1 **Public Perceptions of Management Priorities for the English Channel Region**

2

3 Abstract: Abstract: The English Channel region is an area of high conservational importance, as well

4 being a contributor to economic prosperity, social well-being and quality of life of the people living

5 around it. There is a need to incorporate societal elements into marine and coastal governance, to

6 improve management of the Channel ecosystem. Public Perception Research (PPR) is a relatively

7 unexplored dimension of marine science, with limited research at the scale of the Channel region.

8 Using an online survey, this study examined the public's use of, and funding priorities for, the

9 Channel's marine and coastal environment. It revealed that there are variations in how the English

10 and French coastlines are used. Environmental issues were generally viewed as being more

11 important than economic ones. Country-level differences were observed for public uses of, and

12 priorities for the Channel region. Cleaner water and beaches, and improved coastal flood defences,

13 were more highly prioritised by English respondents, while offshore renewable energy and

14 sustainability of businesses were more highly prioritised by French respondents. The paper

15 contributes to the debate on the value of PPR by addressing evidence gaps in the English Channel

16 region, and to PPR literature more broadly. It provides baseline data to inform future engagement

17 strategies for the marine and coastal governance of the Channel region specifically. It also identifies

18 how this type of research has implications for the wider marine and coastal environment, including

19 contributing to Sustainable Development Goal 14 on conserving and sustainably using the oceans,

20 seas, and marine resources.

21 **Research highlights**:

22 • The paper presents survey findings on public use of and priorities for the Channel.

23 • There are country-level differences in public use and priorities for the Channel.

24 • Environmental issues are generally viewed as more important than economic ones.

25 • English and French coasts present different opportunities for leisure and recreation.

26 • PPR is important for governance of global marine and coastal environments.

27 **Keywords**: English Channel; Le Manche; Public Perception Research; marine governance; marine

28 environment; public engagement

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1. Introduction

Marine and coastal environments are some of the most productive and valued ecosystems in the world [1, 2]. However, they are also some of the most heavily degraded environments as a result of substantial and increasing human pressures, threats and challenges [3-5]. This is reflected in the English Channel (known as La Manche in France; hereafter the Channel), an area of high conservation importance and one which contributes to economic prosperity, social well-being and quality of the life [6]. The geographical area of the Channel is defined as having, as its western limit a line from 48°38′23″N 4°34′13″W to 50°04′N 5°43′W (i.e. Ushant to the Scilly Isles) and as its eastern limit (across the Dover Strait) a line joining the Walde lighthouse in France, at 51°00′N 1°55′E, and Leathercoat Point in England, at 51°10′N 1°55′E [7]. However, the boundaries of the region and its coastal zone can vary depending on the issues being considered, with different boundaries applied by OSPAR, the EU, and other bodies [6].

This paper is based on the results of an online survey conducted under the aegis of the Promoting Effective Governance of the Channel Ecosystem (PEGASEAS) Project and was intended to provide recommendations and identify future challenges for the Interreg V Programme for 2014-2020 (successor to Interreg IV)[1]. All areas included within the Interreg V programme area for the Channel were included in the survey. This includes all the South Coast of England, from Kent to Cornwall, all of the North Coast of France, from Calais to Brest, and incorporates the marine, coastal and terrestrial space within the region (see Figure 1). Responses to the survey came from all of the Interreg V eligible areas, and a breakdown of the residence of those respondents (English by County, French by Département is provided in the Supplementary Material to this paper (Supp.Mat. Figs. 1 and 2).

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[1] The Interreg Europe programme[1] helps regional and local governments across Europe to develop and deliver policy measures that have an integrated and sustainable impact on both people and places. For further information in the Interreg Programme see https://www.Interregeurope.eu/about-us/what-is-Interreg-europe/

73 **Figure 1: Map of the Channel, including Interreg V eligible areas**

74 Map courtesy of the Challenger Society, UK, www.challenger-society.org.uk [8]

75

76 The Channel is a vibrant area, with a growing population living along the coasts of what is one of the

77 busiest maritime regions in the world [6]. It faces a range of economic, social and environmental

78 challenges, including unemployment, social deprivation, vulnerability to the impacts of climate

79 change (e.g. marine-source flooding events and coastal erosion), and ecological deterioration

80 relating to multiple human pressures [9]. Managing both natural environmental risks and the

81 impacts of human activities requires implementation of cross-sectoral, multi-disciplinary, and

82 integrated approaches. Effective management also requires engagement with, and by, the public,

83 and should be based on clear, powerful, and communicable advice, in order to support improved

84 governance of the Channel region [9].

85 In this paper, marine governance is defined in the broadest sense as the sum of all the processes,

86 organisations, institutions and instruments with an influence over how the marine ecosystem of the

87 Channel is used and managed [6, 9]. There is growing recognition and awareness of the need for a

88 greater understanding of how to incorporate the societal element of marine issues into the
89 governance of marine and coastal environments [10, 11]. This has led to a greater emphasis on
90 Public Perception Research (PPR) [10] and its application to marine governance, conservation and
91 policy [12-16]. PPR explores the public's knowledge, interest, social values, attitudes and behaviours
92 [10]. It is predominantly an area of research within social sciences, which incorporates insights from
93 a range of disciplines including psychology, sociology, human geography and the natural sciences
94 [10].

95 The paper is structured in the following way. Section 2 presents an overview of PPR in general and
96 then more specifically in relation to the marine and coastal environment (including evidence gaps for
97 the Channel). Section 3 addresses evidence gaps for the Channel region by presenting the results of
98 the large-scale survey. The survey on which this paper is based is, to the authors' knowledge, the
99 first to identify public use, and perceptions, of a cross-border geographic region. Section 4 analyses
100 the findings of the online survey, identifying how respondents use the Channel coasts in England and
101 France. It compares funding priorities between the two countries on the basis of Interreg V funding
102 categories, before focusing on priorities for the marine and coastal environment more specifically.
103 Implications and limitations of the research are identified in Section 5, together with areas where
104 data collected from the public survey can be used for further research. Finally, in Section 6, the
105 paper draws conclusions from the findings of the survey and examines how those findings can
106 contribute both to the PPR literature and support the future governance of the Channel and the
107 wider marine and coastal environment. This is important as understanding the different uses of the
108 coasts can contribute to effective governance in the wider context of the oceans [17], for example in
109 achieving Sustainable Development Goal (SDG) 14 on conserving and sustainably using the oceans,
110 seas, and marine resources [18].

111

112 **2.   Overview of Public Perception Research (PPR)**
113 In recent years, a growing number of studies have focused on public perceptions of the marine and
114 coastal environment and marine governance. They have explored public perceptions of marine
115 health [15], marine biodiversity [16], attitudes to marine and coastal environments [19-21], marine
116 issues including climate change and ocean acidification [22-24], conservation measures including
117 Marine Protected Areas (MPAs) [25], and blue growth [26]. Such research is important as a strength
118 of PPR for marine governance is the creation of better relationships between stakeholders, together
119 with increased public engagement in decision making [10].

120 These studies pave the way towards a better understanding of social values, attitudes and uses of
121 the marine and coastal environment. To date, they have helped to provide some initial insight into
122 public perceptions and form a basis for further investigations [9]. Current and future PPR research
123 can have several benefits, including:

124 1. It can help to gain public support for current and future research projects and studies [19]. An
125   understanding of public views on future priorities for governance can help researchers and
126   national and local authorities to make informed decisions on future funding priorities and
127   management approaches [10].
128 2. It can help to inform and support ocean governance, policy and decision-making. The public can
129   be the key to the success or failure of marine policy and conservation measures [8, 19]. Public
130   perceptions and opinions of marine and coastal environments can play a role in advising
131   conservation planning and the designation of Marine Protected Areas [27], in the development
132   and reform of marine spatial planning [28] and management of marine resources [29, 30] and in
133   the deployment of marine renewable energy [19];
134 3. An increased understanding of society can help to shape engagement approaches for specific
135   audiences [10]. Knowledge of how societies engage with the sea and pro-environmental
136   behaviour can assist in setting and monitoring environmental targets (e.g. reduction of plastic
137   bag use [31], and targeted educational and awareness strategies (e.g. to change behaviour) [32].
138   Evidence suggests that public participation in 'citizen science' activities, such as beach cleaning
139   or monitoring of marine and coastal habitats, can have a positive effect on marine conservation
140   and management [33]. Increasing public engagement can also help to bring about a sense of
141   'marine citizenship' on an individual and/or collective basis, for example, where individuals
142   exhibit an awareness of and concern for the marine environment and a motivation to change
143   their behaviour to lessen impacts on seas and oceans [15, 34]; and

144 There is a gap in understanding of public perceptions at the Channel scale. Research has previously
145 taken a country-specific approach and has explored (i) the uses of the marine environment [20, 34],
146 (ii) perceptions of the public in the UK and France nationally [19-20, 35-36], and (iii) examined the
147 public awareness, concerns and priorities relating to the marine environment across various
148 European countries [19, 22]. There are two specific reasons why PPR is necessary at the scale of the
149 Channel. Firstly, there is a lack of evidence on how the public use the Channel. Understanding public
150 use has the potential to contribute to the management and planning of marine resources for both
151 the Channel and the wider marine environment including SDG 14 on conservation and sustainable
152 use of the ocean, seas and marine resources [17-18, 37]. For example, this data can be used a social
153 baseline for the development and monitoring of the impact of marine spatial plans. Secondly, there

154 is increasing need to understand public views on future priorities for the governance of the Channel,

155 to enable national and local authorities to make informed decisions on management, planning and

156 conservation strategies for the region, and to identify future funding priorities.

3. Methods

158 Recognising the evidence gaps, individuals from England and France were surveyed to gain a better

159 understanding of how the public use the Channel coasts of Southern England and Northern France,

160 and their perceptions of the region. Information was also collected on individual respondent

161 priorities for investment in the Channel region, if public funding were available to improve it.

3.1.Survey design

163 The survey was comprised of four sections, based around the following themes: (i) socio-

164 demographic information, (ii) public use of the Channel area (English Channel/La Manche); (iii) public

165 funding priorities for the Channel; (iv) and pro-environmental behaviours. Sections (ii) and (iii) are

166 considered in more detail in this paper. The basic survey questions for (ii) to (iv) is outlined in Table 1

167 while full details of the options for those questions are provided in the Supplementary Material to

168 this paper (Supp. Mat. Table 1). All of the questions posed were 'closed', i.e. respondents did not

i. Background/socio-demographic information   Q1. What region do you live in?   Q2. Which of the following best describes the area where you live?
ii. Public use of the Channel area (English Channel /La Manche)   Q3: How often do you visit the Channel coast?   Q4: Why do you visit the Channel coast?   Q5: What do you do when you visit the Channel coast?
iii. Public funding priorities for the Channel   Q6 If there was public funding available to improve the Channel area, how would you spend it?   Q7: This question specifically focuses on the Channel area's marine and coastal environment. If there was public funding available, how would you spend it?
iv. Participation in pro-environmental behaviours   Q8: Based on your knowledge and responses to this survey, have you or would you be willing to change your behaviour to protect the environment?

169 have the option of providing additional information.

170 **Table 1: Specific Survey Questions**

171 NOTE: Section iv and Q8 in Table 1 are not examined in this paper.

172

173 *3.1.1. Background/socio-demographic information*

174 The first section asked respondents for their socio-demographic information, including the region

175 (Q1; i.e. the Interreg V area, set out in Figure 1) and the type of area (Q2; urban, suburban,

176 village/rural or other) they lived in, together with their employment status (for example in full time

177 employment, self-employed, retired). This data was combined with socio-demographic held by GMI,

178 which detailed age, gender, and education level (see Supp. Mat. Table 2).

179 *3.1.2. Public use of the Channel area*

180 The second section of the survey focused on the use of the Channel area. Respondents were asked

181 (Q3) how frequently respondents visited the Channel coast (France, England or both sides of the

182 Channel), (Q4) why they visited the Channel coast (holiday, work, recreation, live there, travel or

183 other) and (Q5) the types of activities they undertook when they visited the Channel coast (see Table

184 1). If a respondent visited both the English and French coasts, they were asked to provide

185 information for each side of the Channel. Furthermore, if respondents stated that they had never

186 visited the Channel coast or only worked there they were automatically directed to the questions on

187 public funding priorities.

188 *3.1.3. Public funding priorities for the Channel*

189 The third section of the survey focused on respondents' funding priorities for the Channel region. All

190 respondents were asked this question, regardless of their use of and visitation to the Channel region.

191 Firstly, at Q6, they were asked to rank the importance of thirteen priorities using a five point Likert

192 scale (1 ='not important at all', 5 = 'very important'). The development of the priorities was based on

193 documentation on the upcoming Interreg V for the France (Channel) England cross-border

194 cooperation programme for 2014-2020 (see Table 2). Interreg sought information under the broad

195 themes of business and local economy, renewable energy, tourism and natural and cultural heritage,

196 environment, and regeneration and deprivation. The research was intended to help direct the

197 Interreg funding agenda for the period 2014-2020. Secondly, at Q7, respondents were presented

198 with seventeen priorities relating specifically to the marine and coastal environment of the Channel.

199 They were asked to select both their five most favoured and five least favoured priorities for public

200 funding, if public money was available. The purpose for doing so is discussed in Section 2, where an

understanding of public priorities is identified as being necessary can help to gain public support for current and future research projects and studies [19]. Options for the both questions were randomised.

Themes	Public Priority
Business and local economy	To support and develop future sustainability in businesses
	To help businesses better respond to economic pressures and/or create new jobs
	To strengthen and build networks between businesses and other stakeholder groups
Renewable energy	To further research into renewable energy technology and its potential impacts (on land and sea)
	To increase the use and awareness of renewable energy by businesses and the public
Tourism, and natural and cultural heritage	To promote tourism and interest in the history, culture and geology and other attractions on the Channel coast
	To support local businesses providing services or goods to visitors and tourists of the Channel Coast
Environment	To raise public awareness of the Channel environment (e.g. through campaigns and social media)
	To reduce pollution and improve the management of environmental risks
	To improve the management of natural resources and conservation of the Channel Environment
	To increase awareness of the benefits that the Channel environment provides to humans (e.g. fish, leisure and recreation, health)
	To support adaptation to climate change
Regeneration and deprivation	To support physical, economic and social regeneration in deprived urban and rural communities

Table 2: Public Priorities for the Interreg V-A (France (Channel) – England) cross-border cooperation programme 2014-2020

3.2. Survey mode, piloting and administration

Ethical approval for the study was granted by Plymouth University Faculty of Science and Environment Research Ethics Committee. An online survey was selected as the survey mode and was administered by a commercial market research company, Global Marketing Insite (GMI; now GMI Lightspeed), which maintains a global panel of respondents. The online survey was used to access a broad cross-section of respondents, from a large and geographically distributed population [38].

214 Previous work has shown that online surveys can be administered in a time-efficient manner [39],
215 are robust in delivering questionnaires [39], are convenient for respondents [40], are cost effective
216 [41] and can achieve improved or comparable response rate to other survey modes (e.g. mail
217 survey) [42]. The results of such surveys are also consistent with results from traditional pencil and
218 papers surveys [43]. There are, however, limitations with the use of online surveys, including self-
219 selection bias [44] and sample representativeness [41, 44]. For example, there may be a small
220 inherent bias from sampling respondents registered on a database with a market research company
221 [20, 44]. The target sample size was 2000 (c.a. 1000 responses from each country) and respondents
222 were recruited based on two criteria: that they were over 16 years of age, and that they lived within
223 one of the Interreg V eligible areas (see Figure 1).

224 The survey was pre-tested ahead of administration, using 100 respondents in each country, to assess
225 the clarity of the language and to identify any issues with understanding of the questions (i.e.
226 qualitative pre-testing). Based on this, no alterations were made to the survey; therefore, these
227 initial responses were included in the final results. The survey closed after approximately two weeks,
228 once 2,000 responses had been received. Respondents received a nominal fee of £1.25 to complete
229 the survey, which helped to reduce the likelihood of bias from auto self-selection [20].

230 **3.3. Respondent profile**

231 In addition to the main groups of questions set out in Table 1, specific socio-demographic data was
232 obtained from GMI including: respondent age, gender and employment status (see Supp. Mat. Table
233 2). GMI was also able to provide some further details on respondents from existing data sets,
234 including highest level of education, income data, and socio-economic status. These factors were not
235 considered in the analysis as, for example, in the case of socio-economic status, data was only
236 available for 45% of respondents, and was provided under differing systems. Social grade data[2] (i.e.
237 A, B, C1, C2, D and E) was provided for English respondents, whereas socio-professional group data
238 (e.g. Farmer, Craftsman/shopkeeper/business owner, Executives and professionals) was given for
239 French respondents. Direct comparison between these categories was not possible. Data on income
240 was not available for 55% of respondents and was therefore also excluded from the analysis of the
241 survey data.

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[2] In the UK approximated Social Grades fall under six categories, A, B, C1, C2, D and E and provide socio-
economic classifications of every Household Reference Person between the ages of 16 and 64 (see
http://www.ukgeographics.co.uk/blog/social-grade-a-b-c1-c2-d-e). In France a range of socio-professional
categories (CSPs) are used to categorise individuals by their professional situation (see
https://www.insee.fr/en/metadonnees/definition/c1758), Data on UK respondent social grades and French
respondent CSPs was provided by GMI.

242 **3.4. Statistical analysis**

243 Many of the items were measured on nominal or ordinal scales, which required the use of non-
244 parametric tests. A range of tests were used to examine whether there were significant differences
245 between (i) French and English respondents and (ii) the two coasts (English coast and French Coast)
246 for the majority of the questions [45]. For Q4 on why each respondent visited the Channel coast, and
247 for Q5 on what activities the respondent participated in, a McNemar test was used because the
248 observations are related (since the same individual can visit both coasts), and the variables are
249 nominal (1 or 0). For Q6 on the respondent's preference for spending public money, responses were
250 given on a 5-point Likert scale resulting in independent samples comparing English and French
251 responses; a t-test was therefore used to test for differences between English and French
252 respondents (based on mean averages). For Q7 on public spending preferences relating to the
253 marine and coastal environment specifically, a Chi-squared test was used as both variables 'country'
254 and 'most preferred priority' are nominal and independent. All statistical analyses were conducted
255 using IBM SPSS 22.

256

257 **4. Results**

258 **4.1. Respondent profile**

259 The general profile of survey respondents is displayed in Table 3.

Characteristics	Sample population (EN) (n=999)	Sample population (FR) (n=1001)
Gender (%)		
Male	45	48
Female	55	52
Age Profile		
Age Range	16 – 82	16 – 79
Mean Age	44	46
Median Age	43	47
Employment status (%)		
Full time (30+ hours/week)	40.5	46.0
Part time (less than 30 hours/week)	13.0	8.0
Self- employed (30+ hours/week)	7.0	2.5
Self-employed (less than 30 hours/week)	2.5	1.0
In full time education	5.5	7.0

|		
Retired	16.0	20.5
Not working for any other reason	14.5	12.0

260 **Table 3: Characteristics of respondents in the sample (n=2000).**

261 *NOTE: Additional information on the place of residence of English and French respondents appears in*
262 *the Supplementary Material as Figures 1 and 2.*

263

264 **4.2. Public use of the Channel Coast**

265 As identified in Table 1, three specific questions were posed on how the public use the Channel,
266 including the frequency of visits to the Channel coast (Q3), why they visit the coast (Q4) and what
267 they do when they visit the coast (Q5). From Q3, 90% of respondents had visited the Channel coast
268 (either in England, France or both) at some point in time (n=1802). In total 73% of all survey
269 respondents (n=1489) had visited the English Channel Coast and 68% of all respondents (n=1399)
270 had visited the French Channel coast. 50% of English respondents (n=499) and 47% of French
271 respondents (n=469) visited the Channel coast at least once or twice a year. 10% of all respondents
272 (n=198) stated that they never visit the Channel region. There was no statistically significant
273 difference between English and French respondents in terms of how often they visit the Channel
274 region (Figure 2).

275
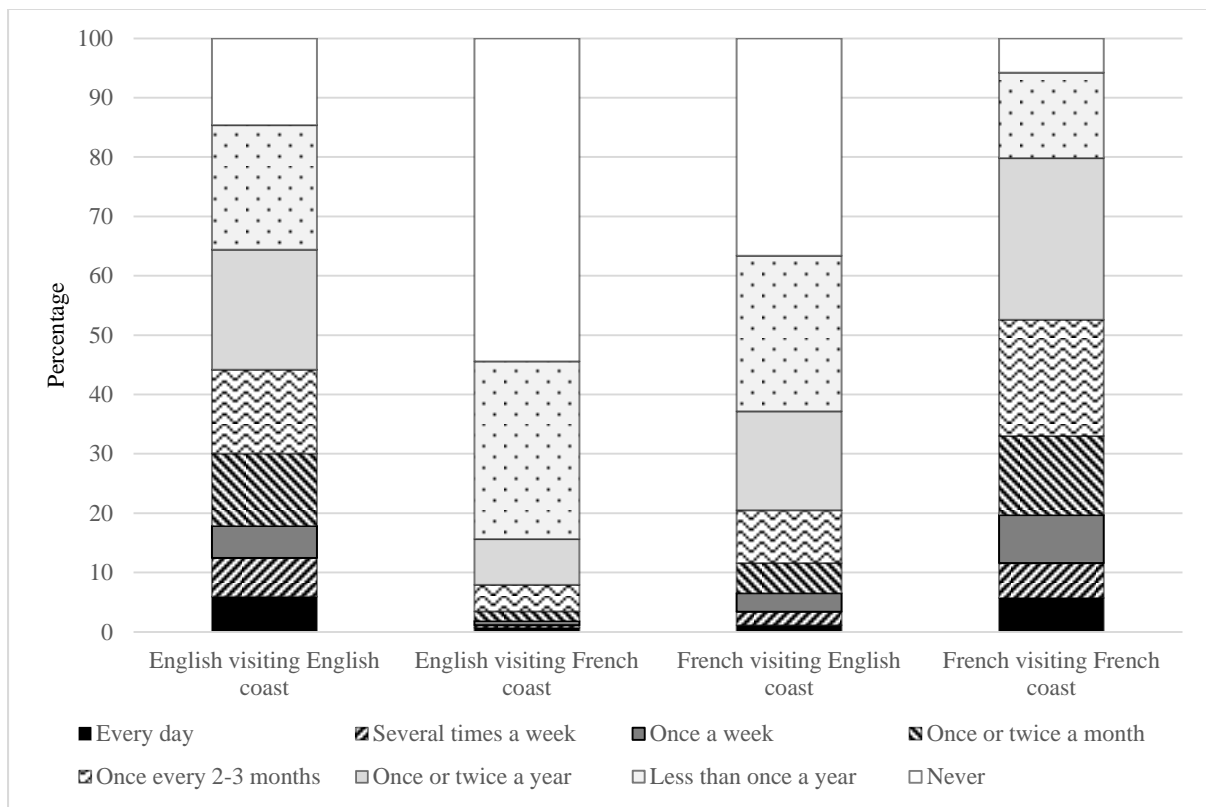
Figure 2: Frequency of visits to the (English and French) Channel Coast (n= 2000).

The main reasons for visiting the Channel coast (see Figure 3) were primarily for recreation (80% of all respondents, n=1596), and holidays (i.e. staying in the area and taking part in activities there; 50%, n=989). The reasons for visiting the English coast and French coast were compared between English and French respondents, using a McNemar Test. There were significant differences between English and French respondents for the categories of holidays and travel ($p<0.05$). French respondents were more likely to go on holiday (i.e. stay in the area for a period of time; more than one day) to the Channel coast than English respondents. English respondents were more likely to travel (i.e. stay in the area for a short period of time; one day or less), or travel from one side of the Channel to the other) on the Channel coast than French respondents.
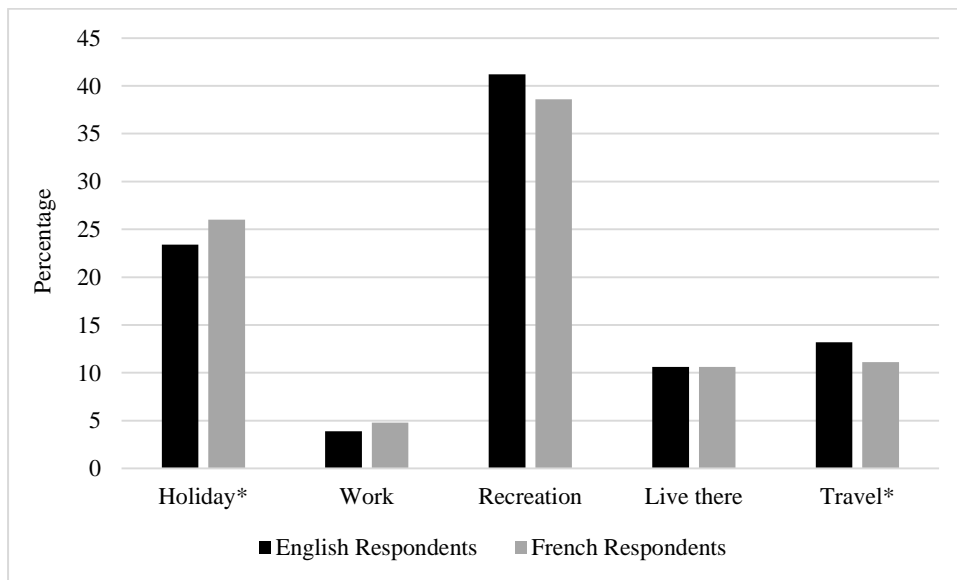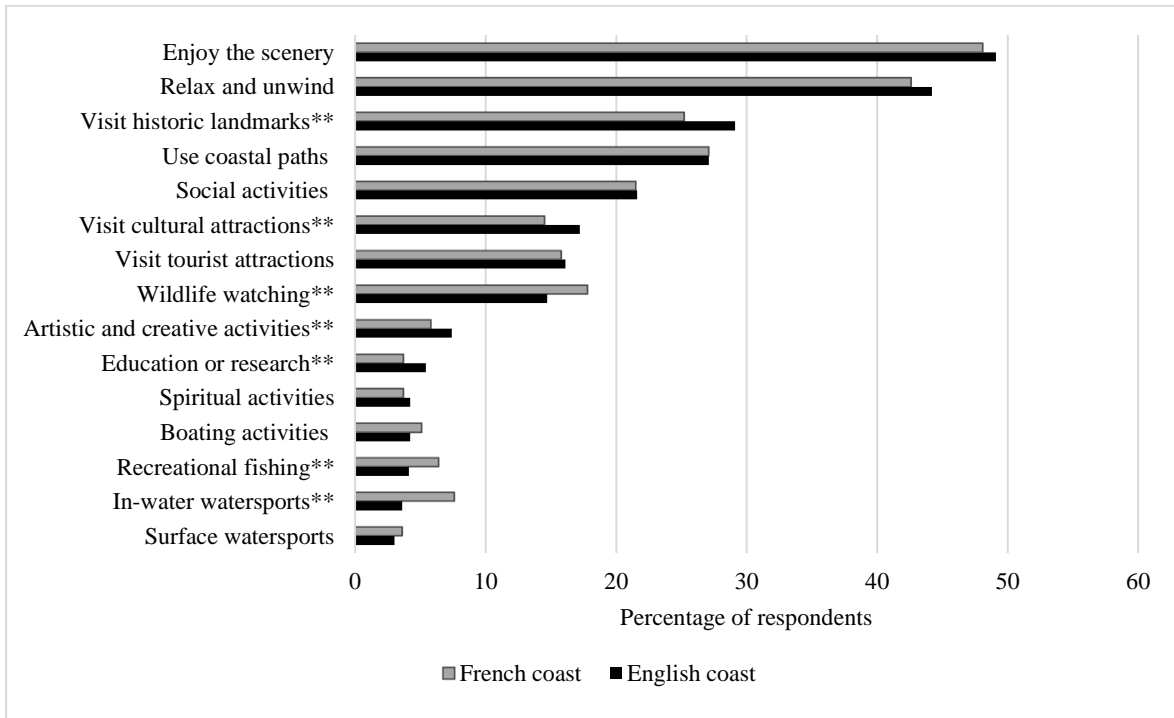

* $p<0.05$ (McNemar Test)

Figure 3. Reasons for visiting the Channel Coast (n=1802)

Q5 asked respondents what they did when they visited the Channel coast (in one or both countries), and could select a maximum of 5 activities that they participated in. Figure 4 compares responses by country for each of the 15 activities. Enjoying the scenery is the most popular activity for nearly half of all respondents, i.e. 49% of those visiting the English coast at any time and 48% of those visiting French coast. Surface water-sports such as water-skiing, kayaking and rowing, were selected by less than 4% of respondents visiting either the English or French coast.

While the McNemar test identified that there were no significant differences between the way English and French respondents used the Channel coast, across the 15 categories of activities, there were significant differences between activities being undertaken on the two coastlines. These

299 differences were identified for seven of the activities (see Figure 4): visiting historic landmarks

300 (p<0.01), visiting cultural attractions (p<0.01), artistic and creative activities (p<0.01) and education

301 (p<0.01) were all carried out more by respondents visiting the English Coast, than those visiting the

302 French coast. Activities such as wildlife watching (p<0.01), fishing (p<0.01), and in-water sports

303 (p<0.01) were significantly more popular at the French coast, compared to the English coast.

304

305 **p<0.01 (McNemar Test)

306 **Figure 4. Activities undertaken when visiting the (English or French) Channel Coast (n=1802)**

307

308 **4.3. Public funding priorities for the Channel Coast - Interreg IV classifications**

309 Q6 (see Table 1) considered public funding priorities for the Channel coast on the basis of five main

310 public funding priorities provided by Interreg IV for the France (Channel) England cross-border

311 cooperation programme for 2014-2020 (see Table 3)

312 The three most highly ranked of the public priorities among all respondents, identified in Table 2,

313 combining 'important' and 'very important' responses (Likert scale options 4 and 5), were: improving

314 natural resource management and conservation (71%), reducing pollution and environmental risk

315 (70%); and promoting tourism (64%). Three priorities received the largest amount of 'not important'

316 or 'of little importance' responses: strengthening and building networks (21%), raising public

317 awareness through campaigns (14%) and supporting adaptation to climate change (13%). Figure 5

318 compares the funding priorities for English and French respondents. French respondents ranked all

13

priorities higher than English respondents. There are significant differences between English and French respondents for the majority of funding priorities, with the exception of supporting regeneration in urban and rural areas, and promoting tourism and culture.
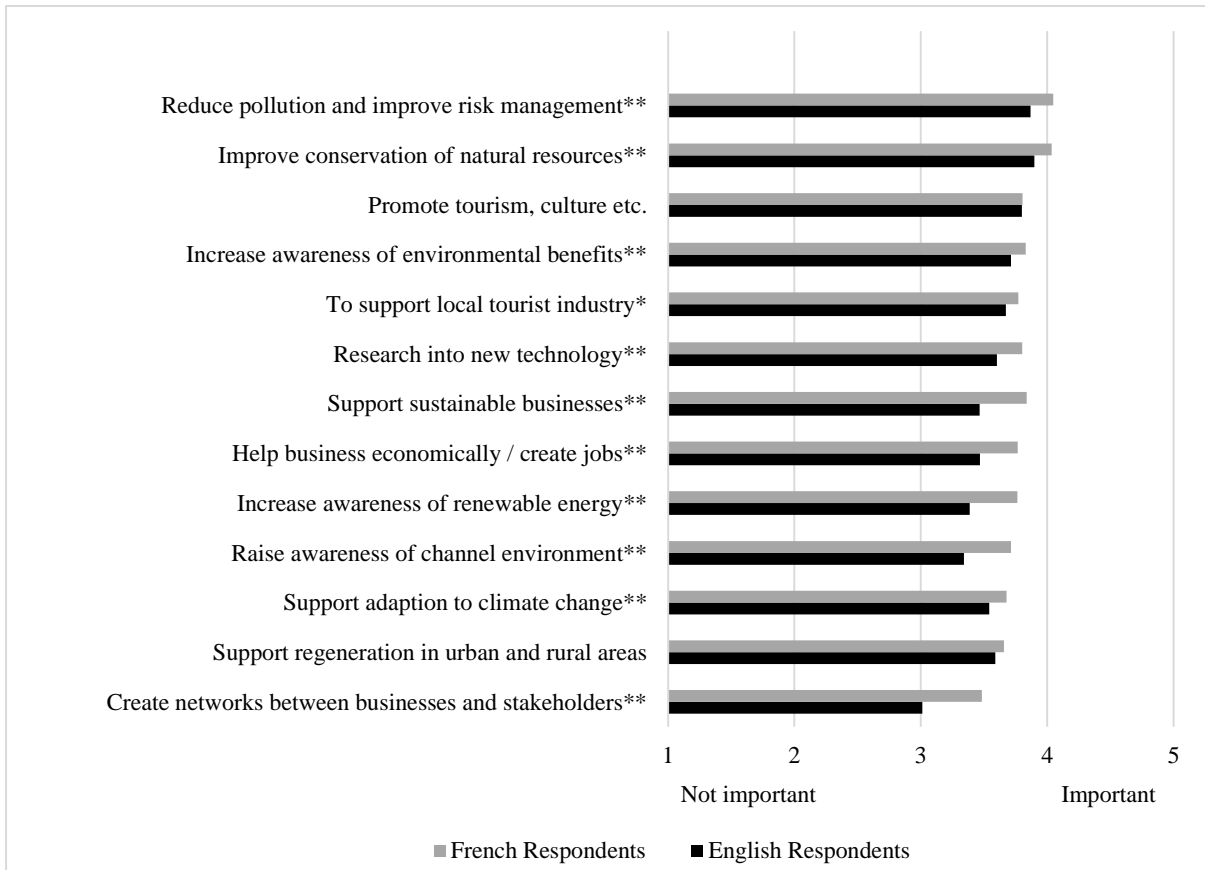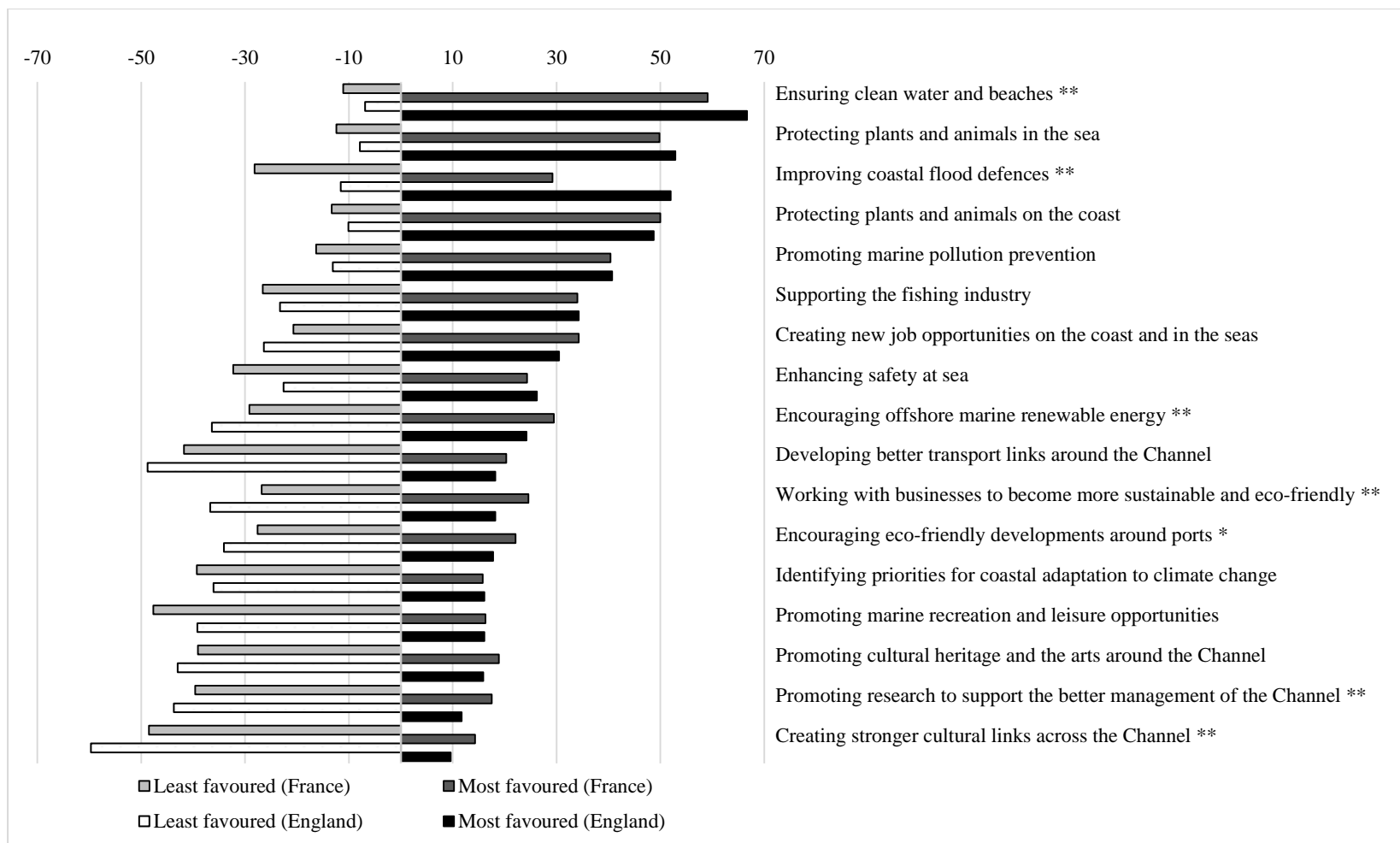
Figure 5: Comparison of Interreg funding priorities between English and French respondents (n=2000).

4.4   Public Funding Priorities for the Channel - marine and coastal environment specific

For Q7 (see Table 1) respondents were asked to select both their five most favoured and five least favoured marine and coastal priorities for public funding, as illustrated in Figure 6. There were significant differences between French and English respondents for 7 priorities: ensuring clean water and beaches (p<0.01), improving coastal flood defences (p<0.01), encouraging offshore marine renewable energy (p<0.01), working with businesses (p<0.01), encouraging eco-friendly developments (p<0.01), promoting research (p<0.01) and creating stronger cultural links (p<0.01). English respondents placed more of a priority on ensuring clean water and beaches and improving

14

338   coastal flood defences, in comparison to French respondents. French respondents placed greater

339   priority on the following: (i) encouraging offshore marine renewable energy, (ii) working with

340   businesses, (iii) encouraging eco-friendly developments, (iv) promoting research, and (v) creating

341   stronger cultural links, than English respondents.

Figure 6

	-70	-50	-30	-10	10	30	50	70	

Ensuring clean water and beaches **

Protecting plants and animals in the sea

Improving coastal flood defences **

Protecting plants and animals on the coast

Promoting marine pollution prevention

Supporting the fishing industry

Creating new job opportunities on the coast and in the seas

Enhancing safety at sea

Encouraging offshore marine renewable energy **

Developing better transport links around the Channel

Working with businesses to become more sustainable and eco-friendly **

Encouraging eco-friendly developments around ports *

Identifying priorities for coastal adaptation to climate change

Promoting marine recreation and leisure opportunities

Promoting cultural heritage and the arts around the Channel

Promoting research to support the better management of the Channel **

Creating stronger cultural links across the Channel **

☐ Least favoured (France) ■ Most favoured (France)

☐ Least favoured (England) ■ Most favoured (England)

342

343 *p<0.05, **p<0.01 (Asymptotic significance, two sided). (Chi-squared test, performed on most favoured priorities). *Note: The order in which these ranking*

344 *appear is on the basis of the most favoured priorities for English respondents (not the side of the Channel).*

345 **Figure 6: Most favoured and least favoured priorities for improving the marine and coastal environment of the Channel**

5. Discussion

This paper analysed the key findings of a public survey of respondents living in the Channel region (English Channel/ La Manche). The discussion is structured around two main sections of the survey: (i) public use of the Channel coast (5.1) and (ii) public priorities for the Channel coast (5.2). This is followed by a discussion of country-level differences (5.3) and the implications of the study and opportunities for future research (5.4).

5.1 Public use of the Channel Coast

The first finding of the survey relates to the way respondents use the Channel environment. The majority of respondents (approx. 50%) visited the Channel Coast once or twice a year. This coincides with previous research for the UK coast, which examined how the UK public interacted with the marine environment, and coastal and inter-tidal spaces [20] and found that 58% of respondents to an online survey on UK public perceptions of the marine environment visited the UK coast more than once a year [20].

The data analysis from the survey of English and French respondents living in the Channel region found that the Channel was mainly used for recreation and holidays and enjoying the scenery and relaxing and unwinding were the most frequently undertaken activities by respondents. This corresponds with a study which found that English and French respondents considered scenery to be one of the most important services of the ocean [19]. From the online survey, only 4% of all respondents reported that they use the Channel for activities such as surface water-sports (e.g. water-skiing, kayaking and rowing), in-water water sports (e.g. scuba diving, snorkelling, swimming) or for recreational fishing (e.g. from the shore or boat). This follows a similar trend to previous research which showed that fewer respondents undertake activities which take them below the low tide mark in the UK (e.g. swimming and water sports); participation in such activities was estimated to be 7% in one study [35] and 18% in another study [10]. Both are somewhat higher than the 4% identified in the current study.

5.2 Public priorities for the Channel Coast

From the survey findings, it appears that the environment is the highest priority for the public. The respondents were found to prioritise the environment over other factors such as improving businesses and the local economy. This may be as a result of the majority of respondents holidaying on the Channel coast or using it for recreation, rather than living or working there, with business improvements therefore being less directly relevant to them. This is in contrast with a European public opinion survey [46], where the environment and climate change were viewed as a much

17

378 lower priority by the public in both England and France [46]. Similarly, a survey of European
379 attitudes towards the marine and coastal environments found that concerns over the oceans were
380 low, although it was recognised as an important provider of ecosystem services [19]. However, that
381 10 country study of levels of concern and awareness of marine impacts found that age and
382 generation (under 27, 27-45, 46-64 years of age) can influence perceptions on marine issues more
383 than the proximity to the coast [19]. This is an aspect of the current study that would merit further
384 analysis and is discussed further in Section 5.4.

385 The respondents perceived improving natural resource management and conservation and reducing
386 pollution and environmental risk to be the most important priorities for the Channel coast. Concern
387 over pollution and its impacts has been previously identified in England and France [19-20, 23-24].
388 There may be a number of reasons for this finding. Firstly, the issue of pollution may be more easily
389 understood by the public in comparison to other issues. This may be due to media coverage and the
390 more direct and clear relationship between pollution and risks to human health [20]. Secondly, the
391 public may associate the environment (e.g. seas and oceans) with pollution [47-48].

392 Ensuring clean water and beaches and protecting plants and animals in the sea and on the coasts
393 were perceived to be the most important marine and coastal priorities. This supports the responses
394 to Q6 where reducing pollution and improving management of environmental risks, and improving
395 the management of natural resources of the Channel coast received the highest levels of support
396 among the priorities identified for the Interreg V-A France (Channel) England cross-border
397 cooperation programme for 2014-2020. The importance of cleanliness of water and beaches has
398 been identified previously [24]. Water pollution, sewage and litter are perceived to be significant
399 issues affecting the health of marine environments [19-20, 24]. For example, previous research
400 indicates that the UK public are pessimistic about the health of the seas [20, 49-50] and perceive it
401 to be in fair or poor health [25].

402 The protection of marine and coastal plants and animals were also highly prioritised by respondents.
403 This finding contrasts with previous PPR research. Prior studies have found that wildlife
404 conservation, habitat degradation and loss and the loss of biodiversity are not considered to be the
405 most important marine environmental problems [20, 23]. They are often behind that of issues such
406 as pollution and coastal erosion. In addition to this, respondents did not deem 'identifying priorities
407 for coastal adaptation to climate change' as a high priority. This may imply that climate change is not
408 perceived to be one of the biggest threats to the Channel's environment. This is in keeping with
409 previous surveys in the UK and France administered during a similar time period [20, 23-24].

410

5.3. Country level differences

The use of the Channel coast and public priorities for funding were compared between the two countries. The study revealed that there were country-level differences with respect to the reasons for using the Channel. French respondents are more likely to holiday (i.e. stay for more than one day) on the Channel coast than English respondents. Conversely, English respondents used the Channel coastal area more for travelling (i.e. staying for one day or less, travelling from one side of the Channel to the other), than French respondents. However, there were no country-level differences in the types of activity undertaken by respondents. English and French respondents participate in similar activities when visiting the Channel coast, predominantly enjoying the scenery, and relaxing and unwinding. However, there were significant differences in the activities undertaken on the two coastlines. The English side of the Channel is more frequently used for visiting historic landmarks and cultural attractions, as well as for education, research and artistic and creative activities. In contrast, wildlife watching, fishing and in-water sports are undertaken more often on the French coast.

There were also differences in the funding priorities of English and French respondents. Overall, French respondents rated all priorities higher than English respondents, with the exception of: (i) promoting tourism and interest in the history, culture and geology and other attractions on the Channel coast; and (ii) to support physical, economic and social regeneration in deprived urban and rural communities. This trend has been identified in previous surveys (for example [19], which observed that British respondents ranked similar options lower than respondents from other European countries (e.g. France). In this survey, British respondents had the least concern across a range of issues.

Differences were also observed in marine and coastal specific priorities for the Channel. English respondents placed a higher priority on ensuring cleaner water and beaches and improving coastal flood defences, when compared to French respondents. The importance of cleanliness of water and beaches, coastal erosion and flooding to UK respondents has been identified previously in PPR research [24]. The importance placed on improvements to coastal flood defences may also be as a result of the survey taking place less than 6 months after severe weather and flooding in southern England (both coastal and inland) from early February of 2014 [51]. The severe weather events resulted, for example, in the severing of the main rail link running along the south coast, west of Exeter and into Cornwall [52]. Further, experience of coastal erosion and flooding has been shown to be directly related to willingness to take personal action [53]. On the other hand, French respondents ranked priorities relating to offshore marine renewable energy, the sustainability of

444 businesses, eco-friendly developments, research and cultural links higher than English respondents.
445 This aligns with a 10 country EU study [19] which considered the importance of the oceans to
446 individuals. On the basis of interviews, that study found that French respondents placed significantly
447 more importance on uses of the ocean relating to energy, employment, culture and identity, and
448 education and science, in comparison to UK respondents [19].

449 Although the study discussed in this paper explored country-level differences in uses and
450 perceptions, it did not investigate the influence of additional socio-demographic variables (e.g. age,
451 gender, employment level, for example). The paper aimed to investigate the overarching trends,
452 rather than the influence of specific variables/the variation between groups. Further, there are a
453 number of challenges associated with the data including differences in the nature and format of
454 socio-demographic data for the two countries (e.g. education level and socio-economic status) as
455 well as missing values (e.g. income). It is intended that a future paper will explore the data further,
456 addressing these challenges, to examine the influence of socio-demographic variables (including
457 age) on public use, perceptions and pro-environmental behaviours in the Channel region. Additional
458 variables that should also be considered in future surveys include proximity to the Channel coast.

459 **5.4. Implications and future research**

460 This research is, to the authors' knowledge, the first study to identify the public use and perceptions
461 of the population at the scale of the Channel region. This study has provided detailed information on
462 public use of the Channel, and priorities for future funding within the region, from respondents in
463 both England and France who live in areas close to the Channel.

464 There are a number of potential implications of this research. Firstly, the research makes a
465 contribution to the wider PPR literature, discussed in Section 2, as the first Channel-specific PPR
466 study to have been conducted. To date there still exists a relatively poor understanding of public
467 perceptions towards the seas and oceans [10, 19-20]. PPR has been identified as a key area of
468 research for improving our ability to conserve and manage the world's marine resources [10, 16] and
469 by identifying specific activities undertaken by survey respondents, and linking those to funding
470 preferences, it could be possible to frame marine conservation messages to different audiences (for
471 example based on activities and country).

472 Secondly the study provides data on the social and behavioural characteristics of the Channel
473 community, including the motivational and regional predictors of visits to the Channel Coast. The
474 results of this study could have wider implications for destination tourism [54] in the Channel coastal
475 area, as well as marine and coastal management and planning in the Channel region. This type of

476 data may contribute to current baseline data on the social environment of marine and coastal
477 environments and may be useful for the development and monitoring of marine plans in England
478 and France [35, 55-56]. For example, social data is necessary for monitoring the impact of marine
479 plans on communities adjacent to the English Channel [55]. In addition, the data may help to shape
480 funding programmes (e.g. future Interreg programmes) and inform regional and local strategic
481 planning (e.g. local enterprise partnerships and local government). Lastly, the research may help to
482 shape engagement approaches for specific audiences. A better understanding of the public uses and
483 perceptions of the marine and coastal environment can help to identify the best ways to frame
484 conservation messages in the Channel region and how to tailor messages for specific target groups
485 [16]. By actively engaging the public in thinking about how and why they use the marine
486 environment, and how their actions can positively (or negatively) impact on it, the research intended
487 to achieve a better understanding of social values, attitudes and uses of the marine and coastal
488 environment [8].

489 In considering how to achieve Sustainable Development Goal (SDG) 14 to conserve and sustainably
490 use the oceans, seas and marine resources, there are many lessons to be learned from coastal
491 management and the efforts of coastal communities [18]. Lessons such as coordination and
492 collaboration between sectoral institutions and government, stakeholder participation to ensure
493 that public views are heard, and integration of both scientific and traditional knowledge, could
494 benefit management of human activities in ocean ecosystems everywhere [18]. These lessons should
495 include ways to identify how the costs and benefits of conservation and management can be shared
496 in an equitable way so that a disproportionate burden does not fall on coastal communities, for
497 example, in the development of Marine Protected Areas [21].

498

6. Conclusions

500 To date a relatively poor understanding of public perceptions towards the seas and oceans remains.
501 This study contributes to the debate on PPR through its examination of the public use of, and
502 funding priorities for, the Channel's marine and coastal environment. The study presents social
503 baseline data on public use of the Channel coasts of England and France, including reasons for
504 visits/use, frequency of use, and the types of activities undertaken. The coasts of England and France
505 are distinct in terms of the types of leisure and recreation activities undertaken. Public funding
506 priorities for the Channel coasts were also elucidated. As a whole, environmental issues were
507 generally viewed as more important than economic ones and the public prioritise plans to ensure
508 cleaner water and beaches and protect plants and animals.

509 There were also country-level differences in the reasons for use of the Channel coast and the
510 priorities for the area. For example, cleaner water and beaches, and improved coastal flood
511 defences, were more highly prioritised by English respondents compared to French respondents,
512 while offshore renewable energy, sustainability of businesses, eco-friendly developments, and
513 research and cultural links were more highly prioritised by French respondents compared to English
514 respondents. This highlights that there are distinctions between (i) the two coasts and (ii) the public
515 in England and France. An understanding of these distinctions and the social and behavioural
516 characteristics of the public may have a number of implications for PPR research, the marine and
517 coastal governance of the Channel (including marine spatial planning and management), future
518 funding in the region and the development of public engagement approaches.

519 Understanding the different uses of the coasts can contribute to effective governance in the wider
520 context of the oceans. There are many lessons that can be learned from coastal management
521 activities such as cooperation between institutions and government, and stakeholder participation
522 activities at the local community level, for example [18]. Integration of both scientific and traditional
523 (local) knowledge, could also benefit management of human activities in ocean ecosystems more
524 widely, or more locally in the development of Marine Protected Areas, for example [18].

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SUPPLEMENTARY MATERIAL

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714 **Prior to completing the survey, respondents were provided with the following statement to define**
715 **the area of the Channel.**

716 *"This survey aims to get your views on the future management of the Channel Coast. The English*
717 *Channel includes all the South Coast of England, from Kent to Cornwall. The Manche Coast includes*
718 *all the North Coast of France, from Calais to Brest."*

719 **Table 1: Summary of Public Survey Questions**

Theme	Question	Categories
Background/socio-demographic information	**Q1. What region do you live in?** *Respondents were asked to select 1 option only*	*England:* (1) Cornwall and Isles of Scilly (2) Devon (3) Somerset (4) Dorset (5) Hampshire (6) Isle of Wight (7) West Sussex (8) East Sussex (9) Kent (10) Essex (11) Norfolk (12) Suffolk (13) Cambridgeshire (14) Wiltshire (15) Surrey *France:* (16) Finistère (17) Côtes-d'Armor (18) Ile-et-Vilaine (19) Manche (20) Calvados (21) Eure (22) Seine-Maritime (23) Somme (24) Pas-de-Calais (25) Nord
	Q2. Which of the following best describes the area where you live?	(1) Urban location (2) Suburban location (3) Village/rural location (4) Other

Public use of the Channel (English Channel and/or La Manche)	**Q3: How often do you visit the Channel Coast?** *Respondents were asked to select 1 option only, for each side of the Channel (English Channel Coast and the French Manche Coast)*	(1) Every day (2) Several times a week (3) (3) Once a week (4) Once or Twice a month (5) Once every 2-3 months (6) Less than once a year (7) Never
	Q4: Why do you visit the Channel coast? *Respondents were asked to select all options that applied to them, for each side of the Channel (English Channel Coast and the French Manche Coast)*	(1) Holiday (2) Work (3) Recreation (4) Live there (5) Travel
	Q5: What do you do when you visit the Channel Coast? *Respondents were asked to select the five main activities that they participated in, for each side of the Channel (English Channel Coast and the French Manche Coast).*	(1) Boating Activities (e.g. sailing and motorboating) (2) Surface watersports (e.g. waterskiing, rowing, kayaking) (3) In-water watersports (e.g. scuba diving, snorkelling, swimming) (4) Recreational fishing (e.g. from the shore or boat) (5) Use coastal paths (e,g, for hiking, walking and running) (6) Wildlife watching (e,g. bird-watching, rockpooling) (7) Visit tourist attractions (e.g. theme parks, aquariums) (8) Visit cultural attractions (e.g. museums, art galleries) (9) Visit historic landmarks (e.g. castles, monuments and heritage sites) (10) Artistic and creative activities (e.g. photography, painting, dancing) (11) Spiritual activities (e.g. visiting places of worship, religious landmarks, retreats or workshops) (12) Enjoy the scenery (e.g. look at the sea view) (13) Education or research (e.g. school excursions to visitor centres, studying the environment) (14) Relax and unwind (15) Social activities (e.g. meeting with friends and family)
Public funding priorities for the Channel	**Q6: If there was public funding available to improve the Channel Coast, how would you spend it?** *Respondents were asked to rate each of the 13 priorities on a 5 point likert scale (not important to very important).*	(1) To support and develop future sustainability in businesses (2) To help businesses better respond to economic pressures and/or create new jobs (3) To strengthen and build networks between businesses and other stakeholder groups (4) To further research into renewable energy technology and its potential impacts (on land and sea) (5) To increase the use and awareness of renewable energy by businesses and the public (6) To promote tourism and interest in the history, culture and geology and other attractions on the Channel coast (7) To support local businesses providing services or goods to visitors and tourists of the Channel Coast

		(8) To raise public awareness of the Channel environment (e.g. through campaigns and social media)
		(9) To reduce pollution and improve the management of environmental risks
		(10) To improve the management of natural resources and conservation of the Channel Environment
		(11) To increase awareness of the benefits that the Channel environment provides to humans (e.g. fish, leisure and recreation, health)
		(12) To support adaptation to climate change
		(13) To support physical, economic and social regeneration in deprived urban and rural communities
	Q7: This question specifically focuses on the Channel's marine and coastal environment. If there was public funding available, how would you spend it? *From the list of priorities, respondents were asked to select their:* *(a) Five most favoured priorities* *(b) Five least favoured priorities* *(Note these priorities could not overlap).*	(1) Protecting plants and animals in the sea
		(2) Protecting plants and animals on the coast
		(3) Working with businesses to become more sustainable and eco-friendly
		(4) Creating new job opportunities on the coast and in the seas
		(5) Promoting marine recreation and leisure opportunities
		(6) Support the fishing industry
		(7) Encouraging eco-friendly developments around ports
		(8) Encouraging offshore marine renewable energy
		(9) Enhancing safety at sea
		(10) Promoting marine pollution prevention
		(11) Improving coastal flood defences
		(12) Identifying priorities for coastal adaptation to climate change
		(13) Ensuring clean water and beaches
		(14) Creating stronger cultural links across the Channel
		(15) Promoting cultural heritage and the arts around the Channel
		(16) Developing better transport links across the Channel
		(17) Promoting research to support the better management of the Channel
Participation in pro-environmental behaviours	**Q8: Based on your knowledge and responses to this survey, have you or would you be willing to change your behaviour to protect the environment?** *Respondents were asked to select the statement (a-h) that best described their intentions for each of the 11 pro-environmental behaviours* *(See categories column for statements and pro-environmental behaviours)*	**Pro-environmental behaviours:**
		(1) Buy sustainably sourced fish
		(2) Join marine conservation groups and take part in activities (e.g. beach cleaning)
		(3) Switch to energy from renewable sources
		(4) Use fewer plastic bags
		(5) Buy more organic or locally produced food
		(6) Write to your local politicians about marine issues
		(7) Use more public transport
		(8) Vote for politicians who support marine issues
		(9) Participate in public meetings or coastal forums
		(10) Support campaigns for more marine protected areas
		(11) Take part in marine planning

	Statements:
	(a) I like my lifestyle the way it is and am not likely to make this change
	(b) I'd like to make this change but I don't know what to do
	(c) I'd like to make this change but it's too difficult
	(d) I'd make this change if I knew other people were doing it too
	(e) I intend to make this change
	(f) I already do a lot to protect the environment so it would be difficult to do more
	(g) I already do this
	(h) Don't know

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722   **Table 2: Characteristics of survey respondents (n=2000)**

|	England (n = 999)	France (n=1001)
Age group	%	%
25 and under	13.4	15.4
26 – 35	19.5	13.5
36 – 35	21.9	18.8
46 – 55	19.9	19.6
56 – 55	12.8	23.8
66 and over	12.4	9.0
Gender		
Male	44.5	48.5
Female	55.5	51.5
Education Level		
No formal qualification / diploma	7.5	2.8
GCSE/CSE/O level UK - GCSE/NVQ France	32.7	22.7
A Level/Scottish Higher UK - A Level France	24.7	28.1
Degree level qualification or equivalent	25.5	18.3
Masters Level qualification or equivalent	6.8	24.1
PhD Level qualification or equivalent	1.5	3.7
Not known	1.2	0.4
Employment Status		
Employee full time (30+ hours/week)	40.7	48.1
Employee part time (less than 30 hours/week)	13.4	7.9
Self-employed full time (30+ hours/week)	7.0	2.5
Self-employed part time (less than 30 hours/week)	2.4	1.2
In full time education	5.6	7.3
Retired	16.3	20.7
Not working for any other reason	14.5	12.3

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726 **Table 3: Most favoured priorities for spending on the marine and coastal environment by country and age group** (percentage of responses by age group)

Preference	English Responses as percentage						French responses as percentage					
	25 and under (n=134)	26-35 (n=195)	36-45 (n=219)	46-55 (n=199)	56-65 (n=288)	66 and over (n=124)	25 and under (n=154)	26-35 (n=135)	36-45 (n=188)	46-55 (n=196)	56-65 (n=238)	66 and over (n=90)
Clean water and beaches	55.97	57.44	67.58	74.37	75.00	70.16	50.65	50.37	62.77	63.78	60.92	64.44
Protecting plants and animals in the sea	50.75	48.21	56.16	56.28	56.25	47.58	51.95	48.89	47.87	50.00	52.10	44.44
Protecting plants and animals on the coast	41.79	49.74	49.32	56.78	49.22	40.32	48.05	46.67	49.47	55.10	49.16	50.00
Improving coastal flood defences	43.28	47.69	49.77	54.27	59.38	60.48	27.92	22.96	28.19	27.04	33.19	36.67
Marine pollution prevention	38.06	36.41	37.44	38.19	53.91	46.77	35.06	34.07	40.96	40.82	45.38	43.33
Support for fishing industry	23.88	29.23	31.05	32.16	41.41	55.65	25.97	28.89	23.94	34.18	45.38	45.56
Creating new job opportunities	33.58	32.31	31.51	25.13	28.91	33.06	31.82	37.04	32.98	39.80	31.09	33.33
Offshore marine renewable energy	32.84	24.10	26.03	25.63	13.28	20.97	32.47	32.59	27.66	30.10	27.73	26.67
Enhancing safety are sea	22.39	33.85	24.20	20.60	30.47	26.61	24.03	21.48	21.81	19.90	28.15	33.33
Helping business become more sustainable/eco-friendly	32.09	23.59	14.61	14.07	13.28	12.90	21.43	27.41	28.19	25.00	23.53	20.00
Eco-friendly port development	23.88	19.49	16.44	19.60	14.06	12.10	22.73	28.89	24.47	21.94	18.91	14.44
Better transport links across the Channel	20.90	20.00	17.81	16.58	19.53	14.52	22.73	24.44	16.49	17.86	15.55	13.33
Cultural heritage and arts around the Channel	20.90	16.41	16.44	12.56	12.50	17.74	24.03	24.44	19.68	16.84	15.55	13.33
Coastal adaptation to climate change	20.90	16.41	19.18	14.72	11.72	12.90	21.43	15.56	17.55	16.84	10.50	14.44
Marine recreation and leisure opportunities	14.18	16.92	21.70	18.09	8.59	12.90	22.08	14.81	23.94	12.24	12.18	12.22
Research/support for better management of Channel	9.70	14.36	14.16	11.56	6.25	11.29	18.18	21.48	16.49	16.84	17.65	13.33
Stronger cultural links across the Channel	14.93	13.85	7.31	10.05	6.25	4.03	19.48	20.00	17.55	11.73	8.82	10.00

727 *Note: Shaded   boxes   are   the   three   highest   ranked   priorities   by   country   and   age   group.*
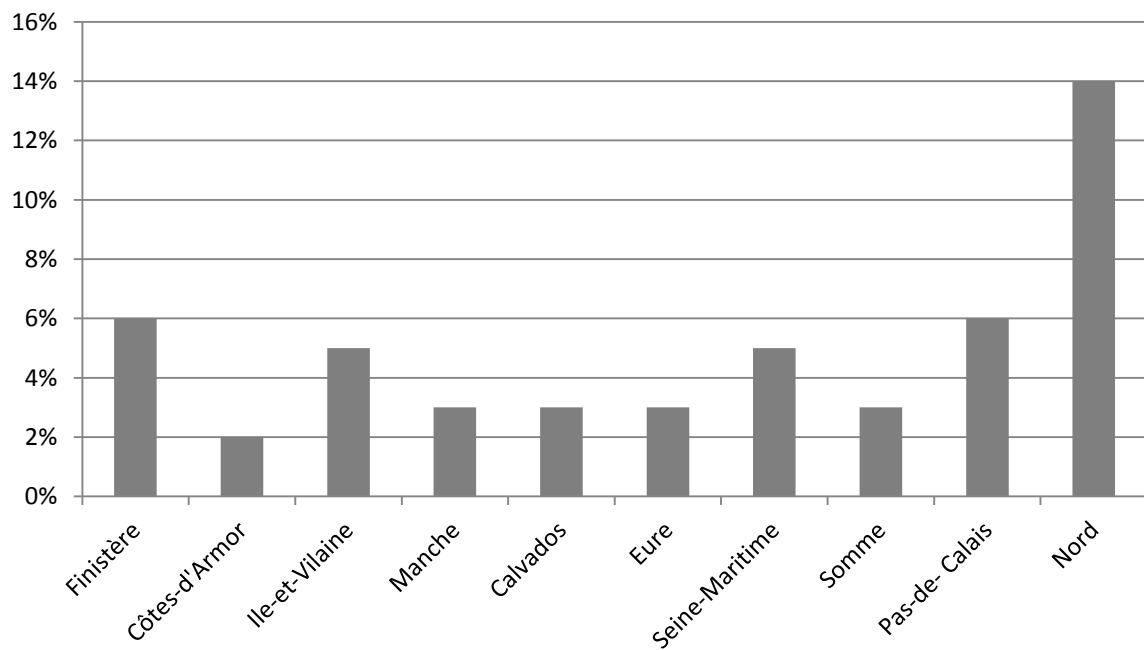
728 **Figure 1: Region of English respondents by County (n = 999)**
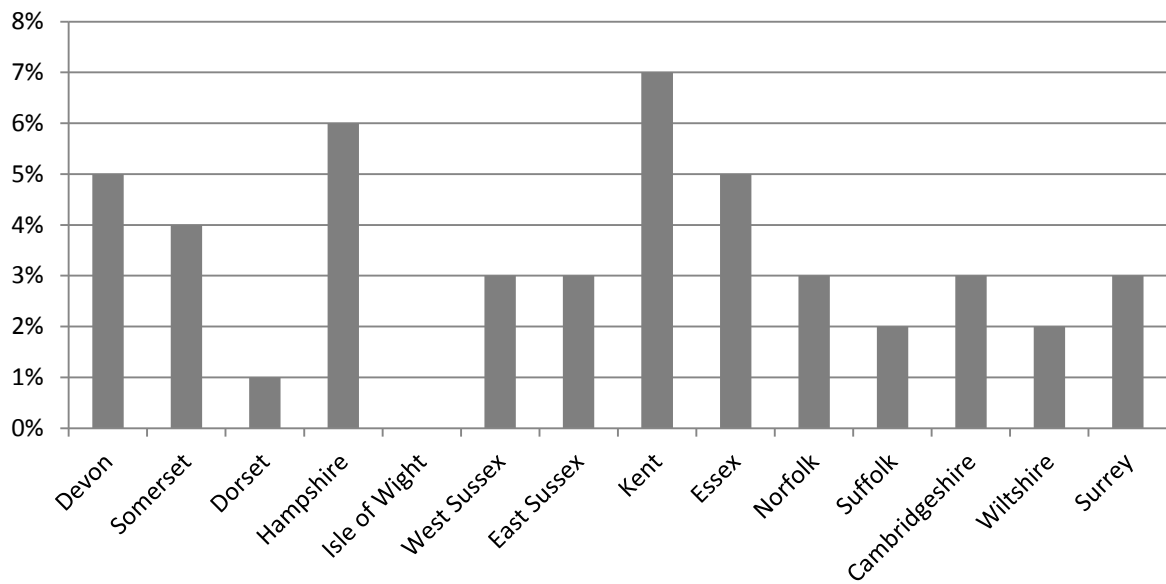
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731 **Figure 2: Region of French Respondents by Département (n = 1001)**

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