at market either cooked or sell them raw by the pounds. He sells 10 pounds each in one bag.</p> <p>There are still many <i>ngims</i> and <i>molech</i> (seacucumbers) but no clams now so they have the <i>bul</i> now for clams for 11 months a year. However, you can eat or sell <i>kim</i> (clam) if you have your own farm</p>
<p>Traditional leader 5</p>	<p>*There are those who bring their fish to sell at Koror or Ngaraard. Some relatives come from elsewhere to fish here. But most sell their harvests in the local market.</p> <p>*for his household, they sell fish and farm products at markets</p>

Appendix5: Team Members and Affiliations

Names	Status	Organization
Noelle Wenty Oldiais	Team leader	PICRC
Supin Wongbusarakum	Advisor	TNC
Yimnang Golbuu	Advisor	PICRC
Dawnette U. Olsudong	Team member and data manager	PICRC
Carol Emaurois	Team member	PICRC
Adelle Lukes Isechal	Team member	PICRC
Jack Isechal	Team member	PICRC
Geory Mereb	Team member	PICRC
John Wong	Team member-guide	PICRC
Waisang Mariur	Team member	Ngarchelong local
Dwight Ngirchemat	Team member	Ngarchelong local
Jordan Ewatel	Team member	Ngarchelong local
Samuel Ldesl	Team member	Ngarchelong local
Luciana Shiro	Team member	Ngarchelong local
Sechedui Kloulchad	Team member-guide	Ngarchelong local

Appendix 6: Indicators

*Demographics

- Age
- Sex
- Marital status
- Original village of the respondents
- Number of household members
- Occupation of household head
- Types of household income generating activities
- Types of household subsistence activities
- Highest cash income generating activities
- Household education level
- Household income level

Coastal and marine activities

- Number of males and females who fish or harvest marine life regularly
- Proportion of household head who fish or harvest invertebrates
- Change of frequency of fishing and invertebrate harvesting by household head compared to 10 years ago and reason
- Average frequency of fishing and invertebrate harvesting by the household members
- Types of important fish and invertebrates for the household for sale, consumption and both
- Perceived number and size of the important fish and invertebrates compared to 10 years ago
- Perceived effort for fishing and harvesting invertebrates compared to 10 years ago and reason
- Change of location for fishing compared to 10 years ago and reason

Management

- Benefits of Ebiil MPA on households and community
- Impacts of Ebiil on purpose and patterns of fishing
- Impacts of Ebiil on fish and seafood consumption
- Impacts of Ebiil on ways to make a living
- *Proportion of household heads who support Ebiil MPA
- Proportion of household head's support of additional MPAs, types of MPA, locations and reasons
- Impacts of Ebiil on marine conservation
- *Levels of enforcement
- *Awareness of regulations and violations
- Awareness of biological and social monitoring

Threats

- Perceived major threats to Ebiil MPA
- Perceived solutions

Tourism

- Level of support of tourism in Ebiil MPA and other areas in Ngarchelong
- Level of interest in different types of tourism activities to be benefited financially

Biological and social activities

- Awareness of biological and social monitorings
- Awareness of biological and social study results
- Best way to communicate study results

**Micronesia Challenge (MC) indicators that were adopted during the 2nd MC measures workshop*