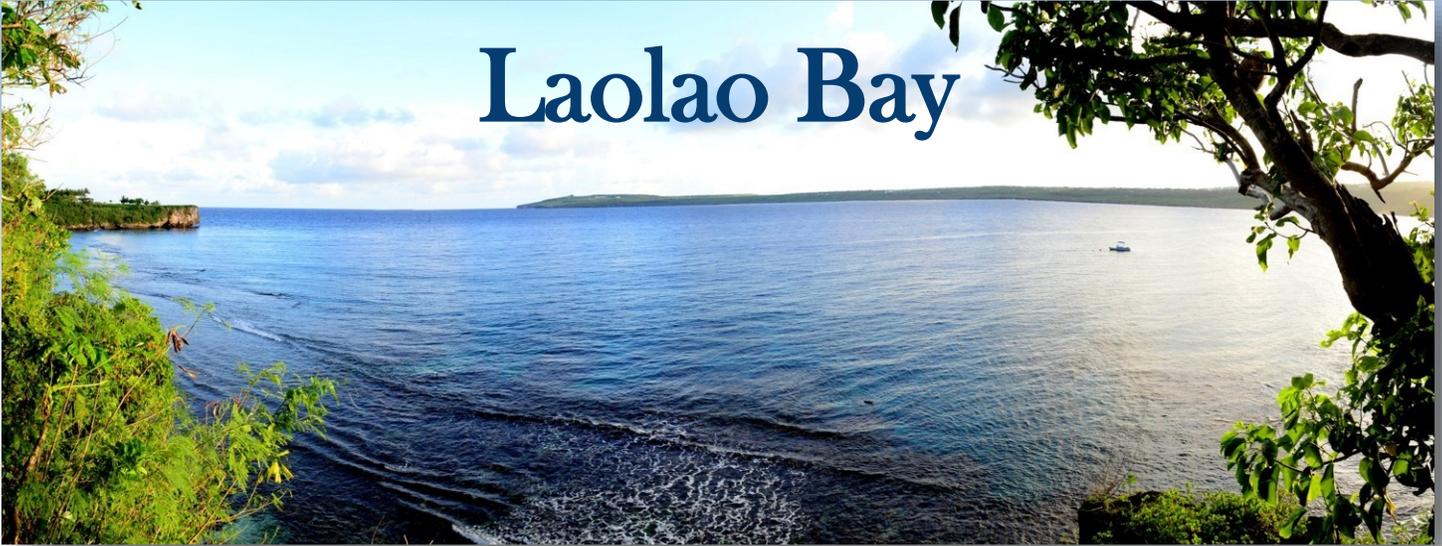


Coastal Use & Management at Laolao Bay



A follow-up SEM-Pasifika study of resource users at Laolao Bay
Saipan, Commonwealth of the Northern Mariana Islands (CNMI)
September 29 to November 10, 2014

This report was prepared by the author under contract for The Nature Conservancy under the cooperative agreement award #NA13NOS4820145 from the National Oceanic and Atmospheric Administration's (NOAA) Coral Reef Conservation Program, U.S. Department of Commerce. The statements, findings, conclusions, and recommendations are those of the author(s) and do not necessarily reflect the views of NOAA, the NOAA Coral Reef Conservation Program, or the U.S. Department of Commerce.

Cover photo: Laolao Bay, Saipan, CNMI. Photo credit: Bureau of Environmental & Coastal Quality

This survey was a follow-up to the initial 2009 baseline assessment to document users' current activities at Laolao Bay and monitor change and to identify existing resource uses, threats and knowledge of damaging activities and their perception of the health of Laolao's resources.

This survey was funded by the CNMI Bureau of Environmental and Coastal Quality and The Nature Conservancy, and conducted by Micronesia Islands Nature Alliance.

Hard and/or electronic copies of this report can be requested from:

Brooke Nevitt

Interim Executive Director

Micronesia Islands Nature Alliance

P.O. Box 506645

Saipan, MP 96950

Telephone: (670) 233-REEF

Email: brookenevitt.mina@gmail.com

1.2 Goals and Objectives

The goal of survey was to perform a follow up socioeconomic assessment to the 2009 baseline survey conducted in Laolao Bay.

Objectives:

1. Conduct follow up assessment in order to monitor change
2. Identify recreational users for natural resources
3. Identify perceived threats and changes to natural resources
4. Identify perceived frequency of damaging activities
5. Explore perceived effectiveness of existing management
6. Provide baseline assessment of Micronesia Challenge indicators

METHODOLOGY

2.1 Data collecting methods

The data collection process was composed of an intercept survey performed over a 43-day period (Monday, September 29 – Monday, November 10, 2014).

2.2 Sampling Design

An intercept survey targeting resource users was conducted over a 43-day period from 8:00 a.m. to 6:00 p.m. Interviewers intercepted all willing visitors within the time frame. This did not include tourist visitors who primarily engaged in SCUBA diving activities; on the other hand, tour operators leading the dive groups were included in the survey. Unlike the 2009 baseline assessment, the follow up survey did not include key informant interviews.



Survey team member interviewing Laolao user

2.3 Indicators used in study

Based on the study objectives, the following indicators, as in the baseline assessment, were selected from the SEM-Pasifika Guidelines:

1. Number and profile of visitors (D2)
2. Age (D4)
3. Sex/gender (D6)
4. Education/Literacy (D7)
5. Ethnicity/clan (D8)
6. Language (D10)
7. Occupation (D11)
8. Perceived resource conditions (T2)
9. Perceived threats to coastal and marine resources (T3)
10. Perceived coastal management problems (T4)
11. Community awareness of the Micronesia Challenge (MC8)
12. Community support for the Micronesia Challenge (MC9)

RESULTS

3.1 Key findings of intercept survey

Village distribution

A total of 158 people were surveyed. Data showed that respondents' residences were distributed throughout the island, with the most residents (43.1%) residing within the Laolao Watershed (Kagman, San Vicente and Dandan).

Kagman residents were the largest user group,

at 23.4% (see Chart 1). This spread is similar to the 2009 SEM-P survey results, which showed 46.45% of respondents also residing in these three villages, indicating that close to half of Laolao users hail from the surrounding, proximate areas. Following these villages, residents from Garapan, Chalan Kanoa and Capitol Hill were the next largest numbers of users.

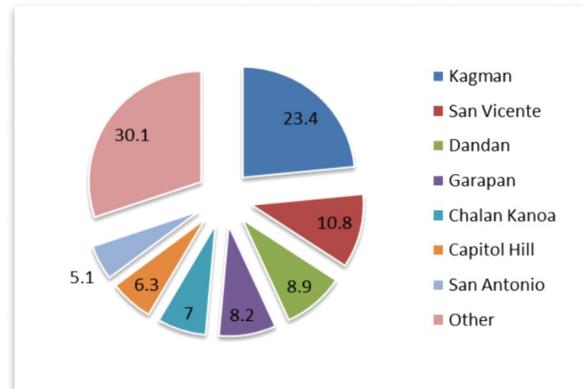


Chart 1: Village distribution of users

Ethnicities

Chamorros composed over half (52.5%) of visitors surveyed at Laolao Bay, followed by Carolinians (12%) and equal numbers of Caucasians and Koreans (7.6%) intercepted. As the top user group, Chamorros continue their recreational and traditional fishing use of the site. There was an increase in visits by Carolinians to the site compared to 2009, when they ranked 6th. There was a corresponding drop in Filipino users, who went from second place (16.13%) in 2009 to sixth place (3.8%) in 2015.

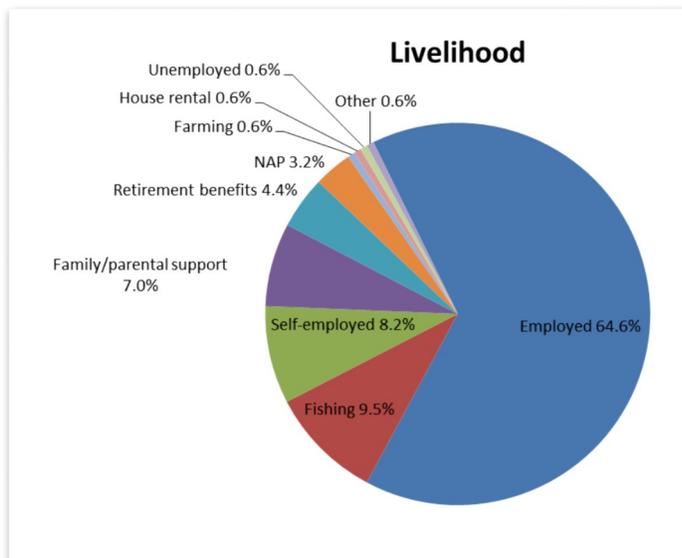


Chart 2: Livelihood of users

responded that they had engaged in a second activity as a means of supporting themselves, with the largest number (44.7%) citing fishing as their second form of support.

Livelihoods

72.8% of respondents were either employed or self-employed. As shown in Chart 2, a sizable percentage (9.5%) listed fishing as their main livelihood, the second highest source of livelihood/income cited by respondents. Following employment and fishing, 7% of users listing family/parental support as their source of livelihood came in third place.

Respondents were asked to indicate if they had a second source of livelihood/income. Almost half (48%) of those surveyed

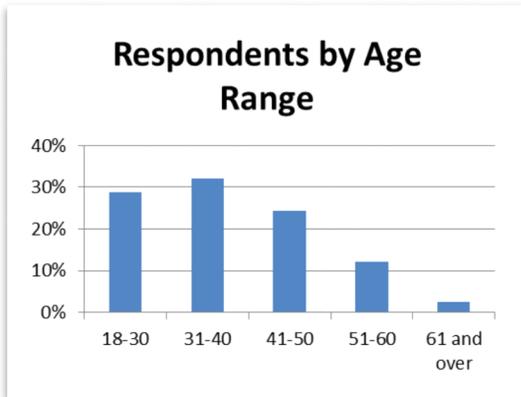


Chart 3: Respondents by Age

Gender distribution and age distribution

The overwhelming majority of respondents surveyed were male (68%). The largest age bracket, as shown in Chart 3 were those between ages 31-40 (32.1%), followed by 18-30 year olds (28.8%). Similarly, in 2009, visitors aged 36-45 made up 34.2% of visitors.

This data shows that most visitors to Laolao Bay are of working age, with decreasing numbers corresponding to the older visitors. There is a high likelihood that those citing fishing as an activity at the site make up part of this group of thirty-somethings.

Activities in Laolao Bay

In an open-ended question inquiring into the types of activities respondents engaged in at Laolao Bay, the top response was to picnic and/or barbeque, followed by swimming and snorkeling. As shown in Table 1, this matched the results from the 2009 baseline assessment. Fishing and diving came in at a close third (46.5%) and fourth (45.2%) activity, respectively. Recreational activities are an important component of visits to Laolao as indicated.

Activity	2009	2014	Change
Picnic/BBQ	63%	69%	6%
Swimming/snorkeling	59%	54%	-6%
Fishing	47%	47%	-1%
Diving	43%	45%	3%
Walking/hiking/running	34%	36%	2%
Camping	34%	24%	-10%
Beach cleanup	34%	23%	-11%
Hunting	12%	5%	-7%
Collecting herbal medicine	14%	3%	-12%

Table 1: Laolao activities (2009 & 2014)

Between the 2009 baseline survey and 2014 survey, the ranking of activities stayed relatively the same, with minor variations between the two surveys. While there were increases in those who picnic/BBQ, SCUBA dive, and exercise (walking/hiking/running), there were decreases in other activities at Laolao. Fewer users are swimming/snorkeling and hunting as compared to 2009. There were also noticeable drops in those visiting Laolao Bay to camp, perform beach cleanups and collect herbal medicines.

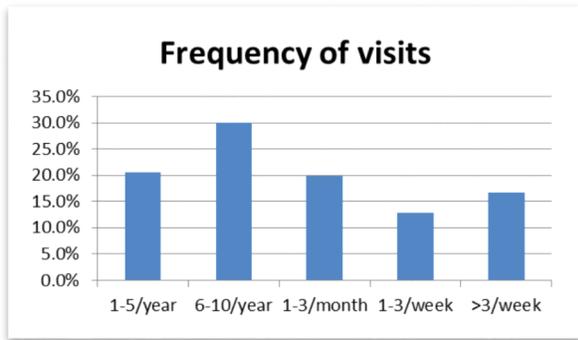


Chart 4: Frequency of visits

Frequency of visits

As shown in Chart 4, nearly half of respondents (49.4%) visit Laolao at least once a month, with 16.7% visiting more than three times a week. A little over half of respondents (51%) have been visiting Laolao only within the past eleven years, with the largest group (19.4%) having visited Laolao only between that past 4 to 7 years.

Perceived condition of natural resources

Top threats to Laolao	2009	2014	Change
Erosion/runoff	31.6%	69.0%	37.4%
Illegal dumping	14.8%	36.2%	21.4%
Poorly maintained road	17.4%	31.0%	13.6%
Littering	31.0%	27.6%	-3.4%
Too much fishing	5.8%	12.1%	6.3%
Harmful fishing practices	5.2%	6.0%	0.8%
Too many divers	0.7%	2.6%	1.9%
Driving on the beach	1.9%	1.7%	-0.2%
Irresponsible diving	3.9%	0.9%	-3.0%

Table 2: Top threats to Laolao

Respondents were asked whether they thought there were any threats to Laolao Bay. A very high number responded in the affirmative – 74.4%. This is a marked increase of 8.6 percentage points from the 2009 survey, quite possibly indicating more awareness and knowledge of threats to Laolao. This may be attributed to increased

efforts by natural resource agencies, particularly BECQ, in educating the general public and communities of Laolao.

Just as in the 2009 assessment, respondents were asked to identify what they perceived to be the top two environmental threats facing Laolao. Of those who responded that there were threats to Laolao, erosion once again topped the list. Interestingly, respondents citing erosion and runoff as the top threat from the 2009 survey more than doubled – from 31.6% to 69%. This increase in knowledge of the threat to Laolao was very likely a result of BECQ’s Laolao Bay Pride Campaign that took place last year, which encouraged community members to plant native and other trees to reduce erosion and sedimentation into Laolao Bay. Illegal dumping came in as the second top threat to Laolao (up from placing 4th amongst perceived threats in 2009), switching places with littering. This could most likely be a result of users recognizing larger quantities of trash being left at Laolao that are not connected to regular visits, ie. household trash. Despite the change in ranking, a similar percentage of respondents (27.6%) still identified littering as a threat as did in 2009 (30.97%).



BECQ Pride Campaign Logo

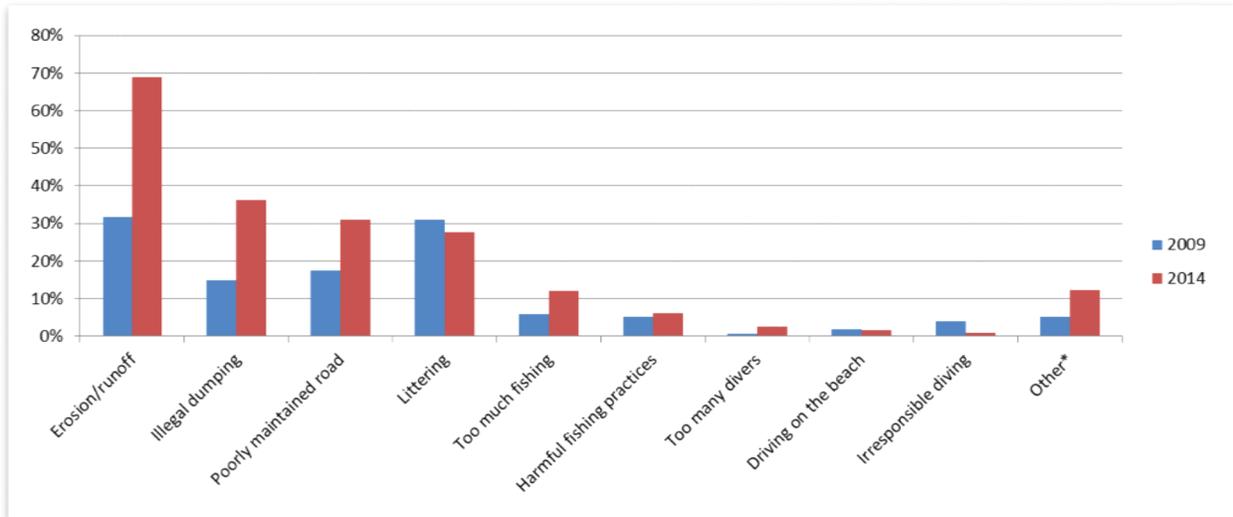


Chart 5: Top threats to Laolao—2009 versus 2014*

Other threats were identified by users, although no threat garnered more than a 1.7% response rate (or two responses). One respondent identified as a threat the fishing and spearing that is increasingly taking place in the middle of dive groups. More of a safety hazard, this statement indicates a tension between fishers and divers, and should be noted by management. While “thieves” received a low response rate as a threat, it should be noted that over the duration of surveying at Laolao, at least one auto break-in took place each week.

Perceived health of coastal and marine resources

As in 2009, respondents were asked to rate the health of each category listed. The options were very *healthy*, *somewhat healthy*, *somewhat unhealthy*, *very unhealthy* and *unsure*. Almost half of respondents (45.8%) indicated that water quality in Laolao Bay was *somewhat healthy*, similar to 2009, with 44.5% having the same response. Interestingly, despite erosion and runoff being identified as the biggest threat to Laolao, a combined 19.6% perceived water quality to be *somewhat unhealthy/very unhealthy*. There was a large increase in those perceiving coral to be *very healthy/somewhat healthy*: 54.9% versus 32.9% with the same responses in 2009.



BECQ staffer and students planting native trees

*Other threats: 2009: too much vegetation, water quality, boats, lack of restrooms, too few pavilions; 2014: jungle burning, cause of hiyok deaths occurring in 2014, weather, unattended areas, development, overgrowth, fishing/spearing in the midst of divers, thieves, marine debris, people, invasive species

Resource (n=153)	Very Healthy	Somewhat Healthy	Somewhat Unhealthy	Very Unhealthy	Unsure
Water Quality	24.8%	45.8%	18.3%	1.3%	9.8%
Sea urchins	29.4%	34.6%	7.8%	3.9%	24.2%
Beach area	22.9%	41.8%	25.5%	3.9%	5.9%
Sea cucumbers	31.4%	33.3%	11.1%	4.6%	19.6%
Coral	19.0%	35.9%	20.3%	9.8%	15.0%
Turtles	34.0%	26.1%	7.8%	3.9%	28.1%
Forest/Grasslands	41.8%	32.0%	11.8%	2.6%	11.8%
Fish	33.3%	37.9%	15.0%	2.0%	11.8%

Table 3: Changes over four years

Few respondents perceived any of Laolao’s resources to be *very unhealthy*, with the highest ranked in this category – coral – receiving this rating by 9.8% of respondents. More than half of respondents perceived all of Laolao’s resources to be either *very healthy* or *somewhat healthy*. The resource receiving the highest response rates for *very healthy* was Laolao’s forest/grasslands. The top three resources receiving combined responses of *very healthy/somewhat healthy*, and thus being perceived the healthiest, were: forest/grasslands (73.8%), fish (71.2%) and water quality (70.6%).

Changes noticed at Laolao over the past four years

The top three most noticeable changes at Laolao were more garbage cans (64.6%), barriers to prevent beach driving (60.4%), and improved parking areas (60.4%). Despite changes noticed over the past several years at Laolao, 93% of respondents still would like more changes or improvements at the site.

Changes were noticed across all indicators more in 2009 than in 2014, when affirmative responses dropped. Whether accurate, this is a reflection that amongst users, most of the obvious changes to Laolao occurred prior to the 2009 survey. Based on a comparison of the results from both surveys, most noticed changes took place leading up to the 2009 survey.

Changes noticed over past 4 years	YES		NO		UNSURE	
	2009	2014	2009	2014	2009	2014
More garbage cans	87%	65%	8%	30%	3%	6%
Barriers to prevent beach driving	85%	60%	9%	26%	5%	13%
Improved parking areas	76%	60%	16%	32%	5%	8%
More pavilions	74%	50%	15%	41%	8%	9%
More frequent garbage collection	90%	49%	4%	37%	4%	14%
Improved drainage	85%	40%	6%	44%	6%	17%
Paved road	82%	25%	14%	67%	3%	8%

Table 4: Changes over four years

Perceived reasons for trash dumping and littering

Just as in 2009, the top two reasons perceived by respondents as strong reasons for dumping and littering at Laolao were because people “do not care” and “are lazy.” There was a noticeable drop in there not being enough trash bins as a strong reason (23 points) and trash bins not being emptied often enough as a strong reason (18 points) for dumping. This can potentially be attributed to the presence of more trash bins, particularly those provided by the Micronesia Islands Nature Alliance (MINA)



MINA recycle bin at Laolao

at the dive site and at the entrance to the DCRM permeable parking lot. Conversely, the presence of more trash bins at the site could be the reason for illegal dumping being seen as the 2nd top threat (noted earlier) to Laolao.

There was also an increase from 2009 in respondents who felt that the transfer station was too far. The decrease in response rates for those who “don’t know it is illegal” and those that “don’t know it can harm the environment” can be an indication that more people are aware of the CNMI’s anti-littering laws as well as the impact of trash on the environment. This may be attributed to the efforts of the Our Laolao campaign, which targeted users with anti-littering messages informed by the 2009 survey. Additionally, MINA’s Tasi Watch Community Rangers performed focused outreach efforts in and around the site, educating users about the important of keeping Laolao “litter free on land and sea.”

Reasons for dumping/ littering	Strong reason		Sort of a reason		Not a reason		Don't know	
	2009	2014	2009	2014	2009	2014	2009	2014
The transfer station is too far	33%	41%	17%	19%	34%	28%	14%	12%
There is no home trash pickup	30%	22%	22%	27%	32%	42%	12%	10%
It is easy to do/not likely to get caught	38%	20%	22%	26%	25%	45%	12%	10%
They don't know it is illegal	14%	8%	14%	14%	61%	70%	6%	8%
They don't know it can harm the environment	17%	9%	18%	18%	50%	65%	12%	8%
There aren't enough trash bins	39%	16%	21%	21%	30%	57%	5%	6%
Trash bins aren't emptied often enough	30%	12%	25%	23%	34%	53%	6%	12%
They don't care	70%	65%	13%	14%	10%	19%	4%	3%
People are lazy	77%	74%	9%	12%	8%	12%	3%	3%

Table 5: Reasons for dumping/littering (respondents could choose more than one answer)

Activities observed by respondents		
	2009	2014
Legal (permitted)		
SCUBA diving	88%	87%
Barbecuing	85%	96%
Fishing with rod and reel	76%	83%
Talaya fishing (throw net)	70%	83%
Illegal (not permitted)		
Driving on the beach	66%	18%
People standing on or breaking coral	39%	38%
Trash dumping	28%	45%
Burning	25%	36%
Collecting and harvesting trochus	21%	13%
Scuba Spearfishing	17%	33%
Collecting and harvesting sea cucumbers	17%	5%
Collecting medicinal plants	12%	19%

Table 6: Activities observed in Laolao Bay

Observation of activities in Laolao Bay

There were changes in response rates for the various activities at the site. The most observed activity in 2014 was barbecuing, at 96%, followed by SCUBA diving at second, and tying for third place at 83% were fishing activities, both rod and reel and talaya. With the exception of SCUBA diving, which dropped one point from 2009, all other legal activities observed at Laolao increased from 2009.

In terms of illegal activities, the top two observed amongst respondents were trash dumping and people standing on/breaking coral. There was a noted increase in those observing trash dumping; while there was an increase in trash bins and trash collection at Laolao, the increase may be attributed to illegal dumping at the site. There were decreases in the observation of the collecting and harvesting of both trochus and sea cucumbers, while respondents noticed an increase in the collection of medicinal plants.

The activity seeing the largest drop between 2009 and 2014 was driving on the beach. This can be attributed to the placement of the large concrete beach barriers preventing beach access.

Changes desired at Laolao Bay

As indicated in Table 6, *paved road* received the highest response rate. Improvements related to trash – receptacles and collection – placed in the top five, with restrooms closely following at sixth place. Close to one-third of respondents noted the need for improved drainage at Laolao, while 8% of respondents cited security/enforcement as a desire. 11% of respondents favored other changes, including landscape maintenance, pathway/trails, benches, lit roads, hut/basketball court, electricity and seasonal fishing permits.

Changes desired	%
Paved road	74.7%
More pavilions	55.3%
More garbage cans	44.0%
Improved parking areas	40.7%
More frequent garbage collection	34.7%
Restrooms	30.0%
Improved drainage	29.3%
Barriers to prevent beach driving	18.0%
Security/enforcement	8.0%
Other	11.5%

Table 7: Changes desired

Perception of resource management and suggestions

The area cited highest for not being managed effectively was *road maintenance*. This corresponds to *paved road* being the most desired change at Laolao. *Beach use* ranked as the most effectively managed area by respondents; this likely corresponds to the increase in barriers preventing beach driving.

	Do you think these areas are being managed effectively in Laolao Bay?		
	Yes	No	Unsure
Road maintenance	27.9%	63.6%	8.4%
Fire prevention/response	31.8%	15.6%	52.6%
Coral reef/fisheries mgmt.	49.4%	24.0%	26.6%
Trash disposal	48.1%	29.9%	22.1%
Forest/grassland mgmt.	52.6%	20.8%	26.6%
Beach use	66.9%	14.9%	18.2%

Table 8: Management effectiveness

Ranking second as the most effectively managed area at Laolao was forest/grassland management. This could partly be due to the fact that most activity at the site takes place at the beach/coastal areas, with little activity upland. There have also been a number of tree-planting events along the coast, possibly contributing to the perception of management of this area.



Brushcutting at Laolao Bay

Management suggestions for Laolao Bay

Respondents were prompted for suggestions for management of Laolao Bay. The top suggestion was the need for more enforcement. Rounding out the top for management suggestions were transparency/accountability/competence of management agencies, informative beach signs, and more litter control officers (more specific enforcement).

Management Suggestions	Count
More enforcement	8
Transparency/accountability/competence	4
Informative beach signs	4
More litter control officers	4
Marker/mooring buoys	2
Outreach/education on regulations	2
More community involvement	2
Plant more trees	1
More nearby village involvement w/ area mgmt.	1
More communication with tour guides	1
More regulation of dive industry	1
Rotate and regulate MPA's	1
Maintenance after typhoons	1

Table 9: Management suggestions

Other feedback included more tree planting, more communication with tour guides, more regulation of the dive industry and maintenance after typhoons.

Micronesia Challenge

With only 18.5% respondents having heard about the Micronesia Challenge, more work still needs to be done to educate the community about this regional effort. Amongst those that have heard about the Challenge, over 90% support its goals. In terms of respondents' knowledge of the goals of the Challenge, of the 18.5% who had heard of the Micronesia Challenge, a little over half knew that it is generally about environmental conservation, while about 35% were able to correctly identify the goals of the Challenge.

Heard of Micronesia Challenge	
Yes	18.5%
No	79.0%
Unsure	2.5%

Table 10: Knowledge of Micronesia Challenge

Support the Micronesia Challenge	
Yes	93.1%
No	0.0%
Unsure	6.9%

Table 111: Support for Micronesia Challenge

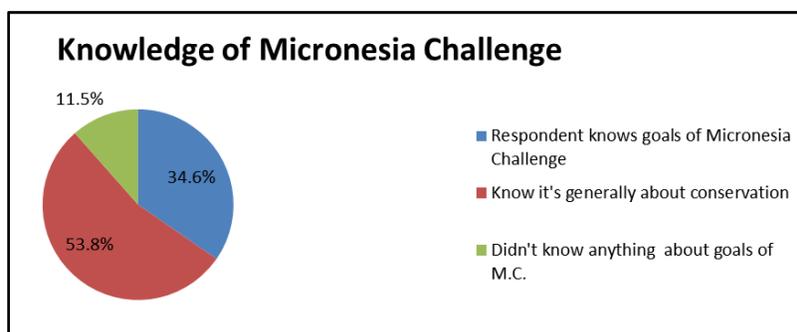


Chart: Knowledge of goals of Micronesia Challenge

Discussion

There were no major departures from the initial assessment conducted at Laolao Bay in 2009 in terms of visitor demographics and resource use. There still exists a variety of resource users at Laolao Bay and based on survey results, there remains a need for continued engagement with these users by management and conservation partners. For future education and outreach efforts addressing the Bay focusing on Kagman, Dandan and San Vicente, where nearly half of all the area's visitors come from would likely be the most effective means of spreading messages. Through the responses, it was clear that visitors to the Bay are noticing changes being implemented by management, such as more garbage cans, the reduction of beach driving, and improved parking. And aside from the road and fire management, when asked, most respondents stated that Laolao is being managed effectively.

Recommendations:

- Signage: Install additional signage on the threats to the site at each of the zones (what are zones?), such as littering and illegal dumping.
- User engagement in management: Consider opportunities to further engage communities and groups who frequent the area, particularly fishers, key landowners from the surrounding villages as well as tour operators with a vested interest in the site's health for the benefit of their customers.
- Addressing threats: Building on the efforts of BECQ's Laolao Bay Pride Campaign, recruit community members to assist with continued planting efforts in the upland areas of the watershed as a way to also continue education efforts on the importance of addressing erosion. Additionally, regular and random patrol schedule would aid in the reduction of littering and dumping at the site, identified as the top suggestion for management. Involve the Department of Public Safety in patrol to reduce the incidents of auto break-ins at the site.
- Outreach and education: Work with neighboring San Vicente Elementary School and Dandan Middle School to further inform students in the neighboring village, and provide more opportunities for field trips and activities to engage them.

Laolao Bay Intercept Survey

Name of Enumerator: _____

Survey ID: _____

Date (month/day/year): _____

Greetings! (Buenas dias, Buenas tatdes, Buenas noches)

My name is _____. The Bureau of Environmental & Coastal Quality (BECQ) is conducting a survey to find out what activities are going on in Laolao Bay and what people think and feel about Laolao Bay. This information will be provided to our natural resource agencies to help build environmental programs in Laolao. We expect that this will take approximately 20 minutes of your time. There are no right or wrong answers and you don't have to answer any questions you are not comfortable with. All responses will be kept confidential. Would you be willing to participate?

If no: Say "Ok, thank you for your time."

If yes: Continue

First, I am going to ask some questions about you:

[VERIFY THEY ARE 18 OR OLDER]

1. **DO NOT ASK ALOUD:** Male **68%** Female **29%**
2. What village do you live in? *Write in answer. If respondent does not live on Saipan, say thank you and end survey now.* _____

Village residing in	%
Kagman	23.4
San Vicente	10.8
Dandan	8.9
Garapan	8.2
Chalan Kanoa	7.0
Capitol Hill	6.3
San Antonio	5.1
Other	30.1

3. What is your ethnicity? *Do not read choices. Circle all that apply*
 - a. Chamorro **52.5%**
 - b. Carolinian **12.0%**
 - c. Other Micronesian (Palauan, Chuukese, etc.) **7.0%**
 - d. Japanese **6.3%**
 - e. Caucasian **7.6%**
 - f. Korean **7.6%**
 - g. Chinese **3.2%**
 - h. Russian
 - i. Filipino **3.8%**
 - j. Other: _____

4. What language are you most comfortable speaking? Tell me one or two languages. *Do not read choices.*

- a. Chamorro **48.7%**
- b. Carolinian **7.0%**
- c. Other Micronesian **2.5%**
- d. Japanese **10.8%**
- e. English **26.6%**
- f. Korean **3.8%**
- g. Chinese **0.6%**
- h. Russian **0.0%**
- i. Tagalog **0.0%**
- j. Other: _____

5. What is the main way you support yourself and/or family? [CHOOSE ONLY ONE]

- a. Salary from employment **64.6%**
- b. Fishing **9.5%**
- c. Farming **0.6%**
- d. Retirement/pension/Social Security **4.4%**
- e. Business owner/self employed **8.2%**
- f. Supported by parents/family **7.0%**
- g. Other: _____

6. In addition to the main way, do you have other ways of supporting your family? *Please choose all that apply:*

- a. Salary from employment **17.1%**
- b. Fishing **44.7%**
- c. Farming **5.3%**
- d. Retirement/pension/Social Security **1.3%**
- e. Business owner/self employed **21.1%**
- f. Other: _____

7. May I ask your age?

- a. 18-30 **28.8%**
- b. 31-40 **32.1%**
- c. 41-50 **24.4%**
- d. 51-60 **12.2%**
- e. 61 and over **2.6%**

Thank you. Now I am going to ask you some questions about Laolao Bay, why you visit, and what you think about the area.

8. What is the MAIN reason you come to Laolao? *(Do not read options, select only one)*

- a. Secluded and peaceful **23.6%**
- b. Less crowded with tourists **1.9%**
- c. Beautiful scenery and marine life **12.7%**
- d. Good fishing grounds **11.5%**
- e. Good place to BBQ **15.3%**
- f. Good for kids **7.6%**
- g. Good place for snorkeling and diving **13.4%**
- h. Alternative dive site when others are too rough **7.0%**
- i. Other: Please explain

9. What activities do you participate in when in Laolao? I'll read a list. Please say *yes or no* to each one. *Check only the activities they participate in.*

- a. Fishing **46.5%**
- b. Diving **45.2%**
- c. Picnic/BBQ **68.8%**
- d. Swimming/snorkeling **53.5%**
- e. Walking/hiking/running **36.3%**
- f. Camping **23.6%**
- g. Hunting **5.1%**
- h. Mountain biking **0.6%**
- i. Collecting herbal medicines **2.5%**
- j. Beach cleanup **22.9%**
- k. Other: _____

10. In the last year, how often have you visited Laolao?

- a. 1-5 times in the year **20.5%**
- b. 6-10 times in the year **30.1%**
- c. 1-3 times per month **19.9%**
- d. 1-3 times per week **12.8%**
- e. More than three times a week **16.7%**

11. Do you think there are any threats to Laolao Bay?

- a. Yes [Continue to next question] **74.4%**
- b. No [Skip to question #13] **18.6%**
- c. Unsure [Skip to question # 13] **7.1%**

12. We would like to know what you think are the two top threats to Laolao. *Do not prompt for answers.*

- a. Erosion and runoff **69%**
- b. Littering **27.6%**
- c. Illegal Dumping **36.2%**
- d. Jungle burning **0.9%**
- e. Driving on the beach **1.7%**
- f. Too much fishing **12.1%**
- g. Harmful fishing practices **6.0%**
- h. Illegal harvesting **0.0%**
- i. Too many divers **2.6%**
- j. Irresponsible diving **0.9%**
- k. Poorly maintained road **31.0%**
- l. Other: _____

13. What do you think of the health or current status of the following categories of Laolao? I will read you a list and ask you to rate the health of each.

Category	Very Healthy	Somewhat Healthy	Somewhat Unhealthy	Very Unhealthy	Unsure
Water Quality	24.8%	45.8%	18.3%	1.3%	9.8%
Sea urchins	29.4%	34.6%	7.8%	3.9%	24.2%
Beach area	22.9%	41.8%	25.5%	3.9%	5.9%
Sea cucumbers	31.4%	33.3%	11.1%	4.6%	19.6%
Coral	19.0%	35.9%	20.3%	9.8%	15.0%
Turtles	34.0%	26.1%	7.8%	3.9%	28.1%
Forest/Graslands	41.8%	32.0%	11.8%	2.6%	11.8%
Fish	33.3%	37.9%	15.0%	2.0%	11.8%

14. About how many years have you been coming to Laolao?

- a. 1-3 (skip to question 16) **18.1%**
- b. 4-7 (cont. to next question) **19.4%**
- c. 8-11 (cont. to next question) **13.5%**
- d. 12-15 (cont. to next question) **12.9%**
- e. 16-19 (cont. to next question) **9.7%**
- f. 20-23 (cont. to next question) **6.5%**
- g. 24-27 (cont. to next question) **5.2%**
- h. 28-30 (cont. to next question) **4.5%**
- i. 31-or more (cont. to next question) **10.3%**

15. What changes have you noticed at Laolao Bay over the past four years? I will read you a list of changes; please say Yes or No or Not sure to each one.

	Yes	No	Not sure
More garbage cans	64.6%	29.9%	5.6%
More frequent garbage collection	49.3%	36.8%	13.9%
More pavilions	50.0%	41.0%	9.0%
Paved road	25.0%	67.4%	7.6%
Improved drainage	39.6%	43.8%	16.7%
Barriers to prevent beach driving	60.4%	26.4%	13.2%
Improved parking areas	60.4%	31.9%	7.6%
Other: _____			

16. Are there changes or improvements you would like to see at Laolao? YES / NO [Circle one]
[If yes, go to #17. If no skip to #18]
 Yes **93.0%**
 No **7.0%**

17. What improvements would you like to see?

[DO NOT READ LIST]

	Yes
More garbage cans	44.0%
More frequent garbage collection	34.7%
More pavilions	55.3%
Paved road	74.7%
Improved drainage	29.3%
Barriers to prevent beach driving	18.0%
Improved parking areas	40.7%
Other	

18. In the past year, have you seen or heard of anyone doing any of these activities? I'll read a list of activities in Laolao. Please say if you have seen or heard about it once, a few times, regularly, or never.

	I have seen or heard about it once	I have seen or heard about it a few times	I have seen or heard about it regularly	I have never seen or heard about it
Burning	9.7%	16.8%	9.7%	63.9%
SCUBA diving	7.7%	7.1%	72.3%	12.9%
Talaya fishing	7.1%	32.3%	43.2%	17.4%
Scuba Spearfishing	10.3%	9.0%	13.5%	67.1%
Collecting and harvesting trochus	2.6%	7.7%	2.6%	87.1%
Collecting and harvesting sea cucumbers	1.3%	3.2%	0.6%	94.8%
BBQ	9.7%	11.6%	74.8%	3.9%
Trash dumping	15.5%	16.1%	13.5%	54.8%
Driving on the beach	7.1%	7.1%	74.8%	3.9%
Fishing with rod and reel	4.5%	23.2%	54.8%	17.4%
People standing on or breaking coral	10.3%	12.9%	14.8%	61.3%
Collecting medicinal plants	7.1%	6.5%	5.2%	81.3%

19. What do you think the reasons are for trash dumping and littering in Laolao? I am going to read you a list of possible reasons and I would like you to rate each one as a strong reason, somewhat of a reason, not a reason, or you don't know.

	Strong reason	Sort of a reason	Not a reason	Don't know
The transfer station is too far	41.0%	19.2%	28.2%	11.5%
There is no home trash pickup	21.8%	26.9%	41.7%	9.6%
It is easy to do/not likely to get caught	19.9%	25.6%	44.9%	9.6%
They don't know it is illegal	7.7%	14.1%	18.6%	2.6%
They don't know it can harm the	9.0%	17.9%	65.4%	7.7%

environment				
There aren't enough trash bins	16.0%	20.5%	57.1%	6.4%
Trash bins aren't emptied often enough	12.2%	23.1%	53.2%	11.5%
They don't care	64.7%	14.1%	18.6%	2.6%
People are lazy	73.7%	11.5%	11.5%	3.2%
Other:				

20. Do you think these areas are being managed effectively in Laolao Bay? Please answer Yes, No, or Unsure for each one..

Management of	Yes	No	Unsure
Road maintenance	27.9%	63.6%	8.4%
Trash Disposal	48.1%	29.9%	22.1%
Fire prevention and response	31.8%	15.6%	52.6%
Forest/ Grassland management	52.6%	20.8%	26.6%
Coral Reef & Fisheries Management	49.4%	24.0%	26.6%
Beach use	66.9%	14.9%	18.2%

21. What are your top two sources of information about the environment? *Read the list and ask for two top choices:*

- Newspaper **62.8%**
- Radio **39.7%**
- TV **22.4%**
- Brochure **0.6%**
- Informational signs **5.8%**
- Community members **22.4%**
- Community meeting **3.2%**
- Work **12.2%**
- Environmental official **10.9%**
- Other: _____

22. Do you have any management suggestions for Laolao?

THANK YOU!

23. Have you heard of the Micronesia Challenge?

- a. Yes **18.5%**
- b. No **79.0%**
- c. Unsure **2.5%**

IF RESPONDENT ANSWERS NO, END SURVEY AND THANK THEM FOR THEIR TIME. IF THEY ANSWER YES, CONTINUE.

24. If yes, do you support the Micronesia Challenge?

- a. Yes **93.1%**
- b. No **0.0%**
- c. Unsure **6.9%**

25. What are the main goals of the Micronesia Challenge? [NOTE TO ENUMERATOR: THE GOALS OF THE MICRONESIA CHALLENGE ARE TO CONSERVE 30% OF MARINE RESOURCES AND 20% OF TERRESTRIAL RESOURCES BY 2020] [LEAVE BLANK IF DID NOT ANSWER YES].

- a. Respondent got the answer exactly right **34.6%**
- b. Respondent knew it was about conservation but didn't quite get the answer right **53.8%**
- c. Respondent didn't know anything about the goals of the Micronesia Challenge **11.5%**
- d. Prefer not to answer **0.0%**

26. What do you think you can do to help the CNMI

reach the Micronesia Challenge

goals? _____
