Recreation user knowledge, support and engagement in French MPAs: Are there reverse side-effects of the French soft regulation and management approach?

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1.0 Introduction

This paper demonstrates the complexity of engaging with recreational users as a marine protected area (MPA) stakeholder group in a country where MPAs are a relatively recent concept superimposed on well-established and historically settled human uses. MPAs are generally considered an important tool for conservation of marine biodiversity, habitats and various ecosystem services, including those related to recreational use (Abecasis et al., 2013; Rees et al., 2015). According to Rees et al. (2015), research on MPA management has historically focussed on fisheries and biodiversity conservation related issues with less emphasis on social aspects. However, understanding the social aspects of MPAs is also important for effective management (Abecasis et al., 2013; Fiske, 1992; Rees et al., 2015). Understanding recreation values and use, as a significant aspect of MPAs, can contribute to more effective engagement of recreational users in the management process, more effective targeting of management strategies for different stakeholder groups, and efficient allocation of often limited management resources (Rees et al., 2015; Smallwood et al., 2012).

1.1 Importance of understanding stakeholder views for effective MPA management

Understanding and factoring in the views of local stakeholders is an important component of effective MPA management (Abecasis et al., 2013; Halkos & Matsiori, 2017 ; Hastings & Ryan, 2017). Hastings and Ryan (2017) and Voyer et al. (2013) observed that effective MPA management also requires the community to understand and support what is being protected and why. Community understanding is more likely to foster support for an MPA and its management practices (Abecasis et al., 2013; Halkos & Matsiori, 2017; Tonin & Lucaroni, 2017). That is, effective MPA management requires managers and stakeholders to have a mutually agreed understanding of the purpose and function of MPAs as a policy tool (Chuenpagdee et al., 2013; Stamieszkin, Wielgus, & Gerber, 2009). This approach is part of what is termed participatory governance (Gaventa, 2007; Parkins & Sinclair, 2014)

Mutual understanding may be a difficult goal as community and stakeholder views can differ regarding how MPAs should be managed and what they should achieve (Abecasis et al., 2013). For example, some authors found local community resistance to establishment and presence of MPAs owing to perceived impact on livelihoods (Salmona & Verardi, 2001; Voyer et al., 2013; Wood & Glasson, 2005). Other authors found that local communities and other stakeholders generally support MPAs as a means for effective management of resources and the associated benefits (Abecasis et al., 2013; Hastings & Ryan, 2017; Tonin & Lucaroni, 2017).

Stakeholders associated with marine and coastal recreation are an important consideration for MPA management (O'Mahony et al., 2009). As with the wider community, engagement with recreational stakeholder groups can be complex because their views are often diverse and even contradictory (Abecasis et al., 2013; Hughes Jones, & Phau, 2016). For example, Rees et al. (2015) noted similarities and differences in response to an MPA across different recreation types. Ahtiainen et al. (2013) and Stamieszkin et al. (2009) found that people who spent more leisure time in marine environments had a greater concern for the management of the particular marine area where they spent time. Rees et al. (2015) noted that understanding the importance of a given MPA for recreation groups facilitates more effective management.

Bennett and Dearden (2014) observed that stakeholder views of an MPA can also vary depending on MPA governance structures and management practices, where inclusive engagement (among other things) is likely to encourage support. In addition, Chuenpagdee et al. (2013) highlighted that stakeholder response to MPAs is a function of the pre-existing socio-political context of the area in which the MPA is established, the nature and extent of community involvement in establishment and the governance structure of the MPA once established. That is, while there are established 'good practice' engagement approaches regarding MPAs, effectiveness relies on the range of community priorities and concerns, regional socio-political context, the legacy of past management practices and decisions and influence of current management approaches in the region (Hughes, Jones, & Phau, 2016). That is, effective management requires a detailed understanding of the specific local context in which an MPA is established.

1.2 MPAs in France

The French government has traditionally focussed on its mainland territories, but has recently strengthened its political ambitions in the marine and coastal environment (Trouillet, 2014). As such, the MPA concept is a relative late comer to marine and coastal management in France (Deboudt et al., 2015). While legislative frameworks to manage specific pressures were introduced in the 1970's (Deboudt et al., 2008), the French Marine Protected Areas Agency, along with the first Marine Natural Park was created decades later in 2006. The European Natura 2000 network of protected areas focused on threatened terrestrial species and habitats was created in 1992. It was expanded to include French marine and coastal areas in 2008. The European Union Marine Strategy Framework Directive was also adopted in the same year. Since establishment of the first Marine Park, the French Government set an objective to incorporate 20% of marine and coastal waters under French jurisdiction into MPAs by 2020 (AAMP, 2015).

Expansion of the natural protected areas network in France has coincided with an evolving management approach. An initial focus on nature conservation and landscape protection has expanded to consideration of socio-ecological systems. The systems approach highlighted the need to manage protected areas as a network within a geographical context to achieve long-term conservation goals and social equity (Mathevet & Godet, 2015; Mathevet et al., 2016). This broader approach has two main implications. Firstly, owing to this socio-economic context, French protected areas, including MPAs, have generally open public access and few regulations (Bouin, 2006; Meur-Ferec, 2007). That is why only 1.44% of French natural protected areas (marine and terrestrial areas together) are covered by the IUCN protected area categories I, II and III (IUCN France, 2017). Regulation is not entirely absent at a national scale but it mainly concerns specific small sites and restricted zones within protected areas (eg. National reserves, hearts of National parks, Biosphere reserves). Secondly, the French approach emphasises participatory management that seeks to integrate community needs with nature conservation through win-win solutions (Mathevet & Godet, 2015; Martin et al., 2017). A strong focus on social considerations means French MPA managers now act as mediators, using their authority to encourage engaging stakeholders in deliberative processes and formalizing collective decisions, mostly through local committees' participation (Mounet, 2007). However, participatory management remains highly institutional and politicized as evidenced by the composition of various consultation committees (e.g. elected officials, state agencies, representatives of regional fishery, tourism industry, environmental protection associations, etc.). Consequently, the negotiation processes struggle to engage

"ordinary" citizens not aligned with formal and often partisan organizations (Julien La Bruyère, 2008). In the case of outdoor recreation, independent users represent the vast majority of recreational users (Thiery, 2013). Mounet et al. (2012) indicate that the formal institutionalization of outdoor recreation in the participatory process means that the traditional spokesperson and sport federations are not representative of the whole recreational user community. As a consequence, recreational users as a stakeholder group are difficult to approach and understand for public authorities (Mounet, 2007). The lack of recreation organization membership and the associated difficulties with engagement, exacerbates MPA managers' negative perceptions that recreation use is a threat and is uncontrollable.

This paper presents findings from a study of recreational users associated with marine and coastal protected areas in France, with a focus on "non-organized" users. The study concentrated on non-extractive recreation and mainly physically active types as these were identified as significant users of the French MPAs. The study provides insights into the characteristics of different recreation stakeholders and their relationship with MPAs as a relatively recent phenomenon in France. To this end, we explore four main variables: the levels of recreational user knowledge about the MPAs, the willingness to engage with local management, the support for regulation and the importance of MPA as a place to practice their respective recreation activity. The aim of the paper is to highlight the implications of a soft MPA management approach in terms of recreational user knowledge and engagement with MPAs governed by a mandate for public participatory management.

2.0 Method

2.1. Selected sites, activities and sampling regime

A total of seven recreation activities were selected based on previous reports and informal discussions with French MPA managers (Maison, 2009) (Table 1). The selected activities (except scuba diving) are mostly conducted independently by users, rather than as part of an organized club activity. Little data exist on independent recreational uses that represents an important part of recreational practices in MPAs.

The study area included a total of ten local sites: two Marine Natural Parks and eight marine and coastal Natura 2000 sites (Figure 1). Each of the sites are ranked as IUCN categories IV and V, which means that their main objectives are to protect biodiversity as well as to foster sustainable management of natural resources (IUCN France, 2013). All of the selected sites are open to the public with no specific regulation for recreation activities. A multisite study enabled data to be gathered for a range of recreation activities and user types representing different sociocultural contexts and how this related to the perception of MPAs.

Figure 1

Survey data was gathered using a questionnaire administered on-site to French recreational users as a face-to-face interview in French language by trained research assistants between April and November in 2016. This sampling methodology was preferred because it enables higher response rates, compared to other sampling methods (such as online surveys or phone calls for example) (Berthier, 2010). It also enabled targeted sampling of respondents participating in specific recreation activities at a specific location based on field observations

rather than self-reported behaviour. Total data collection required 96 days in-field, distributed as evenly as possible according to seasons, school holidays and the days of the week, in an attempt to prevent potential overrepresentation of specific users (such as local people, tourists, students…).

A minimum sample size of 50 responses for each activity in each geographical area (i.e. Brittany or Mediterranean) was used as a nominal minimum sample size to enable valid comparative statistical analysis (Berthier, 2010). Because of the variety of the site characteristics and activity types within the MPAs, research assistants were free to move through each site to meet users. When there were few recreational users at a site (less than 20 for the entire day), all people observed to be conducting one of the target activities were invited to participate in an interview. When the sites were crowded (e.g. some beaches or car parks), assistants were invited to interview the maximum of people on their way. This convenience sampling may not be strictly representative of the broader population from a statistical point of view but allows a good representation of the diversity of attitudes (Ghiglione & Matalon, 1978; De Singly, 2016). Surfers, kite-surfers, hikers, were interviewed on beaches, trails or car parks. Sailors, boaters and divers were interviewed on harbor pontoons or at dive centers located in close proximity to the practice sites. Due to the difficulty to question kayakers, half of them were interviewed directly in the field (ports, beaches) and the other half during two sports events organized in two different protected areas.
Research assistants read out the questions and then entered responses into the questionnaire. The questionnaire included 29 questions and the survey took approximatively 12 minutes to complete.

2.2. Questionnaire design

Questions included basic demographics (age, sex, occupation, residential status) and information about the type of recreation activity they were practicing at the time of the survey. Occupation was categorized into ten groups according to the French system of classification, and residential status included three groups (Table 2). Questions relating to the MPA at each survey site included four dimensions: knowledge of MPA presence and local management, willingness to engage with local MPA management, personal support for more environmental regulation in MPAs and the importance of MPAs for practicing their particular recreational activity. The questionnaire included open and closed responses. Closed questions required a response using a 5 point rating scale (1 = totally disagree, 5 = totally agree) with a neutral mid-point (3) and an additional “don’t know” option.

2.2.1 Knowledge of MPA presence and management

Respondents were asked whether or not the area in which they were recreating at the time of the survey was under nature protection regulation with a choice of three responses: yes, no, and do not know. If the answer was ‘yes’ respondents were asked what types of regulation applied as an open question. The terminology of the open answers were standardized into regulation classes and sub-classes using grounded based theory (Glazer, 1992). The veracity of the standardized individual responses was verified according to the regulations that

actually applied to the area respondents were recreating in. Based on the results, respondents were classified according to 3 categories:

1) No knowledge about the MPA: included those respondents who answered 'no' or 'don't know' to the question regarding whether the area was under environmental regulation.
2) Low level knowledge about the MPA: includes those respondents who answered 'yes' but did not know what type of regulation, provided an incorrect type for the area, referred to specific visible actions (e.g. local management actions, signs), or provided very general answers (e.g. coastal conservation, wildlife protection…).
3) Correct knowledge about the MPA: includes those who responded 'yes and provided answers that were correct or partially correct. Answers were considered correct when they were consistent with the existing regulation status of the area where they conducted their recreation activity or areas close to where they practiced.

2.2.2 Declared importance to practice in a MPA

Respondents were asked to rate their response (on the5 point rating scale) to the statement, 'It is important for me to practice my activity in a MPA'. To help respondents, especially those who didn't understand the term "MPA", concrete French examples were given, such as "natural reserve", "marine park" or "Natura 2000 site".

2.2.3 Personal acceptance of more regulation for environmental reasons

Respondents were asked to rate their response (on the 5 point rating scale) to the statement, 'I would be ready to support more regulations focused on protecting MPA [they use for recreation], even if it limited the ability to access the area for recreation'.

2.2.4 Willingness to engage with local MPA management

Respondents were asked to rate their response (on the 5 point rating scale) to the statement, 'I am willing to get involved personally in managing my recreation practice area' When asking the question, examples of types of engagement were provided by the interviewer (local meeting participation, contributions to decision making, involvement in management actions).

2.2.5 Statistical analysis

Statistical analyses were performed using R software (version 3.5.1). When the dependent variable included at least five ordinal responses (age, declared importance, personal acceptance and willingness), the non-parametric Kruskal–Wallis test was applied. For tests that were significant, we performed a post-hoc analyses to determine which levels of the independent variable differ from each other level. Pairwise multiple comparisons were conducted using the Dunn test and a Bonferroni correction for p-values adjustement (detailed results are included in appendix B). Relationships between pairs of qualitative variables were estimated using a chi-square statistical test. To further explore the underlying structure between groups of variables, multivariate analysis were performed using the package FactoMineR (Lê, S., Josse, J. & Husson, F., 2008). Results from correspondence analysis (CA) on contingency tables were projected on two-dimensional scatter plots of the first and

second principal components (only the CA graphs which concerned the recreation types are presented in this paper). To explore the demographic profile between geographic regions of respondents, Multiple Correspondence Analysis (MCA) for each recreational activity was applied. The geographic region was used as the supplementary variable and remaining variables as active variables.

3.0 Results

An approximate total of 1166 people were invited to participate and 1000 questionnaires were completed (85.7% response rate[1]). This included 586 responses in Brittany and 414 responses in the Mediterranean across the seven targeted recreation activities (Table 1). Kayaking and surfing responses are absent from the Mediterranean region. Surfing is not commonly practiced in this region while kayakers were few and difficult to sample.

Table 1

3.1 Recreation types and demographics

For the total sample of 1000 respondents, most were male (74%) and lived locally in the area where they were surveyed (55.2%) or owned a holiday home in the area (10.6%) (Table 2). About one third were visiting the area as tourists (34.2%). For each respective region (Mediterranean and Brittany), there was a similar pattern of demographic distribution across respondents.

Table 2

Recreational activities were significantly associated with all demographic variables: sex, age, profession and place of residence. Males were dominant in each category except in hiking where 56.5% were females (χ^2 = 157.06. df = 6. p<0.0001). A higher proportion of males was associated with boating (91.0%) kite surfing (89.2%) and sailing (86.7%). Regarding the significant association with age, boating, sailing and hiking were practiced by older age groups while surfing and kitesurfing were associated with younger age groups (Kruskal-Wallis H=363.83. df = 30. p<0.0001). The significant relationship between reactional activities and professional occupation (χ^2=349.21. df=48. p<0.0001) generally reflected the respective age profile of activities. Activities including boating and sailing were mainly associated with retirees (older age groups) and surfing was mainly associated with students (younger age groups). However, kitesurfing was associated with a broad range of occupations. Finally, boating and sailing respondents were mostly local residents while hikers and scuba divers were mainly tourists (χ^2=274.96. df = 12. p<0.0001).

3.2. MPA management dimensions

Descriptive statistics and statistical association results relating to the four dimensions of MPAs measured are presented in Appendix A and Table 3. Results from Table 3 are described in turn.

Table 3

[1] This response rate (85,7%) is based on 35 days in-field data.

290
291 Figure 2
292
293
294 **3.2.1. Knowledge of MPA presence and management**
295
296 About half of all respondents (48.7%) demonstrated "correct" knowledge regarding the MPA
297 they used. However, many had incomplete knowledge (32.2%) or no knowledge (19.1%)
298 about the MPA. Knowledge of MPA presence and management was significantly associated
299 with all demographic variables (Table 3). A higher proportion of respondents with “correct”
300 knowledge were male compared to respondents with incomplete or no knowledge. Older
301 respondents tended to be more knowledgeable than younger respondents, while tourists
302 tended to have the lowest knowledge when compared with residents and secondary residents.
303 The projection into the two first principal components from Correspondence Analysis shows
304 that scuba divers (67.5% correct knowledge), sailors (65.7) and boaters (62.8%) tended to
305 have better knowledge of the MPAs than other activity types (Figure 2a). Conversely,
306 kayakers (35.1% correct knowledge) and kite surfers (40.9% correct knowledge) were less
307 likely to be knowledgeable about MPAs in the area they practiced their activity.
308
309 **3.2.2. Declared importance to practice in a MPA**
310
311 About half of all respondents (54.7%) either totally agreed or agreed with the idea that it was
312 important for them to practice their activity in a MPA. 13.4% had a neutral point of view.
313 About one-third (31.9%) disagreed or totally disagreed.
314 Results indicated strong statistical relations between respondents’ declared importance to
315 practice their recreation in an MPA and the type of recreation activity (Table 3). Declared
316 importance was significantly associated with two demographic variables: sex (H=5,77. df=1.
317 p=0.0163) and occupation (H=18.18. df=8. p=0.0199). Correspondence analysis shows that
318 practicing their recreation activity in an MPA was considered more important for scuba
319 divers and boaters and less important for sailors and kite surfers (Figure 2b). MPAs were of
320 higher importance to females and retirees.
321
322 **3.2.3. Personal support for more MPA environmental regulation**
323
324 Most respondents (63%) agreed or totally agreed with the notion of additional environmental
325 regulations for MPAs. 16.9% had a medium point of view and 20.1% totally disagreed or
326 disagreed.
327 The personal support for more MPA regulation for environmental reasons appears to be
328 strongly associated with all variables (Table 3). Females (79.8% agree or totally agree) were
329 more supportive than males (57.1 %). Students (69.2% agree or totally agree) were more
330 supportive of more regulation while retirees were the less supportive (54%). Tourist
331 respondents were more supportive (66.9% agree or totally agree) than locals (58.5%).
332 Younger respondents (65,4% agree or totally agree) were more supportive than older
333 respondents (55,4%).
334 Correspondence analysis shows that Hikers (83.7% agree or totally agree) and scuba divers
335 (71.2%) tended to be more supportive than sailors and boaters while kite surfers tended to be
336 neutral (Figure 2c).
337
338 **3.2.4. Willingness to engage in local MPA management***:*
339

Just under half of respondents (46.6%) agreed or totally agreed with a willingness to engage in local MPA management. 16.4% were neutral, while. 37% totally disagreed or disagreed. Our results showed that the willingness to engage was strongly significantly associated with recreation activity type ($H=31.294$. $df=6$; $p<0.0001$) (Table 3). Correspondence analysis highlights the contrast between scuba divers (25% agree) and surfers (23% agree) compared to boaters (55.3% disagree) and hikers (45.9% disagree) in their interest to engage in local MPA management (Figure 2d). Results also show that variables with a high score of willingness (scores 4 and 5), located in the centre of the CA graph, are not linked with any specific activity.

4.0 Discussion

This study aimed to understand recreational users' relationships with MPAs and management through the exploration of four relationship dimensions of knowledge, willingness to engage, support for regulation and importance of MPAs to recreation practice between recreation activities and French MPAs. France promotes participatory MPA management. Hence there is a requirement to consider the views of recreational users as an important MPA stakeholder group, among other stakeholders. The results of this study highlight the current limits of a participatory governance approach to MPA management which in France is strongly influenced by few regulations for public access.

4.1 Recreation types and demographics

Our results (table 2) are consistent with the main characteristics of French outdoor activities as described in the national literature, in terms of gender, demographics and general practice.

In our study, the respondents are predominantly men (74%). This proportion is higher than that observed in other French studies (60% in CNAPS, 2002 ; 46.1% in Evrard, 2014 ; 47.6% in Lefèvre, 2016) but can be explained by the specific activities selected in the sample. Thiery (2013) confirms that nautical activities in France are mostly dominated by men (76%). This is especially the case for activities such as boating, sailing, and kite-surfing (Bernard, 2016; Le Corre, 2013; Perras et al., 2015) even if there appears to be an increased proportion of women for some other sports (eg. hiking, kayaking) (Evrard, 2014; Lefèvre, 2016; Lefèvre et Thiery, 2010; Thiery, 2013). Thierry (2013) notes that terrestrial activities are the most feminized activities in France. This gender effect is well known in the French literature (Evrard, 2014) and tends to accentuate when users get older (INJEP, 2017). The French literature explains this gender imbalance in terms of the constraints created by combined responsibilities of the family and the professional life of women and consequently, their limited time for outdoor recreation.

Results globally highlight an over-representation of users from higher professional categories (33% of higher-level professions[2]), with regards to the distribution of the French population (24.4%, French National Institute for Statistics and Economic Research, https://www.insee.fr/fr/accueil). This result is consistent with previous national research that points at the social and economic discrimination in nature-based recreation access, equipment and site of practice in the French population (Lefèvre, 2016; Lefèvre et Thiery, 2010, 2011;

2 We consider here the higher-level professions as the category which covers "Artisans, merchants, company directors" and "Higher education and the liberal profession" (Table 2)

Muller, 2006), especially in nautical activities (Bernard, 2016 ; Evrard, 2014; Michot, 2005 ; Muller, 2006).

Age is also a strong discriminant variable because of the combined effects of the physical demands (eg. surfing and kite-surfing are physically demanding activities that favour young people compared with sailing, boating, hiking), the purchasing power effect (young people are more attracted by cheaper activities compared to older people), the longevity of the activities (eg. kite-surfing appeared in the 1990's and it was less attractive for older people in 2016), the culture and the social habits associated with some activities in terms of the traditional opposition between conformism (eg: sailing, boating, diving, kayaking, hiking) and hedonism/transgression (eg. surfing, kitesurfing) (Jallat, 2018 ; Michot, 2005; Pociello, 1995 ; Robène et Jorand, 2018).

The residence status relationship with recreation activities is influenced by requirements to practice the activity. Activities with a strong territorial dependence (eg. sailing and boating both require a home port) naturally tend to be associated with the local population in France. Conversely, activities which require little equipment and promote geographical roaming tend to be associated with the tourist population. This is particularly the case for hiking which is an important way for tourists to experience regions like Brittany and the Mediterranean.

4.2 Knowledge of MPA and management

Abecasis et al. (2013) emphasized that good stakeholder knowledge of MPAs is an important part of community engagement and effective management. French MPAs appear to have low visibility for many recreational users. One third of people knew the site where they recreated was under environmental protection but do not know much about its boundaries or its specific regulations. One fifth of people simply did not know about the existence of the MPA at all.

Our results show that better informed recreational users were those involved in activities requiring formal training and those with long-term experience of the local context. The formal training required for scuba diving includes knowledge of local regulations (Le Carrer, 2017). This training may explain the higher level of scuba diver knowledge about MPAs compared to other activities without training requirements. Boaters and sailors were mostly older or retired local residents who have been practicing in the same area for several decades. Moreover, they tend to be members of local community organizations, and are more likely to be involved in local authorities (Bernard, 2016, Evrard, 2014). A tradition of local use and involvement may lead them to be better informed about the MPAs (Ahtiainen et al., 2013; Stamieszkin, Wielgus, & Gerber, 2009). Conversely, hiking, kayaking and kite surfing have no formal training requirement and involve younger or non-local participants, and hence these types of recreational users tended to have a low level of MPA knowledge.

The minimal MPA regulatory approach in France intended to minimise public resistance and promote equity of access could create alternative issues resulting from poor recreational user knowledge about the management objectives (particularly conservation objectives), especially amongst those without a long tradition of use. Lack of knowledge could lead to difficulties with community support for, and engagement in, MPA management (Hastings & Ryan, 2017; Voyer et al., 2013).

4.3 Importance of MPAs for recreation: the influence of perceived benefits

The generally low perceived importance of French MPAs as a place for practice recreational activities may relate to minimal regulations. The level of stakeholder concern in relation to MPAs has been linked to perceived positive or negative impacts on stakeholders' lives and livelihoods (Abecasis et al., 2013; Salmona & Verardi, 2001; Voyer et al., 2013). The results of this study indicate that minimal regulation means the presence or absence of MPAs in France make little difference to recreational users. The minimal MPA regulation is associated with the absence of an onsite management presence and promoting open, access for all. This approach means that managers must ensure effective management of the MPAs while minimizing evidence of any management intervention (Mounet, 2007). Consequently, some types of recreational users have a low level of knowledge and are less likely to connect the location with conservation actions and access restrictions often associated with protected areas.

A significant positive response to the importance of MPAs for recreation can be observed for recreation activities that may receive clearly identifiable benefits, such as for scuba divers and boaters. The dive related finding aligns with that of Rees et al. (2015) who found increased dive charter activity linked to the establishment of an MPA in the UK. The French MPAs are associated with important or unique marine habitat, and hence, better quality dive experiences. Many of the surveyed boaters also practiced fishing and hence, MPAs may be considered favourably as they are generally associated with marine habitat that support fish populations (Rees et al., 2015). So it is perhaps not the French MPAs themselves that are important, given they are soft management instruments with little influence on access, but the locations the MPAs are associated with that are important.

4.4 Support for more MPA regulation

In this study, most respondents (63%) supported the introduction of additional MPA regulations to some degree. These results seem to be a positive indicator of concern for the preservation of the marine and coastal environment. This finding appears to counter the concerns of French MPA managers that recreational users are a general threat to conservation objectives (Maison, 2009). However, the finding seems to contradict a study by Mounet (2007) who noted that outdoor recreational users generally perceived environmental protection as a constraint that limited access to desirable sites. Resistance to increased management of recreation access to protected areas has been noted by other studies (Hughes, Jones, & Phau, 2016; Hughes, Tye and Chandler, 2016; Wood & Glasson, 2005). Soft regulation is generally accepted by recreational users because it is less likely to infringe on public use. However, if managers identify a proven or assumed impact, stronger regulation proposals often face user opposition and potential conflict with managers. Results from this study come from a context in which there were generally little or no contentious issues associated with the MPAs.

It is possible that if there were stronger concerns and tension related to MPA access, support for additional regulation would be lower. Additional regulations that may hinder this tradition of use. For example, Bennett and Dearden (2014) found that local communities in Thailand considered that MPAs limited access to much needed resources to maintain livelihoods. Similar findings were also identified in American Samoa (Fiske, 1992), Italy (Salmona &Verardi, 2001) and Australia (Voyer et al., 2013; Wood & Glasson, 2005). From a slightly different perspective, Abercasis et al. (2013) found that communities in the Azores were unlikely to support MPAs. Rather they were likely to ignore MPA restrictions on resource

485 extraction as the communities considered their exploitation of marine resource to be
486 sustainable, despite evidence to the contrary. Along these lines, the results of this study
487 indicate that recreation activities associated with older people and a long tradition of use by
488 locals (sailing and boating) were less likely to support increased regulation. In contrast, the
489 findings of this study indicate that tourists (non-locals) were more supportive than local
490 residents regarding additional regulations for French MPAs. Tourist and non-resident support
491 may relate to perceptions of MPAs being associated with enhanced benefits. That is,
492 stakeholders generally support MPAs when they are seen to be an effective means for
493 management of a resource from which the stakeholders can then benefit (Abecasis et al.,
494 2013; Hastings & Ryan, 2017; Tonin & Lucaroni, 2017). Tourists or nonlocal recreational
495 users are thus likely to support more regulation because they would not have the constraints
496 of regulation on their day to day lives and could take advantage of tourism related benefits
497 associated with improved nature conservation.
498
499 **4.5 Involvement in MPA management**
500
501 Respondents were moderately willing to be involved in the MPA management process. The
502 moderate interest is likely a product of a lack of knowledge, generally low importance of
503 MPAs for access and practicing recreation which ultimately rests on the soft regulatory
504 approach associated with French MPAs. This presents a significant challenge given some
505 scholars note that effective MPA management requires active involvement of key
506 stakeholders (Abecasis et al., 2013; Halkos & Matsiori, 2017; Hastings & Ryan, 2017). The
507 lack of strong interest for involvement by recreational users as a key stakeholder group thus
508 presents a significant challenge for French MPA managers for whom recreation is a priority
509 issue (Maison, 2009). A further complication is the lack of organized representation of MPA
510 recreational users, where most recreational users are independent of formal clubs and
511 associations. A lack of organized group membership means recreation activity spokespersons
512 are often few and sometimes not very representative of the broader views. Mounet (2007)
513 notes that methods for effective participative management involving self-organized
514 recreational users still require development. Indeed, the current approach to MPA
515 management in France is designed to cater for engagement of formal organization
516 representatives who can make collective decisions about MPA use and is not designed to
517 engage independent users (Folco & Germain, 2015). Given that most recreational users of
518 MPAs are independent of formal organizations and do not have a strong interest in
519 engagement, this presents a significant challenge to the requirement of participatory
520 management in France.
521
522 **4.5 Limitations**
523
524 Despite the precautions taken to limit methodological bias, it is important to recognize some
525 limitations of this research. Firstly, in terms of the sampling method, although research
526 assistants were trained to interview people without a social or physical discrimination, the
527 sampling protocol was opportunistic with no standardized approach for selecting participants.
528 This was due to the characteristics of some sites which were mainly open (eg. beaches, car
529 parks). This raises the potential for bias in the sample that could not be quantified in the
530 absence of previous local baseline surveys. However, the demographic profile of the sample
531 in this study is consistent with national French literature. Secondly, demographics results
532 indicate that the target recreational activities, were generally part of the same category of
533 French society, that is a social category with a relatively high level of education and
534 subsequently were likely to be informed and concerned about the natural environment. It

would be interesting for future research to include other more heterogeneous recreational uses (eg beach activities, harvesting activities, etc.) to gain insight into the perspectives about MPAs of a broader cross section of people access MPAs for recreation. Thirdly, we intentionally selected our study sites based on geographic location and protected area status (Brittany and Mediterranean; Natural park and Natura 2000). However, our sites had no or few conflicts involving the recreation activities included in the research. It is very likely that inclusion of activities or sites with conflicts regarding access to sites or resources may have resulted in different patterns of response (eg. possible enhanced knowledge about the MPAs, willingness to engage with local management, less support for more regulation). Finally, it is possible that the effects of social desirability may skew the results especially related to regulatory issues (Berthier, 2010). This effect could have overestimated some results (eg. interest of practicing in a protected marine area, personal acceptance of more regulation, the willingness to engage in management). This suggests that the generally low level of interest in engagement with MPAs in this study may be lower than our study indicates.

5.0 Conclusion

This paper presented the findings of a French recreational user survey regarding knowledge of MPAs, the importance of MPAs to their recreation activity, and support for additional regulation and engagement associated with French MPAs. It seems that soft regulation of French MPAs to avoid impinging on recreation access and public liberties is associated with an overall low visibility and recreational user disinterest and disengagement regarding MPAs.

Could it thus be concluded that there is a need for more regulation, despite concerns about impinging on liberties in French MPAs? Past examples involving stronger regulatory management based, in part, on the exclusion of humans from protected areas, were not supported by local people and also failed to meet the management objectives (Mathevet & Godet, 2015, Mounet, 2007; Folco & Germain, 2015). At the other extreme, soft regulation appears to propagate a lack of recreational user knowledge, support and willingness for engagement with MPAs. Between these two extremes, Mathevet and Godet (2015) suggest a hybrid approach balancing top down regulation with bottom-up community engagement. However, while stronger regulation and community engagement could increase the visibility of French MPAs, dealing with the complexity of independent recreational users, overlaid with a tradition of freedom of access presents significant challenges for MPA managers.

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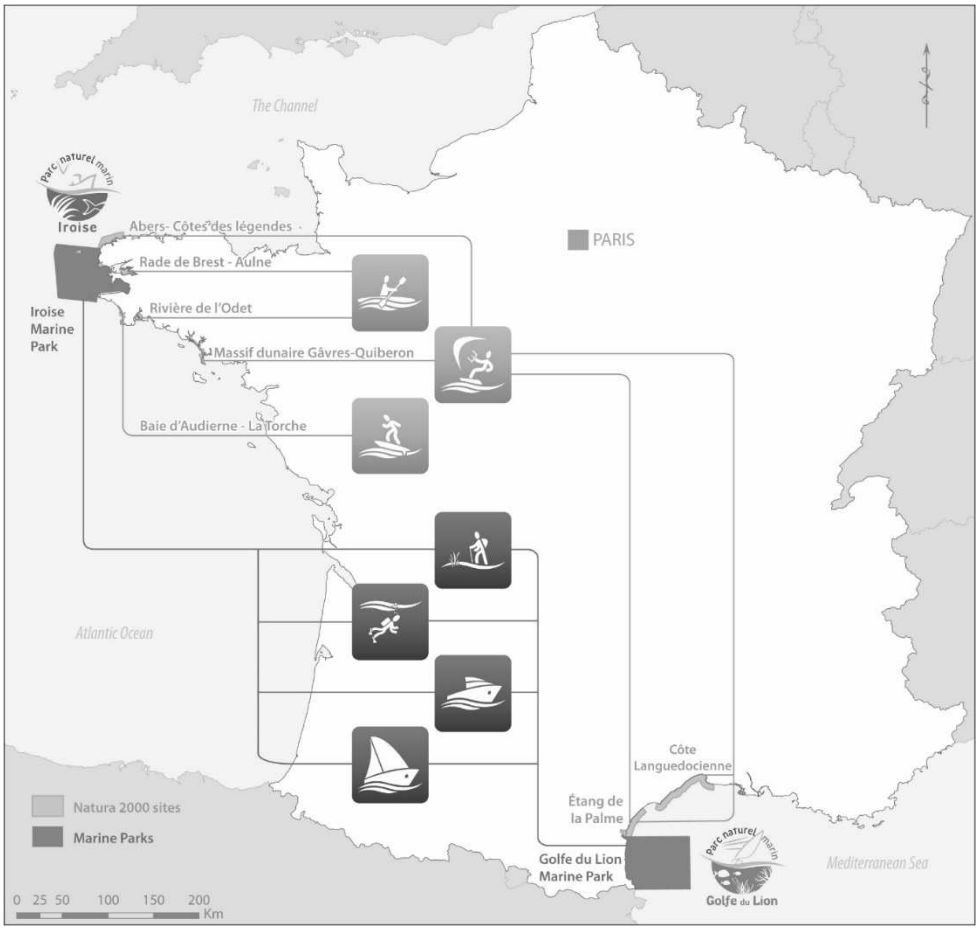
Conflicts of interest: none



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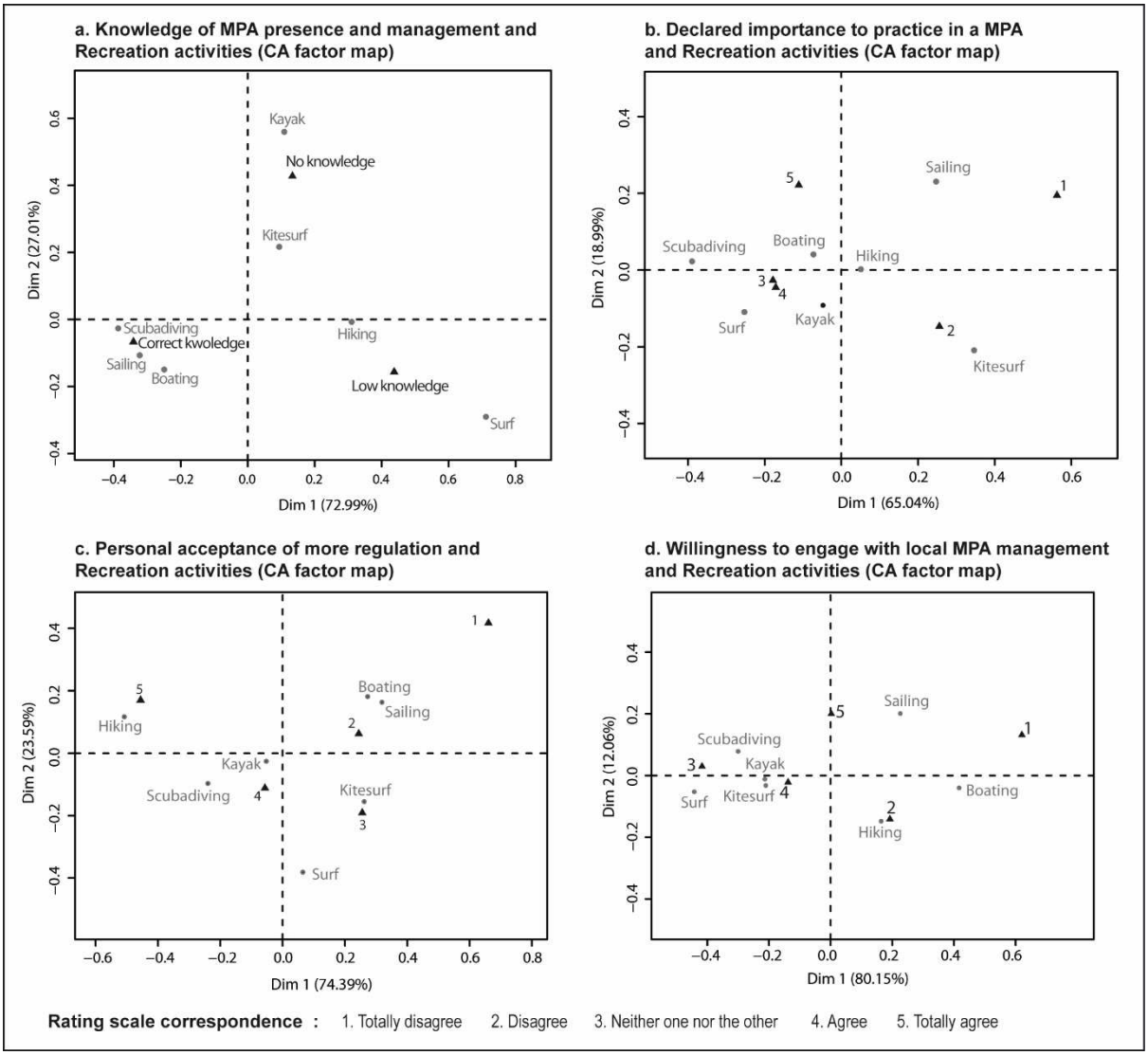

No color is required for Figure 2 (black and white printing).

Recreation Activity	**Brittany**		**Mediterranean**		
	Marine Natural Parks	Natura 2000 sites	Marine Natural Parks	Natura 2000 sites	**Total**
Hiking	101	-	93	-	194
Boating	82	-	74	-	156
Sailing	80	-	86	-	166
Scuba diving	77	-	81	-	158
Kite surfing	-	69	-	80	149
Kayaking	-	78	-	-	78
Surfing	-	99	-	-	99
Sub-total	586		414		
Total	1000				

No color is required for Table 1 (black and white printing).

	Hiking n=194	**Surf** n=99	**Scuba diving** n=158	**Sailing** n=166	**Boating** n=156	**Kitesurf** n=149	**Kayak** n=78	***Total Sample N=1000***	***Total %****
Gender:									
- Male	83	77	112	144	142	132	47	737	74
- Female	108	22	46	22	14	16	31	259	26
- No response	3	0	0	0	0	1	0	4	-
Age:									
- Under 15 years	0	3	2	0	0	2	0	7	0.7
- 15-29 years	21	44	38	9	6	45	14	177	17.9
- 30-44 years	34	44	46	20	19	58	23	244	24.6
- 45-59 years	75	7	50	49	40	32	34	287	29.0
- 60-74 years	57	1	21	78	78	11	6	252	25.4
- More than 75 years	2	0	0	10	12	0	0	24	2.4
- No response	5	0	1	0	1	1	1	9	-
Occupation:									
- Farmers	0	0	1	1	3	0	0	5	0.5
- Artisans, merchants, company directors	5	10	10	12	18	14	4	73	7.4
- Higher education and the liberal professions	47	24	59	38	16	52	19	255	25.7
- Intermediate professions	34	11	17	13	5	20	15	115	11.6
- Employees	32	14	24	9	22	25	13	139	14.0
- Workers	4	4	1	2	6	3	4	24	2.4
- Retirees	57	0	13	82	82	10	9	253	25.5
- Students	10	24	19	1	1	7	5	67	6.7
- Schoolboys	0	5	12	1	1	3	6	28	2.8
- Others	4	6	2	6	2	12	2	34	3.4
- No response	1	1	0	1	0	3	1	7	-
Residential status:									
- Locals	50	59	51	125	119	100	44	548	55.2
- Tourists	127	34	11	10	7	38	31	339	34.2
- Secondary resident	17	6	92	31	30	8	2	105	10.6
- Non-response	0	0	4	0	0	3	1	8	-
Region of practice:									
- *Brittany*	101	99	77	80	82	69	78	586	58,6
- *Mediterrean*	93	0	81	86	74	80	0	414	41,4

*The total (%) was calculated without the “no response” numbers.

No color is required for Table 2 (black and white printing).

	Knowledge of MPA		Declared importance to practice in a MPA		Personal acceptance of more regulation		Willing to engage in MPA management	
	Chi-square χ^2 (df)	**P-value**	**Kruskal-Wallis H (df)**	**P-value**	**Kruskal-Wallis H (df)**	**P-value**	**Kruskal-Wallis H(df)**	**P-value**
Recreation types	166.23 (12)	<0.0001	42.58 (6)	<0.0001	91.60 (6)	<0.0001	31.294 (6)	<0.0001
Sex	22.12 (2)	<0.0001	5.77 (1)	0.0163	50.45 (1)	<0.0001	0.00 (1)	0.9816
Age	36.45 (15)	0.0015	5.73 (5)	0.3329	13.97 (5)	0.0158	11.20 (5)	0.0475
Occupation	27.97 (16)	0.0319	18.18 (8)	0.0199	38.34 (8)	<0.0001	11.97 (8)	0.1523
Residential status	15.32 (4)	0.0040	6.20 (2)	0.0451	20.11 (2)	<0.0001	0.80 (2)	0.6689

No color is required for Table 3 (black and white printing).