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Feasibility of a marine interpretation centre in Isle of Arran (Scotland), based on visitors' and residents' expectations and marine centres around the world.

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Declaration

I agree to work within Edinburgh Napier University's Academic Conduct Regulations which require that any work that I submit is entirely my own and has not been submitted for another assignment. The regulations require me to use appropriate citations and references in order to acknowledge where I have used any materials from any sources. I am providing my student matriculation number in place of a signed declaration in order to comply with Edinburgh Napier University's assessment procedures.

List of abbreviations

COAST – Community of Arran Seabed Trust

MPA – Marine Protected Area

NTZ – No Take Zone

MIC – Marine Interpretation Centre

CALMAC – Caledonian MacBryane

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Abstract

Nowadays the marine environment is facing dramatic changes as a result of increasing economic pressures. The consequences of these alarming changes are visible through the destruction and degradation of the marine ecosystem and the endangered status of a high number of its species. Therefore, international and regional organizations have created some management tools to tackle these issues and restore the remaining ocean life. In Scotland, the panorama is not different, hence, the government is designating Marine Protected Areas (MPA) and Marine Reserves in order to recover the marine habitats to bring back the species diversity and abundancy, for instance, in the Isle of Arran a No Take Zone (NTZ) and a MPA have been designated recently.

Isle of Arran is part of the fifth of Clyde, one of the most degraded habitats in the United Kingdom. Like fishing, their traditional economic sectors have declined significantly, while tourism has emerged and has become the fastest growing and important sector of the island. Therefore, a community organization named COAST have successfully proposed the marine management tools that this island now enforces, and in order to increase the potential of the NTZ and MPA, this organization is hoping to create a Marine Interpretation Centre (MIC), hence, this study is focus on understanding its feasibility, based on visitors' and residents' expectations and marine centres around the world.

Research methods such as questionnaire and focus groups were implemented to study aspects regarding the involvement of residents' and visitors' into marine activities, their knowledge about the marine management tools and expectations for the MIC and socio-demographics characteristics. The results showed that the most important marine based activity involve walking along the coast; over 60% of respondents were interested in the MIC suggested topics and activities and 90% demonstrated willingness to pay. Moreover, the discussion and conclusion highlight the general trends of how the research aspects interact between each other and the socio-demographics features and summary of other marine centres globally. Ideally, the outcome of this study can contribute to the planning process of the MIC and the tourism of Arran.

1. Introduction

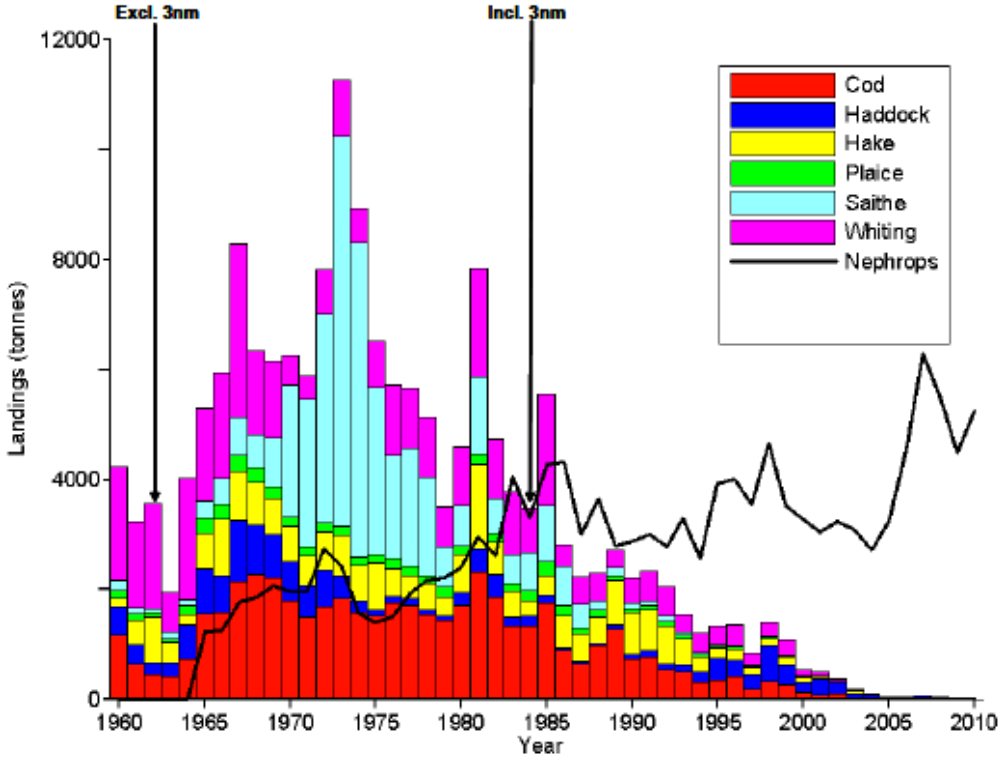
The existence of increasing attention from international and national organizations into our ocean ecosystems is evident, mainly to the changes that it presents in the species that inhabit in it (Fenberg*, et al.*, 2012; Pastres and Solidoro, 2012; Marinesque, et al., 2012). Coastal ecosystems support many activities such as fishery, tourism and urbanization sprawl but their continuing intensification is coming to its limits and if urgent measures are not taken up their impacts will be irreversible. Radical decrease or disappearance of species, eutrophication, pollution, climate change and habitat degradation are some of the most common issues that the marine environment is facing nowadays (Xu, *et al.,* 2015; Angulo-Valdes and Hatcher, 2010; Atkins *at el.,* 2011). In Europe the reality is not different, for many decades European oceans have been exposed to exhaustive extraction of its marine commercial species which use different techniques that maximize economic benefits without a long term mentality (Fenberg, *et al*., 2012; EC, 2014).

In order to improve the general status of the marine environment, the European Union member states launched in 2008 the Marine Strategy Framework Directive (MSFD), to create initiatives and policies that can allow a sustainable economic development while enhancing ocean life (Fenberg, *et al.,* 2012). However, it is disappointing that these measures have not been implemented earlier when the marine food web was still diverse (Fenberg, *et al*., 2012). The case of the Firth Clyde inlet in the west of Scotland is an example of the dramatic changes that the marine environment is suffering worldwide and became famous after a BBC report concluded that it was the most degraded marine environment in the United Kingdom (BBC Springwatch, 2007; Howarth, *et al.,* 2013). Many direct and indirect factors have contributed to the poor status of the Firth Clyde but undoubtedly its intense fishery exploitation is the most responsible.

In 1960, the Firth of Clyde marine environment was rich and diverse with an abundance of fish commercial species such as herring (*Clupea harengus*), cod (*Gadus morhua*), marckerel (*Rastrelliger brachysoma*), whiting *(Merlangius merlangus)* and many others. These economies no longer exist (Bock, *et al.,* 1999; Thrustan and Robert, 2010). These areas suffered the “bloom and bust” pattern of the 19th century when fishery was artisanal, later incorporated by big fleets with

modern technology such as trawls and dredges, causing a 90% declining of the fish species and incrementing the nephrons of commercial species as illustrated in **Figure 1** (Howarth, *et al.,* 2013; The Scottish Government, 2012).

Figure 1: Transformation of the fishery industry in the Firth of Clyde since 1960



Adapted from (The Scottish Government, 2012; Thurstan and Robert, 2010) by author.

It is staggering how the weight and values of the fish species changed in a couple of decades, for instance 1985, recorded a 60% landing weight with a value of 37%, but in 2008 the landing weight was just 2% with a value of 0.5% (The Scottish Government, 2012; Thurstan and Robert, 2010). These devastating records influenced the Scottish Government to integrate some management tools to find solutions that could tackle these issues to save, maintain and improve the marine life left (Coleman, *et al.,* 2013). The most well-known management tools are the Marine Reserves and Marine Protected Areas (MPA), the former is characterized by the prohibition of species extraction, acting as an insurance policy to provide positive advantages to the marine environment and its economies, while the latter is where different regimes apply for fishery, water disposal, tourism, shipping and other

activities in order to create a sustainable environment (Guidetti, *et al.,* 2008; Fenberg, *et al.,* 2012).

In particular, the MPA's have received a satisfactory acceptance by many groups such as scientists, ecologists, politicians, fishermen and communities, agreeing that it is of good initiative to solve the many conflicts of interest between all the affected parties (Hilbron, *et al.,* 2004; Xu, *et al*., 2015). Therefore, in 2010 the amount of marine conservations reached 5000 worldwide, but unfortunately the size of more than 50% of them is around 1 to 10 km^2 and they suffer of a lack of monitoring and enforcement policies to achieve the results expected (The Scottish Government, 2012; Thurstan and Robert, 2010). So far, some MPA's have resulted in positive changes such as a raise in key biological characteristics in species (Fenberg, *et al.,* 2012), improving the restoration of over-exploited stock and its habitat (Fenberg, *et al.,* 2012; Xu, *et al.,* 2015) and enhancing the benefits of fishery management (Guidetti, *et al.,* 2008), however, there are topics that haven't been addressed like its level of effectiveness (Xu, *et al.,* 2015), its reduction of harmful human impacts as half of the world's human population are coast inhabitants (Cicin-Sain and Belfiore, 2005) and the assurance that the MPA's goals are connected with proper plans, policies, implementation rules, investigation and education (Xu, *et al.,* 2015).

Although the MPA's management involve many different aspects, one of the most important is education (Leisher, *et al.,* 2012; Watson, *et al.,* 2015). Education is considered as an indispensable tool which benefits biodiversity, providing protection, spreading knowledge to the surrounding people and transforming the attitudes of locals, hence, the success of a MPA should be connected with appropriate strategies for education (Leisher, *et al.,* 2012; Watson, *et al.,* 2015). Leisher, *et al.,* (2012). Studies in the Islands of Misool and Koriau in Indonesia summarized the advantages that education programs can provide to the MPA's, proving that education transforms positively the behaviour of villagers towards biodiversity protection, improving their understanding about nature and conservation benefits, highlighting the relevance of younger members as they were more willing to accept changes and make villagers work as a community.

Education is also connected with the interpretation concept, which differs from the education because the audience is informal, voluntary, composed of people that are

visiting an specific place (locals or tourist) and inspire excitement and curiosity (Luck, 2015, Stewart, *et al.,* 1998; Jacobs and Harms, 2014). Moreover, interpretation "aims to make the visit a richer and more enjoyable experience" (Luck, 2015), creating a better understanding and empathy of a place emphasizing its relevance and going beyond the expectations of the visitors (Stewart, *et al.,* 1998; Jacobs and Harms, 2014). Jacobs and Harms (2014) researched different types of interpretations in regards to a whale tour and found that when the interpretation was focused in emotions it influenced the conservation's intention, promotion and increased participants will to donate money, proving the crucial benefits that interpretation can provide to reach the MPA's goals. Other interpretations services can be provided through exhibition panels, different guiding activities, information sheets and visitor centres (Jacobs and Harms, 2014).

In order to take advantage of the interpretation benefits, the Community of Arran for the Sea-bed Trust (COAST) is interested in understand the practicability of creating a marine interpretation centre in the newly designated MPA in the south of Isle of Arran, part of the Firth of Clyde, to increase the support among locals and tourists, promote the changes that the marine environment is receiving and publicize future benefits the economy can obtain in the future. This MPA was created in 2014 and it contains a small No Take Zone, designated in 2008 in which recent research has found positive recovery of the benthic communities, serving as a nursery for the majority of species that inhabit in these waters (Coleman, *et al.,* 2013 and Howarth, *et al*., 2015; Gormley, *et al.,* 2014; COAST, 2015). Therefore, this study seeks to provide a guidance and options of the different services and facilities this marine interpretation centre could have, taking in consideration locals and tourist expectations and internationals and nationals marine centres. Also, this centre could help to meet the growing demand of tourism activities in coastal areas (Needham and Szuster, 2011).

Tourism has become one of the most expanding and diversified economic activities, tourists are changing traditional tourism motivations such as sun and beach to other interpretations related to stimulating activities such as learning, exploring and discovering (Beard and Ragheb, 1983). For example, tourists that participated in whale and dolphin tours in New Zealand agreed that their satisfaction rates can

increase if they received more educational information about the marine wildlife instead of vague facts (Luck, 2015).

1.1 Interpretation centres

Educational information can be provided in interpretation or visitor centres, whose main functions can involve relevant knowledge or a specific topic that improves the visitor's experience, controls physical pressures in fragile environments; substitutes inaccessible places with media displays and promotes and orientates the main attractions of the area (Fallon and Kriwoken, 2003). Also, environmental education has helped to promote some marine issues such as oil spills, litter and plastic, hence, education and interpretation are essential to comprehend and maintain the marine ecosystem where we live (Gubbay, 1995).

Interpretations centres success depends on the community's engagement, visitor satisfaction and economic viability (Stewart, *et al.,* 1998). The centre should be the reflection of the community's history, culture and values in reference to a certain topic that transmits the sense of the location and authenticity. It is necessary to develop an overall message of the whole marine ecosystem and communicate the keys aspects to understand the importance of the protection and attention they deserve (Gubbay, 1995).

Moreover, visitor satisfaction is the core of any attraction, hence, the high level of satisfaction can influence the visitors' repeatability, increase the expenditure and night's stay. Economic sustainability is essential, many authors Fallon and Kriwoken, 2002a; Carter, 1997; Sugden and Saunders, 1991; Peart, 1986; and Benson and Baird, 1979 cited in Fallon and Kriwoken (2003) discussed this relevance emphasizing that visitors centres can attract the region's economy with the facilities that they promote but this practice doesn't always match its theory, for example the case of the Strahan Visitor Centre in Tasmania, shows that despite the big amount of visitors, only 20% of them paid to appreciate their displays, as a result they didn't achieve their economic expectations (Fallon and Kriwoken, 2003). Therefore, it is necessary to have a clear and realistic vision of the interpretation centre that

involves all the stakeholders in the planning process and assures satisfied customers.

Furthermore, interpretations centres should take in consideration its location and a distinctive building design. The former should be placed in the centre of other attractions or in an area that can integrate the centre's aim, while the latter can express uniqueness, a local environment and encourage potential visitors to explore the place (Pearce, 2004). Others areas that interpretation centres should include is related to simplicity and innovative displays such as areas for relaxation that can reduce visitors fatigue, accessibility and safe areas for everyone and principles facilities such as toilets (Fallon and Kriwoken, 2003).

Many interpretation or visitors centres exist, providing a wide variety of services, knowledge and support for different reasons; some of interpretations centres are enormous in terms of size and activities offered, for example, the chains of marine aquariums in Britain, Sea Life (Sea Life, 2015) and Deep Sea World (Deep Sea World, 2015), are more focused in entertaining than teaching conservation of the species and habitats, however, their large demand has made them economically sustainable. In contrast, others visitor centres are relatively small in size but provide bigger support to the conservation of wildlife as they support a specific cause, for example the Calanais Visitor Centre in Scotland divulges the history and preservation of the magnificent structure of the Callanish's stones (Calanais Visitor Centre, 2015). The Georgia Sea Turtle Centre in Jekyll Island raises awareness, education and research for sea turtles (Georgia Sea Turtle Centre, 2015); the Texas Freshwater Fishery Centre aims to educate about fish and sustainable catch (Texas Freshwater Fishery Centre, 2015). Some of these organizations operate thanks to community involvement, visitor donations and government support.

Gubbay (1995) described several marine educational models that integrates the financial sustainability aspects with an education focus. One model is The Monterey Bay Aquarium, which consists of providing free admission to schools groups that wish to visit the attraction, an elaborated education program and activities based on marine science and environmental issues with the guidance of more than 50 educators. Also, this Aquarium has an outreach programme, using an Aquavaran to visit schools in order to expand the education of the marine life (Monterey Bay Aquarium, 2015).

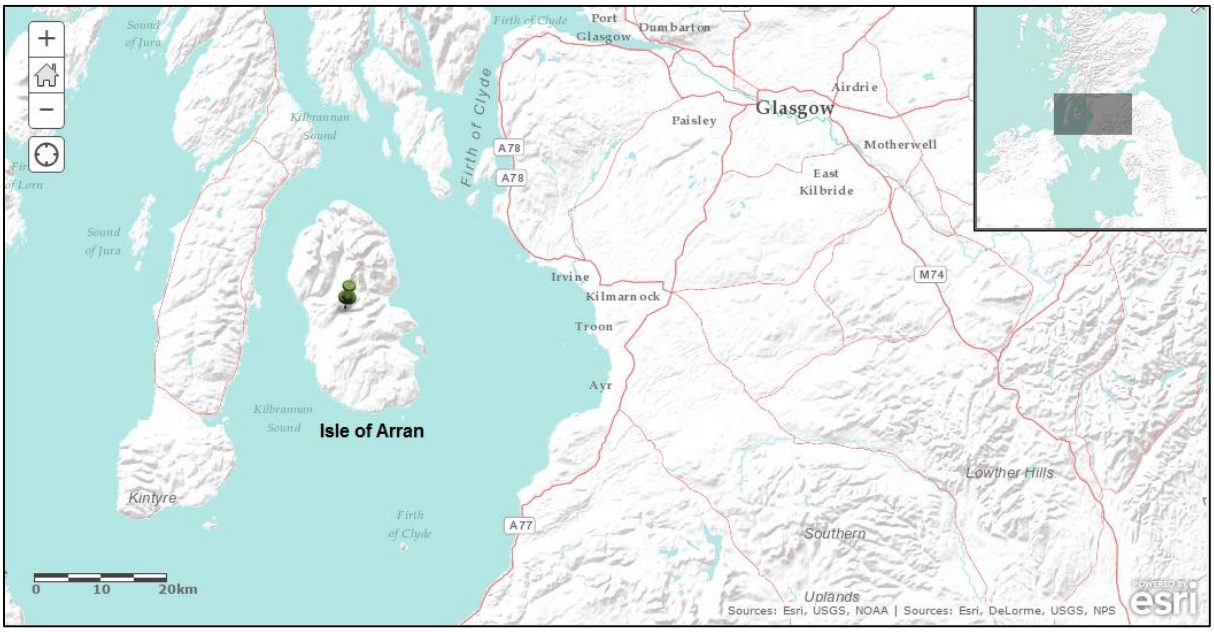
Another model is executed in the Gulf of the Farallones National Marine Sanctuary, due to the extensive covered area, the education and interpretation programs have been addressed using the cooperation of community organizations, personal contact, media and a visitor centre with limited staff available, however, educational and outreach programs are available with prior coordination (Farallones, 2015). The final model is known as Marine Activities, Resources and Education – MARE, developed by the University of California, Berkeley's Lawrence Hall of Science, and it is a very successful education program. It consists of the implementation of Marine Weeks, where schools transformed all their classes into ocean related topics and it has been so successful that some schools have a requested a Marine Month for the following year (MARE, 2015).

In Scotland some good models of small scale marine interpretation centres are the Ocean Explorer Centre, St. Abbs Visitor Centre and Islay Natural History Trust Wildlife Visitor Centre which all aim to educate about the ocean and its environment through different displays, activities and interactive exhibitions that can create an understanding of the history, habitat, species and main concerns while integrating the community into marine life through several events (Islay Info, 2014; Ocean Explorer Centre, 2015; St. Abbs Visitor Centre, 2015). Thus, these centres possess some valuable characteristics that could guide this research into how to create an effective marine interpretation centre.

1.2 Site Description

This research have been conducted in the Isle of Arran, located in the west of Scotland, it covers an area of 165 miles^2 approximately, with the coordinates 5534 2632N 5150 928W and it is the biggest island of the firth of Clyde (McLellan, 2008) as illustrated in **Figure 2**. The island population is 4,629 (National Records of Scotland, 2013) mainly distributed in the three major towns Brodick, Lamlash and Whiting Bay (McLellan, 2013).

Figure 2: Isle of Arran graphical location in Scotland



Adapted using ESRI (2015) by author.

“Scotland in miniature” is the second name given to the island by its local Tourist Board, because its land structure has the same patterns of Scotland. In the north it is characterized by the Highlands, while the lowlands prevail in the south. The main transport link is from Ardrossan to Brodick port, where the majority of the island services and facilities are placed (McLellan, 2008), while the existence of regular bus links around the island makes it accessible for locals and visitors from other towns.

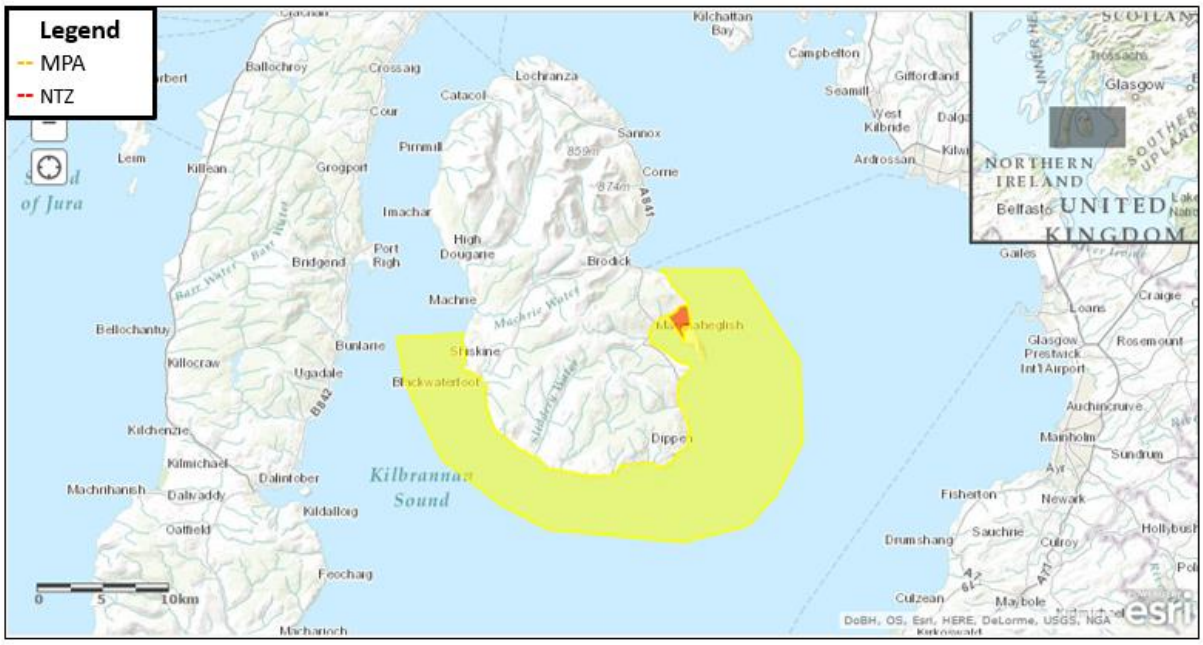
1.3 COAST and Arran Community

As mentioned previously this research was made in cooperation with COAST, a community organization group, composed by Arran residents who are interested in the restoration of the marine environment around the island and it is recognized worldwide for its success with the designation of the MPA and NTZ (COAST, 2015), but the author believes COAST means even more to this community because it provides hope in bringing back the native marine life, promote a sustainable fishery management and improve the understanding of the marine environment through its education programs, researches and a future interpretation centre. In the community,

the high level of approval to COAST works is evident, as the author experienced great support while doing the research. Residents were very enthusiastic to talk about COAST's successes and its positive impacts, reflecting how proud they are of being part of a community that is an example to follow.

Moreover, it is relevant to highlight that the residents were aware of the geographical location of the NTZ and MPA (**Figure 3**), and were assured that they are seeing the positive changes provided by these management tools though the diverse and rich species that are visible in Lamlash Bay, location of the NTZ.

Figure 3: Illustration of the parameters of the NTZ and MPA in the Isle of Arran



Adapted from ESRI (2015) by author.

1.4 Tourism of Arran

The disappearance of the major commercial fishes and the degradation of the marine habitats in the island have developed its economy into tourism, as it is undeniable that Arran natural sceneries transform this island in a paradise. Therefore, in 2009 Arran's tourism represented the 11% of the total income for the Ayrshire region, with visitors' expenditure reaching £2.93 million. The TRI*M score in

regards to the visitors' satisfaction levels positions Arran as one of the 10% - 20% top destinations globally (South Ayrshire Council, 2011).

In 2012, the South Ayrshire Council created a tourism strategy for the region visioning to convert the region in the top destination for visitors in Scotland, aiming to increase the number of visitors by 10%, 20% the amount of expenditure and generate around 9,000 jobs by the end of 2017. The goal is based on potential of discovering cultural and heritage places, tasting the local gastronomy, enjoying the natural environment and participating in sports and activities such as golf, cycling, hiking, sailing and festivals. Moreover, this strategy aims to integrate every single aspect of Arran's community, hence, it includes the promotion of the Lamlash No Take Zone in order to increase activities such as diving and wildlife watching (South Ayrshire Council, 2011a). Considering the growing tourism trend in Arran, the inclusion of the NTZ in the region strategy and the increasing demand for nature based activities, this provides positive indications of the value that a marine interpretation centre could add to the current market supply.

2. Aim and objectives

2.1 Aim

The main aim of this study is to analyse visitor and resident point of views to an MIC and as well an evaluate various marine interpretations centres to determine the feasibility and main features that should be included in the creation of a marine interpretation centre in the Isle of Arran.

2.2 Objectives

To investigate other marine interpretation centres to collect relevant information that can guide the creation of this one.

- Firstly, to make a literature review of the concept, functions, benefits and challenges of interpretations centres.

- Secondly, to study several interpretations centres to verify their attractions and displays, payment policy, collect photos, and the contacts of the previous centres.

To understand the main factors that will draw tourists and residents to visit this attraction.

- Firstly, to elaborate a questionnaire and a focus group that includes the visitors' and residents' expectations in terms of possible locations, willingness to pay and characteristics of exhibitions and information context.
- Secondly, to analyse scientifically the results of the previous research methods and generate conclusions.

3. Methods

Firstly, a desk study have been made to obtain general information and concepts about interpretation centres focusing on those situated in a marine environment through a literature review explained in the introduction. Then, internet research have been conducted to collect service ideas, photos, exhibitions types, contacts and building plans to guide the structure of the possible interpretation centre of this research.

Secondly, several research methods were implemented to engage the visitors and residents for 15 days, from June 3rd until the 24th. Questionnaires were elaborated using the Likert-scale test and closed questions to investigate their expectations. The data collected have been analysed using descriptive and analytical statistics tests in SPSS to obtain a detailed understanding of the results. Non-parametric tests was implemented as the majority of the data results were ordinal and categorical. Also, correlation tests were applied to evaluate the relation between the demographic groups, marine based travel motivations, knowledge and understanding of the MPA and NTZ, particularly in the Isle of Arran and the expectations regarding the possible marine interpretation centre.

The questionnaires were distributed in the Information Visitor Centre and Caledonian MacBryane (CALMAC) terminal ferry in Brodick by the researcher using a face to

face approach (confirmation emails with the obtained permission are in the **appendix 1**) to visitors arriving or leaving the Isle of Arran, **Figure 4** illustrates the places where the questionnaires and focus group data was collected.

Figure 4: Locations of the distribution of questionnaires

Adapted from ESRI (2015) by author.

The target sampling consisted of 150 surveys, where the respondents were recruited on a next to pass basis. Before the participants completed the questionnaires, they were briefed about the project purpose and their anonymity (**Appendix 17**). The participants consent forms were filled in before completing the questionnaires. The respondents had to be 18 years or over to participate in this study. An appropriate risk assessment has been completed **(Appendix 2**).

The questionnaires present a combination of closed Likert-scale questions (**Appendix 3)**. It is composed of four parts:

- The probability of participating in activities related to marine environments: a list of several activities that can be pursued in the coast are presented, which intend to analyse the visitors travel motivations and expectations of Isle of Arran.

- The participants general knowledge of the actual marine management tools in Isle of Arran and understanding of its benefits: aims to identify the general awareness about the Marine Protected Area and No Take Zone for the ocean in the south of Arran and their agreement in regards to the benefits of these management tools and sea life in general.
- Expectations of a marine interpretation centre: this part covers three essential topics in order to evaluate visitors point of view to certain facts: the main facilities and activities of the centre, its location and visitor willingness to pay,
- About yourself: to create demographics features and relevant travel patterns in regards to the profile of the tourists.

Focus groups was the other research technique implemented (**Appendix 4**). It was designed to assess visitor and resident opinions related to the main features that the interpretation centre should have, their learning outcomes, possible location and willingness to pay. Both focus groups were organized with the cooperation of Community of Arran Seabed Trust (COAST), Visit Arran and the Tourist Information Centre in Brodick and the participants were divided into either visitors or residents. They took place in the Tourist Information Centre and COAST office. The focus groups consisted of five questions and had between 4 to 6 respondents.

The questionnaire and focus groups data was stored and secured in a computer with password protection. These data and consent forms were destroyed at the end of the research in the university premises with the researcher and supervisor presence to ensure the anonymity of all the respondents.

3.1 Ethics and Health and Safety

The required permission regarding the health and safety and ethics were summited before starting the research. The risk assessment revealed unknown hazards from participating in this study (**Appendix 2**) and for the interaction with members of the public an ethics application was approved on June 2nd, 2015 (**Appendix 5)**. Additionally, a research proposal was sent to COAST with the generalities of the study, aim, objectives and timeline (**Appendix 6**).

3.2 Questionnaire analysis methods

Using SPSS 20, the questionnaire data was analysed statistically. The objective for this research sample was to understand the factors that will draw tourist and residents to visit the Marine Interpretation Centre. Therefore, frequencies, graphs and descriptive examinations were applied to the data to create a general understanding of the respondents' characteristics and preferences. The data was composed of nominal and ordinal variables, two sample and k sample cases, and independent samples. To identify if the data was normally distributed (**Appendix 15**), the Shapiro-Wilk and Kolmogorov-Smirnov tests were applied to each variable and all the results provided a $P<0.001$, indicating that the data is not normally distributed, hence, different non parametric tests were carried out.

The non-parametric test used were the Kruskal-Wallis, Chi-Square and Mann-Whitney U (Baggio and Klobas, 2011, p.24). The Kruskal-Wallis and Mann-Whitney were run to determine significant associations between respondents' demographic features and likelihood for marine and coastal activities and the level of interest for the topics and activities for the possible MIC. On the other hand, the Chi-Square test was implemented with the 'will to pay' variable interacting with others parts of the questionnaire. To accomplish the Chi-Square assumptions, some categories were merged.

In SPSS, cross-tabulations were generated to identify interactions in frequency data based on likelihood of involvement with marine and coastal activities, the level of interest for the topics and activities for the possible MIC, willingness to pay and respondents' profile.

Additionally, Microsoft Excel was employed to create and organize the data, and create graphs and tables.

4. Results

A summary of the main features from the data collected throughout the questionnaires and focus groups performed in the Isle of Arran is explained in this chapter. Firstly each part of questionnaire data is illustrated using frequencies, graphs and the central tendency measures. Then, cross-tabulation and non-parametric test results are presented to identify any interaction between variables. Finally, the three focus groups carried out are summarized in a table.

4.1 Survey Results

4.1.1 Socio- demographic features

Gender, age group, total annual income and place of residence where the questions asked to visitors and residents (**Table 1**), however, for visitors more questions were asked to analyse the profile of Arran's tourist.

Table 1: Summary of the demographic profile of residents and visitors

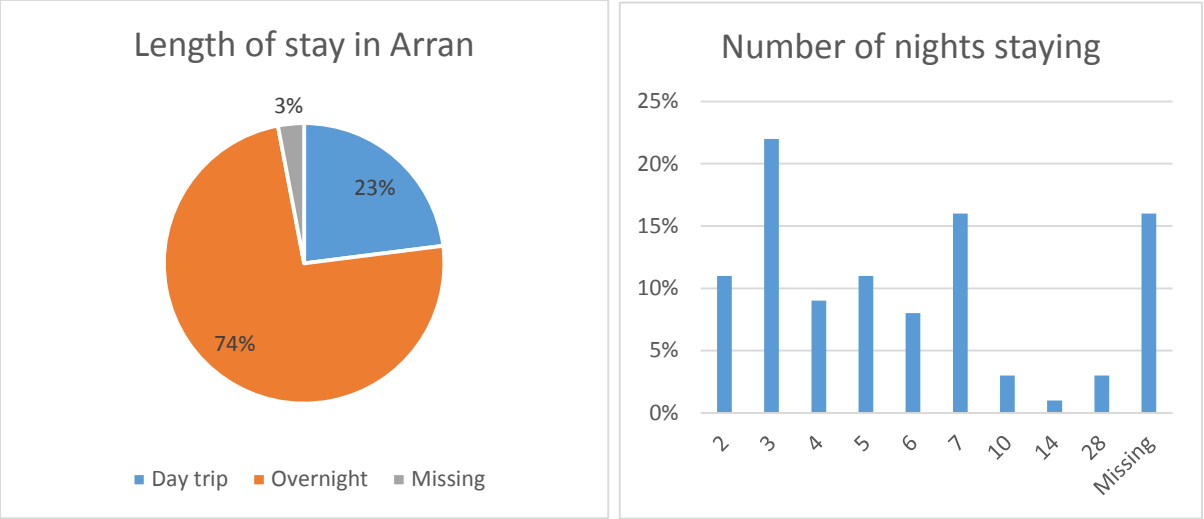
Category	**Frequencies**	**Percentages %**
Gender		
Female	74	48.1
Male	74	48.1
Missing	6	3.9
Age group		
18 - 25 years	36	23.4
26 - 35 years	22	14.3
36 - 45 years	24	15.6
46 - 55 years	27	17.5
56 - 65 years	20	13.0
65+ years	21	13.6
Missing	4	2.6
Total annual amount of net income of your household (amounts in £):		
Under £15,000	25	16.2

£ 16,000 - £25,999	22	14.3
£ 26,000 - £35,999	18	11.7
£ 36,000 - £49,999	24	15.6
£ 50,000 - £69,999	9	5.8
£ 70,000	8	5.2
Prefer not to say	42	27.3
Missing	6	3.9
Place of residence		
Arran	47	30.5
Rest of Ayrshire (not Arran)	19	12.3
Rest of Scotland (not Arran & Ayrshire)	46	29.9
Rest of UK (not Scotland)	27	17.5
International	14	9.1
Missing	1	.6

The total amount of respondents was 154, the results are expressed by frequencies and percentages, and include the missing values corresponding to the total amount of respondents that didn't answer that particular question. In regards to the gender, half of the respondents (50%) were females. The age groups are slightly different, the highest group of 18 – 25 years old account for 23.4% of respondents. Regarding the total annual income, almost 30% of the respondents preferred not to say, however, the highest incomes selected were under £15,000, £ 36,000 - £49,999 and £ 16,000 - £25,999, corresponding to a 16.2%, 15.6 % and 14.3% respectively.

The place of residence indicates that the majority of respondents were from Arran and the rest of Scotland, obtaining a response rate of 30% each. The lowest frequency were internationals, indicating the relevance of domestic visitors for the development of tourism in the island. On the other hand, others questions were addressed to the visitors to identify their travel patterns, such as the length of stay, numbers of night staying, time spent in Arran so far, travel companions and number of times they had visited the island previously (frequencies in **appendix 7**). The following illustrations present the length of stay and number of nights given by respondents.

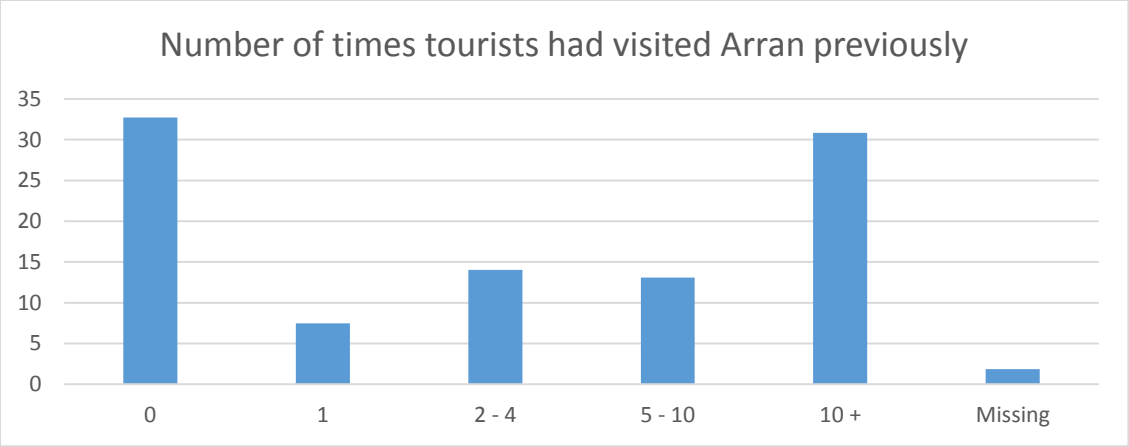
Figure 5: Length of stay and number of night staying (in%)



Almost two thirds of tourists stayed overnight, and the number of nights staying variated from 2 to 28 nights. The most selected number of nights staying was three with a 22% response rate, followed by 16% of respondents that stayed for seven nights. Other high percentages are grouped into two and five nights stay with an 11% response rate each. These results are positive for the economy of the island, indicating the great position that has this destination has among tourists with its diverse offer of activities to do.

Additionally, tourist were surveyed about their travel companions and number of times they had visited Arran previously. For the former, about 40% travelled with their partners or friends, while the remaining corresponded to family (18%), alone (13%) and organized groups (10%). These organized groups fall into the majority of the cases integrated by scholars according to the observations of the researcher. The latter is illustrated in **Figure 6**.

Figure 6: Number of times tourist had visited Isle of Arran



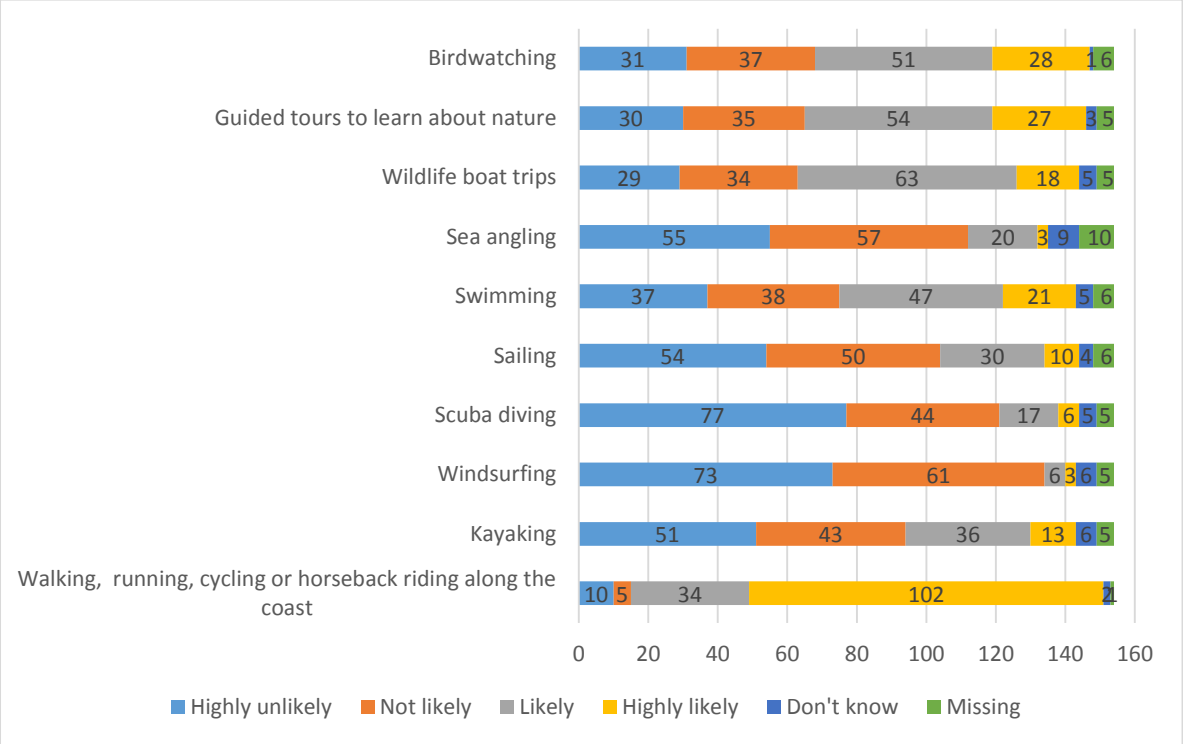
Even though the majority of tourists (33%) were visiting Arran for the first time, the repeatability trend is upward and the category of more than 10 visits reached 31%, almost the same percentage of first time visitors. These results demonstrate the high amount of repeat visitors that enjoy Arran's attractions. On the other hand, it is important to mention that 70% of the visitors approached were leaving Arran when they were surveyed, so they had experienced some marine activities and thus a more knowledge of the area than the 9% arriving and the 15% midway through their visit.

The central tendency measures such as mean and medium in regards to the demographics variables discussed previously have a very similar results with a slight difference between 0.02 to 0.94, although the mode fluctuates. However, the standard deviation and the variance indicate that the responses are very spread out in comparison to the expected value, specially concerning to the number of nights stayed with a standard deviation of 4.6 and a variance of 23.4. The skewness results indicate that the majority of the data is not well distributed as the age group, annual income, place of residence, number of nights stayed and travel companions have most values concentrated in the left with extreme levels in the right, in contrast to the length of stay, time spent in Arran so far and number of times visiting the island, which values are concentrated in the right with extreme values in the left. The only variable that presented a well distribution was gender with a result of zero (0) (details in **appendix 8).**

4.1.2 Likelihood in marine and coastal activities of respondents

Arran offers a diverse amount of activities that engage the marine environment, such as walking in the coast, kayaking in a sunny day or scuba diving in the No Take Zone. The first part of the questionnaires is focused on identifying the likelihood of visitors and residents in regards to different activities in the coast, hence, the following (**Figure 7**) illustrate the results.

Figure 7: Respondents' likelihood of coastal and marine activities



The activity that visitors and tourists participated the most in Arran was walking, running, cycling or horseback riding along the sea with 102 responses in the highly likely level, however, it is important to mention that many respondents notified to the researcher that from these set of activities walking was the priority. Almost one third of respondents selected others activities which obtained reasonable values such as birdwatching, guided nature tours, wildlife boat trips and swimming with a likely value of 51, 54, 63 and 47 respectively. In contrast, there are others activities with high level of disapproval such as sea angling, sailing and scuba diving. Moreover, respondents specified others activities that they enjoy in Arran, for instance, golf,

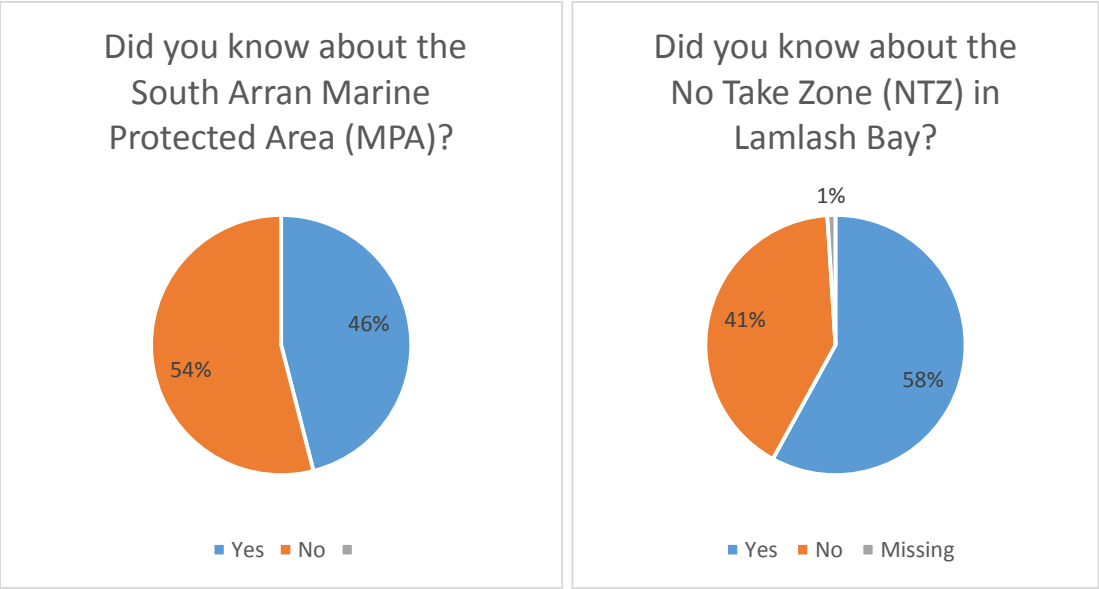
pleasure cruising, wildlife festival, paragliding, hiking, historical monuments and beachcombing.

The central tendency measures in regards to marine activities matched the results of **Figure 7**, indicating a low level of likelihood in the majority of activities except for walking, running, cycling or horseback riding along the sea, birdwatching, guided nature tours, wildlife boat trips and swimming. The data possess high levels of variation and don't have a normal distribution as the values are concentrated in the right with extreme values on the left as easily seen in scuba diving and windsurfing in **Figure 7** (more details in **appendix 9**).

4.1.3 Knowledge about the MPA and NTZ

As the majority of marine activities form part of the designated MPA and NTZ in Arran, this part intends to assess the respondents' knowledge about these management tools and at the same time increase their awareness. More than 99% of those surveyed answered these questions; the results are similar, however, the respondents were more aware of the NTZ than the MPA as illustrated in the following **Figure 8**.

Figure 8: Residents and visitors knowledge about the MPA and NTZ in Arran (in %)



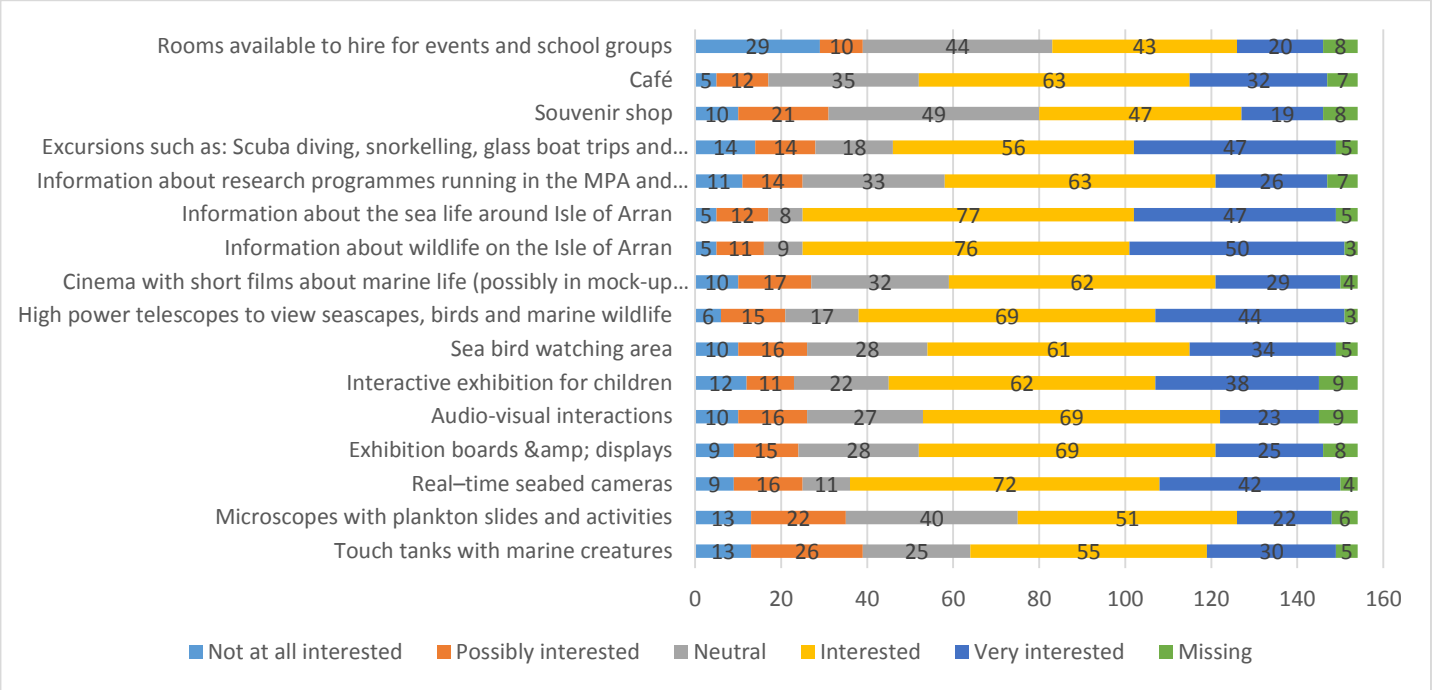
After one year of the MPA was designated almost 50% of respondents acknowledged its existence, surprisingly about the same percentage of the NTZ even though it was designated in 2008, which suggests that there is an increasing national and local promotion about how the oceans are being managed. The results of central tendency measures such as mean, medium and mode are very similar, for the MPA all three stated “No”, while “Yes” was obtained by NTZ. The variation results given by the standard deviation and variance are very low, however, the kurtosis results indicate that the data is not well distributed because the histogram illustration presents a peak (details in **appendix 10**).

4.1.4 Expectations for the Marine Interpretation Centre

As mentioned previously, interpretation centres are very well connected with the MPA and NTZ education strategies, which aim to create and increase the sense of care from visitors and residents about the marine environment and change positively the behaviour of people towards their actions that involve the sea life. In this research the expectations for the possible marine interpretation centre in Arran were assessed taking in consideration three aspects: level of interest about topics and activities, location preference and will to pay. The interest of topics and activities was determined using five levels: not at all interested, possibly interested, neutral, interested and very interested. The central tendency measures indicated that “Interested” was the average, middle value and most common level selected in the majority of topics and activities, apart from the souvenir shop and event rooms for hire where the results are in the neutral level.

Also, activities such as touch tanks with marine creatures and microscopes with plankton slides obtained different results where the former had a medium and a mode of ‘interested’ while the mean is neutral, while the latter has a mean and medium of neutral and a mode of ‘interested’. The standard deviation and variance indicate the data is moderately spread out, while the skewness and kurtosis suggest the data is not well distributed. Therefore, the following illustration provides the frequencies of these levels of interest.

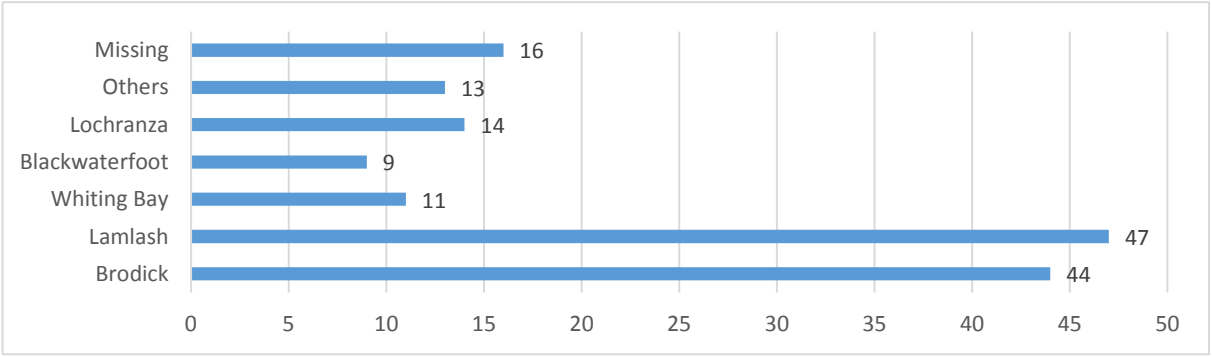
Figure 9: Levels of interest about topics and activities



The previous figure matches directly the results of the central tendency measures and it is easily perceived that the 'Interested' level was the most selected in the majority of topics and activities, followed by the 'very interested' level. These results are very positive indicating a high level of interest from the respondents. Additionally, they specified that would be interested in others activities that involve art and craft projects.

The second aspect of this section concern to identify the most suitable location for the marine interpretation centre and understand the main reasons for this selection expressed by the respondents, hence, **Figure 10** illustrate the frequencies.

Figure 10: Location preference



The most popular locations among visitors and residents were Brodick and Lamlash, with a 30% preference each. The category ‘Others’ refers to respondents that selected more than one location, in most of the cases these included Brodick or Lamlash. Moreover, the following table summarizes the main reasons for the location preference the surveyed pointed out.

Table 2: Reasoning for the location selected

Brodick	Lamlash
• Proximity to the ferry and tourist information centre • Regular buses • Many attractions are in this area. • Good for daytrip visitors • To keep other part of the island quieter • Highly populated • Most visited town	• Close to the NTZ and MPA • To attract more visitors out of Brodick • Easy to access • Nicer seaside than Brodick • Close to other attractions such as the Holy Island, yacht club and life boat • Good views with plenty wildlife. • High capacity for accommodation
Lochranza	Blackwaterfoot
• More wildlife than in other parts of the island. • Picturesque village and sheltered for boat trips • Not far from Brodick. • To benefit the local population • Other places have too many attractions • To attract tourists out of Brodick	• Great balance of wildlife • Easy to reach by transport (except on Sundays). • More suitable to encourage larger parties • Beautiful area for visitors • To attract tourist out of Brodick

Whiting Bay

- Central location
- To attract tourists out of Brodick
- Lovely area and nice beach

This summary contains different perspectives, on one side Brodick is presented as the ideal location for its transport connections, proximity to many attractions and a place that appeals to daytrip visitors as well as overnight. However, others surveyed elected others locations to bring tourists out of Brodick as this location is already crowded. In regards to Lamlash, it is important to highlight that many respondents agreed that their preference was connected with important features of the location such as the NTZ, MPA and COAST office. With Lochranza is necessary to mention that surveyed expressed that in terms of abundance and variety of wildlife this was the best location of the island.

The third section relates to the willingness to pay of the respondents to visit the possible marine interpretation centre. This question divided the willingness to pay in five categories, from £0 / person to £15+ / person as illustrated in the following table.

Table 3: Frequencies and percentages of the willingness to pay

Categories	Frequency	Percentage (%)
£0 / person	7	4.5
£1 to £5 / person	68	44.2
£6 to £10 / person	67	43.5
£11 to £15 / person	7	4.5
£15+ / person	2	1.3
Missing	3	1.9
Total	154	100.0

In general, 93.6% of the respondents had a willingness to pay and the most selected categories were £1 to £5 and £6 to £10 per person, as presented in the previous table, with percentages of 44% and 43.5% respectively. These results are very positive because any attraction should be economically sustainable even if it is run in

a small scale. Some respondents discussed with the researcher others options of entrance fees that could be implemented for families, repeated visitors and residents.

4.1.5 Cross-tabulations and non-parametric test results

As mentioned previously, several non-parametric tests have been implemented to the questionnaire results in order to find relations and differences that can allow the researcher to draw some conclusions about the feasibility of the possible MIC. Therefore, the following sections are focused on combining the sections of the questionnaires such as likelihood of respondents with marine and coastal activities, the level of interest about topics and activities and willingness to pay as the researcher believe these aspects create the base for the future decision taking of the MIC.

4.1.5.1 Likelihood of marine and coastal activities

Demographic characteristics such as age groups, place of residence and length of stay could influence the activities in which the respondents interact with the marine environment. Moreover, it is necessary to comprehend how these likelihoods could be associated with the levels of interest for the topics and activities for the MIC, therefore, these variables are examined in this section.

The likelihood of respondents with the marine and coastal activities was analysed with the age groups. These groups were merged into three new categories, comprising ages to 18 to 35 years, 36 to 55 years and 56 to 65+ years, renamed as young and families with small children, families with teens and empty nester respectively. These variables were analysed using the Kruskal-Wallis test and the frequencies presented previously. For the former the results indicate a $P<0.05$ for kayaking, windsurfing, scuba diving, swimming, sea angling and birdwatching in which the respondents likelihood level was concentrated in highly unlikely or not likely. On the other hand, walking, running, cycling or horseback riding along the coast, sailing, wildlife boat trips and guided nature tours obtained a $P>0.05$. In general, the ‘likely’ option had a higher selection than the ‘highly likely’ option among age groups, except for walking, running, cycling or horseback riding along the coast,

indicating these activities are not the respondents' first option when they want to enjoy the marine environment. To appreciate the difference between age groups and marine activities the likelihood levels were examined in two groups as illustrated in **Table 4 and 5.**

Table 4: Highly likely and likely of the marine activities participated among the age groups (in%)

Marine Activities	Likeliness	Young and families with small children	Families with teens	Empty nest
Walking, running, cycling or horseback riding along the coast	Likely	18	25	24
	Highly likely	72	63	68
Kayaking	Likely	28	22	22
	Highly likely	12	8	5
Windsurfing	Likely	3	6	3
	Highly likely	2	2	3
Scuba diving	Likely	14	12	8
	Highly likely	9	0	3
Sailing	Likely	22	19	18
	Highly likely	5	6	11
Swimming	Likely	41	31	19
	Highly likely	16	16	11
Sea angling	Likely	20	4	18
	Highly likely	0	4	3
Wildlife boat trips	Likely	40	46	42
	Highly likely	16	8	13
Guided to learn about nature	Likely	26	43	45
	Highly likely	24	10	18
Bird watching	Likely	26	33	42
	Highly likely	14	14	34

Table 5: Highly unlikely and not likely of participating in the marine activities among the age groups (in%)

Marine Activities	Unlikeliness	Young and families with small children	Families with teens	Empty nest
Walking, running, cycling or horseback riding along the coast	Highly unlikely	5	6	7
	Not likely	4	4	0
Kayaking	Highly unlikely	21	44	41
	Not likely	33	22	32
Windsurfing	Highly unlikely	31	61	61
	Not likely	55	29	34
Scuba diving	Highly unlikely	40	63	55
	Not likely	33	20	34
Sailing	Highly unlikely	24	42	47
	Not likely	45	29	24
Swimming	Highly unlikely	12	27	43
	Not likely	26	24	24
Sea angling	Highly unlikely	24	47	47
	Not likely	45	38	32
Wildlife boat trips	Highly unlikely	14	22	24
	Not likely	25	20	21
Guided to learn about nature	Highly unlikely	21	20	16
	Not likely	26	27	18
Bird watching	Highly unlikely	28	22	11
	Not likely	30	31	13

The higher percentages expressed in green in **Table 4,** for the highly likely and likely was provided by the young and families with small children, corresponding to a 60% and 50% respectively, for the overall coastal activities. Followed by, the empty nest group which had a 20% in likely and 30% in highly likely. Nevertheless, to have a better understanding of the 'likely' and 'highly likely' results between the age groups, these options have been merged into one, therefore, each activity is coloured the same as the age group that it was most popular with, this deduces that: a) the empty nest has higher percentages in walking, running, cycling or horseback riding along the coast, sailing, guided nature tours and birdwatching than the others age groups; b) the young and families with small children highest percentages are concentrated

in activities such as kayaking, scuba diving, swimming, sea angling and wildlife boat trips; and c) windsurfing's highest percentage was provided by families with teens.

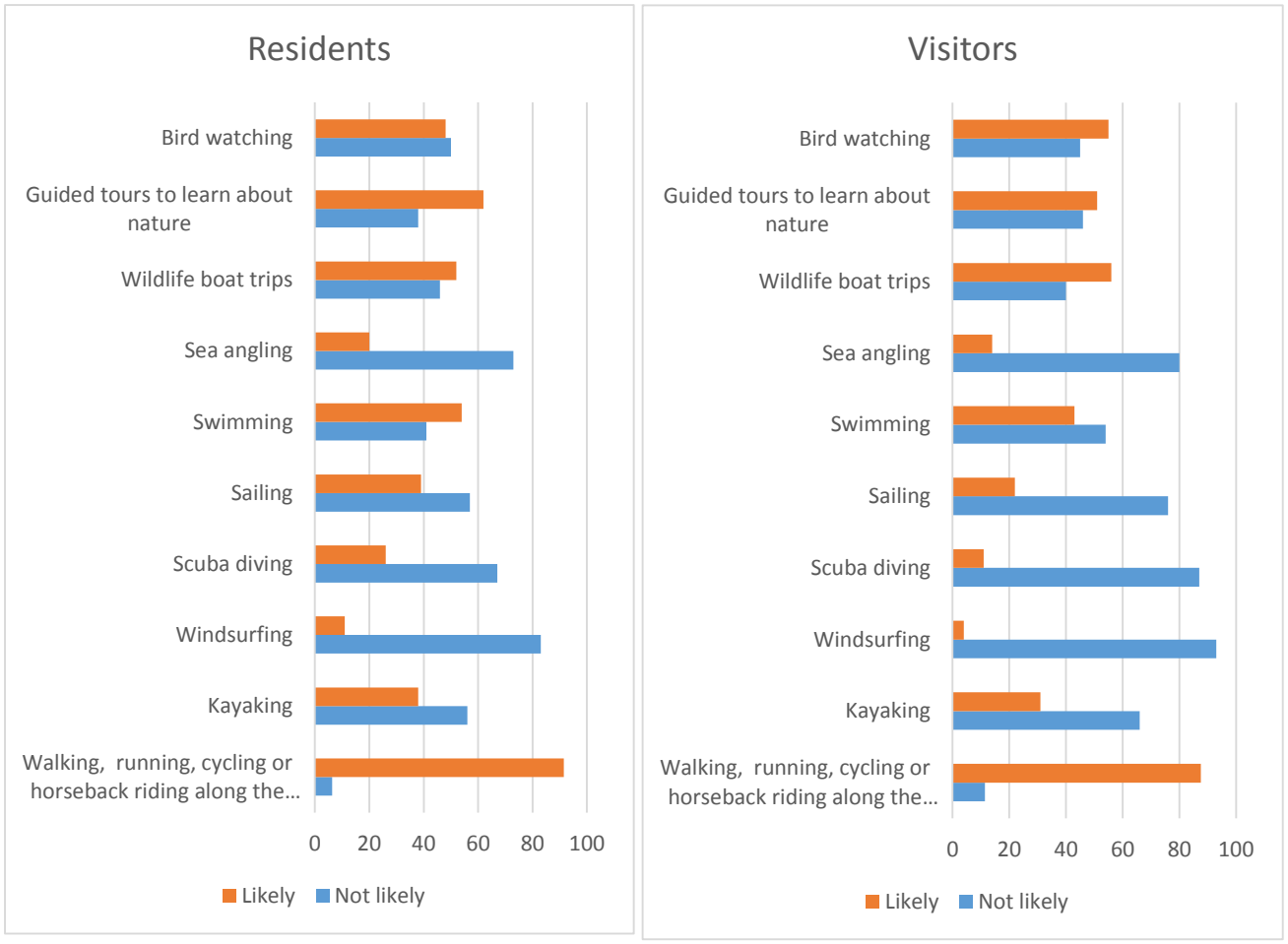
Moreover, **Table 5** evaluates the highly unlikely and not likely levels. In general, these percentages are surprisingly similar to the likeliness levels, as the higher percentage of not likely (58%) was provided by the young and families with small children, while the empty nest had the highest percentage for the highly unlikely level. These levels were also merged into one to provide the age group accountability for the highest unlikely results. The general percentages differed when the analysis was focused on each marine activity separately in comparison to the age groups. Therefore, the only coastal activity in which the young and families with small children had the highest percentage of unlikeliness was birdwatching, while the empty nest had the highest amount of activities in their unlikeliness percentages such as kayaking, windsurfing, scuba diving, swimming and wildlife boat trips. Families with teens have the highest percentages for walking, running, cycling or horseback riding along the coast and sea angling. The remain activities such as sailing and guided nature tours have the same percentages between families with teens and other age groups, the former is shared with empty nest while the latter with young and families with small children.

On the other hand, the marine interpretation centre wants to attract visitors and residents it is necessary to understand the activities they get involved with in the marine environment and any differences and similarities between each category. The Kruskal-Wallis test was implemented, providing a $P>0.05$ between all the variables as presented in **Table 6**. The place of residence categories such as Rest of Ayrshire (not Arran), Rest of Scotland (not Arran & Ayrshire), Rest of UK (not Scotland) and International were merged into one as 'Visitors' in order to compare it with the Arran (residents) group. The percentages about the involvement between residents and visitors in marine activities are very similar, demonstrating that there is not a remarkable difference in the likelihood levels as illustrated in **Figure 11**. However, the highest likeliness percentages for the majority of activities account to the residents, except for wildlife boat trips and birdwatching.

Table 6: Kruskal-Wallis results of marine activities and place of residence

Test Statistics[a,b]										
	Walking, running, cycling or horseback riding along the coast	Kayaking	Windsurfing	Scuba diving	Sailing	Swimming	Sea angling	Wildlife boat trips	Guided tours to learn about nature	Bird watching
Chi-Square	8.085	4.159	4.894	9.182	6.043	4.883	8.302	3.969	3.208	6.714
df	4	4	4	4	4	4	4	4	4	4
Asymp. Sig.	.089	.385	.298	.057	.196	.299	.081	.410	.524	.152
a. Kruskal Wallis Test										
b. Grouping Variable: Place of residence										

Figure 11: Involvement of residents and visitors in coastal activities (in %)



Moreover, it is relevant to point out that activities such as windsurfing and sea angling obtained very high values of unlikeliness among residents and visitors. Scuba diving and sailing obtained high unlikeness values by visitors.

Previously in the length of stay, the frequencies results pointed out that the majority of visitors were going to Arran overnight, it is logical that overnight visitors get involve in more activities than the daytrip visitors, but, does there exist a relevant difference

between the marine activities these type of visitors choose to do when arriving to Arran? To answer this inquiry, a Mann-Whitney test was run, providing a P<0.05 for walking, running, cycling or horseback riding along the coast, sea angling, wildlife boat trips and birdwatching, demonstrating that in these activities the daytrip and overnight visitors differ in regards to the likelihood levels and the length of stay as presented in **Table 7**. As above the likelihood levels were merged into unlikely and likely, as can be appreciated in the following **Table 8**, which provides the percentages for the mentioned activities.

Table 7: Mann-Whitney U results of marine activities and length of stay

Test Statistics[a]

	Walking, running, cycling or horseback riding along the coast	Kayaking	Windsurfing	Scuba diving	Sailing	Swimming	Sea angling	Wildlife boat trips	Guided tours to learn about nature	Bird watching
Mann-Whitney U	755.000	745.500	768.500	830.500	827.500	826.500	592.000	640.500	777.500	527.000
Wilcoxon W	1080.000	1070.500	1068.500	1130.500	3677.500	1102.500	868.000	965.500	1102.500	803.000
Z	-2.141	-1.686	-1.305	-.741	-.632	-.408	-2.352	-2.511	-1.415	-2.992
Asymp. Sig. (2-tailed)	.032	.092	.192	.459	.528	.683	.019	.012	.157	.003

a. Grouping Variable: Length of stay in Arran

Table 8: Crosstabs between of marine activities and length of stay (in%)

Length of Stay	Marine Activities							
	Walking, running, cycling or horseback riding along the coast		Sea angling		Wildlife boat trips		Bird watching	
	Unlikely	Likely	Unlikely	Likely	Unlikely	Likely	Unlikely	Likely
Daytrip	28%	68%	91%	4%	60%	36%	74%	26%
Overnight	6%	94%	76%	18%	32%	64%	36%	64%

Daytrip visitors present higher percentages of unlikeness between these activities than the overnight visitors. Except for walking, running, cycling or horseback riding along the coast, daytrip visitors getting involved in activities is very low. However, overnight visitors accounted for a high percentages for sea angling.

On the other hand, for the success of the marine interpretation centre it is essential to understand the likelihood of respondents participating in marine activities and the topics of the MIC based on the activities they perform while in Arran. Likeliness is composed by ‘likely’ and ‘highly likely’ results, while, ‘highly unlikely’ and ‘not likely’

results are merged into unlikeliness. Therefore, these variables have been analysed using crosstabs. The MIC topics and activities were ranked, merging the levels “Interested’ and ‘Very Interested” to highlight the respondent’s preferences. These ranks levels were evaluated with two marine activities, one with very high percentages of likeliness, and the other with high percentages of unlikeliness in order to identify any differences.

The first case ranks the merged levels of interested and very interested with walking, running, cycling or horseback riding along the coast activity, while, sailing is the second case. The former represent the activity with high levels of likeliness and the latter the opposite. Both marine activities are illustrated in comparison with each possible topic and activity of the MIC, as presented below.

Table 10: Ranks of respondents’ interest for MIC topics and activities in comparison with the likeliness of walking, running, cycling or horseback riding along the coast activity

Marine Interpretation Centre Topics and Activities	Ranks
Information about wildlife on the Isle of Arran	1
Information about the sea life around Isle of Arran	1
Real–time seabed cameras	2
High power telescopes to view seascapes, birds and marine wildlife	3
Interactive exhibition for children	4
Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.	5
Sea bird watching area	6
Audio-visual interactions	7
Exhibition boards & displays	8
Café	9
Cinema with short films about marine life (possibly in mock-up submarine)	10
Touch tanks with marine creatures	11
Information about research programmes running in the MPA and NTZ	11
Microscopes with plankton slides and activities	12
Rooms available to hire for events and school groups	13
Souvenir shop	13

Table 9: Ranks of respondents' interest for MIC topics and activities in comparison with the unlikeliness of sailing

Marine Interpretation Centre Topics and Activities	Ranks
Information about wildlife on the Isle of Arran	1
Information about the sea life around Isle of Arran	1
Real–time seabed cameras	2
High power telescopes to view seascapes, birds and marine wildlife	3
Exhibition boards & displays	4
Interactive exhibition for children	4
Café	4
Information about research programmes running in the MPA and NTZ	5
Audio-visual interactions	5
Sea bird watching area	6
Cinema with short films about marine life (possibly in mock-up submarine)	6
Touch tanks with marine creatures	7
Microscopes with plankton slides and activities	7
Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.	8
Souvenir shop	8
Rooms available to hire for events and school groups	9

In general, the “Interested” level had more acceptance by the respondents, however the ‘Very Interested’ obtained reasonable results. Overall, the high levels of interest in the activities and topics for the MIC for the respondents with likeliness in walking, running, cycling or horseback riding along the coast activity is very noticeable as illustrated in **Table 10**. Information about wildlife and sea life in the Isle of Arran have a rank of 1. Others activities with high levels of interest were real-time seabed cameras, high power telescopes to view seascapes, birds and marine wildlife with a a rank of 2 and 3 respectively. The lowest level of interest in this case is appointed to the souvenir shop, rooms available to hire for events & schools groups occupying the last rank.

As walking, running, cycling or horseback riding along the coast represent the most important marine activity for tourists and residents in Arran, the results of **Table 10** provide an optimistic perspective of the favourable outcome of the MIC, however, it is necessary to compare this panorama with an marine activity that obtained high levels of unlikeliness to understand if the trend changes, hence, **Table 9** illustrate this results.

The interest levels trend is similar than in **Table 10**. Some changes occur in the features of exhibition boards & displays, café and information about research programmes running in the MPA and NTZ, with higher ranks of 4, 4 and 5 respectively. Other changes are reflected in the excursions as it dropped from rank 5 to 8 in **Table 9.** Even though this marine activity obtained high unlikeness results, the levels of interest are reasonable with percentage average of 44% in the topics and activities for the MIC.

4.1.5.2 Level of interest for the topics and activities for the MIC

This key section provides an analysis of the age groups, residence, length of stay for visitors and willingness to pay in comparison to the topics and activities for the MIC, in order to provide a better understanding of how the levels of interested were rated by the respondents and which market segments could be prioritized. As in the previous section, the “Interested” and “Very Interested” are the illustrated levels.

The level of interest for each topic and activity of the MIC were analysed statistically using crosstabs and the Kruskal-Wallis test indicating that the age groups don't present a significant difference as the P>0.05, except for the Exhibition boards and displays with a P<0.05 as presented in the following **Table 11.**

Table 11: Kruskal-Wallis results of the level of interest for each topic and activity and the age groups

	Touch tanks with marine creatures	Microscopes with plankton slides and activities	Real–time seabed cameras	Exhibition boards & displays	Audio-visual interactions	Interactive exhibition for children	Sea bird watching area	High power telescopes to view seascapes, birds and marine wildlife
Chi-Square	2.501	3.420	1.156	7.410	1.978	1.766	6.085	4.643
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.286	.181	.561	.025	.372	.414	.048	.098
	Cinema with short films about marine life (possibly in mock-up submarine)	Information about wildlife on the Isle of Arran	Information about the sea life around Isle of Arran	Information about research programmes running in the MPA and NTZ	Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife	Souvenir shop	Café	Rooms available to hire for events and school groups
Chi-Square	5.814	5.992	4.246	4.332	4.005	.904	2.264	.240
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.055	.050	.120	.115	.135	.636	.322	.887

However, the interest levels of the age groups are different. In general, the highest percentages of interest were obtained by the young and families with small children and the lowest by the empty nest, except for cinema with short films about marine life where the empty nest group had a higher percentage than families with teens and the information about research programmes running in the MPA and NTZ where the highest percentage was obtained by the families with teens. In terms of the level of interest, the higher values are concentrated in the "Interested" with a percentage average of 42%, while the "Very Interested" had a 22%, demonstrating that more than 60% of the respondents among the different ages have a high interest level in the topics and activities illustrated in the questionnaire.

The biggest differences in the interest levels between the young and families with small children and empty nest group account to excursions, real-time seabed cameras, touch tanks with marine creatures, interactive exhibitions and information about the wildlife with a 16%, 9%, 7%, 7% and 7% respectively from the total percentage of "Interested and Very Interested" levels. Between the other age groups the obtained differences are smaller. On the other hand, activities such as

microscopes with plankton slides and activities and sea bird watching area don't present a relevant difference.

For the places of residence such as; Arran, Rest of Ayrshire, Rest of Scotland, Rest of the UK and Internationals, they were examined with each topic and activity for the MIC. The Kruskal-Wallis results provide P<0.05 for Interactive exhibition for children and Rooms available to hire for events and school groups, as the former have high values concentrated in the "Very Interested" level, while, "Not at all interested" had high values in the latter as illustrated in the following **Table 12**.

Table 12: Kruskal-Wallis results of the level of interest for each topic and activity and places of residence

	Touch tanks with marine creatures	Microscopes with plankton slides and activities	Real–time seabed cameras	Exhibition boards & displays	Audio-visual interactions	Interactive exhibition for children	Sea bird watching area		High power telescopes to view seascapes, birds and marine wildlife
Chi-Square	2.480	5.932	1.001	3.465	5.534	24.960	4.100		5.454
df	4	4	4	4	4	4	4		4
Asymp. Sig.	.648	.204	.910	.483	.237	.000	.393		.244

	Cinema with short films about marine life (possibly in mock-up submarine)	Information about wildlife on the Isle of Arran	Information about the sea life around Isle of Arran	Information about research programmes running in the MPA and NTZ	Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.	Souvenir shop	Café	Rooms available to hire for events and school groups
Chi-Square	5.342	4.418	4.263	8.830	3.610	7.156	3.347	26.926
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.254	.352	.372	.066	.461	.128	.502	.000

Overall the interest level with the higher percentages was the "Interested" with an average of 42%, excepting for the rooms available to hire for events and school groups and souvenir shop, where the percentages in comparison to the "Neutral" level were not different.

To create a better understanding of high levels of interest, the levels "Interested and Very Interested" were merged into High Interest, however, all the crosstabs frequencies between these variables can be appreciated in the **appendix 11**. Therefore, the maximum percentages in the high interest level was concentrated among Arran residents with an average of 22%, followed by Rest of Scotland visitors with a 19%. The others places of residence such as Rest of UK, Rest of Ayrshire and International obtained a 9%, 7% and 7% respectively. In total the high interest percentage is over 60%.

In Arran the topic with the highest percentage was Information about the sea life around Isle of Arran with a 28%, in contrast to a 16% in Microscopes with plankton slides and activities and Souvenir shop. For the rest of Scotland the situation is similar, however, the topics about Information about the sea life and wildlife around Isle of Arran reached the highest percentages with a 26% each one, the lowest in comprehend by the Rooms available to hire for events and school groups. The others places of residence had a very similar panorama.

On the other hand, it is necessary to highlight that the daytrip and overnight visitors from these difference locations did not present any relevant difference at when selecting their interest level for the topics and activities for the MIC as illustrated in the **appendix 12**.

For the willingness to pay the topics and activities for the possible MIC were statistically tested using the Kruskal-Wallis test (**Table 13**), the results fluctuate as sea bird watching area, souvenir shop, café and rooms available to hire for events and school groups obtained a P>0.05 because the responses are better spread out between the interest levels than in the other activities. On the other hand, a P<0.05 was obtained by the rest of activities and topics, these activities are characterized for having the results concentrated in the “interested” and “Very Interested” levels, excepting for the excursions with the lowest P<0.001, indicating the highest values for the “Very Interested” level.

Table 13: Kruskal-Wallis results of the level of interest for each topic and activity and willingness to pay

	Touch tanks with marine creatures	Microscopes with plankton slides and activities	Real–time seabed cameras	Exhibition boards & displays	Audio-visual interactions	Interactive exhibition for children	Sea bird watching area	High power telescopes to view seascapes, birds and marine wildlife
Chi-Square	14.914	10.082	16.691	14.918	12.204	15.181	7.241	14.066
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.005	.039	.002	.005	.016	.004	.124	.007

	Cinema with short films about marine life (possibly in mock-up submarine)	Information about wildlife on the Isle of Arran	Information about the sea life around Isle of Arran	Information about research programmes running in the MPA and NTZ	Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.	Souvenir shop	Café	Rooms available to hire for events and school groups
Chi-Square	11.551	13.562	17.272	12.149	21.303	3.473	2.020	3.521
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.021	.009	.002	.016	.000	.482	.732	.475

In general, values are concentrated in the “interested” and “Very Interested” levels among the fee ranges especially to £ 1 to £5 / person and £ 6 to £10 / person, where most of 80% of the responses were obtained. The respondents with not much interest in the topic and activities for the MIC were the ones that didn’t agree to pay an entrance fee in the majority of the cases.

As the majority of responses were concentrate in the £ 1 to £5 / person and £ 6 to £10 / person fees, each activity and topic were analysed in comparison to these categories. The following figures provide a better understanding of each case.

Figure 12: Willingness to pay £ 1 to £5 / person

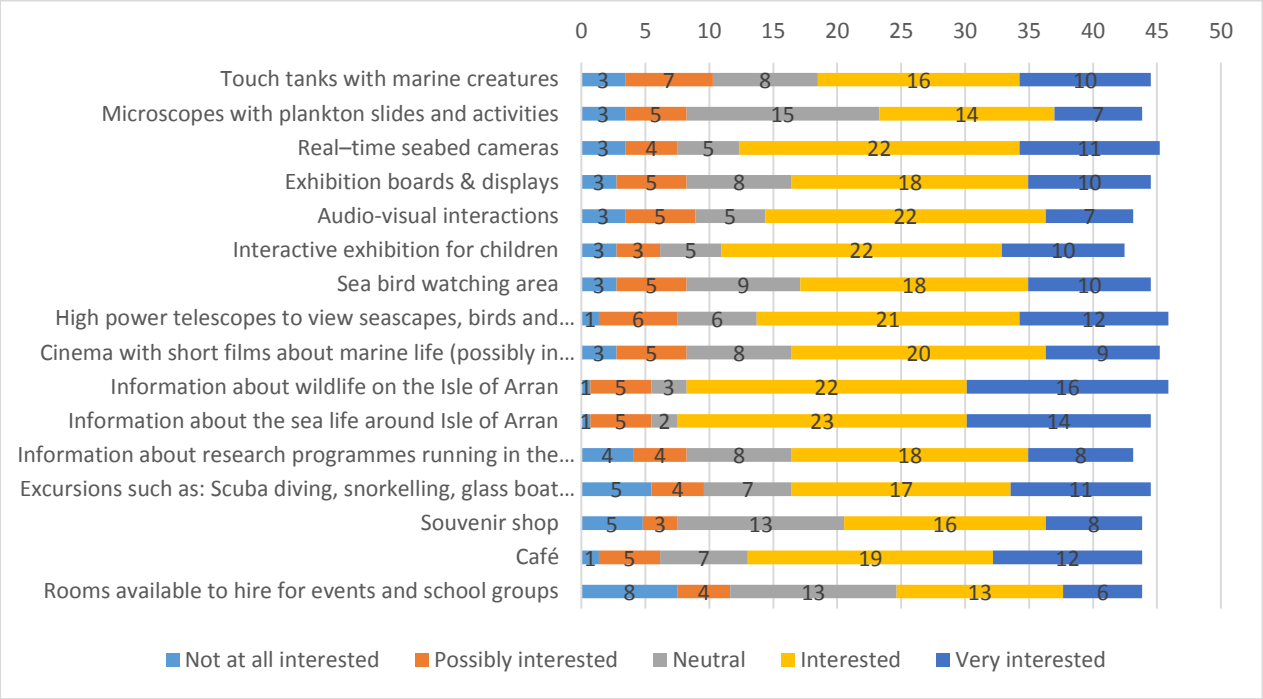
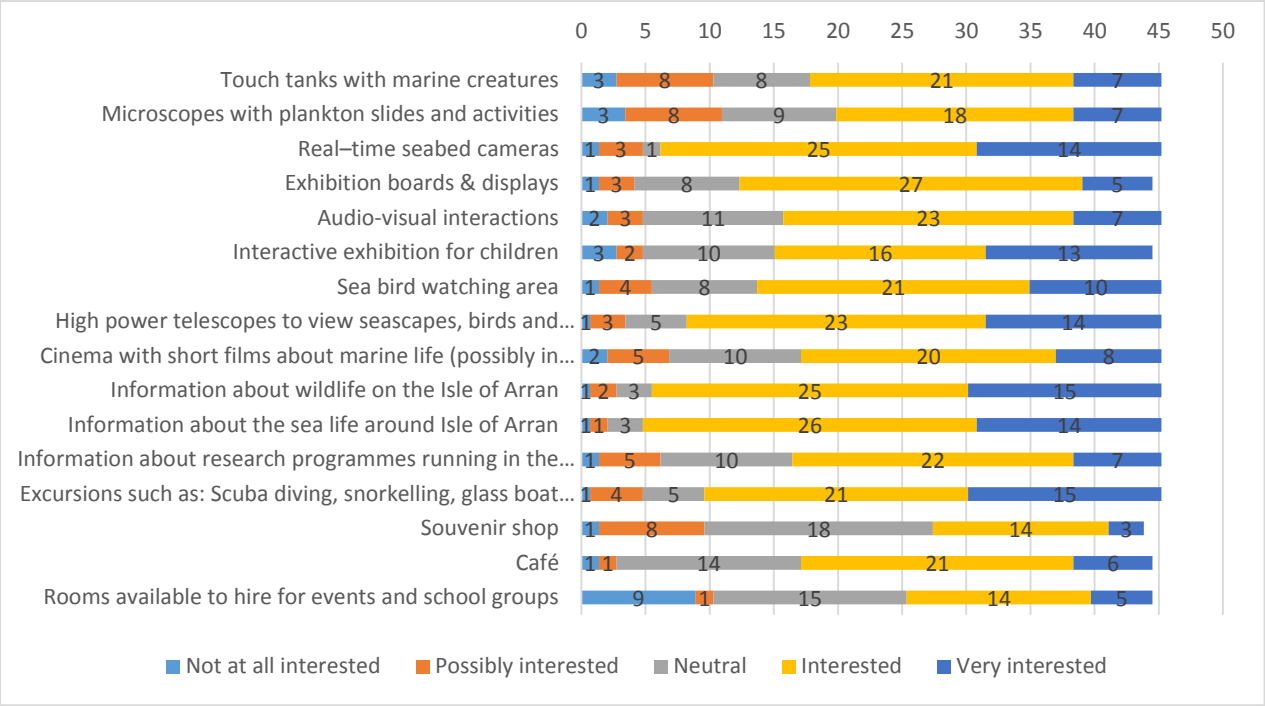


Figure 13: Willingness to pay £ 6 to £10 / person



The £ 1 to £5 / person interest levels averages were 3% for not at all interested, 5% for possible interested, 8% for neutral, 19% and 10% for interested and very interested respectively. For the entrance fee of £ 6 to £10 / person, very similar low percentages were obtained in not at all interested, possible interested and neutral with a 2%, 4%, 9% respectively, while, interested received 21% and very interested a 9%.

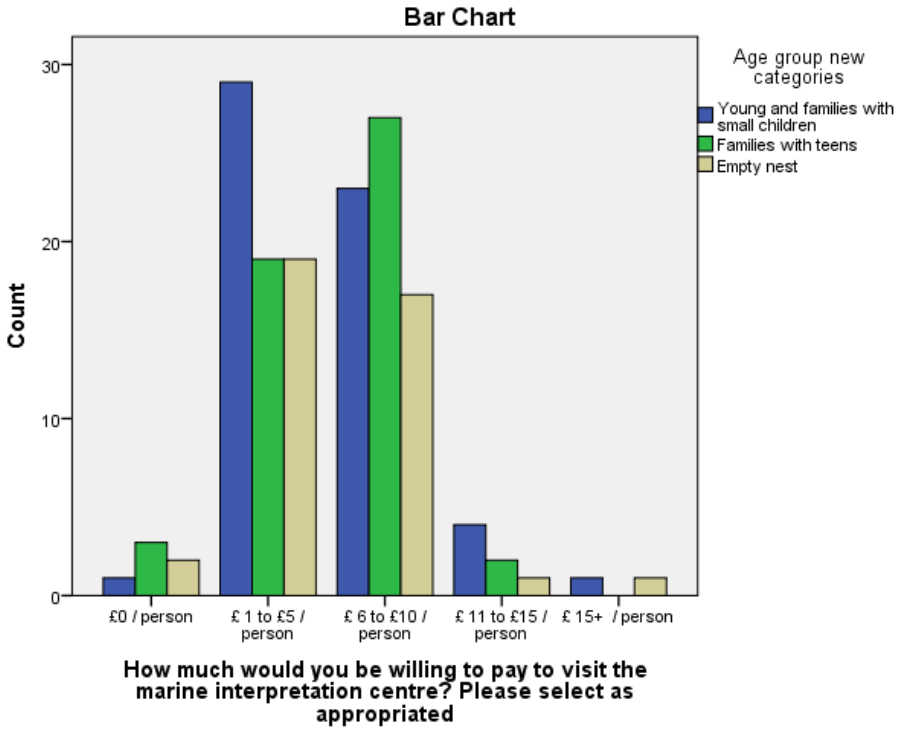
For the £ 1 to £5 / person group, the activities and topics with high interest levels were Information about the sea life around Isle of Arran with a 23% and 22% for each of the following: Information about wildlife on the Isle of Arran, Interactive exhibition for children, Audio-visual interactions and Real–time seabed cameras. The £ 6 to £10 / person category slightly varied from the previous entrance fee in the “Very Interested” level as High power telescopes to view seascapes, birds and marine wildlife and Excursions were in the top percentages.

4.1.5.2 Willingness to pay to enter to the MIC

After presenting the interaction in the crosstabs between the willingness to pay and levels of interest for the topics and activities of the MIC, this section complies the demographics aspects compared with the previous variables such as age group, place of residence and length of stay, in order to identify the general features of each entrance fee category. As the willingness to pay is a nominal variable the data was manipulated in order to achieve the chi square assumptions, hence, the categories £0 / person, £11 to £15 / person and £15 + / person were merged as they obtained the very low values. However, the crosstabs results present the all the categories separately.

The age group X^2 results provided a P>0.05 demonstrating not significant difference between the age groups and will to pay ranges. However, the highest values for the young and families with small children and empty nest were obtained in the category £1 to £5 / person, while, families with teens preferred the £6 to £10 / person as illustrated in the figure below.

Figure 14: Crosstabs of age groups and willingness to pay



Moreover, the previous figure illustrate others categories, which obtained values lower than 5.

On the other hand, even the Chi-Square assumptions of the place of residence indicate that have been violated, the researcher verify attentively the results and made sure the expected count was achieved with a 20% as 3 cells counted less than 5 (detailed in **appendix 13**). This non-parametric test provided a P>0.05, as no significant difference was found between these categories.

However, the crosstabs indicate that all Arran residents were willing to pay an entrance fee, their highest values were concentrated in £1 to £5 / person and the 5 out of 7 surveyed indicated they were willing to pay £11 to £15 / per person as illustrated in the following table.

Table 14: Crosstabs will to pay and place of residence with all the categories

	Place of residence					
Will to pay	Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
£0 / person	0	1	4	1	1	7
£ 1 to £5 / person	23	12	18	10	5	68
£ 6 to £10 / person	18	6	22	16	5	67
£ 11 to £15 / person	5	0	1	0	1	7
£ 15+ / person	1	0	1	0	0	2
Total	47	19	46	27	12	151

The previous table highest values for the others places of residence were allocated in £ 6 to £10 / person for rest of Scotland, rest of the UK and internationals, excepting for the rest of Ayrshire, which obtained its highest values as Arran residents in the £ 1 to £5 / person fee. Moreover, it is relevant to point out that 4 out of 7 respondents that selected the category £0 / person were from Rest of Scotland.

On the other hand, the length of stay was statistically tested with the will to pay and the results indicated no relevant preferences in the fee ranges by these types of visitors (**Appendix 14)**.

4.2 Focus groups

At the same time the questionnaire data was collected, this quantitative research sample was implemented. Three focus groups were run in total, two for Arran residents and one for visitors. The former, needed a second focus group because the first one didn't accomplish the minimum of participants, however, the information collected was very useful. Therefore, the focus groups transcription is presented in the following **Table 15**.

Table 15: Focus groups discussions about visitors and residents point of view in regards to the possible MIC.

Questions	Residents I	Residents II	Visitors
1. What do you understand by 'marine interpretation centre'?	The participants expressed that it took a bit of time to understand the concept of marine interpretation centre but they related to an aquarium, information/visitor/education centre for the marine life, where visitors can learn about the ocean features of the island.	- A place that provides a better understanding of the marine ecosystem, with an explanation of its features and information on how humans could improve it. - Information about local plants and animals and display with few small living creatures. - Underwater cameras. - Different fish species as some of the participants have never seen a local fish.	- Education could be another way to call this centre. - Conserving resources for the next generation is a good focus. - It could attract different segments of visitors. - It could increase the promotion of Arran as a destination.
2. Have you been to any marine interpretation centres or aquariums? **If yes, what did attract you to visit it?**	The participants have not been in a marine interpretation centre but they have visited some aquariums and marine centres. The former were Sea life centres in Australia and Loch Lomond as part of a family activity to share time with the children, the most interesting exhibitions in these places were a tunnel display, touching tanks and information about the main pollutants of the ocean. The marine	- Edinburgh Sea life Centre: To swim with the sharks - Newcastle Sea Life: A rainy day activity, however, the participant was fascinated to see these marine creatures so close in a semi-natural environment. - Oban Sea Life: Family activity, so the children could interact with octopus and seals. Also, they had some exhibitions about their seals rescue programs which the participant found very interesting.	- Sea life centre in Birmingham: It was good to see the variety of marine life that you won't be able to see by just looking in the beach. -Sea centre in Sydney: This attraction was based on the immense variety of species, not seen anywhere else. The most interesting exhibitions were a glass tunnel, open tanks and ray tanks to touch them.

	centres visited provided a both a different and similar experience to the marine interpretation centre concept, as they illustrated the local marine life found when diving and offered diving experiences.		
3. Imagine there is a marine interpretation centre in the Isle of Arran and you are planning to visit. The website presents several pictures of the different exhibitions and facilities it contains, which of those are you most interested to experience? Please explain your choice.			
Touch tanks	Participants agreed that the assistant of an expert in this activity is necessary, because it will encourage more people to participate in it, provide education about the species and keep health and safety issues under control.	All the participants had interest in touching living creatures, however, they pointed out the need of having someone explaining and guiding this exhibition which brings the high cost of having someone there at all times.	The participants didn't present interest in touching living species but they agreed children would love to do so.
Interactive exhibitions and activities for children	Participants discussed that the more interactive the activities there are the better, the laboratory and storytelling are good ideas but they may target children of different age groups. Moreover, they agreed that storytelling is a more engaging activity than a laboratory as with the latter the equipment is more expensive and it is very individualist.	Some participants found the Laboratory activity interesting as it is something new and interesting for kids, while the storytelling aspect could be used for special events but not on a daily basis. Moreover, they mentioned a popular exhibition for children in which they compared the size of different marine species.	They agreed that the small laboratory for microscopically species and a storytelling space are very good ideas and children would like to do these activities. Moreover, some hunt activities will be ideal, as one of the participant's grandchildren likes to return to attractions that provide them with a hunting and finding environment.
Reading exhibitions, sculptures for animals and plants species, cartoon species	The respondents expressed that living creatures are more interesting than sculptures. Also, a lot of reading information around are always well appreciated. For children it is necessary to have many activities as possible to keep them happy and engaged.	The participants mentioned that it is necessary to create a balance between the exhibitions to cater for all age groups. For example, reading exhibitions are more focused towards adults than children, while Sculptures could appeal to the majority of age groups. However, they didn't like cartoonish images as children are more curious about the real pictures and size of the animals.	They argued that in the majority of places they go there is too much information displayed, hence, it will be more interesting to highlight in small phrases the most important parts and if anyone is interesting in reading more about it, they could find more information elsewhere. Also, they agreed pictures and sculpture are fundamental.

<u>Real time sea-bed cameras</u>	Both participants expressed their enthusiasm to this part. They said that it is important to be able to appreciate the marine life in their local water as it is more relevant than any picture or exhibition and it allows activity levels to be recorded over the years.	It was evident the need to connect with the marine environment and to have an understanding of its life, that's why, the participants seems very enthusiastic about the idea of viewing the ocean world of Arran. However, some concerns were pointed out such as the fact that sometimes nothing is really happening in the area where the camera is located which could be boring for the people that could be watching it, hence, some recorded videos of previous interesting moments could be shown.	Everyone very enthusiastically said that they would love to see what is under the water of Arran. They were interested in appreciate the marine life, especially the seal colonies, as they highlighted that there is not much information about the behaviour of seals and others species under the water. Moreover, they said that it is a good idea to appreciate the marine life with a camera where we benefit of discovering their habitat without disturbing them. Other important facts they would like to know about the sea-bed cameras is the places where the cameras are located so if they visit this place, they know where the species they saw are located. They suggested the No Take Zone as a possible location for the sea-bed camera because it can show the changes that this place have been receiving and create more awareness.
4. In terms of education, what would you like to learn at the Centre?	- Animals and plant species that inhabit the Arran Ocean. - Ecology of the rest of the Clyde. - Different actions and programs the community can participate in to improve the state of the ocean. - Information about the pollution and examples of its impact.	- General and local issues about the ocean. - The marine life of Arran. - Historical development of Arran marine environment from the last 50 or 100 years, presented in a timeline. - Positive changes that can be developed in the area and which measures should be applied. - Sustainable fishing methods. - Highlighting products that are beneficial or harmful for the ocean.	- Sea life in general and the life cycle. - Humans impact to the behaviour of the sea and local area. - Fishing effects. - History of the sea in the area, and its future. - Possible solutions of what we can do to make positive changes.

5. Would you be interested in Gannet web cams in Ailsa Craig?	Both participants sounded very interested to have web cam access with this idyllic place for wildlife as it is not easy to see the gannets behaviour if you don't have a boat to go there.	Everyone showed interest about some web cams in this location as they expressed the difficulties of getting to there. Also, they highlighted that people in the area are more enthusiastic for birds than sea life, so, this could be another way to engage more people to the marine environment.	Yes, it was the universal answer. They expressed the existence of transport difficulties in getting there, that's why, web cams could satisfy visitors and local interests in knowing about the gannets breeding and immigration periods. Also, they were enthusiastic about watching some videos that illustrate gannets diving. Moreover, the participants highlighted importance of bird life in the marine ecosystem.
6. Would you like to see short videos of Arran marine life and issues?	Both respondents answered positively. They demonstrated a lot of interest in knowing the issues that are happening in their surrounding marine life. Also, they said that this type of short videos could change positively the behaviour of the community towards their environment.	This part was not deeply discussed by the participants, however, they present interested in watching several short films and all of them have watched previously the video presented about the cost of dredging in the Arran sea-bed created by COAST.	The participants watched a short film about the cost of dredging in the marine environment of Arran. One of the participant expressed how sad and shocking is that in Arran and in Scotland dredging is allowed. Others thought this activity was outlawed. They discussed about the small benefits that dredging provide to locals such as few jobs and enrichment of large corporations instead of the local community. They mentioned that nowadays everything is focused the in economy without taking the necessary measurements to sustain it, hence, the interpretation centre should focus on the education about this issue. Additionally, others surrounding issues should be presented through interactive exhibitions and small conferences, where the public can provide their thoughts and opinions.
7. Would you be willing to pay a) Entry	An entry fee is fair but the amount should be competitive and reasonable and it will depend on the exhibitions.	They agreed that it will depend on the offer. They were more focused on in the donation option because they believe it will	The majority were willing to pay, some agreed the best option was an entry fee because the place should be economically sustainable as

fee b) See different exhibitions c)Donate	Also, the total amount of time that visitors could spend there could indicate the entry fee amount. Additionally, they recommended to have a special entry fee for families and children of different ages. Yearly membership could be a really good options for local families, repeat visitors and schools. On the other hand, it could be possible to create partnership with local businesses to promote this attraction.	be more acceptable by visitors and residents than an entrance fee. Also, others payment options discussed were yearly membership, which could allow the residents to assist in several talks activities and take their guests and families more frequently. Additionally, they were interested in paying for extra activities such as snorkelling.	they are going to be people working there and exist a high cost to maintain a place like this running. However, one of the participants wouldn't pay arguing that the majority of museums in United Kingdom are free and the government provide resources for their maintenance. Others fee options could be an adult or family membership, fee for extra services such as excursions and conferences or talks. Moreover, they agreed that if they will visit a marine interpretation centre they will be willing to pay a fee under £10.
8. Are there any specific locations that you think will be ideal for this centre?	Lamlash next to the No Take Zone, specifically in the land in front of the outdoor centre. Moreover, in this location is where COAST main office is located and it is close to ferry and accessible for to the shoreline to create some outdoor activities.	As residents, the participants expressed the advantages and disadvantages of having the MIC in Lamlash, the former because it hosts the No Take Zone and for the latter they indicated the high cost of the property and lands as it is the most expensive area of the island. On the other hand, they agreed that the closer it is to the sea the more successful this MIC could be, even if it is a place not so popular like Kildonan, because they believe the scenery is more important than the location.	- Lamlash: Possess proximity to the holy island and outdoor centre. Moreover, it is where the No Take Zone is placed and could bring more visitors to Lamlash. - Brodick: The majority of visitors come to this area and sometimes don't travel further around. - Whiting Bay, Kildonan, Blackwaterfoot and Machrie: if the visitors are interested in a beach experience.
Other general comments:		- To maintain resident interest in the MIC it is necessary to have regularly talks and conferences and create new activities with the community.	- They would like to see more information about COAST as an organization in other places not just in Lamlash. - The interpretation centre must have a coffee shop and souvenir area.

		- The MIC should have a balance in the exhibition for children and adults, and residents and visitors. - The information should generate more interest of the ocean life for visitors.	

5. Discussion

The questionnaire and focus group results in connection with the aim and objectives illustrated in chapter 2, are discussed in this chapter. Additionally, from the outcomes, a desk study of other marine centres and the research's limitations and suggestions are stated.

5.1. General trends

The growing tourism tendency in the Isle of Arran is evident, as it is recognized as a top destination in the South Ayrshire Council and in Scotland (South Ayrshire Council, 2011). Its main attractions involve nature landscapes and heritage places, creating an enjoyable experience for visitors and residents. The marine and coastal activities are an important component of Arran's tourism offer and hence, the purpose of this study is to understand the feasibility for a marine interpretation centre. To achieve this it was necessary to analyse the residents and visitors likelihood towards marine and coastal activities. The pattern for these activities was illustrated using descriptive statistics, which indicated that the activity with the highest 'highly likely' levels were walking, running, cycling or horseback riding along the coast in the mean, medium and mode.

Lately, Arran's marine environment has been experiencing new management tools to create sustainability, the trend indicates that the awareness about the MPA and NTZ among residents and visitors has almost reached 50%. These results are positive as these designated areas are relatively new. However, the possible implementation of a MIC could increase the spread of this knowledge and hopefully create a greater sense of care from the public.

The expectations for the marine interpretation centre were addressed taking in consideration three variables, the levels of interest for topics and activities, preference location and the willingness to pay. The levels of interest for topics and activities indicated that the highest levels of interest were appointed to information about sea life and wildlife of Arran, followed by the 'real-time seabed cameras, high power telescopes and several types of exhibitions. Regarding the location preference, Lamlash and Brodick obtained the highest values, as respondents'

highlighted that these areas feature easy accessibility and proximity to other attractions. Additionally, 94% of the surveyed expressed a positive will to pay an entrance fee, the highest values were concentrated in £1 to £5 and £6 to £10 / person.

Focus groups highlighted similar trends of the questionnaires, as more than 90% of the participants had a positive will to pay and the most mentioned location was Lamlash. Arran's sea life and solutions to improve the state of the marine ecosystem were the education topics the participants wanted to learn the most. Moreover, they were very enthusiastic for real-time seabed cameras, videos about Arran's marine issues and web cams in Ailsa Craig. Other questions discussed in the focus groups were related to the meaning of a MIC and if the participants had visited others marine centres, for the former they answered that it should be a place that is focused on the education of the marine ecosystem, while, for the latter, the majority of participants had visited aquariums and agreed that it was part of a family activity to learn and interact with species that are difficult to see in a visit to the beach.

5.2 Pattern of marine activities involvement in Isle of Arran

The evaluation of the marine activities that respondents get involved in the Isle of Arran was obtained through a combination of analysis such as Kruskal-Wallis and crosstabs results with several variables that compare the likelihood differences of these coastal activities into certain age groups, places of residence, visitors' length of stay and ranked the topics and activities for the MIC expectations. The analysis pointed out similar results in the majority of interactions between these variables, in terms of the high and low likelihood levels that each marine activity received with the others variables, however, some categories were merged to indicate a more specific outcome.

The study illustrated that 66% of respondents marked the activity of walking, running, cycling or horseback riding along the coast as highly likely with 22% as likely, making it the most popular marine activity. Moreover, when this activity was evaluated with the age groups, the 'young and families with small children' contributed to the highest answers, however the difference in comparison to other age groups was not

significant in regards to this activity. For the residents and visitors the panorama is the same, however, this situation changes when this coastal activity interacted with the type of visitors, as the daytrip visitors total ‘highly unlikely’ and ‘not likely’ percentage almost reached 30%, in contrast to the ‘likely’ and ‘highly likely’ 90% of the overnight visitors.

Activities such as birdwatching, guided nature tours and wildlife boat trips obtained a total percentage of likely and highly likely over 50%. The empty nest age group provided the highest percentage in the majority of these activities, except in wildlife boat trips, however the difference is not relevant as young families with small children obtained a total of 56% in likely and highly likely, while, 55% was provided by the empty nest. The difference is more noticeable in birdwatching where the empty nest obtained 78%, the families with teens 47% and young and families with small children 40%. On the other hand, when visitors and residents were assessed in relations to these activities, the higher likeliness percentages were provided by the visitors in all of the cases and for the length of stay, the overnight visitors demonstrated a 64% of likeliness for birdwatching and wildlife boat trips than the daytrip with a 26% and 36% respectively, nonetheless, for guided nature tours the percentages were very similar.

In contrast, respondents’ provided high unlikeliness values for windsurfing, scuba diving, sea angling, sailing and kayaking with a total percentage of highly unlikely and not likely of 87%, 79%, 73%, 68% and 61% respectively. The age categories pointed out several trends with these coastal activities, the first trend allocates the empty nest group with the highest unlikeliness percentages for windsurfing, scuba diving and kayaking, the second trend indicates that the families with teens appoint the highest percentages for sea angling and sailing, and the young families with small children provided the lowest unlikeliness values for all these activities. For residents and visitors, the pattern was very clear, indicating that visitors gave the highest unlikeliness percentages, however, in windsurfing and sea angling the difference is small than in kayaking scuba diving and sailing where the totals differ 10% to 20% for the last two activities. On the other hand, the daytrip and overnight visitors did not present any important difference in these activities, except for sea angling where the daytrip visitors granted 91% to highly unlikely and not likely, in comparison to the 76% received from overnight travellers.

Swimming is the remaining coastal activity, with a slightly even likelihood level total of 49% in highly unlikely and not likely and a 47% in likely and highly likely. This activity do not follow the same trends of previous activities, as for the age groups the highest percentage was obtained from the young and families with small children and the residents provided higher likeliness values than visitors. The length of stay indicates that daytrip and overnight visitors did not present significant difference.

Moreover, only using crosstabs the marine activities were examined with the expectations for the topics and activities of the MIC in order to understand how the likelihood values impact the levels of interest. Therefore, two coastal activities with contrasting likelihood results analysed each topic and activity of the MIC, the results were ranked to identify where the highest levels of interest were concentrated. Walking, running, cycling or horseback riding along the coast and sailing were the marine activities selected, as the former obtained high values in the highly likely option, in opposition to the latter where the values were concentrated in the other extreme, the highly unlikely option.

This analysis revealed some trends; a) information about wildlife and sea life of Arran, real-time seabed cameras and high power telescope occupied the three highest ranks; b) the last ranks were provided by the souvenir shop and rooms to hire; c) café, excursions and seabird watching area obtained different ranks in each marine activity. However, this comparison indicates that independently of the likelihood results of the marine activities, the expectations about the topics and activities for the MIC maintain a similar tendency and the majority of the values are concentrated in the interested and very interested levels.

5.3 Respondents' prevailing features about the expectation for the MIC

For the analysis of this section several statistics techniques were implemented such as the crosstabs, Kruskal-Wallis, Mann-Whitney U and Chi-Square to the levels of interest in topics and activities for the MIC and willingness to pay, however, the location preference was evaluated only using frequencies. Moreover, for the focus group data the main findings are connected to the similar variables investigated in the questionnaire. The researcher's intention is to highlight the main characteristics

of respondents' when these variables are combined between each other and some demographics aspects.

Three-fifths of respondents indicated interest for the topics and activities of the MIC, this encouraging result demonstrate a possible high participation of Arran's residents and visitors if this attraction is developed. As mentioned previously, topics and activities such as information about the sea life and wildlife of Arran, high power telescopes and real-time sea bed cameras obtained the highest levels of interest, over 70%. Young and families with small children provided the values with the highest levels of interest in each of the activities and topics mentioned previously, while the empty nest appointed the lowest values. However, the difference between the maximum and minimum value was small, hence, it can be concluded that these activities and topics will be highly accepted by all ages groups. In regards to the place of residence, from the total results visitors indicated higher levels of interest than residents with percentages of almost over 50%. For the length of stay the highest levels of interest were presented by the overnight visitors.

For the remaining activities and topics the respondents' characteristics are very similar among all the interactions between the topics and activities already discussed, however, microscopes with plankton slides and sea bird watching obtained the same results among age groups. For information about research families with teens gave the lowest interest values, while, they provided the highest interest value in exhibitions boards and displays.

Furthermore, it is important to highlight that the souvenir shop, café and rooms to hire obtained less than 50% of interest, hence, the implementation of these services should take in consideration some geographic aspects, for instance, the proximity to others locals souvenir shops and cafés.

In the focus groups, similar facts about the activities visitors and residents wanted to experience in the MIC were asked. For the short videos about general and local marine issues and real-time cameras about the seabed in Arran and the gannet colony in Ailsa Craig, residents and visitors expressed higher enthusiasm than for the others activities. For the former a local video made by COAST was presented and the respondents' agree that these type of information could change positively the behaviour of visitors and resident toward the marine environment. About the

cameras, visitors and residents pointed out that the difficulties to watch the marine species in their natural environment and to travel to Ailsa Craig could make the MIC the perfect spot to connect with these areas.

The activities and topics for children discussed in the focus groups were laboratory, story-telling and illustration of species in cartoon. The visitors and first residents' focus group agreed these ideas were very good as the children should be engaged in many different ways, however, the second focus group of residents highlighted that the story-telling should be an occasional activity as it could be expensive to have a permanent staff to do this activity and the MIC needs to create a balance between the exhibition for children and adults.

The reading exhibitions obtained a lot of acceptance between the focus groups, the participants agreed they were more suitable for adults, nonetheless, the visitors expressed that sometimes the reading displays include a lot of information, hence they recommended to highlight the main facts and if the reader gets very interested in the topic will finish to read it all. Moreover, the touch tanks with living creatures was presented to the participants and their opinions fluctuated in each focus group, as the visitors didn't present any interest in this activity, however, the residents were willing to participate.

Additionally, the participants were questioned about the themes they would like to learn in the MIC. Residents and visitors agreed on topics such as the animals and plants of Arran's ocean and the rest of the Clyde, and initiatives that they could get involved in to restore the marine environment. Others themes pointed out by visitors and residents of the second focus group were; history of the local marine ecosystem, fishing effects and sustainable fishing methods.

The findings between the will to pay and the topics and activities of the MIC were also assessed in the questionnaire. The categories that obtained higher values in the willingness to pay were £1 to £5 and £6 to £10 / person, as already illustrated, hence, the findings indicate that the average values for the levels of not at all interested, possibly interested and neutral were very low ranging from 6 to 9 in both categories and 29 was the total average value for interested and very interested levels. However, the category of £6 to £10 / person obtained slightly higher values in

10 out 16 topics and activities than the £1 to £5 / person, demonstrating that if the MIC visitors' level of interest is high they could agree to pay more.

In the focus groups an entry fee was recommended by the visitors and first residents group, however, the second residents group indicated that a donation would be more acceptable by visitors and tourists. All the participants within the focus groups highlighted that other payments regimes could be applied such as family and member' yearly membership, and others payments for extra activities, for instance, excursions and conferences. Although, only the visitors focus group agreed to pay an entrance fee under £10, in overall visitors and residents indicated that the entrance fee will depends on the offer.

In the questionnaire, the will to pay was also analysed with some demographics variables, such age groups, place of residence and length of stay. In general, the statistical results did not point out a significant difference, however, the cross-tabulation highlighted some dissimilarities, from which, can be concluded that: a) the entrance fee of £1 to £5 / person was highly supported by young and families with small children and Arran's resident; b) visitors, especially from the rest of Scotland, and families with teens selected the £6 to £10 / person; c) the length of stay variable did not set a specific preference for these entry fee categories. It is interesting and contradictory at the same time to find out that the even the young and families with small children were the age group with highest levels of interest to the topic and activities for the MIC, their will to pay was not in average the higher one.

Overall, the will to pay outcomes creates a positive perspective for the MIC, because as noted in the literature review its success needs to be connected with an economic sustainability.

To complete the discussion about the dominant characteristics for expectation of the MIC, the research methods inquired about the preference for a location. In the questionnaire, the categories illustrated villages around the island, especially in the south, and the highest results were appointed to Brodick and Lamlash. However, for the remaining locations the respondents' argued that new attractions should be distributed more even in the island and outside of Brodick, which already receive enough tourists. In the focus groups, the results were similar as in the majority of cases the participants agreed that the most suitable location was Lamlash, as it is

part of the MPA and NTZ, however, any other places with a sea view within the MPA parameters could work perfectly.

5.4 Summary of desk research about international and national marine centres main features

In order to create a better understanding of the main characteristics of others marine centres mostly in the United Kingdom, a compilation (**Appendix 10**) was made illustrating the different attractions they offer, photos of the exhibitions and building, payment policy, social media channels and contacts. The marine centres collected were of different dimensions, for instance; St. Abbs Visitors Centre can be consider as a small marine centre, in comparison to Deep Sea World. The purpose of this differentiation is to provide more options to choose for the development of Arran's MIC. Unlike the exhibitions and activities inquired in this study, the compiled marine centres provide the following: displays with large living marine animals such as sharks, turtles and rays, non-native species displays, wildlife survey cruises, marine hospital, giant touchscreen featuring the marine environment, a hydrophone, a wormery, shark tunnel sleep over and others (Cardigan Bay Marine Wildlife Centre, 2015; Deep Sea World, 2015; Gairloch Marine Wildlife Centre & Cruises, 2015; Islay Natural History Trust Wildlife Visitor Centre, 2015; Island Bay Marine Education Centre, 2015, Ocean Explorer, 2015; Scottish Seabird Centre, 2015; Scottish Sea Life Sanctuary, 2015; St. Abbs Visitor Centre, 2015; Wembury Marine Centre, 2015). Certainly, these marine centres attractions are very diverse, but the more variety and unique is the offer, the higher the entry fee is.

An entrance fee is not the only way these marine centres obtained economic support, hence, ocean explorer, St. Abbs visitor centre Cardigan Bay marine wildlife centre, Island Bay marine centre education and Gariloch marine wildlife centre & cruises, provide a free entrance and get the economic support from donations, but the cruises in the Gariloch marine wildlife centre have an extra cost. Others marine centres that have set entrance fee, which vary depending on the size and exhibitions

of the centre, small size such as the Islay Natural History Trust Wildlife visitor centre charge between £1.50 to £3 / person; the Scottish Seabird centre charge between £5 to £9 / per person and it can be considered as a medium size; and the largest ones such as Deep Sea World and the Scottish Sea Life Sanctuary entrance fee range from £8 to £14 / person. Additionally, another centre in the list is the Wembury Marine Centre, which has a different way to obtain its economic resources, offering a free entrance but charging for parking (Cardigan Bay Marine Wildlife Centre, 2015; Deep Sea World, 2015; Gairloch Marine Wildlife Centre & Cruises, 2015; Islay Natural History Trust Wildlife Visitor Centre, 2015; Island Bay Marine Education Centre, 2015, Ocean Explorer, 2015; Scottish Seabird Centre, 2015; Scottish Sea Life Sanctuary, 2015; St. Abbs Visitor Centre, 2015; Wembury Marine Centre, 2015).

Others characteristics of these marine centres include location, the majority have sea view, however, others uses historic building such as the St. Abbs visitor centre and Islay Natural History Trust Wildlife visitor centre which both promote the marine environment while informing you about the history of the building and the village. It is important to highlight that all these centres have at least a Facebook account to inform their followers about their activities and general information.

5.5 Research limitations and suggestions

The time of the year that the questionnaires were distributed was most important limitation. The research started at the beginning of June and lasted for three weeks, during the school year and the participation of families in the survey was not ideal and hence, further research should start at the beginning of July so the family segment could be better examined. Also, this year in Scotland the winter climate was extended discouraging many tourists to go on holidays. Therefore, the findings may not be a precise reflection of the visitors' expectations for the MIC.

Further validation of the socio-demographic aspects, could be enriched with a larger sample size, even though the total number of questionnaires collected (n=156) for this research matched others statistically viable studies, a larger sample size could generate more specific characteristics in order to create the MIC visitors profile. The sampling results indicate a larger amount of visitors than residents, hence, to make

more realistic comparisons between the residents' and visitors' preferences, further research should try to incorporate more residents.

Questions regarding the involvement of marine activities and the expectations for the topics and activities for the MIC, could be addressed differently, instead of obtaining the levels of respondents likelihood and interest towards participating in the suggested activities, it may be more effective to understand the numbers of times they participate in such activities within a year time period for the residents and during a visit for a tourist.

As the will to pay was examined in categories, a precise entrance fee was not obtained, therefore, it could be beneficial in further studies for them to incorporate an option to specify the amount. Moreover, it could be favourable to question the respondents will to pay in comparison to the exhibitions they are interested in experience. On the other hand, it is arguable to interpret the respondents' will to pay decision if they have not been in an attraction with similar characteristics and objectives of a MIC.

Additionally, further research should address others aspects not included in this study that can influence the success of the MIC such as, tourists' main source of planning a visit to Arran, involvement of local businesses, deeper understanding of others UK marine centres and legal requirements to open a marine centre.

6. Conclusion

To understand the feasibility for a marine interpretation in the Isle of Arran, was this study's purpose, through several research techniques to draw the main characteristics of Arran's visitors and residents for the MIC. The analysis integrated the actual marine activities the respondents participate in, the expectations for the MIC, an insight of others marine centres and demographics aspects in order to assist COAST in the future development of the MIC. The achievement of the planned objectives has demonstrated a high interest level of respondents for the potential activities and topics and set their preference for the location and entrance fee. Therefore, it will be necessary for the MIC to prioritize topics such as information of the sea life and wildlife of Arran as they obtained the greater levels of interest.

Moreover, as walking running, cycling or horseback riding along the coast resulted as the most popular activity that visitors and residents have in mind when they are planning to enjoy Arran's marine environment, the MIC should integrate these activities in the programs they decide to offer. The desk research about marine centres highlighted the quality and diverse range of exhibitions that they provide to maintain and enhance the visitors' expectations and experience, hence, this aspects should be properly discussed.

On the other hand, it is relevant to point out that even the economic sustainability is a strong pressure that this type of attraction faces, it is necessary to identify the marine interpretation centre focus between conservation and entertainment, so that way the exhibitions and activities to develop can be prioritized.

Although this study is concentrated in the practicability of a small-scale marine interpretation centre that could support the conservation goals of the NTZ and MPA in Isle of Arran and promote the marine environment of the area, the outcomes could contribute to a wider comprehension of the aspects that should be taken in consideration when a marine based attractions wants to be develop, moreover, indicate some travel trends that could help the development and enhancement of Arran's tourism.

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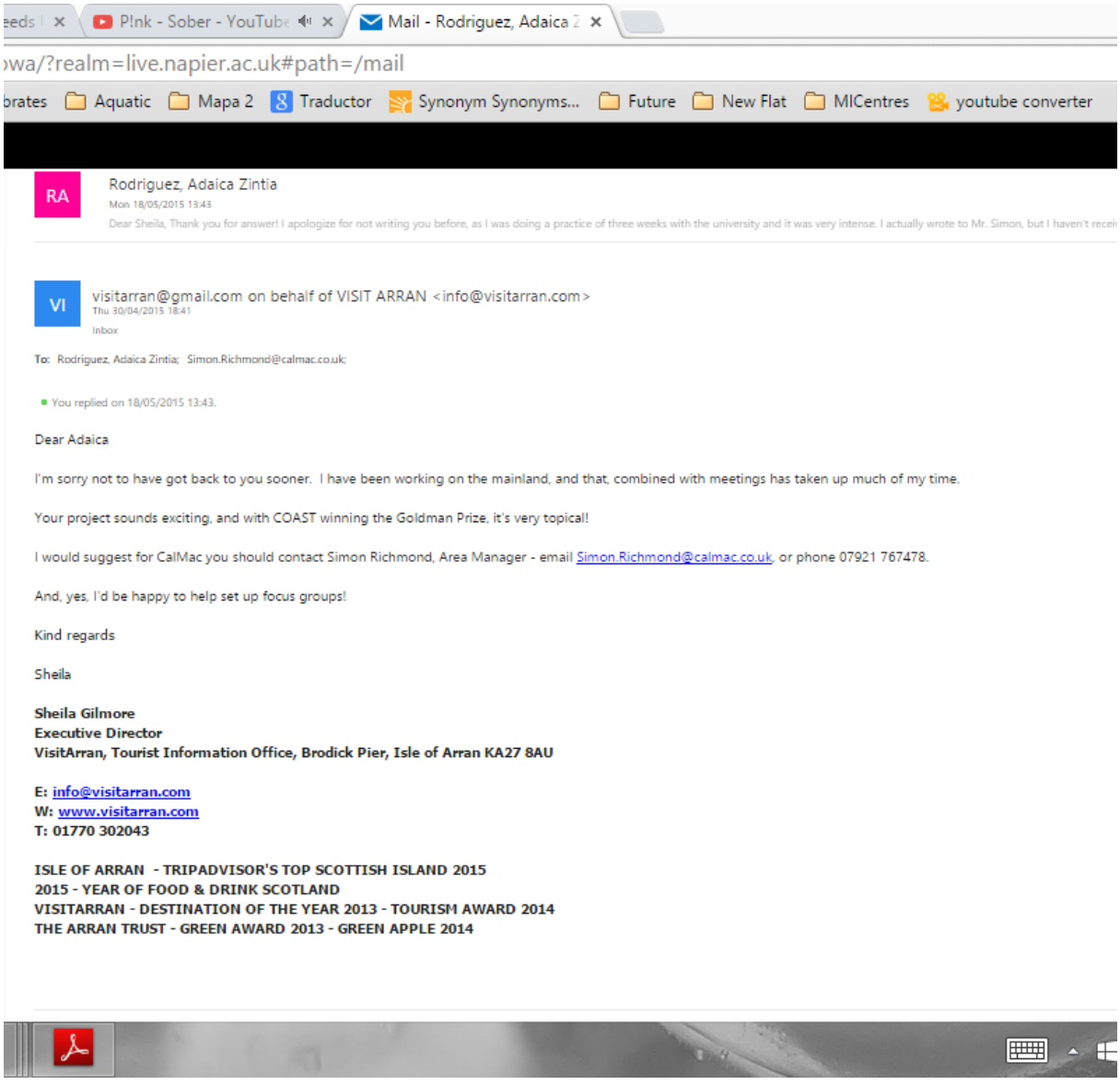
Appendices

Appendix 1: Confirmation emails

a) Visit Scotland



P!nk - Sober - YouTube | Mail - Rodriguez, Adaica

owa/?realm=live.napier.ac.uk#path=/mail

brates | Aquatic | Mapa 2 | Traductor | Synonym Synonyms... | Future | New Flat | MICentres | youtube converter

RA

Rodriguez, Adaica Zintia

Mon 18/05/2015 13:43

Dear Sheila, Thank you for answer! I apologize for not writing you before, as I was doing a practice of three weeks with the university and it was very intense. I actually wrote to Mr. Simon, but I haven't recei

VI

visitarran@gmail.com on behalf of VISIT ARRAN <info@visitarran.com>

Thu 30/04/2015 18:41

Inbox

To: Rodriguez, Adaica Zintia; Simon.Richmond@calmac.co.uk;

You replied on 18/05/2015 13:43.

Dear Adaica

I'm sorry not to have got back to you sooner. I have been working on the mainland, and that, combined with meetings has taken up much of my time.

Your project sounds exciting, and with COAST winning the Goldman Prize, it's very topical!

I would suggest for CalMac you should contact Simon Richmond, Area Manager - email Simon.Richmond@calmac.co.uk, or phone 07921 767478.

And, yes, I'd be happy to help set up focus groups!

Kind regards

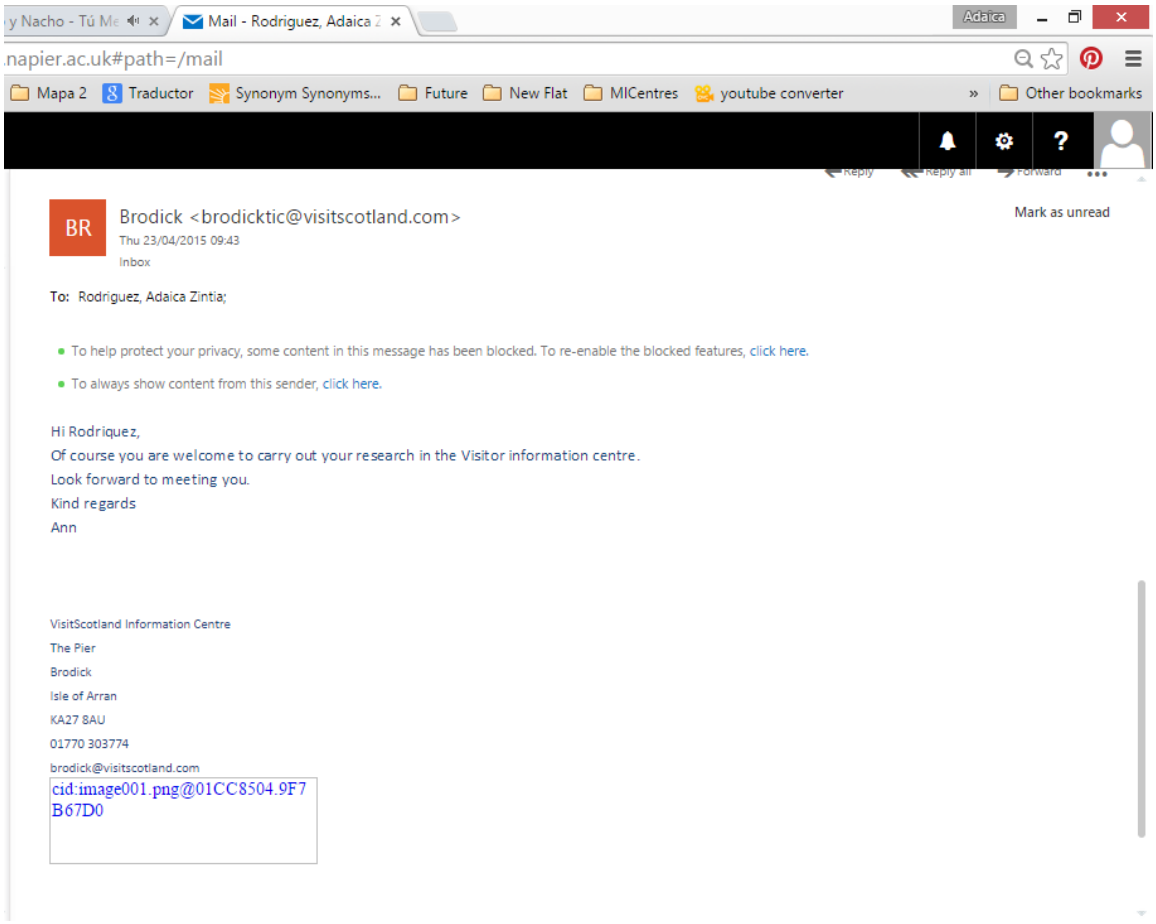
Sheila

Sheila Gilmore
Executive Director
VisitArran, Tourist Information Office, Brodick Pier, Isle of Arran KA27 8AU

E: info@visitarran.com
W: www.visitarran.com
T: 01770 302043

ISLE OF ARRAN - TRIPADVISOR'S TOP SCOTTISH ISLAND 2015
2015 - YEAR OF FOOD & DRINK SCOTLAND
VISITARRAN - DESTINATION OF THE YEAR 2013 - TOURISM AWARD 2014
THE ARRAN TRUST - GREEN AWARD 2013 - GREEN APPLE 2014

b) Information Visitor Centre



c) COAST

Request: Potential Research about Marine Interpretation Centre

REPLY REPLY ALL FORWARD
Mark as unread

acbinnie <acbinnie@yahoo.com>
Mon 09/03/2015 16:28
Inbox

To:
Rodriguez, Adaica Zintia;
...
Inbox
Get more apps
Action Items

Hi Adaica,

Look forward to it. I was thinking visitors for focus groups. The Ferry won't let you work on board but you can catch folk outside the terminal in Brodick and Ardrossan.

I'll get back to you on accommodation options this week.

Andrew

Sent from my HTC

"Rodriguez, Adaica Zintia" <40182637@live.napier.ac.uk> wrote:

Hi Andrew,

Thank you for accepting me to develop this research, I am very excited!!

I will start making the proposal, as soon as I have it ready I will send it to you. Please remember to send me others materials or research you have about the topic or related to the area.

I already informed my thesis supervisor Dr. Kathy Velander and we were wondering if the focus group was aim to locals or tourist?; For the tourist, is it possible to get tickets for the ferry to be able to conduct surveys or questionnaires there?

Moreover, I would like you to get me if it is possible the contact of the other students planning to do a research there, so maybe we could get accommodation together with them.

Thank you for all your cooperation.

Best regards,

Adaica Rodriguez

From: acbinnie <acbinnie@yahoo.com>
Sent: 06 March 2015 10:56
To: Rodriguez, Adaica Zintia
Subject: Re: Request: Potential Research about Marine Interpretation Centre

Hi Adacia,
Good to meet you in Edinburgh. This is to confirm that we would like you to conduct an MSc project on a possible interpretation Centre. They main areas of study I suggest are as follows:

Site location, three possible sites.
Visitor expectations and wants: what features, attractions would draw visitors, tanks, film theatre, exhibits, cafe. ..
Other centres , on line desk top survey of other marine centres world wide. Not big commercial aquatic circuses but genuine interpretation centres. What do they offer? What do they charge?
Also collecting photos of these centres, building plans and contacts.

I suggest on island information gathering using questionnaires and maybe two focus groups.

I'll send through previous studies next week. Out of the office today.
Cheers
Andrew

Sent from my HTC

"Rodriguez, Adaica Zintia" <40182637@live.napier.ac.uk> wrote:

Good Morning Andrew,

It was a pleasure to meet you yesterday!

I am writing you in order to get more details about the Interpretation Centre research project as agreed yesterday; also please send the any other relevant information that you have about the same topic (if you have them on hand).

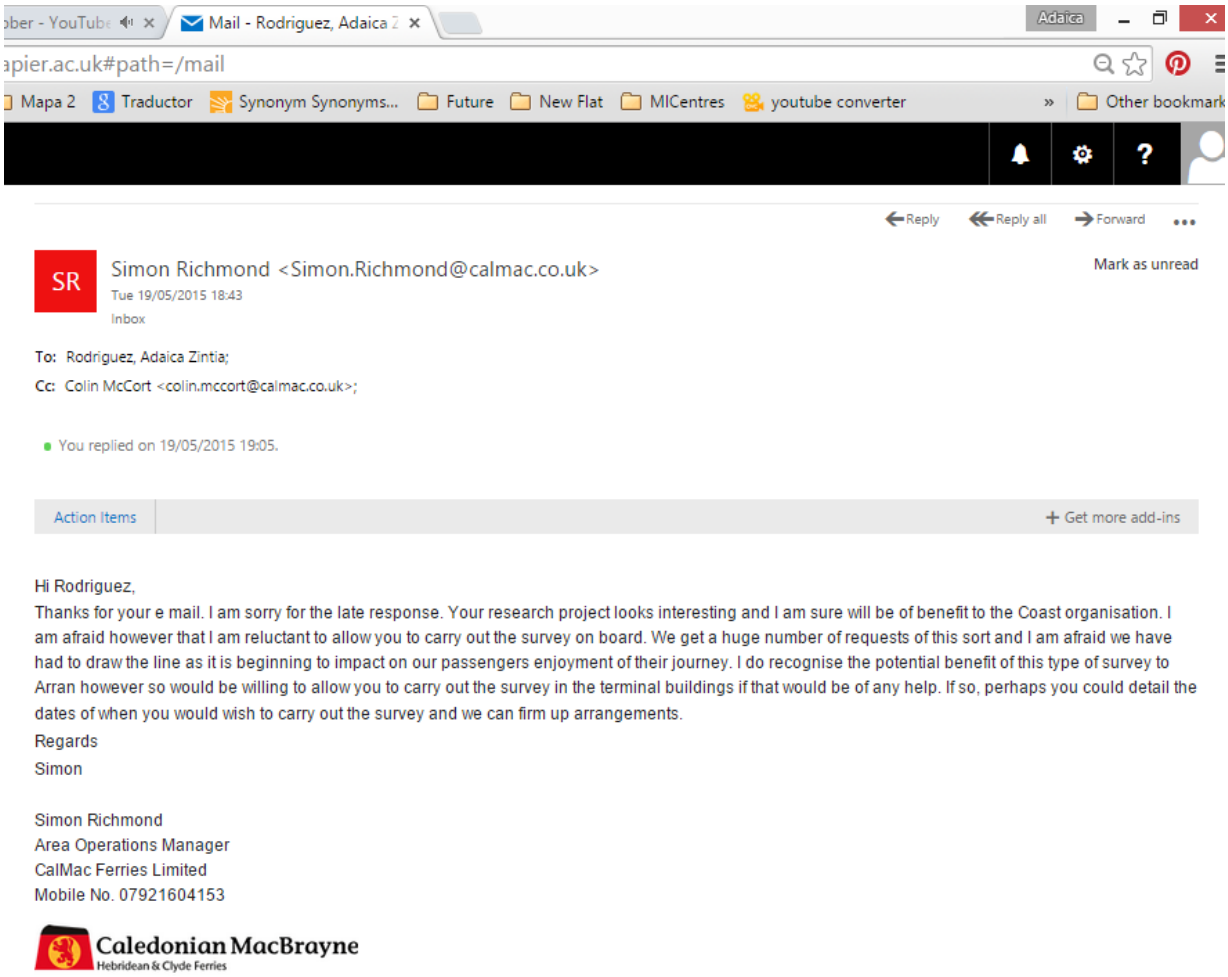
As soon as I have this information I will start creating the proposal theme for this project.

Thank you advance for your collaboration.

Best regards,

Adaica Rodriguez

d) CALMAC



Appendix 2. Risk assessment

Edinburgh Napier UNIVERSITY

SCHOOL OF LIFE SPORT AND SOCIAL SCIENCES
RISK ASSESSMENT FOR EXTERNAL ACTIVITIES AND VISITS

Name(s): **Adaica Zintia Rodriguez Sanchez (Matriculation: 40182637)**

Module: **ENV08102 Ecotourism**
Activity: **Msc Thesis research: Questionnaire sampling and focus groups**
Date(s) of activity: **June 2015**
Ref No.

Summary of Activity: Describe what is being done and indicate whether High/Medium/Low Risk
Questionnaire and focus group will be used to analyse the main factors that will draw tourists to visit a marine interpretation centre in the Isle of Arran. Low risk.

Description of Site(s): Name and describe site and indicate whether High/Medium/Low Risk
The questionnaires sampling will be made in the CALMAC ferry terminal and visitor information centre, both places are located in the municipality of Brodick on the eastern coast of the Isle of Arran. The former is situated in Brodick Isle of Arran ferry terminal, while the latter is at the pier. Both places provide services and facilities such as toilets and eating places withing walking distance. The focus groups will be organized in the visitor information centre. Low risk.

Physical Hazards: List the hazards encountered and indicate whether Major/Serious/Slight
Ordinary traffic walking to and from the visitor information centre and the ferry terminal. Slight

Chemical/Biological Hazards: List the hazards encountered and indicate whether Major/Serious/Slight
None

Control Measures: Explain how the above hazards will be controlled eg safety equipment
The CALMAC ferry terminal and the visitor information centre have first aid kit and trained staff members, hence, the questionnaires and focus groups will be organized during their open hours.

Instructions for Students:
Mobile phone and emergency contact details will be in possession at all times.

First Aid: Explain what personnel and equipment is available
The CALMAC ferry terminal and visitor information centre staff members are equipped with first aid kit and trained to provide first aid care if necessary.

Emergency Procedures: Explain what arrangements are in place
If an emergency occurs the following persons should be contacted:
Dr. Chris Edmans, School of Life Sport and Social Sciences, Edinburgh Napier University Tel: 0131 455 2203 and Dr. Kathy Velander, School of Life Sport and Social Sciences, Edinburgh Napier University Tel: 0131 455 2221 or 07849850639

Any Other Comments:
None

Assessment of Overall Risk:
LOW

Signed Adaica Rodriguez **(Student)** **Date** May 1st, 2015

Signed **(Supervisor)** **Date**

Appendix 3. Project questionnaire

Reference number:

Date: _____ Time _____ Location _____

Marine interpretation centre questionnaire

The aim of this questionnaire is to assess the feasibility of a marine interpretation centre for the Marine Protected Area, on the Isle of Arran.

This survey is being carried out as part of my Master's Degree in Ecotourism. Your answers and information will be treated anonymously and your help is greatly appreciated. Thank you for taking the time to complete this questionnaire.

Part I. **Your involvement with marine and coastal activities during your visit to the Isle of Arran.**

1. Please state the likelihood of you taking part in the following activities during your stay on Arran. For each activity please select the most appropriate level.

	Highly unlikely	Not likely	Likely	Highly likely	Don't know
Walking, running, cycling or horseback riding along the coast					
Kayaking					
Windsurfing					
Scuba diving					
Sailing					
Swimming					
Sea angling					
Wildlife boat trips					
Guided tours to learn about nature					
Bird watching					
Others (Please specify below)					

Part II. **Your knowledge about Marine Protected Areas and the No Take Zone in Isle of Arran.**

2. Did you know about the South Arran Marine Protected Area?
   ☐ Yes ☐ No
3. Did you know about the No Take Zone (NTZ) in Lamlash Bay?
   ☐ Yes ☐ No

Part III. **Your expectations of a marine interpretation centre.**

4. Please rate your level of interest about the topics and activities that you would like to see in a marine interpretation centre.

	Not at all interested	Possibly interested	Neutral	Interested	Very Interested
Touch tanks with marine creatures					
Microscopes with plankton slides and activities					
Real–time seabed cameras					
Exhibition boards & displays					
Audio-visual interactions					
Interactive exhibition for children					
Sea bird watching area					
High power telescopes to view seascapes, birds and marine wildlife					
Cinema with short films about marine life (possibly in mock-up submarine)					
Information about wildlife on the Isle of Arran					
Information about the sea life around Isle of Arran					
Information about research programmes running in the MPA and NTZ					
Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.					
Souvenir shop					
Café					
Rooms available to hire for events and school groups					
Others (Please specify below)					

5. Which area or location do you think would be the most suitable for the centre? Please state why in the box below.

☐ Brodick ☐ Lamlash ☐ Whiting Bay
☐ Blackwaterfoot ☐ Lochranza

£0 per person ☐

£1 to £5 per person ☐

£6 to £10 per person ☐

£11 to £15 per person ☐

£15 + per person ☐

Part IV. Please provide the following information about yourself?

8. Gender: ☐ Female ☐ Male

9. Age group: ☐ 18 – 25 years ☐ 26 – 35 yrs ☐ 36 – 45 yrs

☐ 46 – 55 yrs ☐ 56 – 65yrs ☐ 65+ yrs

10. Total annual amount of net income of your household (amounts in £):

☐ Under £15,000 ☐ £16,000 – £25,999 ☐ £26,000 - £35,999 ☐ £36,000 - £49,999

☐ £50,000 - £69,999 ☐ £70,000 + ☐ Prefer not to say

11. Place of residence:

☐ Arran ☐ Rest of Ayrshire (not Arran) ☐ Rest of Scotland (not Arran & Ayrshire)

☐ Rest of the UK (not Scotland) ☐ Other (Please specify) _____

12. Length of stay in Arran:

☐ Day trip ☐ Overnight Number of nights staying -_____

13. Time spent in Arran so far:

☐ Just arrived ☐ Midway through visit ☐ About to leave

14. Travel companions:

☐ Alone ☐ Partner/ Spouse ☐ Friends ☐ Family

☐ Organized group ☐ Other, please specify _____

15. Number of times you have visited Arran previously:

☐ 0 ☐ 1 ☐ 2 – 4 ☐ 5 – 10 ☐ 10 +

END OF QUESTIONNAIRE

Thank you for your time and enjoy the remainder of your visit.

Adaica Rodriguez

Appendix 4. Semi-structured focus groups questions/discussion points

Focus groups: visitors and residents of Isle of Arran (to provide a deeper understanding of the services and facilities the marine interpretation centre should include)

Number of people: 4 to 6

1. What do you understand by 'marine interpretation centre'*? An institution for dissemination of knowledge of natural or cultural heritage*
2. Have you been to any marine interpretation centres or aquariums?
   Follow up: If yes, what attracted you to visit them?
   Follow up: What were the main features you found?
   Follow up: What did you like the most? What didn't you like?

Imagine there is a marine interpretation centre in the isle of Arran and you are planning to visit. The website presents several pictures of the different exhibitions and facilities and you can choose which one you are more interested to see. Please explain your choice? (Several pictures of different exhibitions from marine interpretation centres will be shown to the participants and they will decided which they like the most).

a) Touch tanks with marine creatures
b) Interactive exhibitions and activities for children
c) Exhibitions, reading and displays
d) Real time sea-bed cameras

3. In terms of education, what would you like to learn at the Centre? e.g. Ocean life in general, the marine species in Isle of Arran, changes of marine ecosystems in the No Take Zone, etc.
4. Would you be interested in Aisla Craig Gannet web cams?
5. Would you like to see short videos on Arran marine life?
6. Would you be willing to pay a) an entry fee b) a fee to sea different exhibitions c) donate?
   Follow up: If yes, how much would be reasonable?
7. Are there any specific locations that you think will be ideal for this centre?
   Follow up: Why?

Appendix 5. Ethics application and approval

FACULTY OF HEALTH, LIFE & SOCIAL SCIENCES
APPLICATION FORM FOR PROJECT ETHICAL APPROVAL

Edinburgh Napier UNIVERSITY

Project title: Feasibility of an interpretation centre in Lamlash Bay (Isle of Arran), based on visitor's expectations and small scale marine centres around the world.	**Version no:** 1
Full name & title: Ms. Adalca Zintia Rodriguez Sanchez	**School:** School of Life, Sport & Social Sciences
E-mail address: adalca.tropical@gmail.com	**Telephone:** 07578417141
Postal address: Kathy Velander, *Edinburgh Napier University, Sighthill Court, Edinburgh EH11 4BN*	
Status: Staff (Edinburgh Napier University) ☒ **External Applicant** ☐	**Student (Edinburgh Napier University)** ☒ *Please provide additional details below:* **Matriculation Number:** 40182637 **Degree programme:** Msc Ecotourism **Level of study: MA/MSc**
Other researchers (name, role & affiliation): Kathy Velander, School of Life, Sport and Social Sciences, Edinburgh Napier University	
Independent advisor: Dr. Phyllis Layboum	
Financial support from outside Edinburgh Napier University (amount & source): N/A	
Project start date: 01/06/2015	**Project duration:** 12 weeks
Date application submitted: 30/04/2015	**Ref no. (LEAVE BLANK):** Click here to enter text.

	YOU MUST ANSWER ALL QUESTIONS	YES	NO	N/A
1	Will you describe the main procedures to participants in advance, so that they are informed about what to expect in your study?	☒	☐	☐
2	Will you tell participants that their participation is voluntary?	☒	☐	☐
3	Will your participants be able to read and understand the participant information sheet?	☒	☐	☐
4	Will you obtain written consent for participation?	☒	☐	☐
5	If the research is observational (including tape and video), will you ask participants for their consent to being observed?	☐	☐	☒
6	Will you tell participants that they may withdraw from the research without penalty and without reason?	☒	☐	☐
7	With questionnaires and interviews, will you give participants the option of omitting questions they do not want to answer?	☒	☐	☐
8	Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs?	☒	☐	☐
9	Are the data to be stored anonymously (i.e. the identity of the person is NOT linked directly or indirectly with their data)?	☒	☐	☐
10	Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study and an opportunity to ask questions)?	☒	☐	☐
11	Will the research involve deliberately misleading participants (deception) in any way?	☐	☒	☐
12	Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort?	☐	☒	☐
13	Is the information gathered from participants of a sensitive, personal or contentious nature?	☐	☒	☐
14	Will any payment or reward be made to participants, beyond reimbursement or out-of-pocket expenses?	☐	☒	☐
15	Do participants fall into any of the following special groups? *If the answer is YES, indicate which group(s) by checking the appropriate box(es).*	☐	☒	☐
	☐ Children (under 18 years) ☐ People in custody ☐ Clinical population ☐ People with learning or communication difficulties ☐ People with mental health issues ☐ People engaged in illegal activities (e.g. drug-taking) *NOTE: You may also need to obtain clearance from Disclosure Scotland or an equivalent authority.*			

You must check **either Box A or Box B** below and provide **all** relevant information in support of your application in the Details of Project section. If you answered **NO** to any of **questions 1-10**, or **YES** to any of **questions 11-16** (with a shaded background), then you **must** check Box B.

DETAILS OF PROJECT

1. Background information *(300 words maximum; references should be cited and listed)*

The "Global decline of marine resources has triggered a worldwide demand for changing the way ocean resources are managed" (Anguilo-Valdes and Hatcher, 2010) as a result of the "ever increasing and diverse use of the marine environment" (Atkins at el., 2011) is the main reason to create management tools that can "preserve the integrity of the ocean's unique biodiversity" (Boersma and Parrish, 1999) through a balance of development and environment. Therefore, regimes such as the marine protected areas (MPAs) are functioning as a management tool that can minimize the negative impacts of human actions, especially in the European Union where regional goals are promoting the conservation of this ecosystem (EC, 2014).

Education and interpretation form essential tools for the MPA's related organizations and interested groups to change people's point of view and behaviour regarding biodiversity (Watson, et al., 2015; Stewart et al., 1998). This maximizes the residents and visitors understanding and experience of the environment to communicate its significance and importance in order to create a sense of care that contribute to a sustainable development (Stewart et al., 1998; Luck, 2015).

This proposed research proposal focusses on studying the feasibility of a small scale marine interpretation centre in the Lamlash Bay in Isle of Arran in Scotland. In this coastal area a Not Take Zone and an MPA are established (COAST, 2015; Howard, et al., 2015).That's why a local charity, COAST (Community of Arran Seabed Trust) is interested in evaluating the possibilities to create a marine interpretation centre to increase the knowledge and understanding of the marine ecosystems benefits and promote the positive transformation this area have obtain with these management tools.

References

Anguilo-Valdes, J.A., Hatcher, B.G. (2012) A new typology of benefits derived form marine protected areas, Marine Policy 34: 635-644

Atkins, J.P., Burdon, D., Elliott, M., Gregory, A.J (2011) Management of the marine environment: Integrating ecosystem services and societal benefits with the DPSIR framework in a systems approach, Marine Pollution Bulletin 62:215-226

Boersma, P. D. and Julia K. Parrish (1999) Limiting abuse: marine protected areas, a limited solution, Ecological Economics 31: 287–304

COAST [Community of Arran Seabed Trust] (2015) Lamlash Bay No Take Zone (NTZ). Available from: http://www.arrancoast.com/campaigns/lamlash-bay-no-take-zone [accessed March 28th, 2015]

EC [European Commission], 2014, Introduction to the new EU Water Framework Directive, Available from: http://ec.europa.eu/environment/water/waterframework/info/intro_en.htm [accessed March 28th, 2015]

Howarth, L. M., Pickup, S. E., Evans, L. E., Cross, T. J., Hawkins, J. P., Roberts, C. M. and Stewart, B. D. (2015) Sessile and mobile components of a benthic ecosystem display mixed trends within a temperate marine reserve, Marine Environmental Research

Luck, M. (2015) Education on marine mammal tours – But what do tourists want to learn? Ocean & Coastal Management 103: 25–33

Stewart, J. E., Hayward, B. M. and Devlin, P. J. (1998) The "place" of interpretation: a new approach to the evaluation of interpretation, Tourism Management 19, Issue 3: 257-266

Watson, G.J., Murray, J.M., Schaefer, M. and Bonner, A. (2015) Successful local marine conservation requires appropriate educational methods and adequate enforcement, Marine Policy 52: 59 - 67

2. Aims & research questions

Aim

The main aims are to carry out a review of current marine interpretation centres and use this information to suggestion features that should be included in the centre on the Isle of Arran and engage with visitors' and residents' in two focus groups to assess the feasibility of the centre, suggested features and potential use

Objectives

To investigate other marine interpretation centres to collect relevant information that can guide the creation of this one.

Firstly to carry out a literature review of the concept, functions, benefits and challenges of interpretations centres.
Secondly to study several interpretation centres to verify their service, structure, payment policy and displays and collect photos, building plans and the contacts of the previous centres.

To understand the main factors that will draw tourists to visit this attraction.

Firstly to develop a questionnaire and hold a focus group that includes the visitor's expectations in terms of possible locations and its characteristics, facilities, programs, information context and presentation.
Secondly to analyse scientifically the results of the questionnaire survey and focus group to generate conclusions.

To determine the community's expectations and how they can support this initiative.

Firstly to hold a focus group that includes the resident's expectations in terms of the possible locations and its characteristics, facilities, programs, the information context and presentation, and the advantages and disadvantages this attraction could bring to their community.
Secondly to interpret the outcome of the previous research technique and create a summary.

1. **Participants**

- ***Number & nature of sample:*** Questionnaires: 150 samples of tourists visiting the island. Focus groups: One resident and one visitor with a minimum of 4 to 6 people in each group.
- ***Inclusion/exclusion criteria:*** Residents and visitors in Isle of Arran. Aged 18 and over. Informed signed consent will be obtained prior to participation. Only English speaking respondents will be included.
- ***Recruitment of participants:*** Several techniques will be implemented. The questionnaires will be carried out in person on the next to pass basis. The focus group for visitors will be organized with the cooperation of the information visitor centre in Brodick. For the second focus group, emails will be sent to several community residents with the guidance of the Community of Arran Seabed Trust (COAST) and Visit Scotland authorities. The focus group location and venue will be advised by COAST.

2. **Outline of methods & measurements** *(approx. 500 words)*

Firstly, a desk study will be made to obtain general information and concepts about interpretation centres focusing on those situated in a marine environment through a literature review. Then, internet research will be conducted to collect service ideas, photos, exhibitions types, contacts and building plans to guide the structure of the possible interpretation centre of this research.

Secondly, several research methods will be implemented to engage the visitors and residents. For the former, questionnaires are elaborated using mainly the Likert-scale test and close questions to investigate their expectations. The data collected will be analysed using descriptive and analytical statistics tests in SPSS to get a detailed understanding of the results. The questionnaires will be distributed in the Information Visitor Centre and CALMAC terminal ferry in Brodick by the researcher using a face to face approach (please find confirmation emails with the permission attached) to visitors arriving or leaving in Isle of Arran. The target sampling is 150 survey where the respondents will be recruited on a next to pass basis. Before the participants complete the questionnaires, they will be briefed about the project purpose and their anonymity. The participants consent forms will be filled in before completing the questionnaires. The respondents must be 18 years or over to participate in this study. An appropriate risk assessment has been completed (please find it in the attachments).

The questionnaires present a combination of closed Likert-scale questions. It is composed of four parts:
- About the probability to participate in activities related in marine environments: a list of several activities that can be developed in the coast are presented, which intend to analyse the visitors travel motivations and expectations of Isle of Arran.
- About the general knowledge of the actual marine management tools in Isle of Arran and understanding of its benefits: wants to identify the general awareness about the Marine Protected Area and No Take Zone for the ocean in the south of Arran and their agreement in regards to the benefits of these management tools and sea life in general.
- About the expectations of a marine interpretation centre: this part covers three essential topics, the main facilities and activities of the centre, its location and visitor willingness to pay, in order to evaluate visitors point of view to

certain facts.
- About yourself: to create demographics features and relevant travel patterns in regards to the profile of the tourists.

Moreover, focus groups are designed to assess visitors' and residents' opinions and point of view related to the main features that the interpretation centre should have, their learning outcomes, possible location and willingness to pay. Both focus groups will be organized with the cooperation of Community of Arran Seabed Trust (COAST) and the information visitor centre. They consists of five questions that assess visitors' and residents'. Both focus groups will consist of 4 to 6 people.

The results will be presented to the Information visitor centre and Visit Scotland in order to provide a profile of visitors and to COAST to provide them with the main expectations of tourists and residents for this centre and demonstrate its level of feasibility.

The questionnaire and focus groups data will be stored and secured in a computer with password protection. These data and consent forms will be destroyed at the end of the research.

As mentioned, the data will be analysed using SPSS. Non-parametric tests will be implemented as the majority of the data results will be ordinal. Also, correlation tests will be applied to evaluate the relation between the demographic groups, marine based travel motivations, knowledge and understanding of the MPA and NTZ particularly in the Isle of Arran and the expectations regarding the possible marine interpretation centre.

1. **Risks to participants**

There are no known risks from participating in this study.

2. **Consent and participant information arrangements, debriefing**

In the CALMAC ferry terminal and Visitor Information Centre the respondents will be approached at the entrance. They will be asked if they would like to participate in the questionnaire or focus group. Then, the participation information sheet and consent form will be provided, and the people interested will be participating in the research. After filling up the questionnaire or finishing the focus group, I will ask them if they have any other questions or concerns about this research.

3. **Ethical considerations raised by the project and how you intend to deal with them.**

I have read the policies and guidelines related the ethics and governance in research of Edinburgh Napier University. I am agree to abide by those relevant professional bodies (e. g. BPS, BSA, IFPA, SIR, NMC).

DECLARATION

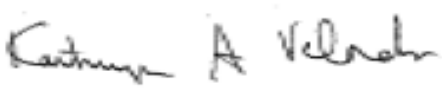
There is an obligation on the researcher to bring to the attention of the Faculty Research Ethics Approval Sub-Group any issues with ethical implications not clearly covered by this application form.

I request ethical and governance approval for the research described in this application. I have read Edinburgh Napier University's policies and guidelines relating to ethics and governance in research, and those of relevant professional bodies (e.g. BPS, BSA, IFPA, SIR, NMC) and agree to abide by these.

A ☒	**I consider that this project has no significant ethical implications to be brought to the attention of the Faculty Research Ethics Approval Sub-Group**
B ☐	**I consider that this project <u>may</u> have significant ethical implications to be brought to the attention of the Faculty Research Ethics Approval Sub-Group**

Signature **Date May 1st, 2015**

I am the Director of Studies or supervisor for this research. I have read this application and approve it. I do not consider that any part of the research process will cause physical and/or psychological harm to participants, or be detrimental to the reputation of Edinburgh Napier University.

Signature  **Date May 1st, 2015**

- **You must also attach Participant Information Sheet(s), Consent Form(s), as well as copies of any questionnaires, details of interview questions you plan to use, debrief sheets and notices advertising the study. You may need to create different versions of these materials (e.g. parental Participant Information**

Appendix 6. Research proposal

Research Topic

Feasibility of an interpretation centre in Lamlash Bay (Isle of Arran), based on visitor's expectations and small scale marine centres around the world.

Introduction

"Global decline of marine resources has triggered a worldwide demand for changing the way ocean resources are managed" (Angulo-Valdes and Hatcher, 2010) as a result of the "ever increasing and diverse use of the marine environment" (Atkins *at el.,* 2011) is the main reason to create management tools that can "preserve the integrity of the ocean's unique biodiversity" (Boersma and Parrish, 1999) through a balance of development and environment. Therefore, regimes such as the marine protected areas (MPAs) are functioning as a management tool that can minimize the negative impacts of human actions, especially in the European Union where regional goals are promoting the conservation of this ecosystem (EC, 2014). The International Union for Conservation of Nature (IUCN) defined conservation as the sustainable human-use of nature that can satisfy the present demands without compromising the future ones, which is directly connected with the MPA's goals. However, it is difficult to change human actions, but not impossible (Angulo-Valdes and Hatcher, 2010).

Accordingly, education and interpretation form essential tools for the MPA's related organizations and interested groups to change people's point of view and behaviour regarding biodiversity (Watson, *et al.,* 2015; Stewart *et al.,* 1998), maximizing the residents and visitors understanding and experience of the environment to communicate its significance and importance in order to create a sense of care that contribute to a sustainable development (Stewart *et al.,* 1998; Luck, 2015). Existing evidence has proven that well-coordinated MPA's strategies help the marine ecosystem to recuperate its habitat and principal species and at the same time favour economy sector activities such as tourism and fishery (Stewart, 1993; Howard, et al., 2015; Needham and Szuster, 2011). The benefits of MPA's has been stated by many authors (Xu, *et al.,* 2015; Taylor, *et al.,* 2013; Atkins, *et al.,* 2011; Pitchford, *et al.*, 2007) trying to categorize them as either human and non-human benefits but unfortunately they focus more in the former one, which is why Angulo-Valdes and Hatcher (2010) describes different approaches that include activities such as: recreation/tourism, consumptive and non-consumptive benefits or opportunities, protection of the ecosystem structure and function, and increasing knowledge and understanding of marine ecosystems, in order to create a system that can provide an advantage to nature. Therefore, this proposal is focused in the previously mentioned approach of increasing the knowledge and understanding of marine ecosystems in a current MPA located in the south of the Isle of Arran in Scotland.

This MPA was established in 2014, proposed by its local community and includes a 'No Take Zone' in Lamlash Bay, which prohibits all fishery activities (Gormley, *et al.,* 2014; COAST, 2015). The sea of Arran has been deteriorated by over-exploitation of resources especially with fisheries using an unsustainable extraction technique called dredging which has been proved through different study cases has destroyed and changed the benthic community (Eleftheriou and Robertson, 1992; Bradshaw *et al.,* 2002; Colema, *et al.,* 2013). However, the No Take Zone of Lamlash Bay, created in

2008, presents evidence of how the seafloor recovers with this type of protection highlighting positive changes in the abundance of epifaunal assemblages and cod fish, functioning as a nursery for the latter, which benefits they economy through commercial species such as cod fish (Howard, *et al.,* 2015). Therefore, there is a need to promote the changes and benefits that marine environments and the economy can receive through this No Take Zone management tool, which is the aim of this research that seeks to create an interpretation centre that takes in consideration the visitors expectations and small scales marine centres to meet the growing demand of tourism activities in coastal areas (Needham and Szuster, 2011).

Tourism has become one of the most expanding and diversified economy activities, tourists are changing traditional tourism motivations such as sun and beach to others related to stimulating activities such as learning, exploring and discovering (Beard and Ragheb, 1983). For example, tourists that participated in whale and dolphin tours in New Zealand agreed that their satisfaction rates can increase if they received more educational information about the marine wildlife instead of vague facts (Luck, 2015). Also, educational information can be provided in interpretation or visitor centres, whose main functions can involve relevant knowledge or a specific topic that improves the visitor's experience, controls physical pressures in fragile environments; substitutes inaccessible places with media displays and promotes and orientates the main attractions of the area (Fallon and Kriwoken, 2003).

Interpretations centres success depends on the community's engagement, visitor satisfaction and economic viability (Stewart, *et al.,* 1998). The centre should be the reflection of the community's history, culture and values in reference to a certain topic that transmits the sense of the location and authenticity. Moreover, visitor's satisfaction is the core of any tourist attraction, hence, the high level of satisfaction can influence the tourist repeatability, increase the expenditure and night's stay. Economic sustainability is essential, many authors grouped by Fallon and Kriwoken (2003) discuss this relevance emphasizing that visitors centres can attract the region's economy with the facilities that they promote but this practice doesn't always match its theory, for example the case of the Strahan Visitor Centre in Tasmania, shows that despite the big amount of visitors, only 20% of them paid to appreciate their displays, as a result they couldn't achieve their economic expectations (Fallon and Kriwoken, 2003). Therefore, it is necessary to have a clear and realistic vision of the interpretation centre that involves all the stakeholders in the planning process and assures satisfied customers.

Furthermore, interpretations centres should take in consideration its location and a distinctive building design. The former should be placed in the centre of other attractions or in an area that can integrate the centre's aim, while the latter can express uniqueness, a local environment and encourage potential visitors to explore the place (Pearce, 2004). Others areas that interpretation centres should include is related to simplicity and innovative displays such as areas for relaxation that can reduce visitors fatigue, accessibility and safe areas for everyone and principles facilities such as toilets (Fallon and Kriwoken, 2003).

Many interpretation or visitors centres exist, providing a wide variety of services, knowledge and support for different reasons; some of interpretations centres are enormous in terms of size and activities offered, for example, two marine aquariums in Britain, Sea Life (Sea Life, 2015) and Deep Sea World (Deep Sea World, 2015), are more focused in basic education and interaction with ocean species rather than

teaching conservation of the species and habitat, however, their large demand has made them economically sustainable. In contrast, other visitor centres are relatively small in size but provide bigger support to the conservation of wildlife as they support a specific cause, for example the Calanais Visitor Centre in Scotland divulges the history and preservation of the magnificent structure of the Callanish's stones (Calanais Visitor Centre, 2015). The Georgia Sea Turtle Centre in Jekyll Island raises awareness, education and research for sea turtles (Georgia Sea Turtle Centre, 2015); the Texas Freshwater Fishery Centre aims to educate about fish and sustainable catch (Texas Freshwater Fishery Centre, 2015). Some of these organization operate thanks to community involvement, visitor donations and government support.

Some good models of small scale marine interpretation centres in Scotland are the Ocean Explorer Centre and St. Abbs Visitor Centre which aim to educate about the ocean and its environment through different displays that can create an understanding of the history, habitat, species and main concerns while integrating the community into marine life through several events (Ocean Explorer Centre, 2015; St. Abbs Visitor Centre, 2015). Thus, these centres possess some valuable characteristics that could guide this research into how to create an effective marine interpretation centre.

Considering this information related to marine ecosystems, its benefits and management tools, this research will be divided in two parts to study the practicability of a small scale marine interpretation centre in Lamlash Bay. Firstly, a literature review of interpretation centres, focused on a compilation of information related to the structure of other marine interpretation centres globally. Secondly, data collection will be used for quantitative and qualitative methods in understanding visitors and residents expectations in terms of the features they would like to see in this attraction.

Aim

The main aim is to analyse visitors and residents' point of views, and various marine interpretations centres to determine the feasibility and main features that should be included in the creation of a marine interpretation centre in the Isle of Arran.

Objectives

- To investigate other marine interpretation centres to collect relevant information that can guide the creation of this one.
  - Firstly to make a literature review of the concept, functions, benefits and challenges of interpretations centres.
  - Secondly to study several interpretations centres to verify their service, structure, payment policy and displays; and collect photos, building plans and the contacts of the previous centres.

- To understand the main factors that will draw tourists to visit this attraction.
  - Firstly to elaborate a questionnaire and a focus group that includes the visitor's expectations in terms of possible locations and its characteristics, facilities, programs, information context and presentation.
  - Secondly to analyse scientifically the results of the previous research methods and generate conclusions.

- To determine the community's expectations and how they can support this initiative.

- Firstly to elaborate a focus group that include the resident's expectations in terms of the possible locations and its characteristics, facilities, programs, the information context and presentation, and the advantages and disadvantages this attraction could bring to their community.
- Secondly to interpret the outcome of the previous research technique and create a summary.

Methods

This section will be split in two parts. Firstly, a desk study will be made to obtain general information and concepts about the interpretations centres focusing in those situated in a marine environment through a literature review. Then, an internet research will be conducted to collect service ideas, photos, exhibitions types, contacts and building plans to guide the structure of the possible interpretation centre of this research.

Secondly, several research methods will be implemented on to the visitors and residents. For the former, questionnaires will be elaborated using mainly the Likert-scale test to investigate their expectations, after, this data will be analysed with SPSS to get a detailed understanding of the results. Moreover a focus group will be designed to get the visitors opinions and point of view related to the main features that the interpretation centre should have. For the residents, a focus group will be organized which involves putting into action the prioritisation exercise from the Tourism Resource Auditing Methodology (TRAM) (personal communication - Velander and MacIntyre, 2013).

Timeline

Date	**Action**
2nd April 2015	Proposal Hand-in
20th April 2015	Elaborate the Questionnaire and Focus groups questions
30th April 2015	Ethics approval Hand-in
20th May 2015	Obtain permission to distribute questionnaires in the Tourist Information Office and CalMac ferry terminal in Brodick
1st June 2015 – continuing	Start: Desk study
1st June 2015 – continuing	Research: Questionnaires
8th June 2015	Research: Focus groups to visitor and residents
22nd June 2015	Finish research
30th June 2015	Finish desk study

1st - 22nd July 2015	Analyse results and write results, discussion and conclusion chapters
23rd July – 9th August 2015	Write introduction, abstract, acknowledgement chapters and final arrangement of appendices
10th – 14th August 2015	Grammar and spell check, Check referencing and table of contents, bind and prepare the thesis for submission
16th August 2015	Submit final thesis

Health and Safety

No hazardous chemicals will be used for this study. Data collection will consist of questionnaires and focus groups.

Ethics approval

Ethics approval through Edinburgh Napier University will be required. Timeline present the exact dates this will information will be hand in.

Reference

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Appendix 7. Frequencies

a) Length of stay

	Length of stay in Arran	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Day trip	25	23	24.0	24.0
	Overnight	79	74	76.0	100.0
	Total	104	97	100.0	
Missing		3	3		
Total		107	100		

b) Numbers of night staying

	Number of night staying	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2	9	8	13.6	13.6
	3	17	16	25.8	39.4
	4	7	7	10.6	50.0
	5	9	8	13.6	63.6
	6	6	6	9.1	72.7
	7	13	12	19.7	92.4
	10	2	2	3.0	95.5
	14	1	1	1.5	97.0
	28	2	2	3.0	100.0
	Total	66	62	100.0	
Missing		41	38		
Total		107	100		

c) Time spent in Arran so far

	Time spent in Arran so far	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Just arrived	16	9	15.8	15.8
	Midway through visit	10	9	9.9	25.7
	About to leave	75	70	74.3	100.0
	Total	101	94	100.0	
Missing		6	6		
Total		107	100		

d) Travel companions

	Travel companions	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Alone	14	13	13.2	13.2
	Partner / Spouse	34	32	32.1	45.3
	Friends	27	25	25.5	70.8
	Family	19	18	17.9	88.7
	Organized group	11	10	10.4	99.1
	Other	1	1	.9	100.0
	Total	106	99	100.0	
Missing		1	1		
Total		107	100		

e) Number of times they had visited the island previously

	Number of times you have visited Arran previously:	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	35	33	33.3	33.3
	1	8	7	7.6	41.0
	2 - 4	15	14	14.3	55.2
	5 - 10	14	13	13.3	68.6
	10 +	33	31	31.4	100.0
	Total	105	98	100.0	
Missing		2	2		
Total		107	100		

Appendix 8. Central tendency measures of the demographics features

		Gender	Age group	Total annual amount of net income of your household (amounts in £):	Place of residence	International	Length of stay in Arran	Number of night staying	Time spent in Arran so far	Travel companions	Number of times you have visited Arran previously:
N	Valid	148	150	148	153	14	104	66	101	106	105
	Missing	6	4	6	1	140	50	88	53	48	49
Mean		1.50	3.24	4.09	2.62	5.79	1.76	5.44	2.58	2.83	3.02
Median		1.50	3.00	4.00	3.00	6.00	2.00	4.50	3.00	3.00	3.00
Mode		1[a]	1	7	1	2[a]	2	3	3	2	1
Std. Deviation		.502	1.744	2.257	1.328	2.694	.429	4.625	.752	1.230	1.681
Variance		.252	3.043	5.093	1.763	7.258	.184	21.389	.565	1.514	2.827
Skewness		0.000	.148	.075	.163	-.010	-1.233	3.721	-1.445	.362	-.055
Std. Error of Skewness		.199	.198	.199	.196	.597	.237	.295	.240	.235	.236
Kurtosis		-2.028	-1.267	-1.465	-1.135	-1.288	-.490	16.269	.369	-.651	-1.671
Std. Error of Kurtosis		.396	.394	.396	.390	1.154	.469	.582	.476	.465	.467
Percentiles	25	1.00	2.00	2.00	1.00	3.00	2.00	3.00	2.00	2.00	1.00
	50	1.50	3.00	4.00	3.00	6.00	2.00	4.50	3.00	3.00	3.00
	75	2.00	5.00	7.00	4.00	8.25	2.00	7.00	3.00	4.00	5.00

a. Multiple modes exist. The smallest value is shown

Appendix 9. Central tendency measures of respondents' likelihood in coastal activities

		Walking, running, cycling or horseback riding along the coast	Kayaking	Windsurfing	Scuba diving	Sailing	Swimming	Sea angling	Wildlife boat trips	Guided tours to learn about nature	Bird watching
N	Valid	153	149	149	149	148	148	144	149	149	148
	Missing	1	5	5	5	6	6	10	5	5	6
Mean		3.53	2.19	1.71	1.78	2.05	2.45	1.99	2.57	2.58	2.53
Median		4.00	2.00	2.00	1.00	2.00	2.00	2.00	3.00	3.00	3.00
Mode		4	1	1	1	1	3	2	3	3	3
Std. Deviation		.859	1.125	.947	1.026	1.042	1.115	1.084	1.041	1.066	1.046
Variance		.738	1.266	.896	1.052	1.085	1.243	1.175	1.085	1.136	1.094
Skewness		-1.765	.676	1.917	1.448	.842	.255	1.331	.065	-.019	-.055
Std. Error of Skewness		.196	.199	.199	.199	.199	.199	.202	.199	.199	.199
Kurtosis		2.647	-.301	4.125	1.712	.157	-.761	1.508	-.480	-.854	-1.030
Std. Error of Kurtosis		.390	.395	.395	.395	.396	.396	.401	.395	.395	.396
Range		4	4	4	4	4	4	4	4	4	4
Minimum		1	1	1	1	1	1	1	1	1	1
Maximum		5	5	5	5	5	5	5	5	5	5
Percentiles	25	3.00	1.00	1.00	1.00	1.00	1.25	1.00	2.00	2.00	2.00
	50	4.00	2.00	2.00	1.00	2.00	2.00	2.00	3.00	3.00	3.00
	75	4.00	3.00	2.00	2.00	3.00	3.00	2.00	3.00	3.00	3.00

Appendix 10. Central tendency measures of knowledge about the MPA and NTZ

		Did you know about the South Arran Marine Protected Area?	Did you know about the No Take Zone (NTZ) in Lamlash Bay?
N	Valid	154	153
	Missing	0	1
Mean		2	1.41
Median		2.00	1.00
Mode		2	1
Std. Deviation		.500	.494
Variance		.250	.244
Skewness		-.158	.362
Std. Error of Skewness		.195	.196
Kurtosis		-2.001	-1.894
Std. Error of Kurtosis		.389	.390
Range		1	1
Minimum		1	1
Maximum		2	2
Percentiles	25	1.00	1.00
	50	2.00	1.00
	75	2.00	2.00

Appendix 11. Cross-tabulation of levels of interest and place of residence

Touch tanks with marine creatures * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Touch tanks with marine creatures	Not at all interested	4	1	6	1	1	13
	Possibly interested	6	3	8	5	4	26
	Neutral	11	1	6	3	4	25
	Interested	12	9	18	11	5	55
	Very interested	13	4	7	3	2	29
Total		46	18	45	23	16	148

Microscopes with plankton slides and activities * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Microscopes with plankton slides and activities	Not at all interested	3	2	4	2	2	13
	Possibly interested	3	3	13	2	1	22
	Neutral	14	3	11	8	4	40
	Interested	12	8	12	10	8	50
	Very interested	12	2	5	2	1	22
Total		44	18	45	24	16	147

Real–time seabed cameras * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Real–time seabed cameras	Not at all interested	3	2	4	0	0	9
	Possibly interested	2	2	6	3	3	16
	Neutral	8	0	1	2	0	11
	Interested	19	7	23	12	11	72
	Very interested	13	7	12	7	2	41
Total		45	18	46	24	16	149

Exhibition boards & displays * Place of residence Crosstabulation

Count

		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Exhibition boards & displays	Not at all interested	2	4	3	0	0	9
	Possibly interested	3	1	6	4	1	15
	Neutral	7	2	9	5	4	27
	Interested	24	6	22	11	6	69
	Very interested	10	4	5	3	3	25
Total		46	17	45	23	14	145

Audio-visual interactions * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Audio-visual interactions	Not at all interested	2	3	4	1	0	10
	Possibly interested	2	2	7	4	1	16
	Neutral	5	3	7	5	6	26
	Interested	25	7	20	10	7	69
	Very interested	9	3	7	3	1	23
Total		43	18	45	23	15	144

Interactive exhibition for children * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Interactive exhibition for children	Not at all interested	1	1	4	0	6	12
	Possibly interested	0	3	2	4	1	10
	Neutral	3	1	13	5	0	22
	Interested	19	9	17	10	7	62
	Very interested	22	3	8	4	1	38
Total		45	17	44	23	15	144

Sea bird watching area * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Sea bird watching area	Not at all interested	3	2	4	1	0	10
	Possibly interested	3	2	5	4	2	16
	Neutral	8	4	11	3	2	28
	Interested	18	7	15	12	8	60
	Very interested	14	2	10	4	4	34
Total		46	17	45	24	16	148

High power telescopes to view seascapes, birds and marine wildlife * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
High power telescopes to view seascapes, birds and marine wildlife	Not at all interested	2	1	3	0	0	6
	Possibly interested	2	3	5	4	1	15
	Neutral	3	5	4	3	2	17
	Interested	23	5	22	11	8	69
	Very interested	16	4	12	6	5	43
Total		46	18	46	24	16	150

Cinema with short films about marine life (possibly in mock-up submarine) * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Cinema with short films about marine life (possibly in mock-up submarine)	Not at all interested	1	2	4	3	0	10
	Possibly interested	2	3	6	4	2	17
	Neutral	10	4	9	1	7	31
	Interested	21	5	20	11	5	62
	Very interested	12	4	7	4	2	29
Total		46	18	46	23	16	149

Information about wildlife on the Isle of Arran * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Information about wildlife on the Isle of Arran	Not at all interested	1	0	4	0	0	5
	Possibly interested	2	2	2	4	1	11
	Neutral	2	4	1	2	0	9
	Interested	22	7	24	12	10	75
	Very interested	19	5	15	6	5	50
Total		46	18	46	24	16	150

Information about the sea life around Isle of Arran * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Information about the sea life around Isle of Arran	Not at all interested	1	1	3	0	0	5
	Possibly interested	2	1	2	5	2	12
	Neutral	1	3	1	2	1	8
	Interested	24	8	24	11	9	76
	Very interested	17	5	15	6	4	47
Total		45	18	45	24	16	148

Information about research programmes running in the MPA and NTZ * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Information about research programmes running in the MPA and NTZ	Not at all interested	2	4	4	1	0	11
	Possibly interested	2	0	6	5	1	14
	Neutral	8	4	11	4	6	33
	Interested	20	7	20	10	5	62
	Very interested	13	3	3	3	4	26
Total		45	18	44	23	16	146

Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips. * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.	Not at all interested	4	3	6	0	1	14
	Possibly interested	2	2	6	2	2	14
	Neutral	4	4	4	4	2	18
	Interested	21	5	16	10	4	56
	Very interested	14	4	14	7	7	46
Total		45	18	46	23	16	148

Souvenir shop * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Souvenir shop	Not at all interested	1	0	5	3	1	10
	Possibly interested	3	3	7	6	2	21
	Neutral	17	5	13	7	6	48
	Interested	15	8	14	6	4	47
	Very interested	8	1	6	1	3	19
Total		44	17	45	23	16	145

Café * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Café	Not at all interested	2	0	1	1	1	5
	Possibly interested	3	1	3	4	1	12
	Neutral	12	3	9	6	4	34
	Interested	18	10	20	7	8	63
	Very interested	9	3	13	5	2	32
Total		44	17	46	23	16	146

Rooms available to hire for events and school groups * Place of residence Crosstabulation

Count

		Place of residence					
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	Total
Rooms available to hire for events and school groups	Not at all interested	0	3	10	9	7	29
	Possibly interested	3	1	2	2	2	10
	Neutral	12	4	16	8	3	43
	Interested	19	7	14	3	0	43
	Very interested	11	2	3	1	3	20
Total		45	17	45	23	15	145

Appendix 12. Mann-Whitney U results of the topic and activities for the MIC levels of interest and length of stay

Test Statistics[a]

	Touch tanks with marine creatures	Microscopes with plankton slides and activities	Real–time seabed cameras	Exhibition boards & displays
Mann-Whitney U	784.500	825.000	916.500	767.000
Wilcoxon W	3710.500	3828.000	3997.500	3617.000
Z	-1.080	-.822	-.167	-.529
Asymp. Sig. (2-tailed)	.280	.411	.867	.597

Test Statistics[a]

	Audio-visual interactions	Interactive exhibition for children	Sea bird watching area	High power telescopes to view seascapes, birds and marine wildlife
Mann-Whitney U	866.000	798.500	807.000	869.500
Wilcoxon W	3716.000	3573.500	1083.000	1169.500
Z	-.292	-.468	-.674	-.557
Asymp. Sig. (2-tailed)	.770	.640	.500	.578

Test Statistics[a]

	Cinema with short films about marine life (possibly in mock-up submarine)	Information about wildlife on the Isle of Arran	Information about the sea life around Isle of Arran	Information about research programmes running in the MPA and NTZ
Mann-Whitney U	818.500	839.500	814.000	854.000
Wilcoxon W	3821.500	1139.500	1090.000	3780.000
Z	-.879	-.834	-.734	-.492
Asymp. Sig. (2-tailed)	.379	.404	.463	.623

Test Statistics[a]

	Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.	Souvenir shop	Café	Rooms available to hire for events and school groups
Mann-Whitney U	870.000	759.000	771.500	690.000
Wilcoxon W	1170.000	3685.000	3774.500	3693.000
Z	-.448	-.989	-.991	-1.369
Asymp. Sig. (2-tailed)	.654	.323	.322	.171

Appendix 13. Cross-tabulation used for the Chi-Square results

		Place of residence					Total
		Arran	Rest of Ayrshire (not Arran)	Rest of Scotland (not Arran & Ayrshire)	Rest of UK (not Scotland)	International	
How much would you be willing to pay to visit the marine interpretation centre? Please select as appropriated	£ 1 to £5 / person	23	12	18	10	5	68
	£ 6 to £10 / person	18	6	22	16	5	67
	£0, £11 to £15 and £15+ / person	6	1	6	1	2	16
Total		47	19	46	27	12	151

Appendix 14. Chi-Square results of will to pay and length of stay

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	.454[a]	2	.797
Likelihood Ratio	.430	2	.806
Linear-by-Linear Association	.439	1	.507
N of Valid Cases	102		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.21.

Appendix 15. Normality test for the questionnaire

a) Involvement in marine activities

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Walking, running, cycling or horseback riding along the coast	.388	153	.000	.654	153	.000
Kayaking	.200	149	.000	.860	149	.000
Windsurfing	.280	149	.000	.687	149	.000
Scuba diving	.293	149	.000	.746	149	.000
Sailing	.223	148	.000	.842	148	.000
Swimming	.182	148	.000	.893	148	.000
Sea angling	.273	144	.000	.782	144	.000
Wildlife boat trips	.237	149	.000	.890	149	.000
Guided tours to learn about nature	.216	149	.000	.894	149	.000
Bird watching	.213	148	.000	.884	148	.000

a. Lilliefors Significance Correction

b) Knowledge about the MPA and NTZ

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Did you know about the South Arran Marine Protected Area?	.361	154	.000	.634	154	.000
Did you know about the No Take Zone (NTZ) in Lamlash Bay?	.386	153	.000	.625	153	.000

a. Lilliefors Significance Correction

c) Levels of interest for the activities and topics for the MIC

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Touch tanks with marine creatures	.250	149	.000	.882	149	.000
Microscopes with plankton slides and activities	.215	148	.000	.901	148	.000
Real–time seabed cameras	.325	150	.000	.804	150	.000
Exhibition boards & displays	.292	146	.000	.855	146	.000
Audio-visual interactions	.295	145	.000	.854	145	.000
Interactive exhibition for children	.287	145	.000	.835	145	.000
Sea bird watching area	.266	149	.000	.866	149	.000
High power telescopes to view seascapes, birds and marine wildlife	.300	151	.000	.824	151	.000
Cinema with short films about marine life (possibly in mock-up submarine)	.261	150	.000	.875	150	.000
Information about wildlife on the Isle of Arran	.324	151	.000	.770	151	.000
Information about the sea life around Isle of Arran	.332	149	.000	.769	149	.000
Information about research programmes running in the MPA and NTZ	.266	147	.000	.869	147	.000
Excursions such as: Scuba diving, snorkelling, glass boat trips and wildlife boats trips.	.278	149	.000	.828	149	.000
Souvenir shop	.192	146	.000	.907	146	.000
Café	.258	147	.000	.871	147	.000
Rooms available to hire for events and school groups	.202	146	.000	.878	146	.000

a. Lilliefors Significance Correction

d) Willingness to pay

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
How much would you be willing to pay to visit the marine interpretation centre? Please select as appropriated	.266	151	.000	.820	151	.000

a. Lilliefors Significance Correction

e) Questionnaire age groups and new age groups

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age group	.148	150	.000	.895	150	.000

a. Lilliefors Significance Correction

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Age group new categories	.251	150	.000	.791	150	.000

a. Lilliefors Significance Correction

f) Place of residence

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Place of residence	.195	153	.000	.874	153	.000

a. Lilliefors Significance Correction

g) Length of stay

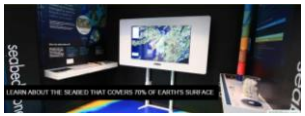
Tests of Normality

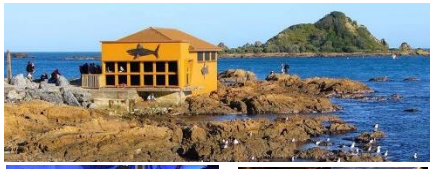
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Length of stay in Arran	.472	104	.000	.530	104	.000

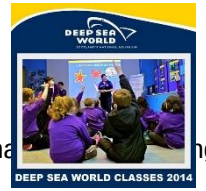
a. Lilliefors Significance Correction

Appendix 16. Main features of marine centres

Name	Different Attractions	Photos
Islay Natural History Trust Wildlife Visitor Centre	• Information about the geology to its birds, butterflies, wild flowers and mammals. • Displays, library, lecture room and laboratory, which houses marine and freshwater aquaria and the touch table. • Lecture room able to seat up to 100 people, with audio-visual and projection facilities suitable for small conferences • Large laboratory which accommodates 25 people comfortably • Hands-on activities for visitors • Marine and freshwater aquaria touch table • Wormery • Huge reference library containing up-to-date identification guides to all the major groups of animals and plants, a wide range of other natural history reference books, magazines, journals and reprints, together with files containing records of the flora and fauna found on Islay • Large and informative display areas with exhibition boards illustrating and explaining the diversity of Islay's natural history, together with collections of shells, pellets, dried seaweeds and geological samples. • Children's room with art and craft activities, puzzles, games and quizzes.	
St. Abbs Visitor Centre	• Exhibition with marine and nautical artefacts • Information about the history of the village • Information about geology and wildlife of the area • A high-powered telescope to view the cliffs and wildlife from the Outlook room • Activities for children • Gift shop • Exhibition of photographs, artwork and crafts by local artists • Exhibition talking about SCUBA diving in the local area	

Wembury Marine Centre	• Interactive displays about the surrounding area and its wildlife through • Live aquaria • Information about geology and wildlife of the area • **Events:** (some of these events have a fee of £2 per child) • Regular rockpool rambles • Nature Trail • Seashore Crafts • Meet the Plankton • beachcombing walk • Activities at the beach such as; beach cleans, seashore arts and crafts, coastal walks, birdwatching and stream dipping	
Ocean Explorer	• Polar themed cinema to watch short films on marine science • 3D Globe • Ocean currents and the technology that uses • Giant touchscreen with the seabed landscape of the Firth of Lorn • Interactive cameras and hydrophone to identify the sea life in the Fifth of Lorn • High spec microscope • Café	
Cardigan Bay Marine Wildlife Centre	• Interpretative and interactive displays • Aquarium full of rock pool species • Information about locals dolphins, seals and sea birds • Information about the geology of the area. • Information about important issues surrounding pollution and sustainable fishing. • Room to hire • Gift shop • Research on Dolphins	Cardigan Bay Marine Wildlife Centre CBMWC visitor centre

Scottish Seabird Centre	• Several live cameras • Wildlife Theatre for shows, films and events • Kid's zone for soft play • Kid's corner with all sorts of marine-themed storybooks and picture books • Fish Tanks • Flyway tunnel • Turtle and Ray Zone • Scope Deck • Gift shop • Café	
Island Bay Marine Education Centre	• The history of Island Bay Bait Shed • One of the largest collections of local marine life in New Zealand • Learn about the variety of marine animals and plants that live in Cook Strait • Bait House Aquarium	
Scottish Sea Life Sanctuary	• Regular talks and feeding demonstrations • Meet our resident Seals and Otters • Learn about our Top 20 creatures • Indoor displays including sharks, seahorses and rays • Outdoor displays including otters and Seals • The amazing Interactive Rockpool – Hold crabs and starfish • Marine Hospital – take a peek at what goes on in a real fish hospital • Our award winning Shoreline Coffee Shop • SEA LIFE Gift Shop with souvenirs and treats for all the family • The Terry Nutkins Nature Trail	

Deep Sea World	• Seals • Underwater Safari • Amazon rainforest displays • Piranhas • Remnants of villages devastated by Krakatoa and the exotic creatures tha ng their ruins. • Fish tank with Lake Malawi species • Rocky shores and its species • Collection of amphibians • Diving with sharks • Birthday Parties • Souvenir shop and Café • Shark tunnel sleepover	
Gairloch Marine Wildlife Centre & Cruises	• Interpretive and interactive wildlife displays • Boat trips • Remote underwater and shore based cameras • Large viewing window overlooking porpoise, otters, seals and many shore birds. • Cetacean sound booth • Daily marine wildlife survey cruises	

Name	Fees	Contacts
Islay Natural History Trust Wildlife Visitor Centre	• Entrance Fee £3 Adults, Concession £2, Children £1.50 and Family £7.50 (4 individuals) • Membership £12.00 per year per adult • For guided walks £4 per person, £10 per family (2 adults and children) • Talks £3 Admission, £1 Members	Telephone: +31(0)1496-850288 Website: http://www.islayinfo.com/islay-natural-history-trust.html http://www.islaynaturalhistory.org/ Blog: http://islaynaturalhistory.blogspot.co.uk/ Email: manager@islaynaturalhistory.org Address: Port Charlotte Islay PA48 7TX
St. Abbs Visitor Centre	• Free but donations are welcome	Telephone: 018907 71672 Website: http://www.stabbsvisitorcentre.co.uk/ Facebook: https://www.facebook.com/pages/The-St-Abbs-Visitor-Centre/148456108555745?fref=ts Email: visitorservices@stabbsvisitorcentre.co.uk Address: Coldingham Road St Abbs, Berwickshire TD14 5PL
Wembury Marine Centre	• Free but parking charges apply	Telephone: 01752 862538 Website: http://www.wemburymarinecentre.org/ Facebook: https://www.facebook.com/wemburymarine/timeline Twitter: https://twitter.com/WemburyMarine TripAdvisor: http://www.tripadvisor.co.uk/Attraction_Review-g2618974-d4312861-Reviews-Wembury_Marine_Centre-Wembury_Plymouth_Devon_England.html Email: visitorservices@stabbsvisitorcentre.co.uk Address: Church Road Wembury, Plymouth Devon PL9 0HP

Ocean Explorer	• Free but donations are welcome	Telephone: 1631559123 Website: http://www.oceanexplorercentre.org/ Facebook: https://www.facebook.com/OceanExplorerCentre Twitter: https://twitter.com/OECentre Flickr: https://www.flickr.com/photos/118237847@N06 Email: anuschka.miller@sams.ac.uk Address: Scottish Marine Institute Dunbeg, Oban PA37 1QA
Cardigan Bay Marine Wildlife Centre	• Free but donations are welcome	Telephone: 01545 560 224 Website: http://www.cbmwc.org/ Facebook: https://www.facebook.com/CBMWC?fref=ts Email: info@cbmwc.org Address: Patent Slip Building Glanmor Terrace New Quay Ceredigion SA45 9PS
Scottish Seabird Centre	Adult £8.95 Child (3-15) under 3s FREE £4.95 Concession £6.95 Family (2 adults & 2 children) £25 Additional children £4.50 Members FREE Seabird Café and gift shop FREE **Membership:** From only £1.80 per month our members enjoy:	Telephone: 01620890202 Website: https://www.seabird.org Facebook: https://www.facebook.com/ScottishSeabirdCentre Twitter: https://twitter.com/seabirdcentre Flickr: https://www.facebook.com/ScottishSeabirdCentre TripAdvisor: http://www.tripadvisor.co.uk/Attraction_Review-g315944-d668352-Reviews-Scottish_Seabird_Centre-North_Berwick_East_Lothian_Scotland.html Email: info@seabird.org Address: The Harbour North Berwick EH39 4SS

	Free entry to the Discovery Centre all year 10% discount in the Seabird Cafe, gift shop* and on boat trips and events 10% off entry into the Discovery Centre for your guests Special events and exhibitions Members' magazine E-newsletters Annual one-off payment / Annual Direct Debit £6 off in year one / Monthly Direct Debit £6 off in year one Adult: £26 / £20 / £1.80 Joint adult: £45 / £39 / £3.45 Senior: £24 / £18 / £1.60 Joint senior: £41 / £35 / £3.10 Junior: £15 / £9 / £80p Family (same household) One adult, up to 4 kids: £45 / £39 / £3.45 Family (same household) Two adults, up to 4 kids: £58 / £52 / £4.60 Friend for Life: £500 one-off lifetime payment	
Island Bay Marine Education Centre	• Free but donations are welcome	Telephone: 04-3838285 Website: http://www.octopus.org.nz/content/our-centre Facebook: https://www.facebook.com/Aquariumnz Email: info@octopus.org.nz Address: P.O. Box 20001 Wellington South, New Zealand

Scottish Sea Life Sanctuary	Door / Online Adult (15+) £13.2 £9.24 Child (3-14yrs) £10.8 £7.56 Family of 4 (2 adult & 2 child) £42 £29.4	Telephone: 01631 720386 Website: https://www.visitsealife.com/oban Facebook: https://www.facebook.com/scottishsealifesanctuary Twitter: https://twitter.com/SeaLifeOban YouTube: https://www.youtube.com/channel/UC-J71EizcJt5D6-ETixJ4PA Flickr: https://www.flickr.com/photos/93146678@N02/ Email: scottishsealifemarketing@merlinentertainments.biz Address: Barcaldine Oban Argyll PA37 1SE
Deep Sea World	TICKET TYPE / DOOR PRICE / ONLINE SAVING Standard (13+) £13.50 £2 Junior (age 3-12 years, under 3s go free) £9.50 £1.50 Concession (OAPs, students* carers*) £11.50 £1.25 Family (2 standard and 2 junior) £44 £7 Groovy Grandparents (2 concessions + 2 junior) £40 £5.50 Special prices for groups, schools and members: http://www.deepseaworld.com/tickets	Telephone: 01383 411 880 Website: http://www.deepseaworld.com/ Facebook: https://www.facebook.com/pages/Deep-Sea-World/246307797604 Twitter: https://mobile.twitter.com/DeepSeaWorld YouTube: https://www.youtube.com/user/deepseaworld100 Pinterest: https://www.pinterest.com/deepseaworld/ Email: info@deepseaworld.co.uk Address: Battery Quarry North Queensferry Fife - KY11 1JR
Gairloch Marine Wildlife Centre & Cruises	Free to the visitor centre Cruises: Adults £20 Under 18's £15 Infants under 12 months free of charge	Telephone: 01445 712636 Website: http://www.porpoise-gairloch.co.uk/ Facebook: https://www.facebook.com/pages/Gairloch-Marine-Wildlife-Centre-Cruises/111514232219555?fref=ts Blog: http://www.porpoise-gairloch.co.uk/wordpress/ Email: info@porpoise-gairloch.co.uk Address: Charleston Harbour Pier Road Gairloch Ross-shire IV21 2BQ

Appendix 17. Participants information sheet and consent forms

a) For questionnaires

Participant information for questionnaires

My name is Adaica Rodriguez and I am a master student from the School of Life, Sports and Social Science at Edinburgh Napier University. As part of my degree course, I am undertaking a research project for my Master dissertation. The title of my project is: 'Feasibility of an interpretation centre in Lamlash Bay (Isle of Arran), based on visitor's expectations and small scale marine centres around the world'.

This research is focused on studying the practicability of a small scale marine interpretation centre in the Isle of Arran. COAST (Community of Arran Seabed Trust) is interested in the results of this study to evaluate the possibilities of creating a marine interpretation centre to increase the knowledge and understanding of the marine ecosystems benefits and promote the positive transformation that the coast and seabed are getting with the Marine Protected Area and No-Take Zone management tools.

I am looking for volunteers to participate in the project. The participants have to be 18 or over and be a visitor in the Isle of Arran.

If you agree to participate in the study, you will be asked to fill a questionnaire. The researcher is not aware of any risks associated with this study. The whole procedure should take no longer than 10 minutes. You will be free to withdraw from the study at any stage; you would not have to give a reason.

All data will be anonymised in the data set. Your name will be replaced with a participant number, and it will not be possible for you to be identified in any reporting of the data gathered. All data collected will be kept in a secure place (e. g. locked cabinet in locked room and stored on a pc that is password protected) to which only my supervisor and I have access. These will be kept until the end of the examination process, following which all questionnaires, permission forms and transcripts will be destroyed.

The results may be published in a journal or presented at Edinburgh Napier University.

For further inquiries, you are welcome to contact the researcher to the following email, 40182637@live.napier.ac.uk and the project supervisor Dr. Kathy Velander, School of Life Sport and Social Sciences, Edinburgh Napier University, Edinburgh, Scotland, EH11 4BN; k.velander@napier.ac.uk; tel: + 44 (0) 131 455 2221.

If you would like to contact an independent person, who knows about this project but is not involved in it, you are welcome to contact Dr Phyllis Laybourn, School of Life Sport and Social Sciences, Edinburgh Napier University, Edinburgh, Scotland, EH11 4BN (p.laybourn@napier.ac.uk; tel: +44 131 455 6017.

If you have read and understood this information sheet, any questions you had have been answered, and you would like to be a participant in the study, please now see the consent form.

b) For focus groups

Participant information for focus groups

My name is Adaica Rodriguez and I am a master student from the School of Life, Sports and Social Science at Edinburgh Napier University. As part of my degree course, I am undertaking a research project for my Master dissertation. The title of my project is: 'Feasibility of an interpretation centre in Lamlash Bay (Isle of Arran), based on visitor's expectations and small scale marine centres around the world'.

This research is focused on studying the practicability of a small scale marine interpretation centre in the Isle of Arran. COAST (Community of Arran Seabed Trust) is interested in the results of this study to evaluate the possibilities of creating a marine interpretation centre to increase the knowledge and understanding of the marine ecosystems benefits and promote the positive transformation that the coast and seabed have obtain with the No-Take Zone and Marine Protected Area management tools.

I am looking for volunteers to participate in the project. The participants have to be 18 or over and be a resident / visitor in the Isle of Arran.

If you agree to participate in the study, you will be asked to participate in a focus group. The researcher is not aware of any risks associated with this study. The whole procedure should take no longer than 30 minutes.

The focus group will be recorded to enable it to be transcribed. Your name will be replaced with a participant number or a pseudonym, and it will not be possible for you to be identified in any reporting of the data gathered. All data collected will be kept in a secure place (e. g. locked cabinet in locked room and stored on a pc that is password protected) to which only my supervisor and I have access. These will be kept till the end of the examination process, following which all questionnaires, permission forms and transcripts will be destroyed.

The results may be published in a journal or presented at Edinburgh Napier University.

If you would like to contact an independent person, who knows about this project but is not involved in it, you are welcome to contact Dr. Phyllis Laybourn, School of Life Sport and Social Sciences, Edinburgh Napier University, Edinburgh, Scotland, EH11 4BN p.laybourn@napier.ac.uk; tel: +44 131 455 6017.

For further inquiries, you are welcome to contact the researcher to the following email, 40182637@live.napier.ac.uk and the project supervisor Dr. Kathy Velander, School of Life Sport and Social Sciences, Edinburgh Napier University, Edinburgh, Scotland, EH11 4BN; k.velander@napier.ac.uk; tel: + 44 (0) 131 455 2221.

If you have read and understood this information sheet, any questions you had have been answered, and you would like to be a participant in the study, please now see the consent form.

c) Consent forms

Consent Form

Project title: Feasibility of an interpretation centre in Lamlash Bay (Isle of Arran), based on visitor's expectations and small scale marine centres around the world.

I have read and understood the information sheet and this consent form. I have had an opportunity to ask questions about my participation.

I understand that I am under no obligation to take part in this study.

I understand that I have the right to withdraw from this study at any stage without giving a reason.

I agree to participate in this study.

Name of participant: _____

Signature of participant: _____

Signature of researcher: _____

Date: _____

Contact details of the researcher

Name of researcher: Adaica Rodriguez

Address: Master Student, Ecotourism, School of Life, Sports and Social Science

Edinburgh Napier University. Sighthill Court, Edinburgh EH11 4BN

Email / Telephone: 40182637@live.napier.ac.uk / 0131 455 2221