

Public Perception on Marine Protected Areas Around the Northern Mariana Islands

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Abstract

The management and enforcement of marine protected areas (MPAs) has long been a complex management issue. This is particularly the case for large-MPAs, which often cover extremely large areas of the ocean. On Saipan, the most populated island of the Commonwealth of the Northern Mariana Islands (CNMI), interviews were carried out with 253 residents to find out their perceptions of marine conservation, including opinions of their seven coastal MPAs, and the federally established Mariana Trench Marine National Monument. Support for ocean conservation was high, with 66% of respondents wanting more protected areas around the CNMI. Similarly, support for the marine monument was high, with 69% of the respondents who had heard of the monument supporting its existence. Despite this high level of support, several concerns over equity and ownership were raised amongst respondents. Both the local and federal government of the CNMI should do more to better represent the expectations of the local people regarding marine protection, and more appropriate representation is needed in decision making regarding the monument.

Public perception on marine protected areas around the Northern Mariana Islands

A marine protected area (MPA) is an area of the ocean where human activities such as fishing are regulated to achieve conservation objectives (UN Convention on Biological Diversity, CBD). They are one of the most popular tools for ocean conservation, covering approximately 3% of the ocean's surface, with another 3.4% proposed (MPAtlas.org). The coverage of MPAs has increased exponentially in recent years (Worm, 2017), and as a result the Convention on Biological Diversity's goal of achieving 10% ocean area protection by 2020 is projected to be exceeded (CBD Press Release, 2017).

In recent years, the development of several extremely large marine protected areas has helped achieve this rapid increase of protection (Worm, 2017). Although there is no official definition of a 'large MPA', it is often recognised as a protected area larger than 100,000 km² (Leenhardt et al., 2013), and this is the definition used here. Large MPAs are instrumental in progress towards achieving the CBD's 10% protection target, with the ten largest MPAs accounting for more than 80% of all protected area coverage (*ibid*).

As a form of ecosystem-based management, marine protected areas provide an array of benefits, including providing protection for the entire area rather than for a specific species (Halpern et al., 2010). Large MPAs also reduce many of the disadvantages of smaller MPAs, such as reducing edge effects and providing a better buffer against stochasticity and uncertainty (Moustakas and Silvert, 2011). However, many studies have also raised concerns over their effectiveness, with factors such as location, level of protection and enforcement, and the life-histories of target species (pelagic, benthic, etc) significantly influencing their level of success (Hilborn et al., 2004; Selig and Bruno 2010; Edgar et al., 2014). Recently the human dimensions of MPAs have also come into focus, with potentially negative impacts on local people who may have cultural ties to fishing grounds and the resources they provide (Jones, 2002). Particularly for large MPAs, social impacts are often overlooked whilst assessing their effectiveness, often due to their remote location believed to remove them from these

implications (Richmond and Kotowicz, 2015). This assumption may or may not be true, and requires careful consideration. As local support is increasingly being recognised as vital in achieving conservation goals (Walpole and Goodwin, 2001), it is of paramount importance to fully understand the social implications of large MPAs, throughout both the planning phase and continued management. Failure to account for human dimensions has often led to conflict between resource users and conservation (Jones, 2002).

A prime and understudied example of the social implications a large MPA may have is the Mariana Trench Marine National Monument, which is owned and managed by the USA as federal waters, with consultation with the Commonwealth of the Northern Mariana Islands (CNMI) (Presidential Documents, 2009). The Mariana Trench Marine National Monument (henceforth called 'the monument') covers approximately 246,608km² (95,216 miles²) in total and is divided into three units (Presidential Documents, 2009). The Trench Unit is the largest, encompassing only the submerged lands of the Mariana Trench. The Volcanic Unit encompasses 21 designated volcanic features, and also only protects the submerged lands. Finally, the Islands Unit provides protection for the submerged lands and waters of the three northernmost islands: Asuncion, Maug, and Farallon de Pajaros (figure 1). The Island Unit is therefore the only unit to protect the water column as well as the sea floor.

The monument was established by presidential proclamation in 2009, by then-president George W Bush (Presidential Documents, 2009). At the time of its creation, there was some controversy over the location and size of the monument, particularly amongst indigenous peoples (Pew Charitable Trusts, Unpubl. Data, 2008). A survey funded by Pew Charitable Trusts found that people's largest concern was that the monument would prevent traditional cultural practices, such as fishing and access to the northern islands (*ibid*). Many residents of the CNMI claimed to have strong cultural attachments to these islands, which required rare but significant ventures to visit and fish the waters (Richmond and Kotowicz, 2015). These fishing trips are predominantly taken by those from the Chamorro and Carolinian indigenous groups (*ibid*). Due to the federal top-down approach used in imposing

restrictions, concerns over equity and ownership were also raised (*ibid*). As a result, in a ‘first-of-its-kind’ move, the decision to allow “traditional, indigenous fishing” within the monument was taken in the proclamation, and approved by the National Oceanic and Atmospheric Administration (NOAA, 2009). Currently, the monument is managed by federal agencies including NOAA and the U.S. Fish and Wildlife Service, with consultation with the CNMI’s government (Presidential Documents, 2009).

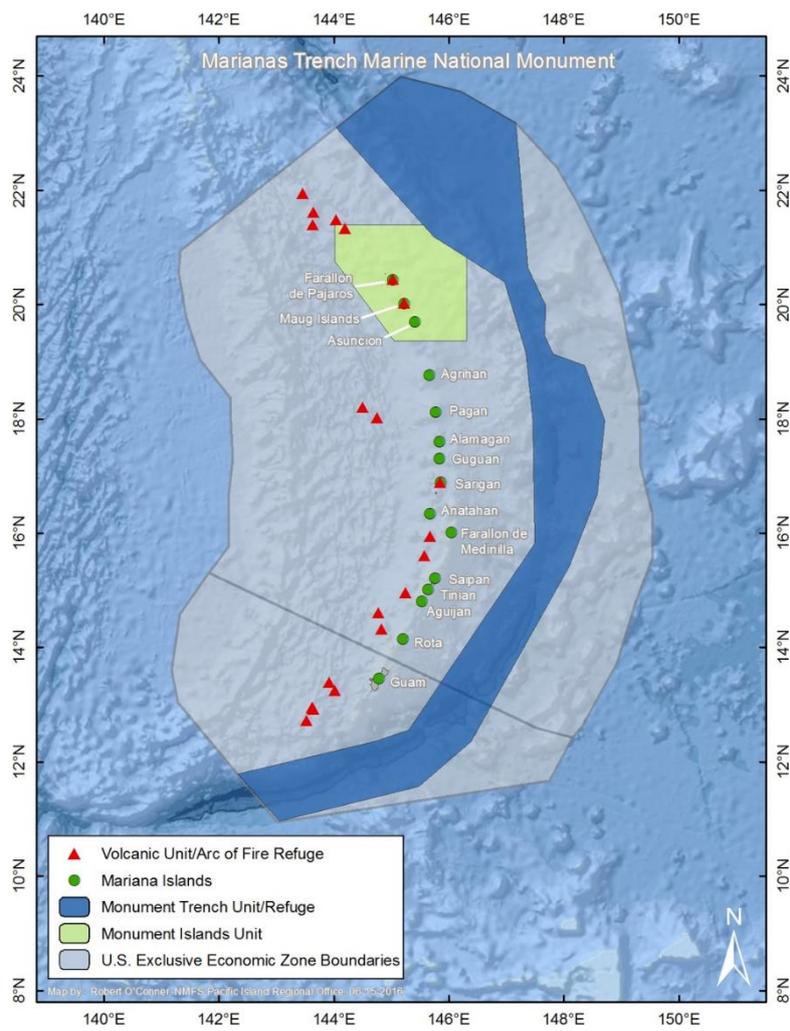


Figure 1. The Trench Unit (blue area), Islands Unit (yellow area), and Volcanic Unit (red triangles) of the Mariana Trench Marine National Monument. Image source: NOAA.gov/monuments science

In addition to the monument, the Mariana Islands have seven smaller MPAs strategically placed around the inhabited islands of Saipan, Tinian, and Rota (CNMI Department of Fish and Wildlife, 2007). These have been established over the past 23 years, with the first created in 1994 adjoining Tinian, and are fully controlled by the CNMI’s Department of Fish and Wildlife (Moretti, 2007). These smaller marine protected areas are all coastal and within the CNMI’s territorial waters.

Although it has been nine years since the Mariana Trench Marine National Monument was created, it continues to divide opinions between residents. Through interviews with the residents of Saipan, the largest of the Mariana Islands, I explore public opinion of the nearby marine protected areas. This is then compared to the same people's opinions on the Mariana Trench Marine National Monument, and any differences between the two explored. Finally, suggestions are made for how to best gain local support for future management and conservation efforts.

Methods

Information was collected by a semi-structured survey, which firstly asked respondents for opinions on the condition of the oceans and the importance of marine protection. Next, interviewees were asked specific questions about the seven small marine protected areas around the CNMI's three inhabited islands, followed by a series of questions centred around their attitudes towards the monument (see Appendix for the full survey). All respondents were verbally told their rights to withdraw at any point.

A total of 253 responses were gathered over a five-week period, averaging 15 minutes per survey. Of the 253 responses, 214 were collected verbally and 39 were collected via a self-administered online version of the survey. Participants were approached at random around the busiest areas of Saipan, and the questions were asked by the interviewer to minimise any misunderstanding. For consistency, the survey was only carried out if the participant was a US citizen.

Once completed, questionnaire responses were assigned a code and stored in a Microsoft Excel data sheet. Open questions were recorded directly as answered, and later grouped into similar sub-groups. For example, for the open question "who do you think should be responsible for decision-making within the monument?", responses were placed into the groups of local government, federal government, local people, non-governmental organisations, or a combination of several.

Data Analysis

A chi-squared test (χ^2) was used to examine whether respondents were significantly more likely to prefer one category in an answer over another (Hollander and Wolfe, 1973), such as in the question “Please indicate what should be the top priority for ocean planning around the Mariana Islands”. χ^2 was used when the data was ordinal, including the Likert scale used in many questions. For post-hoc testing on χ^2 analysis, a χ^2 contingency table was generated, before using the adjusted z-values associated with each variable to calculate the χ^2 values, and ultimately estimating the P-values (Beasley and Schumacker, 1995). The P-values were then compared against the Bonferroni corrected P-value for significance ($\alpha = 0.0063$). The formula $\sqrt{(p*(1-p))/n}$ was used to estimate the standard error of percentages, where p is the percent in question (Barde and Barde, 2012). A Kruskal-Wallis test was used to compare means across more than three independent groups of continuous data (Marusteri and Bacarea, 2010), such as comparing a person’s age with the percent of the CNMI’s ocean they felt should be protected. This was used when the data did not meet the criteria for an Analysis of Variance, namely the assumptions on normality. Similarly, Mann-Whitney U-tests were performed when comparing the differences between two continuous variables (Prybutok, 1989). Z-scores were used for testing significance between proportions (Rossi, 1985).

Results

Demographics of responses

Of the 253 survey responses, the three largest ethnicities were Chamorro (107 responses, or 42%), Filipino (53, or 27%), and Carolinian (37, or 15%) (see figure 2). The last census data reported that the largest ethnic groups were Filipino (35%), Chamorro (24%), and Carolinian (6.9%) (US Census Bureau, 2010^[1]). Although similar, only interviewing US citizens may explain the apparent underrepresentation of Filipinos and overrepresentation of Chamorros and Carolinians. 55% of respondents were male, and 45% female, very similar to the 52:48 ratio in the last census. The age of respondents ranged from 18 up to 85 (figure 2). 'High school or less' was the most common category of education, accounting for 54% of responses (136), which was followed by a BA/BS degree (58), AA (41), and ultimately MA/MS (18).

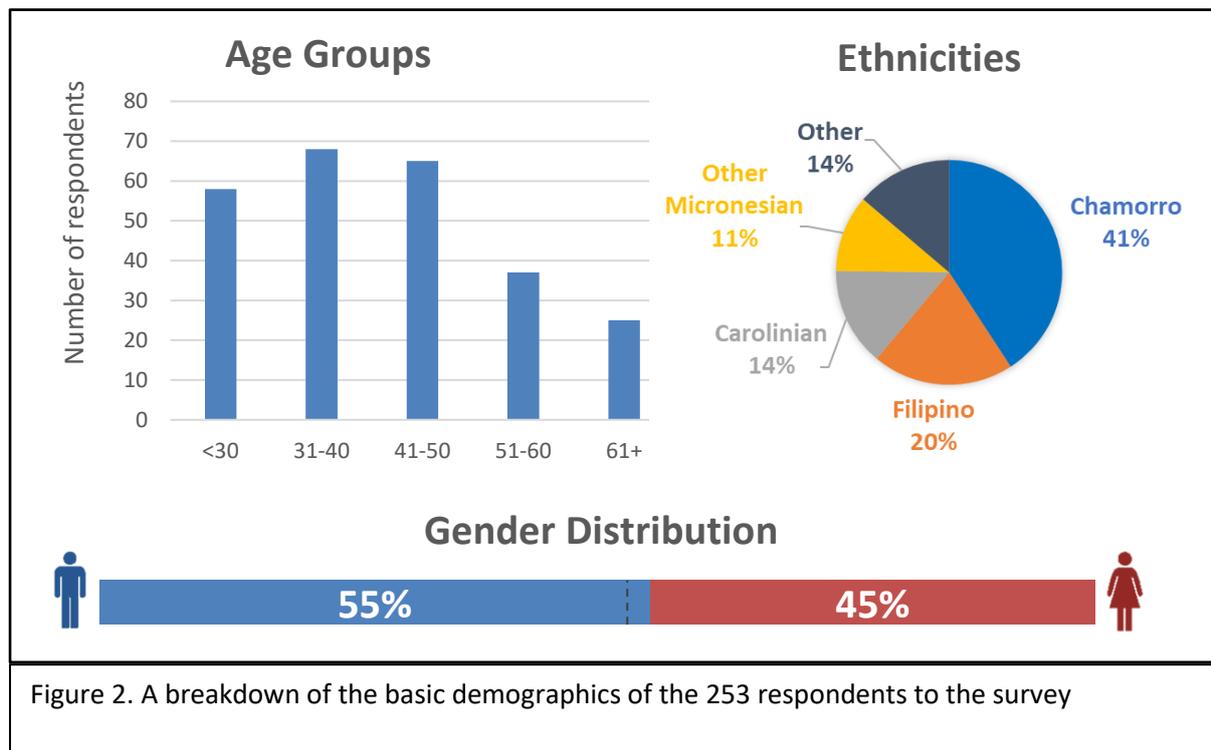


Figure 2. A breakdown of the basic demographics of the 253 respondents to the survey

Marine Protected Areas

Support for marine protected areas was consistently high, with 86% of respondents (217/253) saying they felt it was ‘very important’ to protect the oceans, and 59% (148/252) stating they “strongly support” the Mariana Islands having certain areas as marine protected areas. Furthermore, 63% (158/252) of people thought the oceans were not adequately protected, and 53% (133/253) thought the CNMI’s oceans have worsened over the past 10 years (figure 3). 66% (163/246) of those interviewed said they would like to see more marine protected areas, 27% (66/246) said the current amount is suitable, and only 7% (17/246) said they would prefer less. Opinions on exactly how much of the CNMI’s ocean should be protected ranged from 0% to 100%, with a mean average of 57% (median 50%) from all responses.

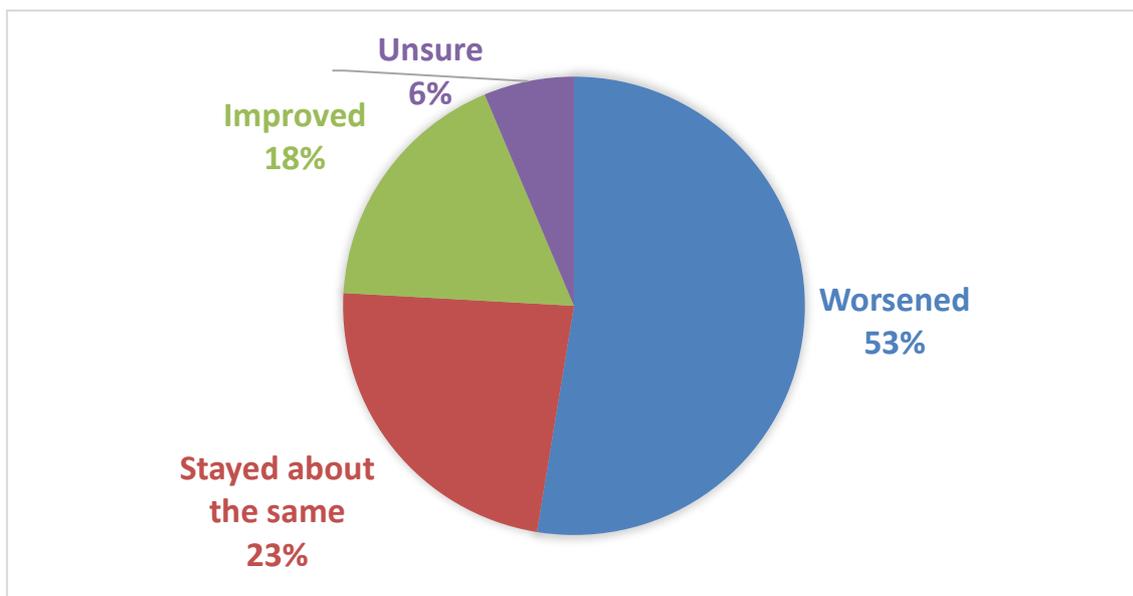


Figure 3. Responses to the question “Compared to ten years ago, how do you think the health of the CNMI’s oceans has changed?”

When asked to rank the most important priorities for ocean planning around the Mariana Islands, the most chosen ‘first’ priority by a significant margin was “To protect the fish, wildlife, and the health of the ocean” (χ^2 , d.f. = 4, P-value < 0.001). This was followed by “to protect historically and culturally important sites”. The most chosen ‘second’ priority was also “To protect the fish, wildlife, and the health of the ocean” (χ^2 , d.f. = 4, P<0.001) (see figure 5).

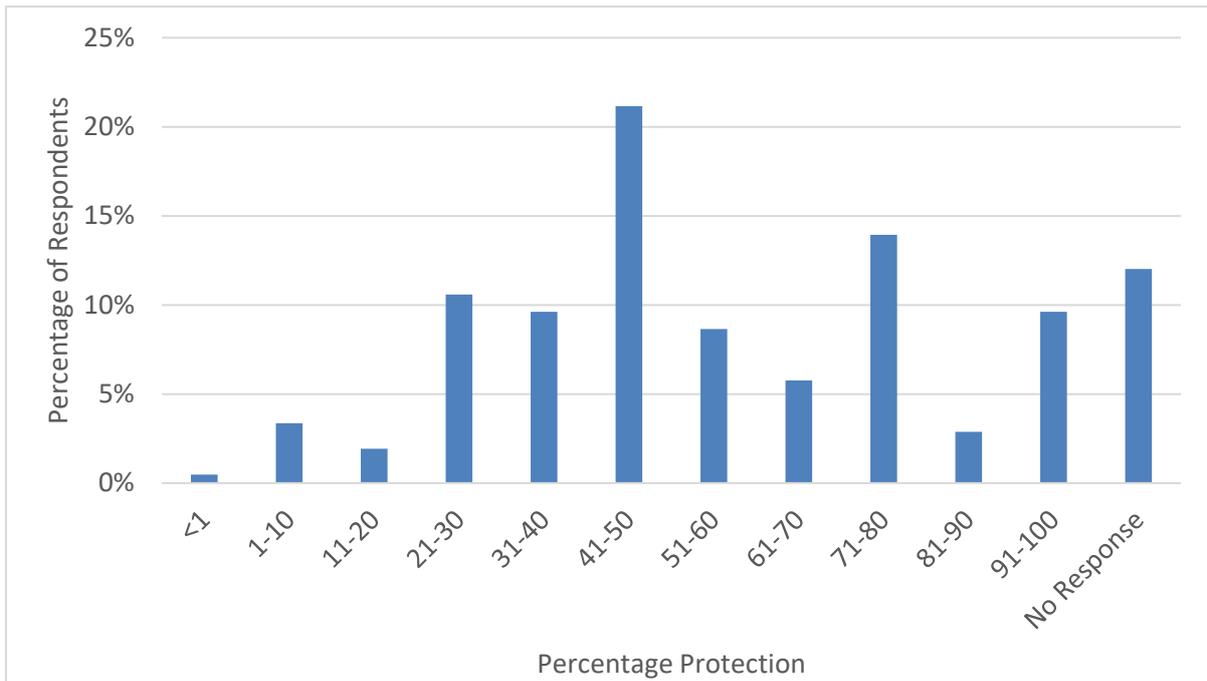


Figure 4. Percentage of Saipan's seas respondents thought should be protected.

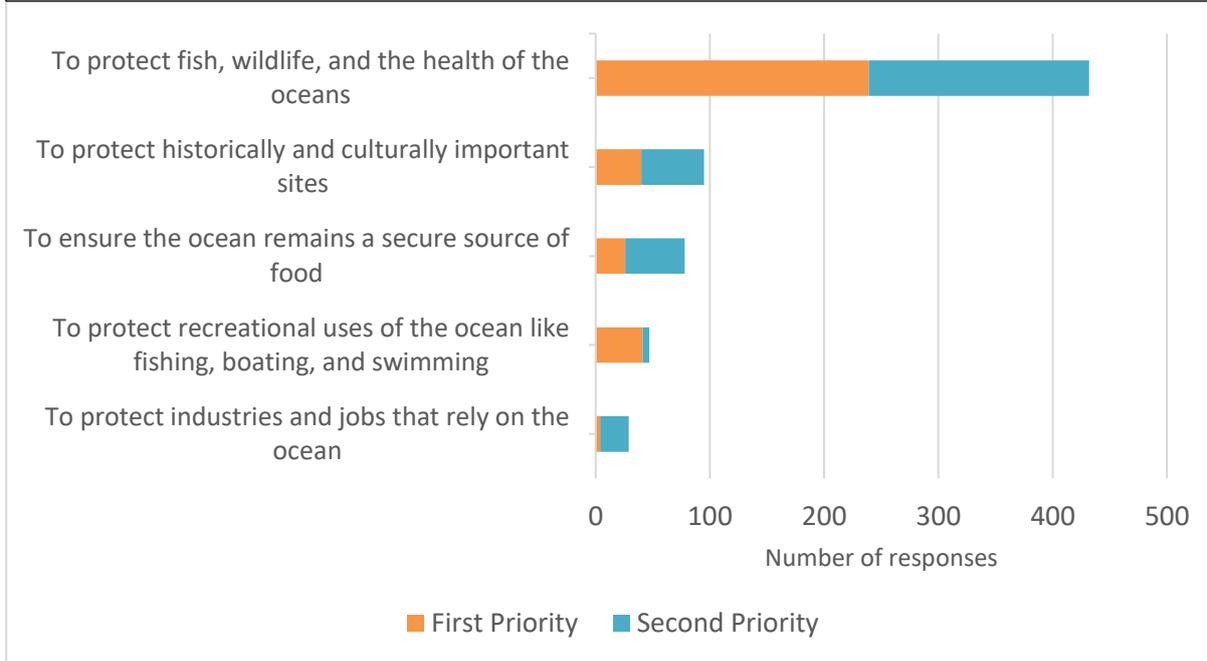


Figure 5. The most important priorities for ocean planning around the Mariana Islands, as voted by the 253 responses. Respondents were asked to choose their first priority (orange) and second priority (blue).

Despite overwhelming support for MPAs, 72% (180/249) of respondents believed that subsistence fishing should be allowed within the protected areas, particularly for indigenous peoples (Chamorro and Carolinians) (see figure 6).

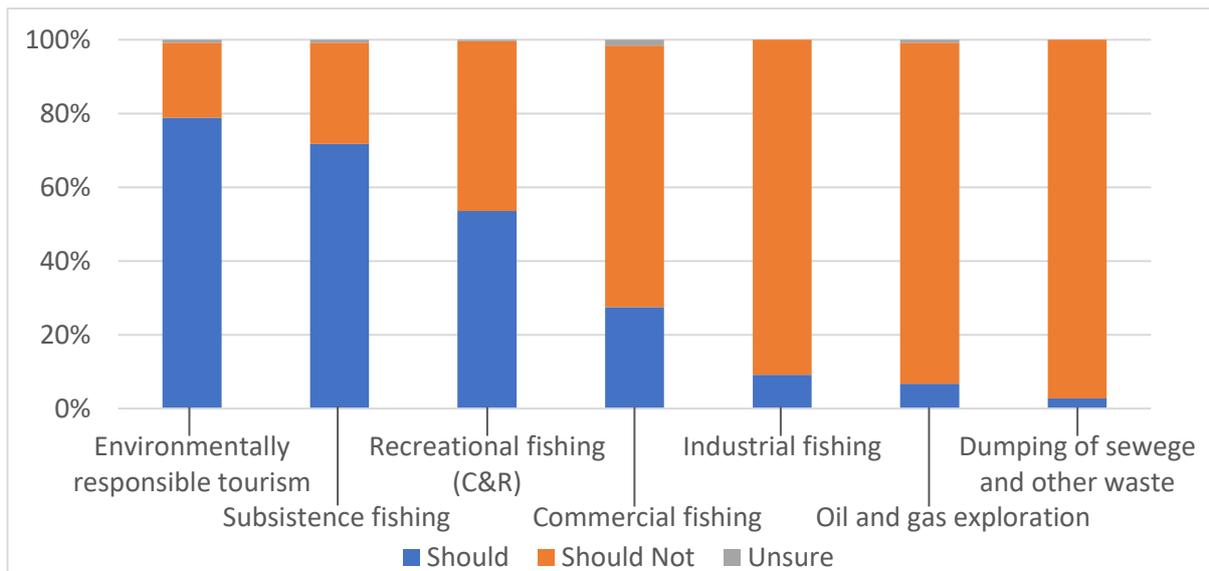


Figure 6. Responses to “Please indicate which of the following activities should or should not be allowed inside a marine protected area”.

The Mariana Trench Marine National Monument

68% (172/253) of people had heard of the Mariana Trench Marine National Monument, and of those, 69% supported it (118/172), 24% (42/172) did not, and 7% (12/167) were unsure. However, although over two thirds of those who had heard of the monument supported its existence, they were divided when asked about its effectivity in achieving its goals, with an average score of 2.7/5. Women were also significantly more likely to support the monument than men (χ^2 , $df = 1$, $P < 0.001$).

Opinions on the seven small marine protected areas were more positive than the monument. The majority of residents thought that protected areas were positive for the economy, culture, and the environment (figure 7a). When asked the same question about the monument however, the majority thought it was ‘neutral’ for the economy and culture (figure 7b). This change in opinions was significant across all categories (χ^2 , ‘Economically’: $df = 4$, $P = 0.016$, ‘Culturally’: $df = 4$, $P = 0.007$, ‘Environmentally’: $df = 4$, $P < 0.001$).

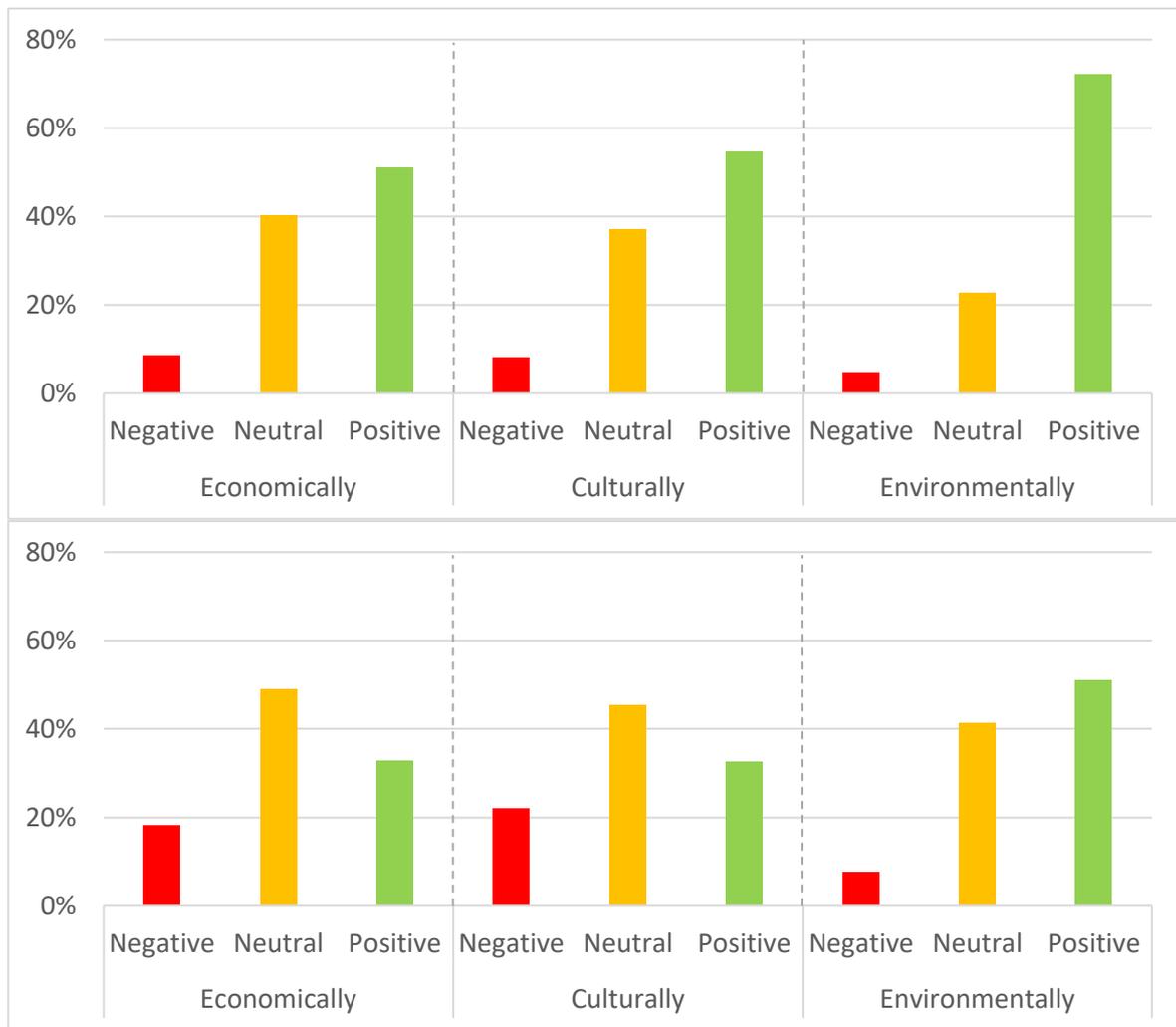


Figure 7. a) Perceived impacts of MPAs 'in general' on the economy, culture, and environment of Saipan. b) Perceived impacts of the monument specifically, for the same categories, on Saipan. A significant change in opinions was observed across all categories (χ^2 , 'Economically': $df = 4$, $P = 0.016$, 'Culturally': $df = 4$, $P = 0.007$, 'Environmentally': $df = 4$, $P < 0.001$).

When asked an open question about what could be improved regarding the monument, a recurring theme amongst those who answered was the need for more information regarding its implementation and successes. Concerns over equity and ownership were also commonplace, with many respondents wanting ownership to be handed over fully to the CNMI government. Other themes included desires for a visitor/education centre about the monument, and wanting more scientific research to occur. The majority of respondents (~69%, or 92/155) thought that decision making regarding the monument should be done predominantly by the CNMI government and their relevant departments (e.g. Coastal and Resource Management, Department of Fish and wildlife etc), with input from the local people, such as having representatives from different stakeholders, and allowing public votes on decisions. As

a generality, desire for more input towards management from local people featured strongly throughout the interviews. Approximately 23% (35/155) of people thought the federal government should be involved in decision-making to some extent. Similarly, the majority of people thought that the local government should be responsible for enforcement of the monument, although 40% of respondents (59/148) thought the federal government should feature here, significantly higher than in the decision-making process (χ^2 , df = 1, $P < 0.001$).

When asked whether they support President Trump's order to review the size of national monuments, including the Mariana Trench Marine National Monument, opinions were divided. Of the 189 responses to the question, 76 (41%) supported the executive act, whilst 90 (47%) did not and 23 (12%) were unsure. The difference between supporting the executive order or not was not statistically significant (X^2 , df = 1, $p > 0.05$), indicating that the greater preference for not reviewing monuments was by chance.

When looking into the sub-groups, several interesting trends arose. Firstly, both Carolinians and Chamorros had significantly lower support rates of the monument than all other ethnicities (Carolinians: Z-value = 2.53, $P = 0.01$; Chamorros: Z-value = 2.09, $P = 0.03$) (Fig.7). Despite this, support within these communities was high, with 65% of Chamorros and 56% of Carolinians in favour of the monument. However, Chamorros and Carolinians were more likely to believe that the monument had a negative effect on their culture than any other ethnicity (Z-Score = 2.65, $P = 0.008$), although only 26% of Carolinians and 16% of Chamorros felt this. There was no significant difference however between economy (Z-Score = 1.30, $P > 0.05$) or environment (Z-score = 1.80, $P > 0.05$) between the ethnicities. Despite this, when asked what percent of the CNMI's ocean they thought should be within a protected area, there was no significant difference between any of the ethnicities (Kruskal-Wallis, df = 9, $P > 0.05$).

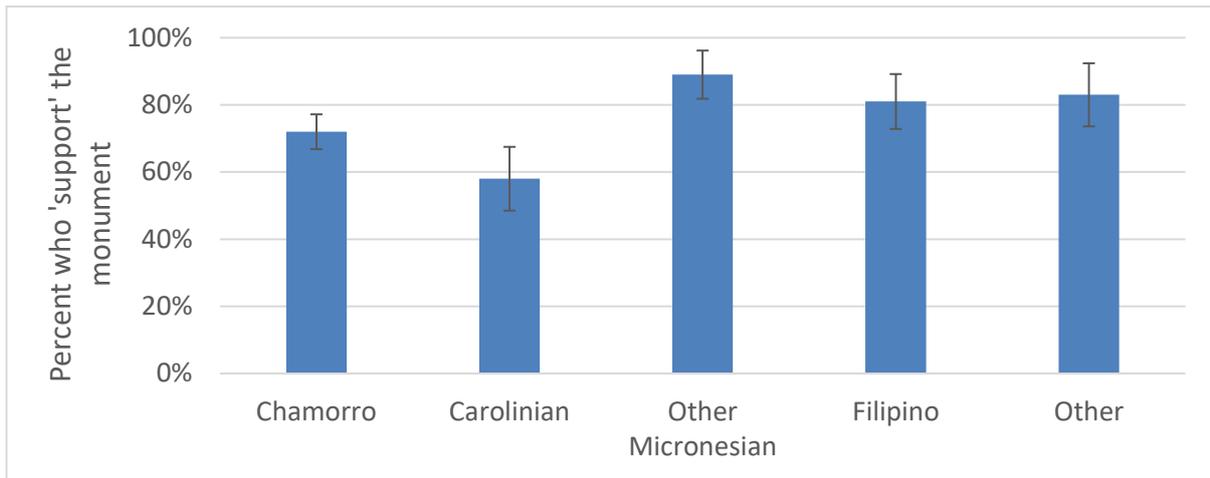


Figure 8. Percent of respondents (\pm SE) who support the monument separated by the largest ethnicities. Despite support being high across all groups, the Chamorro and Carolinian indigenous ethnicities are significantly less likely to support than other ethnicities (Carolinians: Z-value = 2.53, $P=0.01$; Chamorros: Z-value = 2.09, $P = 0.03$)

Support also significantly differed between age groups (X^2 , $df=8$, $p=0.001$), with those above 51 years old being significantly less likely to support the monument than all other ages (X^2 Contingency Table, $\alpha=0.0063$, $p<0.001$) (figure 9). Similarly, those who opposed the monument had lived on Saipan significantly longer, on average, than those who supported it (Mann-Whitney U, $W = 1181$, $P<0.001$). However, there was no significant difference between age groups and what percentage of the CNMI they thought should be protected (Kruskal-Wallis, $df = 8$, $p = >0.05$). The highest level of education completed did not significantly affect support for the monument or MPAs (X^2 , $df=2$, $P>0.05$).

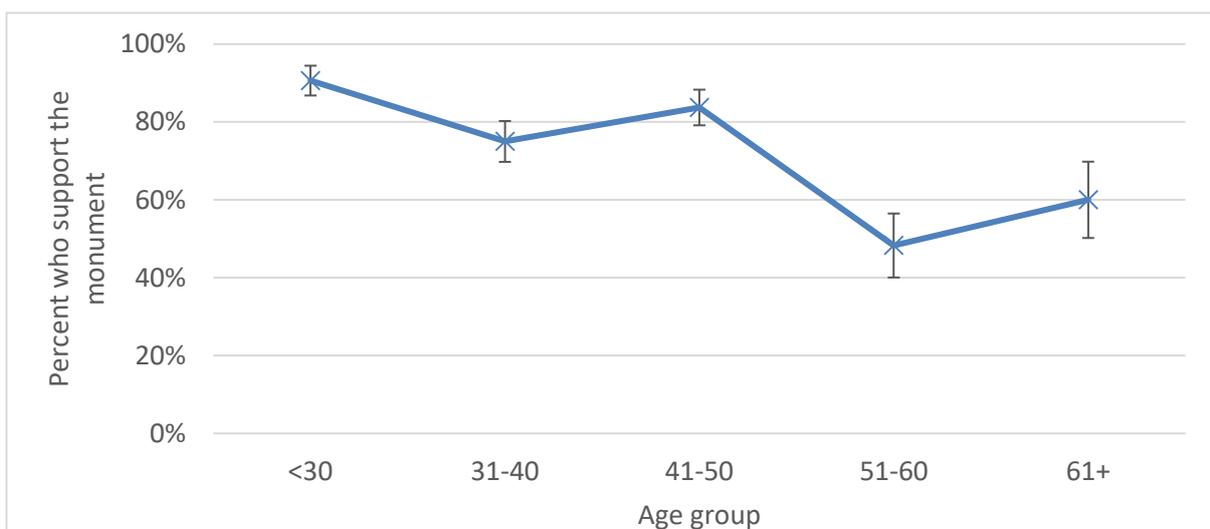


Figure 9. Percent of respondents (\pm SE) who support the monument separated by age group. Age groups above 51 are significantly lower than all other age groups (X^2 Contingency Table, $\alpha = 0.0063$, $p<0.001$)

Discussion

Marine Protected Areas

Support for the seven smaller marine protected areas was high on Saipan, with the vast majority of those interviewed stressing the importance of having protected areas around the CNMI. People were enthusiastic and engaged when talking about the ocean, often discussing at length how they felt about Saipan's waters. The majority of those interviewed (63%) believe there is not enough protection for the ocean and 86% rated the importance of protecting the ocean as 5/5 on the Likert scale, which clearly demonstrates this opinion. This is further confirmed by the result that over half of the respondents (59%) stated that they "Strongly Support" marine protected areas and 66% would like to see more of them. From a perspective of ocean conservation, this level of support is encouraging for MPAs, which are often controversial in their establishment (Christie and White, 2007).

Respondents were relatively pessimistic on the conditions of the CNMI's ocean. The majority of those interviewed believed the waters around Saipan are worsening, which is particularly relevant as a large proportion of these people spend much of their free time fishing and swimming (Beukering, 2006). Many of the fishermen interviewed were quick to mention how fish stocks have fallen over the years, with fewer and smaller edible fish today. One fisherman, aged 60, told of how what he used to catch in a day 30 years ago now takes him a week. A study by Cuetos-Bueno and Houk (2014) supports these claims, estimating that reef-fish landings have declined by up to 73% since the 1950's on the CNMI, as a result of the negative impacts associated with urban development. It is worth noting that the majority of fishing activity on Saipan is for personal consumption however, and thus difficult to track accurately (NOAA Pacific Island Fisheries Science Center, 2015^[3]).

Given that so many on Saipan engage in fishing, it is encouraging that such a high level of enthusiasm for MPAs was shown. Coastal MPAs are important in these conditions, as many studies have found that even small-scale artisanal fishing can have long-term impacts on reef ecosystems (Hawkins and

Roberts, 2004; Ruttenburg, 2001). In Saipan, anglers will eat most species. Whilst many of the popular target species are not threatened with extinction, such as the yellowfin goatfish (*Mulloidichthys vanicolensis*) (IUCN red-list 'least concern'), those threatened with extinction are also caught, including the ecologically important parrotfish (*Scaridae* Spp.) (Pers. Obs. 2017). Indeed, one angler told of how there is still a market for the endangered green turtle (*Chelonia mydas*) on Saipan.

As over 63% of respondents thought that the oceans were not adequately protected, it is unsurprising that when asked what percent of the CNMI's ocean they thought should be protected within a MPA, the average response was 57% (figure 4). This is much higher than the current level of protection, which is approximately 0.21% in territorial waters (Marine Conservation Institute Sea States Report, 2013) and approximately 4.3% in the U.S. EEZ surrounding the islands (Islands Unit/EEZ = 16,405 mi² = 4.3%).

The finding that respondents in Saipan want more of the ocean to be protected is similar to other studies looking into public expectations of marine protected areas. For example, in a study in the UK, 234 people were asked how much of the country's waters they thought should be protected. When the distribution of these responses was compared to the findings on Saipan, remarkable similarities were shown (figure 10). To highlight this, the findings of Hawkins *et al.*, (2016) are overlaid with those

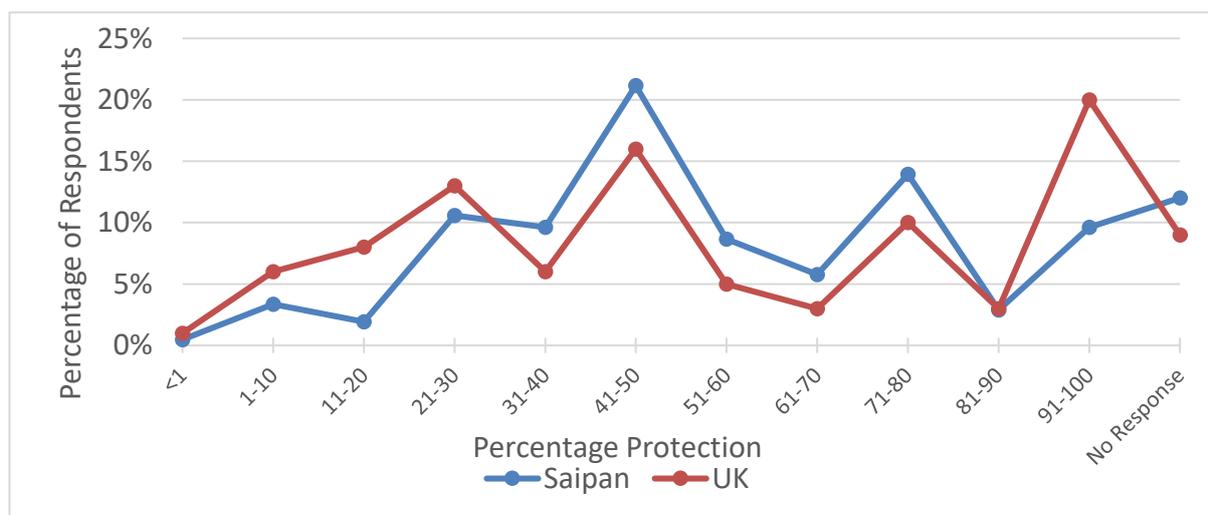


Figure 10. Percentage of Saipan's seas respondents thought should be protected (blue), overlaid with findings from a similar study carried out in the UK (red)(UK data: Hawkins et al., 2016)

found on Saipan's. Perhaps this underlines a more widespread trend of high support for marine conservation, and ultimately governmental conservation efforts lagging behind the desires of the public.

These findings on attitudes towards marine protected areas may be of particular interest to efforts to establish more protected areas around the CNMI, with the vast majority of the public being in favour of them. As the majority of the public support increasing the coverage of protected areas, the CNMI government should focus more effort on establishing new marine protected areas, with what appears to be the support of the majority of its population. In this respect, the CNMI government could bring its marine management more in line with public expectations. The support was not unanimous however, and several legitimate concerns were raised regarding the current MPAs around Saipan. Several respondents believed that they have fished the waters sustainably for many years, and it is large scale industrial fisheries that should be targeted when conserving the ocean, rather than small-scale subsistence fishers. It is worth noting however that coastal subsistence fishing is estimated to remove more than twice the volume of fish than coastal commercial fishing in Saipan (350 tonnes and 142 tonnes respectively), and thus is likely having a significantly larger effect on fish populations (NOAA Pacific Island Fisheries Science Center, 2015^[3]).

Mariana Trench Marine National Monument

When asked specifically about the Mariana Trench Marine National Monument, the majority of the public supported its existence (69%). Interestingly, this suggests that support is now higher than when the monument was being established, with those who support the monument increasing from 46% in 2008 (Pew Charitable Trusts, Unpubl. Data) to 69% today. Furthermore, across all ethnicities support remained above 50%, often being much higher (figure 8).

Opinions on the monument however did differ from the smaller, coastal MPAs in certain aspects. This was most pronounced when people were asked what effect they thought the monument had on Saipan's economy, culture, and environment (figure 7). Whilst the majority had rated the smaller MPAs positive across all three categories earlier on in the survey, opinions on the monument shifted significantly away from this. 'Neutral' became the predominant answer, with a significant increase in 'negative' answers in response to the culture. Despite this shift in attitudes however, 'negative' was still the least selected option across all categories.

This shift in opinions highlighted a deeper trend observed throughout discussions with local people. Whilst the majority support the monument, in practice many were concerned about certain aspects of its creation and management. The most common, reoccurring theme in discussions were concerns relating to equity and ownership of the land. These are likely to have arisen as a result of the top-down nature of the monuments creation (i.e. presidential proclamation), and despite being federal territory since 1983 (Presidential Proclamation 5030, 1983), some on Saipan were concerned that the US was overreaching itself by implementing restrictions on local fishing.

It is interesting that concerns were raised over fishing rights, especially given fishing trips to the northern islands are rare (Richmond and Kotowicz, 2015), and that under the guidelines of the proclamation "traditional indigenous fishing" is still allowed. Whilst it's true restrictions are placed on making a profit from the sales of fish, previously doing this was extremely rare, with fewer than 60 historically recorded trips making a profit from fish sales (*ibid*). Furthermore, the islands within the Island Unit have been designated as nature reserves since 1978, ensuring they are used "only for the protection of natural resources" (First Const. Conv., 1985^[4]). When this is combined with their remote location taking several days to travel to, it is understandable that they rarely receive any form of visitors. This is highlighted by the fact there has been no applications for a fishing permit since the monument was created in 2009 (Chow, 2017, NOAA Habitat Conservation Branch Chief, Pers. Comm.).

It is somewhat paradoxical therefore that some of those interviewed felt so strongly about the monument's presence. It is also often forgotten that only the Islands Unit protects the water column. Both the Volcanic Unit and the larger Trench Unit only protect the submerged lands, and as a result the majority of the monument would not prevent the methods of fishing typically used by the residents of the CNMI (Amesbury and Hunter-Anderson, 2003).

It was a common misconception that the monument prevented fishing entirely. This may explain why people of Chamorro and Carolinian ethnicity were more likely to rate the monument as negative to their culture, as a result of believing it is preventing these fishing ventures. Similarly, this would explain why older generations were concerned the monument was contributing to culture loss. Dispelling pervasive misconceptions such as this may be important to retaining support for the monument, as false concerns amongst locals has historically had negative impacts on conservation success (Agardy et al., 2011). Several respondents also thought that the monument was being illegally fished by other nations, and therefore the CNMI is 'missing out' on catches. There is no evidence however to suggest that significant levels of illegal fishing are occurring in this area of the world (Agnew et al., 2005).

Concerns over ownership of the territory led a large proportion of those interviewed to call for the monument to be handed over fully to the CNMI government and its relevant authorities, such as Coastal Resource Management (CRM) or the Department of Environmental Quality (DEQ). This will almost certainly never happen however, as the land is federal property and the CNMI a US territory, which must therefore abide by the Commonwealth Constitution^[4]. Instead, the CNMI may be successful if they continue to push for co-management of the monument, in a similar way to the agreement with Hawaii and the large-MPA Papahānaumokuākea. Papahānaumokuākea is cooperatively managed by four co-trustee's, which includes Hawaii's Department of Land and Natural Resources (DLNR) and the Office of Hawaiian Affairs, who represent the indigenous cultures^[5]. Whilst

Hawaii is a US state and the Mariana Islands a territory, it is feasible that a similar agreement could be reached at some point in the future.

Pushing for a more inclusive advisory board would be another feasible option for the CNMI to take increased ownership. Currently, the advisory council includes just three officials from the government of the CNMI who are selected by the Secretaries of Commerce and Interior (NOAA.gov^[6]). This method of local representation is far inferior to those seen in Hawaii, with arguably underrepresentation of the local people. By pushing for a more diverse and representative advisory board, the indigenous cultures would have a fairer share of input into management discussions. Not only would this provide more influence from the indigenous perspective, but it would also be likely to appease some of the equity concerns discussed by the Chamorros and Carolinians, the most likely groups to oppose the monument. Nevertheless, despite the minority being more vocal, the majority of those interviewed supported the monument and the protection associated with it.

Something that would be likely to further increase support of the monument is the building of a long overdue visitor centre, which would act as a permanent form of recognising the monument and communicating its purpose and successes. This is advised for several reasons. Firstly, many respondents said that whilst they want to support the monument, they only hear of it when it is in the news, mostly for controversial reasons. A visitor/education centre, or 'Multipurpose Centre' as it has been referred to in draft management plans, (e.g. Mariana Trench Monument Advisory Council [MTMAC] meeting minutes, April 2014), would serve as a way of advertising the monuments benefits and successes. Secondly, a visitor/education centre was one of the very first 'benefits' that was advertised to the public when the monument was being established, paid for by federal funds (MTMAC meeting minutes, September 2012). Currently, this is yet to happen and was often used as an example of the failings of the monument promises throughout the survey. If efforts to secure a visitor centre are increased, it would act as a physical, observable benefit of the monument, whilst

simultaneously providing other associated benefits to the area such as employment and tourism. There are plans to apply for 'marine sanctuary' status sometime in the near future, which would be likely to speed up the process of being granted federal funds for a visitor centre (Villagomez, 2017, Pew Bartarelli Ocean Legacy, Pers. Comm.).

In many ways, the fact the US is yet to publish a completed management plan epitomizes the early management of the monument. For Papahānaumokuākea, a management plan was published after just two years of its creation (Papahānaumokuākea Marine National Monument: Management Plan, 2008). It is disappointing that this has yet to materialise in the 9 years the Mariana Trench monument has existed, as publishing such a document would set realistic and achievable goals to focus activity and resources.

Concluding remarks

Pushing for a more inclusive advisory board, with an ultimate aim of co-management based on a similar model to that used in Hawaii is strongly advised for the CNMI government. This would give a fairer and more representative voice to the local government and indigenous ethnicities, and would be likely to address much of those concerns voiced throughout these interviews.

Whilst it is disappointing that the monument has missed several opportunities to demonstrate the benefits to the CNMI, such as the visitor centre, it is encouraging that support for it remains high, having increased since a survey carried out before the monument was created (Pew Charitable Trusts, Unpubl. Data. 2008). If support for the monument is maintained, and better management incorporated, the benefits associated with it can only increase.

The combined actions discussed may have a significant impact in further improving the public image of the monument, which is already high. The better representation of the indigenous cultures may also improve its reputation amongst those with the lowest support rate, including Chamorros and Carolinians. Whilst the initial nine years may not have been managed the most effectively, the establishment of the monument was a huge success for conservation. If properly managed, the benefits it will provide to the environment, and also the socio-economics of Saipan will be significant. The local and federal government of the CNMI need to do more however to better represent the expectations of the local people.

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Web-links

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Appendix

Questionnaire attached overleaf

Information about yourself

(Circle the correct answer)

1. Are you a US citizen? **Yes** **No** 2. Gender: **M** **F**
3. What is your age? **18-30** **31-40** **41-50** **51-60** **60+**

4. What is your occupation?
(please write)

5. What is the highest level of education you have completed? **High School or less** **AA** **BA/BS** **MA/MS**

6. What is your ethnicity? **Chamorro, Carolinian, Other Micronesia, Mainland American, Korean, Japanese, Chinese, Other**

7. How long have you lived in Saipan?

Part 1/4. The Health of the Oceans

1. How would you rate the health of CNMI's oceans?	Very Unhealthy 1 2 3 4 5 Very Healthy
2. Compared to ten years ago, how do you think the health of CNMI's oceans has changed?	Worsened Stayed about the same Improved Unsure
3. Do you think it is important, or not important, to protect the world's oceans?	Not important Very Important Unsure 1 2 3 4 5
4. Do you feel the oceans as a whole are adequately protected?	Yes No Unsure
5. Which of the following options do you think should be a top priority for ocean planning around the Mariana Islands? (Rank your top two)	<input type="checkbox"/> 1. Protecting fish, wildlife, and the health of the ocean environment <input type="checkbox"/> 2. Protecting industries and jobs that rely on the ocean <input type="checkbox"/> 3. Protecting recreational uses of the ocean like fishing, boating, surfing, and swimming <input type="checkbox"/> 4. Protecting historically/culturally important sites <input type="checkbox"/> 5. Ensuring the ocean remains a secure source of food

Part 2/4. Protected Areas

A Marine Protected Area (MPA) is an area of the ocean where human activities such as commercial fishing are strictly regulated.

6. Do you know of any marine protected areas in the Mariana Islands? Can you name them?					
7. Do you support or oppose the Mariana Islands having certain areas of the ocean within their territorial waters as MPAs?	Strongly Oppose 1	2	3	4	Strongly Support 5
8. How much importance should be placed on each of the following perspectives when making decisions about MPAs?	Scientific Evidence People who live/work in coastal areas Traditional knowledge of local people Conservation groups Commercial fishing companies	A lot A lot A lot A lot A lot	Some Some Some Some Some	A little A little A little A little A little	None None None None None
9. Please indicate which of the following activities should or should not be allowed in an MPA	Industrial fishing Commercial fishing Recreational fishing Subsistence Fishing Environmentally-responsible tourism Oil and gas exploration Dumping of sewage and other waste	Should Should Should Should Should Should Should	Should not Should not Should not Should not Should not Should not Should not		
10. Which of the following do you feel the main purpose of a marine protected area should be? (rank your top two)	<input type="checkbox"/> 1. To protect fish, wildlife, and the health of the oceans <input type="checkbox"/> 2. To ensure the ocean remains a secure source of food <input type="checkbox"/> 3. To protect industries and jobs that rely on the ocean <input type="checkbox"/> 4. To protect recreational uses of the ocean like fishing and boating <input type="checkbox"/> 5. To protect historically/culturally important sites <input type="checkbox"/> 6. To provide educational and research opportunities				
11. Would you like to see more, the same, or less MPAs around the Mariana Islands? What percentage of CNMI's ocean do you think should be protected?	More The same Less Percent:				

12. Do you think marine protected areas in general are:	Economically:	Negative	Neutral	Positive
	Culturally:	Negative	Neutral	Positive
	Environmentally:	Negative	Neutral	Positive

3/4 Mariana Trench Marine National Monument

13. Do you know of the existence of the Mariana Trench Marine National Monument?	Yes	No	14. Do you support the existence of the monument?	Yes	No		
15. What effect has the monument had on you personally?	Positive, no effect, neutral						
16. For Saipan, do you feel the creation of the monument has been:	Economically:	Negative	Neutral	Positive			
	Culturally:	Negative	Neutral	Positive			
	Environmentally:	Negative	Neutral	Positive			
17. How do you think the Monument has impacted employment on Saipan, if at all?	It has reduced employment	No impact	It has increased employment				
18. What do you feel is the intended purpose of the monument? (tick all that apply)	<input type="checkbox"/> 1. To protect fish, wildlife, and the health of the ocean <input type="checkbox"/> 2. To protect the health of fish stocks to maintain populations outside of protected areas <input type="checkbox"/> 3. To protect industries and jobs that rely on the ocean <input type="checkbox"/> 4. To protect recreational uses of the ocean like fishing and boating <input type="checkbox"/> 5. To protect historically/culturally important sites <input type="checkbox"/> 6. To provide educational and research opportunities <input type="checkbox"/> 7. To meet international conservation goals <input type="checkbox"/> 8. A presidential legacy manoeuvre						
19. How effective do you think the monument is in achieving its goals?	Very ineffective	1	2	3	4	5	Very effective
20. Is there anything you feel could be improved or changed with the design and management of the monument?							
21. Who should be responsible for <u>decision-making</u> within the monument?							
22. Who should be responsible for <u>enforcement</u> within the monument?							

PRESIDENT TRUMP HAS RECENTLY ORDERED A REVIEW OF MANY NATIONAL MONUMENTS. THE MARIANA TRENCH MARINE NATIONAL MONUMENT IS INCLUDED IN THIS.

23. Do you support President Trump's executive order to review large National Monuments?	Yes	No
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24. There are plans to overlay the monument with a 'Marine Sanctuary' sometime in the near future. Are you aware of the differences between these?	Yes	No	25. Are you in favour of this action?	Yes	No
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26. What are your primary sources of information regarding protected areas around the CNMI	<ol style="list-style-type: none"> 1. Local News Papers (Saipan Tribune, Marianas Variety etc) 2. Local Radio 3. Local TV (KSPN) 4. NGO's (e.g. Pew Charitable Trusts, Micronesia Islands Nature Alliance) 5. Social Media 6. Government Agency (e.g. CRM)
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27. What is your opinion on the following people/organisations in regard to MPAs?

	STRONGLY DISLIKE	DISLIKE	NEUTRAL	LIKE	STRONGLY LIKE	DON'T KNOW
1. National Oceanic and Atmospheric Administration (NOAA)	1	2	3	4	5	6
2. Governor Ralph Torres	1	2	3	4	5	6
3. Pew Charitable Trusts	1	2	3	4	5	6
4. US military	1	2	3	4	5	6
5. Delegate Sablan	1	2	3	4	5	6