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Title

A cultural approach to ecosystem services to assess the public acceptance of wetlands restoration

Running head

Public acceptance of wetlands restoration

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All authors conceived and designed the research; JP performed the data collection and run the statistical analyses; AR, RF checked the robustness of the results; all authors interpreted the results and discussed the implications; JP wrote the manuscript with editing input from AR, RF.

Abstract

Ecological restoration of coastal wetlands is extremely important because they provide a huge variety of ecosystem services but they are the most degraded ecosystems in the world. However, coastal wetlands are usually located in largely modified and densely populated landscapes. Hence their restoration may conflict with cultural values. Therefore, considering the cultural dimension of ecological restoration is a way of increasing public acceptance of restoration projects. In this study, we assessed the public acceptance of a restoration project in a coastal wetland of Costa Brava (Spain). We combined the ecosystem services framework with a cultural approach, which is capable of considering interdisciplinarity, introducing new services like tranquility and integrating the human dimension in the ecosystem services framework. We administered an open-ended questionnaire to 232 visitors and the answers were submitted to a content analysis to get a post-hoc classification of services and values. Our results show that visitors undervalue environmental values, while tranquility is the most commonly stated value. An additional finding was that visitors were not able to identify regulating or provisioning services. Moreover, place attachment is found to be the main driver to influence the perception of the ecological restoration. The study concluded that the project enjoys a high public acceptance. However, some disengagement exists between the goals of restoration and visitors' perceptions, and this needs to be addressed. Sharing the decision-making power with

stakeholders and informing visitors about ecosystem services that are not easily perceived could be appropriate steps to take.

Keywords

coastal wetlands; cultural ecosystem services; cultural values; ecological restoration; landscape assessment; visitor perception

Implications for practice

- Using open-ended questions to collect the perceptions of citizens regarding ecological restoration provides values and cultural meanings that remain hidden in studies based on predefined categories related to values and services.
- Giving more prominence to those ecosystem services not easily identified by visitors, such as flood protection and water purification, is a way of increasing public acceptance of the project.
- Landscape changes and previous restrictions in use due to the project can lead to decreased public acceptance when citizens are not well informed about the project, especially local residents and visitors with greater attachment to the place.
- In projects where some landscape elements are removed, it is important whether visitors perceive those elements as landmarks or not. Removing a landmark can cause opposition to a project.
- When a top-down participation process is mandatory because a bottom-up one is not applicable, the decision-making power must be shared with stakeholders to improve their commitment to ecological restoration goals.

Introduction

Coastal wetlands are some of the most biodiverse ecosystems on earth. Moreover, beyond their intrinsic value as pristine and fragile ecosystems, they also offer a substantial variety of ecosystem services (ES) that support the wellbeing of many local communities (MEA 2005a). The Millennium Ecosystem Assessment (MEA) defines ES as "the benefits people obtain from ecosystems", and classifies them into four categories: provisioning services, such as food and water; regulating services, such as flood protection and water purification; provisioning services, such as nutrient cycling and soil formation; and cultural services, such as aesthetic values and recreation (MEA 2005b). In northern Mediterranean regions, a high value is placed on the recreational opportunities provided by wetlands (Ghermandi & Nunes 2013), especially due to the tourism sector being extremely important to the economy of the region. Furthermore, recreational activities and tourism in coastal wetlands allow people to benefit from many other complementary cultural services, such as aesthetic appreciation or spiritual enrichment, among others. Therefore, such activities represent a good opportunity to involve society in ecological conservation (Schaich et al. 2010). Hence, the ecological conservation of wetlands must exist alongside recreational activities, despite their commonly coming into conflict with one another (Birol et al. 2009).

Despite the importance of coastal wetlands and their benefits to society, they are the most degraded ecosystems in the world due to constant human pressure and climate change threats (Zhao et al. 2016). Their ecological restoration (ER) is therefore important for a myriad of reasons. The goal of ER is to convert a degraded ecosystem into a healthy one, which means

favoring an ecosystem capable of sustaining the pertinent flora and fauna and the cultural values of local inhabitants as well (Burger et al. 2008). In other words, ER is the ensemble of practices that constitute the entire field of restoration, including restoration ecology as well as the participating human and natural sciences, politics, technologies, economic factors, and cultural dimensions (Higgs 2005). However, the adoption of the ES framework by the main environmental institutions has led practitioners and scholars to include ES in the planning and evaluation of ER. For instance, the Convention on Biological Diversity in Japan in 2010 encouraged the restoration of biodiversity and ecosystem services (Halme et al. 2013). Thus, whereas the focus was previously on the structure and functioning of ecosystems, it has now moved onto the benefits and services that can be provided by the ecosystem (Burger et al. 2008). The provision of benefits and services is assumed as the well-being provided by ecosystems, which is usually quantified in monetary terms.

Cultural ES are the most important ones for increasing society's commitment to ecological conservation in developed countries (Norton et al. 2012). The MEA (2005b) classified cultural ES into 10 the following categories: cultural diversity, spiritual and religious values, knowledge systems, educational values, inspiration, aesthetic values, social relations, sense of place, cultural heritage values, and recreation and tourism. However, although cultural ES are included in the ES framework, assessment methods for their identification and quantification differ hugely from those of other categories. Cultural ES do not depend on the measurement of ecological processes but on people's perceptions and their interactions with ecosystems; and this poses a complex and transdisciplinary challenge (Brancalion et al. 2014). Another issue is that categories of cultural ES usually overlap and this represents a problem when it comes to identifying services and

avoiding double-counting their economic valuation. This shortcoming often results in a misrepresentation of cultural ES in ES-based research (Brancalion et al. 2014). When cultural ES are not well represented, the discussion of trade-offs could be limited to provision and regulation services and important issues ignored, such as aesthetic quality or historical values, among others (Schaich et al. 2010).

Additionally, the easier quantification of recreational functions compared to other cultural ES has led to an overrepresentation of recreation and tourism. This could result in the wrong idea that recreational services represent all the value of cultural ES, thus contributing to an unconscious marginalization of other values equally important as recreation, further widening the gap between counting what matters to people and what is easy to measure (Milcu et al. 2013).

Additionally, wetland and estuary restoration presents a number of complex challenges that are primarily social, cultural and economic rather than ecological in nature (Root-Bernstein & Frascaroli 2016). Consequently, ecological improvement via ER can conflict with cultural values or previous uses forbidden in the restored ecosystem (Birol et al. 2009). A possible explanation for this is that those responsible for restoration projects often view recreational activities and tourism as a threat to ecological conservation (Daniel et al. 2012). The result is that ER generally only focuses on the restoration of ecological functions (Khater et al. 2012). By way of illustration, a review of ER projects found that none of 89 analyzed projects explicitly evaluated cultural ES (Benayas et al. 2009). In line with this, a review of 1,589 papers dedicated to evaluating ER projects found that only 3% of studies surveyed people to evaluate the citizens' perception of ER (Aronson et al. 2010). However, although ER is usually based on expert

judgment, decisions regarding what must be restored are based on the perception of "what was there" or "what should have been there" (Hobbs 2016). Moreover, avoiding the local perception often provides a decontextualized vision of the goals of the project (Ruoso et al. 2015) that ignores the cultural and historical context of the natural area (Vos & Meekes 1999). The consequence might be an insufficient public acceptance of the changes in landscape and functions during and after restoration processes (Decker et al. 2010). Nonetheless, in some cases, preserving some recreational functions or upholding specific cultural values of the place are not compatible with ER goals. Public acceptance then depends on the practitioners' ability to inform and enhance identification with those goals among the affected parties (Pfadenhauer 2001).

However, public acceptance of ER is required for the sustainability of ER projects because restored ecosystems can only endure if they enjoy the support of local communities (Higgs 2005). Moreover, conflicts between ER goals and affected parties are even capable of paralyzing claims for sustained environmental development for decades (Pfadenhauer 2001). Previous studies on public acceptance of ER have proposed different ways of increasing it. Many of them involved negotiating outcomes and trade-offs in a value-based dialogue (Failing et al. 2013), with the aim of accommodating widely varying goals and ways of reaching them (Lyver et al. 2016). In this negotiation, some authors have emphasized the importance of considering local views and local knowledge to produce their own local development concept (Pfadenhauer 2001) and integrate social and political realities, of particular importance in the Mediterranean basin (Khater et al. 2012). Moreover, most authors agree that interdisciplinary approaches are needed. Therefore, restoration ecologists must embrace collaboration with fields in the humanities and arts such as economics, sociology and landscape architecture (Pfadenhauer 2001) to include

everything that matters to people, even if it is hard to measure (Failing et al. 2013). The assumption inherent in these approaches is that when people can identify with the goals of restoration, they will committ to the project and thus public acceptance will increase (Pfadenhauer 2001). Therefore, considering the cultural values of ER can help to fill these gaps by providing a better understanding of attitudes, expectations and levels of support or opposition (Decker et al. 2010), increasing public acceptance of wetlands restoration.

Complementing the ecosystem services framework with a cultural approach

The value of nature can also be assessed by adopting a cultural approach. The difference between an ecosystem services perspective and a cultural approach is the focus and direction of the process. Whereas in the ES framework values stem from the biophysical structure, as represented in the ecosystem cascade (Fig. 1), in a cultural approach they come from the observer. Furthermore, Stephenson (2008) considered natural and cultural processes to be inseparable because human activities affect natural processes (e.g. dam building affects delta formation) and natural processes affect human activity (e.g. delta formation favors some kinds of agriculture). Hence, in a cultural approach, humans are not seen as factors that put pressure on the environment, as they are in the ecosystem cascade (Fig. 1), but as an integral part of the environment (Vallés-Planells et al. 2014). Continuing with the ecosystem cascade as a reference, while in the ES framework services are produced by functions of ecosystems, with the integration of the cultural dimension they are also conceptualized as coproduced by humans. Thus, cultural values influence how humans produce nature. Furthermore, the question is not about limiting pressures. Rather, the key question is which human attitudes can improve

184 biophysical structures. Finally, integration of the cultural dimension improves the interpretation
185 and contextualization of ER goals by helping to answer the question “What values?”; and not
186 only “what”, but also “why” and “how”, rather than “which” and “how much”, as the ES
187 framework does.
188
189 Therefore, several authors have taken a broader approach and argue for integrating a cultural
190 perspective, and therefore the human dimension of ES, into ES valuation (Ruoso et al. 2015). For
191 instance, Gee and Burkhard (2010) combined the two areas to analyze people’s projected values
192 of the sea with the aim of increasing society’s approval of offshore wind farming. Tengberg et al.
193 (2012) explored how cultural ES were linked to concepts like landscape, heritage and identity,
194 concluding that combining the two areas is not only possible but also recommendable. Norton et
195 al. (2012) used this interdisciplinary approach to combine biophysical data with perceptions of
196 the landscape to develop a cultural ES map for England. Ruoso et al. (2015) identified cultural
197 ES using a tool called the territorial lens, which distinguishes between physical, logical and
198 existential dimensions of landscapes.
199
200 An ER focused on ecosystems or cultural values could award different priorities to important
201 aspects like biodiversity or aesthetic quality (Moreira et al. 2006). For this reason, our goal is to
202 make a contribution to the evauation of ER projects by bringing ES and cultural values together.
203 We apply this approach to a coastal wetland located in a mass tourism destination. We aim to
204 detect which ES are identified by local residents and tourists and how ER is perceived in line
205 with this, with the final goal of assessing public acceptance of the project.
206

207 ## Material and methods

Case study: European Union LIFE Pletera

The Pletera coastal wetlands have a surface area of 45 ha and combine a saltmarsh with dunes and salty lagoons. They are located in the *Montgrí, Illes Medes i Baix Ter* Natural Park on the Costa Brava, one of Spain and Europe's most popular tourism destinations, with 3.4 million visitors in 2016. Despite having this and other natural areas of high ecological value, Costa Brava tourism is focused on sun and beach resources (Sardà et al. 2009). The Natural Park includes marine and inland areas with low mountains and wetlands and has a surface area of 8,192 ha (2,037 are marine). Ecological interest in the Pletera wetlands is based on the presence of salty coastal lagoons with corresponding vegetation and populations of Spanish toothcarp (*Aphanius iberus*), an endangered endemic fish species that lives on the Iberian Peninsula. In spite of its high ecological value, in the late 1980s this wetland was impacted by the development of a residential area, which was halted at the beginning of the 1990s and remains incomplete. As a consequence of this development, the ecological function of the lagoon system was modified extensively. Nevertheless, Pletera is widely used by local inhabitants and tourists as a natural area to cycle or walk. Besides that, other visitors use the wetlands for parking to access the contiguous beach, taking benefits from the unfinished urban development (Pueyo-Ros et al. 2017).

The first aim of the Pletera EU Life project is to restore the integrity of its lagoon systems so as to recover their ecological function. Planned restoration actions include removing urban elements, particularly a promenade with decorative Greek-style columns; creating temporary and permanent lagoons; restoring wetland vegetation; building a car park; and re-routing road traffic access and entrances to the beach. These interventions will impose restrictions on users, whose

main purpose for visiting Pletera is access to the beach. Furthermore, the project also plans to create multi-use paths (bike and pedestrian) and a bird-watching infrastructure (Figure 2), which will support improvements in recreational services related to nature-based tourism. This project has a budget of €2,528,148 (75% funded by the EU). The agents involved include the local and regional councils, the University of Girona and Tragsa (a company dedicated to agrarian development and environmental conservation and restoration projects). This project was designed and approved in 2014 and its first actions were undertaken in November 2015. The project is expected to be completed in the second half of 2018.

Classification of services as a cornerstone

An important issue that has gone hand-in-hand with ES research from the beginning is their classification. The most widely used in the scientific literature is the MEA classification (Fisher et al. 2013). As mentioned above, the MEA (2005b) classified cultural ES into 10 categories. However, this classification has been adapted by some scholars by adding or removing services in line with the context or aims of their research.

Nonetheless, one of the main problems of classification is overlapping, especially within cultural ES (e.g. aesthetic values and recreation), but also between cultural ES and other categories (e.g. heritage values and agrarian production) (Daniel et al. 2012). People undertake recreational activities in a place because it is visually attractive, but also for cultural heritage and health or educational reasons, among many others. Spiritual and religious benefits are often related to cultural heritage or services; by way of example, sense of place or inspiration are linked to

253 extractive activities like hunting or gathering wild food (Plieninger et al. 2013). Thus, when
254 cultural ES are valued is difficult to know specifically which ones (Gee & Burkhard 2010).
255
256 Furthermore, using pre-defined classifications determines what is identified and, thus, what is
257 considered valuable. Such approaches reinforce an assumption that values always fit predefined
258 types, and that types will encompass all values. The outcome can be the acceptance and
259 reinforcement of an impoverished understanding (Stephenson 2008). Predefined classifications
260 restrict participants' answers to the categories identified by the researcher (Dobbie & Green
261 2013), with the result that the research is not able to properly reflect some services or values
262 which could be important in the cultural context of the study (Burger 2003).
263
264 A possible solution to this is to allow participants to express themselves in their own words and
265 compile a post-hoc classification. This approach has been developed in an assessment of
266 seascape values, for instance (Gee & Burkhard 2010). The authors used open-ended answers to
267 run a content analysis that generated a classification of services. It included 8 categories
268 combining cultural services and material benefits. A similar approach was used to identify the
269 values of wetlands in the southeast of France (Ruoso et al. 2015); the authors used the term roles
270 of landscape instead of ES with the aim that participants might express themselves in their own
271 words. Another study asked participants how they used an estuary to capture the recreational
272 uses of estuaries on the northeast coast of the US. The answers were classified a posteriori and
273 the outcome was a list of 16 cultural ES adapted to the study context (Burger 2003). Open-ended
274 questions were also used to identify ES in the forests of Oregon (US) (Asah et al. 2012). These
275 authors found that although answers coincided well enough with the MEA categories, they did

identify some services not included by the MEA or classified in a different way. In conclusion, whereas predefined classifications are more suitable when systematic valuations are needed (Groot et al. 2002), post-hoc classifications are more able to provide all services and cultural meanings of an ecosystem in a specific cultural context (Hermann et al. 2011).

Therefore, with the aim to capture all uses and perceptions regarding the wetland and its ecological restoration, we used four open-ended questions in the survey. Two of them addressed the wetland uses and preferences; and the other two asked for positive and negative aspects of the ecological restoration project. The specific formulations of the questions are detailed in the next section.

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Data collection and analysis

The data used in this study were collected by distributing a survey questionnaire to visitors at Pletera. The surveys were collected during the peak tourism months of July to September, 2015. They were collected face-to-face by two interviewers on a proportionate basis each day of the week, from 8am to 8pm; the interviewers both held a Geography degree and had previous experience in distributing and collecting surveys. In order to collect information from all types of visitors (cyclers, runners and beach users, among others), we determined that the interception method was the most appropriate for this case (Burger 2003; Oh et al. 2009). The interviewers were located on the main access to the wetlands, which is also the closest access to the tourist town.

The questionnaire was structured into three sections. The first focused on gathering information for visitors' sociodemographic profile, using close-ended questions and thus following the European Tourism Indicators System approach (European Commission 2013), which had been regularly applied in the town since 2013. The second section focused on the current behavior and perceptions of visitors to the wetlands with two open-ended questions. First, we asked "Why are you visiting Pletera?" Then, we asked respondents to complete the following sentence: "I like Pletera because…" In the third section of the questionnaire, the goals of ER and its main actions were detailed, and respondents were given an official pamphlet. The pamphlet provided more detailed explanations about the values and threats to wetlands and the aims and interventions of the project. It also showed some photomontages and maps to provide a more accurate picture of the expected wetland characteristics after ER (found in the English version on the supplementary file). In this section, we requested that participants evaluate the ER project on a ten-point Likert scale (ranging from 10=strongly favour to 0=strongly oppose) and provide their positive and negative perceptions of it, also in open-ended questions. In addition, we asked about changes in frequency of visits due to ER by completing the sentence "After restoration, I will visit Pletera more/less because…" As discussed in the previous section, we opted to use open-ended questions so as not to restrict the answers with a predefined classification and to capture all cultural meanings and perceptions. In addition, the questionnaire design was previously validated by conducting a focus group with scholars, ER managers and tourism managers working in the town.

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The open-ended answers were subjected to an iterative content analysis to define categories (Gee & Burkhard 2010). In other words, similar answers were manually linked in categories that sum

up their meaning. The process was repeated with the new categories until we obtained a workable quantity of categories for each variable (less than 10). All variables needed two rounds, except the positive aspects of ER and the reasons to modify the frequency after the restoration, which only needed one round to be summed up in 7 and 5 categories respectively. All answers and the coding rounds can be found in tables from S1 to S5. The content analysis was run by one researcher and supervised afterwards by the other two authors of the paper. The answers and categories are shown in the supplementary files (Tables S1 to S5).

Visitors were classified according to place of origin and place of overnight stay. Comparing different categories with given scores on the Likert scale, we concluded that place of overnight stay was a significant factor, whereas origin was only significant between local inhabitants and visitors from outside the municipal area. Therefore, 5 categories were created: local inhabitants, excursionists (one-day visitors), hotel users, campsite users and second home owners.

To analyze the evaluation and perceptions of ER, descriptive and inferential analysis were developed using the software R v.3.2.3 (R Development Core Team 2015). Descriptors of given scores on the Likert scale were calculated, as were the significant relationships between this variable, the visitor's profile and the categories extracted from content analysis. Since the variable did not follow a normal distribution, following Shapiro-Wilk test, Kruskal-Wallis tests were developed to compare the Likert scale variable with categorical data (Kruskal & Wallis 1952). Relationships with a p-level lower than 0,05 were considered statistically significant. The Kruskal-Wallis test indicates that at least one sample stochastically dominates one other sample. However, the test does not identify where this stochastic dominance occurs or for how many

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pairs of groups stochastic dominance is obtained. Hence, we developed graphs of means comparing the Likert scale scores with each categorical variable that presented a statistically significant relationship.

After eliminating 16 incomplete surveys, the final sample included 232 individuals (approximately 80% response rate). Because the surveys were administered by two different scholars, we tested for response bias. The null hypothesis was that interviewers did not significantly influence the perception of ER. To check the hypothesis, we compared the Likert-scale scores between surveys collected by Interviewer 1 and Interviewer 2 using the Kruskal-Wallis test. The results of this test (0.26, p-value=0.61) demonstrated that interviewer-induced bias was not significant.

Results

Figure 3 shows the distribution of the variables according to the socioeconomic profile of visitors. The most usual type of visitor was second home owners (32.76%), followed by local inhabitants (19.40%). Gender was equally distributed and the predominant age was between 25 and 49 years old. Most visitors were middle-class (€1,000-3,000 per month), with a university degree and full-time job.

The most usual reason to visit the wetlands was walking a dog (39.22%) because the beach is dog-friendly. Visitors who stated that the reason was the wetlands or their environment represented only a 12.93%. The most frequent answers to complete the sentence “I like Pletera because…” were related to tranquility (34.05%), followed by naturalness degree (21.98%).

Tranquility was valued by both visitors to the wetlands and beach users. Many answers related to naturalness degree were in line with feeling in contact with nature or included adjectives such as wild or unspoilt (Table 1).

The ER project obtained a mean score of 7.99 on the ten-point Likert scale with a standard deviation of 2.20 and a mode of 10 (30.17% of answers). Most visitors considered the improvement of ecological quality the main positive aspect of ER (56.47%). They mentioned the restoration of the saltmarsh or natural areas in general, the improvement of habitat for local species, or more ethical sentences like “giving back to Nature what belongs to it”. In second place, there were visitors who valued the improvement of aesthetic qualities (14.22%), highlighting the removal of constructed elements, especially the promenade. The most common answer regarding negative aspects of the project was “Nothing” (38.36%), closely followed by answers related to access restrictions, to the beach as well as to the wetlands (31.47%). Many answers in this category regarded issues such as future problems parking or longer walks to access the beach (Table 2).

Most visitors stated that they would not change the frequency of their visits after ER was completed (55.17%). With regard to the others, 36.64% would increase the frequency and 8.19% would decrease it. Improvements in ecological and aesthetic values were the most common reasons to increase the number of visits (34.11% each). Most visitors who predicted a decrease in frequency alleged access restrictions to the wetlands or to the beach.

The ER evaluation revealed statistically significant relationships ($p<0.05$) with 9 variables: age, level of education, employment situation, time of visit, type of visitor, positive and negative aspects of the ER project, and frequency variation (Figure 4). Regarding age, an inverse correlation was detected between age and the given scores. In addition, the correlation with level of education was direct: the higher the latter, the higher the scores for the project. Although employment situation was statistically significant, the trend was not clear. The positive aspect linked with higher scores was related to verifying that the area will not be urbanized in the future. On the other hand, visitors who were critical with the removal of the promenade awarded the lowest scores. Finally, the local inhabitants were the most critical with the ER, while hotel users gave the highest scores. As expected, visitors who would increase the frequency of their visits gave higher scores than visitors who would decrease it, although this was very similar to visitors who would not change the frequency.

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Discussion

The results showed that most visitors to Pletera were not motivated by the qualities of the wetlands. Rather, they used the wetlands to access the beach or to take their dog for a walk. Hence, the environmental values of the wetlands were undervalued, similarly to other Mediterranean wetlands (Blázquez Salom 1998). Despite this, the ER project was perceived positively by most visitors. This is not entirely surprising because ER projects are usually valued positively by citizens (Junker & Buchecker 2008). Nonetheless, the positive evaluation of the ER to be carried out in Pletera may be related to the improvement of values that visitors already valued, especially tranquility, which was the most commonly stated value of the wetland. Tranquility can be defined as a mixture of moderate fascination (or involuntary attention) and

pleasure (aesthetic beauty, preferences). Tranquility was a quality sought by both visitors to the wetlands and beach users, who had found an alternative to urban beaches in the tourism destination. Without well-preserved wetlands behind the beach, it would not appeal as much to that kind of visitors (Münch et al. 2016).

According to previous literature, cultural ES such as knowledge systems or cultural diversity were not mentioned by visitors because they are not meaningful for local-level users (Norton et al. 2012; Plieninger et al. 2013). Whereas most studies based on the ES framework have only identified use values (Chan et al. 2012), open-ended answers allowed us to identify some non-use values. For instance, the answers related to the evidence that the natural area will not be urbanized in the future can be considered to be linked to bequest values (TEEB 2010). Despite these not being the most common types of answer, it is worth noting that they were linked to the highest scores on the Likert scale.

None of the visitors' answers were related to regulating services, like protection against extreme climate events, or to provisioning services like food or water, although these kinds of ES were clearly identified by visitors in other geographical contexts (Birol et al. 2009; Smardon 2012; Kim & Petrolia 2013). However, other studies have already evidenced that most ES perceived by visitors are cultural because they are directly experienced (Daniel et al. 2012), especially those related to aesthetic appreciation and recreational uses (Plieninger et al. 2013). Therefore, a gap exists between practitioners, whose aims are usually focused on provisioning and regulating services, and the preferences of visitors and local inhabitants (Burger 2003; Junker & Buchecker 2008). Moreover, this evidences the role of environmental education in making citizens aware of

443 the importance of invisible or hidden ES. Since some ES are not easily perceived by visitors,
444 they must be acknowledged by information programs.
445
446 The identification of disservices is also important to raise the CS of ER projects. Some studies
447 that have addressed negative impacts of ER detected concern regarding an increase in the
448 number of mosquitos and the invasion of alien weeds (Buckley & Crone 2008). However, these
449 results were not in line with ours; only 8 of the 232 visitors in our sample stated a concern about
450 mosquitos and none mentioned alien weeds. The main concerns in Pletera were the access
451 restrictions, especially related to reaching the area by car. Hence, visitors were mainly concerned
452 about the changes that ER will mean for their lifestyle, coinciding, despite the differences, with
453 another study focused on bison restoration in Europe (Decker et al. 2010). The presence of
454 infrastructures is usually considered positive when natural values are perceived as low (Junker &
455 Buchecker 2008). Therefore, critical views regarding the removal of the promenade and access
456 restrictions may be reduced when ER is completed.
457
458 Regarding visitors' socioeconomic profile, the results showed that age and educational level
459 were the most influential variables in evaluating ER. In line with previous literature, educational
460 level correlated with environmental behavior (Mobley et al. 2010). Our results showed that
461 elderly people were more reticent towards the project. This may be the combination of two
462 factors. On the one hand, it may be a practical issue, because access restrictions affect people
463 with mobility problems more. Once the ER is completed, accessing the beach will require longer
464 walks. Additionally, the concrete paths will be removed and become dirt paths, making mobility
465 more complicated. On the other hand, a place attachment driver was also present (Irwin & Low

1992), since elderly people are usually more reticent to changes because their place attachment is stronger (Rowles 1983). This relationship between place attachment and evaluation of the project was also detected in visitor type. Our results suggested that given scores correlated inversely with the days people spent at the destination: local inhabitants were on one side of the graph and hotel users on the opposite side (Figure 4). In between, there were tourists who returned to the destination: second home owners and campsite users. Respondents' age and relationship with the area are common as significant predictors in studies on landscape values (Garcia-Martin et al. 2017). However, although some studies have concluded that place attachment directly correlates with eco-friendly attitudes (Lee 2011), our study pointed to the opposite conclusion. Landscape changes due to ER, especially the removal of the promenade, which had become some kind of landmark, were perceived as a loss of identity. As a matter of fact, visitors who viewed the removal of the promenade as a negative aspect gave the lowest scores to the project.

Whereas the main attractions in other coastal wetlands are natural values or wildlife watching (Nassauer 2004; Lee 2011), we found tranquility to be the main attraction of Pletera. Tranquility is barely assessed in ES-based studies because it is not included in the MEA framework. However, tranquility is a value that is often included in studies adopting a cultural approach. They have already shown that tranquility is one of the most valued aspects by visitors to waterscapes (Sakıcı 2015) or to wetlands in general (Diaz-Christiansen et al. 2016). Institutional reports often include tranquility as an important quality of natural areas too. For instance, a report on the cultural services of English landscapes included tranquility as a cultural service of ecosystems (Natural England 2009). The European Environment Agency has even published a report asking whether there are still any quiet areas in Europe (EEA 2016). Our study has again

highlighted the importance of tranquility in natural areas, a value that is systematically forgotten by the ES framework.

Tranquility is an example of how considering cultural values can improve the outcomes of ES-based research. Moreover, the outcomes of our approach have evidenced some improvements. Firstly, we have used an interdisciplinary approach that considered sociological rather than economic drivers to assess the social impact of ER. Secondly, we have introduced the value of tranquility, a service not usually included in ES lists, and also identified non-use values also seldom included in ES-based studies. And thirdly, it has facilitated the integration of the human perspective into ER, providing a vision of what is perceived as positive or negative by visitors themselves. The open-ended questions provided some cultural meanings regarding ER and the changes it will represent for the sense of place. Moreover, our study has also shown how these cultural meanings are related to a quantitative evaluation of the project.

From a practical perspective, one of the problems of the project is that the information campaigns have been based on what was called top-down one-way communication (Reed et al. 2017). That is, the project consulted citizens and stakeholders but retained the decision-making power. Although the project enjoys a quite high public acceptance, as shown by the Likert-scale, it could have been higher if the project had been based on top-down deliberation and coproduction. That is, as defined by Reed at al. (2017), the deliberation being led from the top down but the decision-making power being shared with stakeholders. A bottom-up deliberation process would be even more desirable to increase public acceptance. However, this kind of

deliberation is not applicable to this case study because the project was initiated as a top-down intervention.

All in all, the main objective of ER is to restore ecological functionality and at times it is incompatible with the preservation of some previous uses or cultural values. However, our study has highlighted the importance of environmental education in support of ER and conservation policies in general. Regulation services such as flood protection or keeping sand on the beaches, which are important in these wetlands but not detected by visitors, will improve due to ER. Disseminating these benefits barely perceived by citizens may increase their willingness to accept changes in the landscape and restrictions, thus raising the public acceptance of the project. Highlighting the relationships between ES and the most valued aspects of the natural area seems appropriate to this end. For instance, in Pletera, spreading information about how the ER of the wetlands will improve the quality of the beach will probably raise the acceptance of the project among those users who are not motivated by the intrinsic values of nature.

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680

681 Table 1. Current behavior and perceptions of Pletera

Variable	Category	Description	n	%
Reason for visit	Dog	To take dog to the beach	91	39.22
	Beach	To go to the beach	59	25.43
	Sport	To exercise	52	22.41
	Environment	To enjoy nature	30	12.93
I like Pletera because	Tranquility	They liked the tranquility of the place	79	34.05
	Natural	They liked the natural setting	51	21.98
	Dog-friendly	They liked that it was a dog-friendly site	43	18.53
	Aesthetics	They liked the site's natural beauty	34	14.66
	Others	Answers that did not fit in other categories	25	10.78

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684 Table 2. Perceptions of the ER project

Variable	Category	Description	n	%
Positive aspects	Ecological	Improvement of the ecological quality of the saltmarsh	131	56.47
	Aesthetic	Improvement of the aesthetic quality of the site	33	14.22
	Recreational	Improvement of the recreational functions of the site	20	8.62
	Nothing	Nothing about the project is positive	15	6.47
	Something	Doing something is good enough	13	5.60
	De-urbanization	That the urbanization project had been abandoned	12	5.17
	Everything	Everything about the project is positive	8	3.45
Negative aspects	Nothing	Nothing about the project is negative	89	38.36
	Accessibility	Access restrictions to the beach and by car	73	31.47
	Recreational	Recreational uses will be restricted	19	8.19
	Promenade	Promenade should not be removed	15	6.47
	Others	Answers that did not fit in other categories	13	5.60
	Technical	Technical doubts about the project	12	5.17
	Cost	The project budget	11	4.74
Frequency variation	Same	Contingent frequency is the same as current frequency	128	55.17
	More	Frequency will increase after restoration	85	36.64
	Less	Frequency will decrease after restoration	19	8.19
Reasons to increase frequency	Ecological	Because it will be more natural	29	34.11
	Aesthetic	Because it will be more beautiful	29	34.11
	Recreational	Because it will have improved recreational facilities	16	18.82
	Blank	Do not know or refused to answer	6	7.05
	Curiosity	To see how it will look	5	5.88
Reasons to decrease frequency	Accessibility	Access to site will be more difficult	10	52.63
	Blank	Do not know or refused to answer	4	21.05
	Will not like	They do not think they will like the result	3	15.79
	Incoherent	Incoherent answers with decreasing frequency	2	10.52

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686

687 Figure 1. Ecosystem cascade. Adapted from TEEB (2010); and Potschin and Haines-Young
688 (2011).

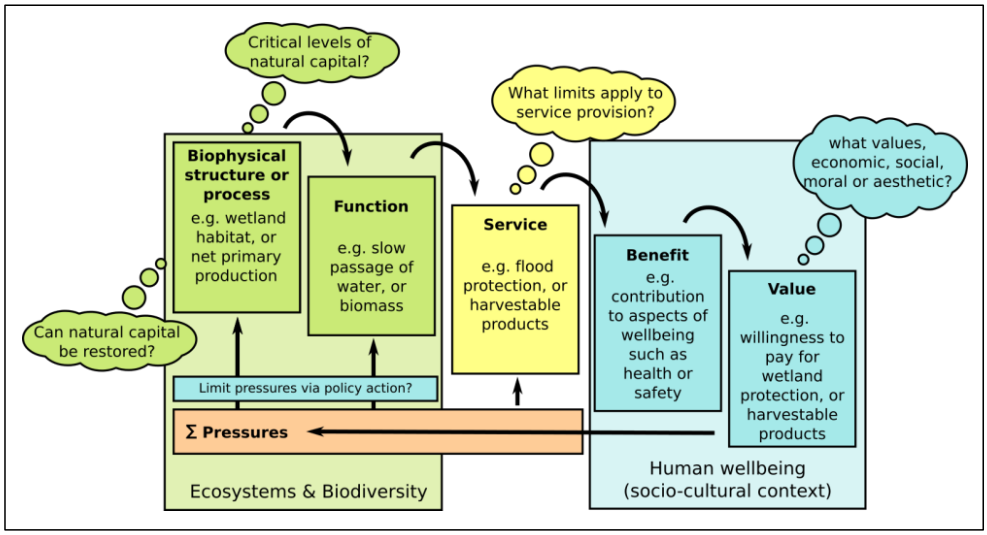
689 Figure 2. Map of the Pletera wetlands and main ecological restoration project activities

690 Figure 3. Distribution of visitors' socioeconomic variables

691 Figure 4. Variables which influenced evaluation of ecological restoration ($p<0.05$)

Con formato: Resaltar

692 Figure 1



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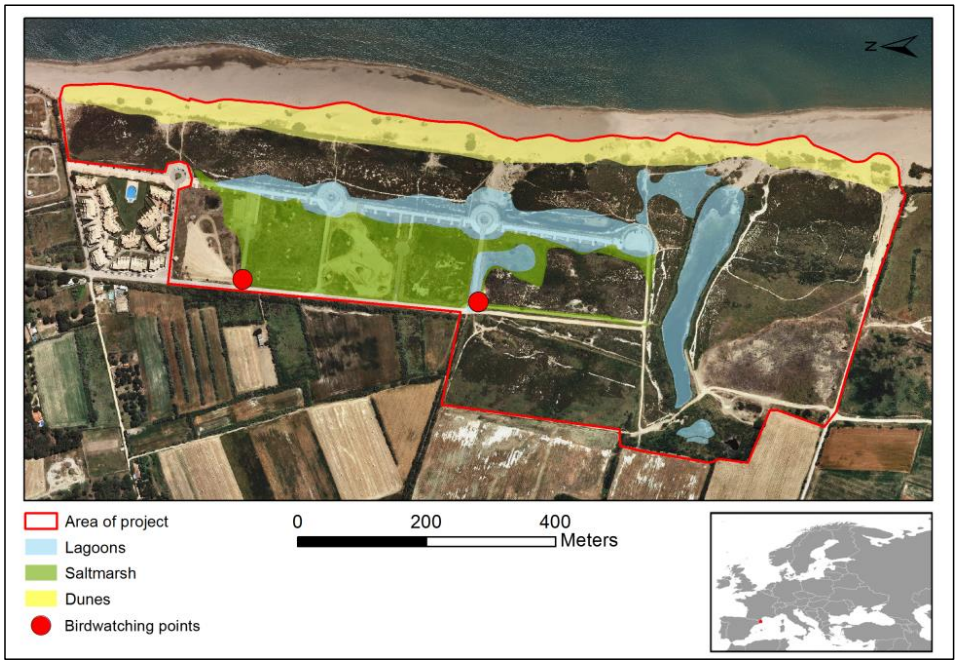
695 Figure 2



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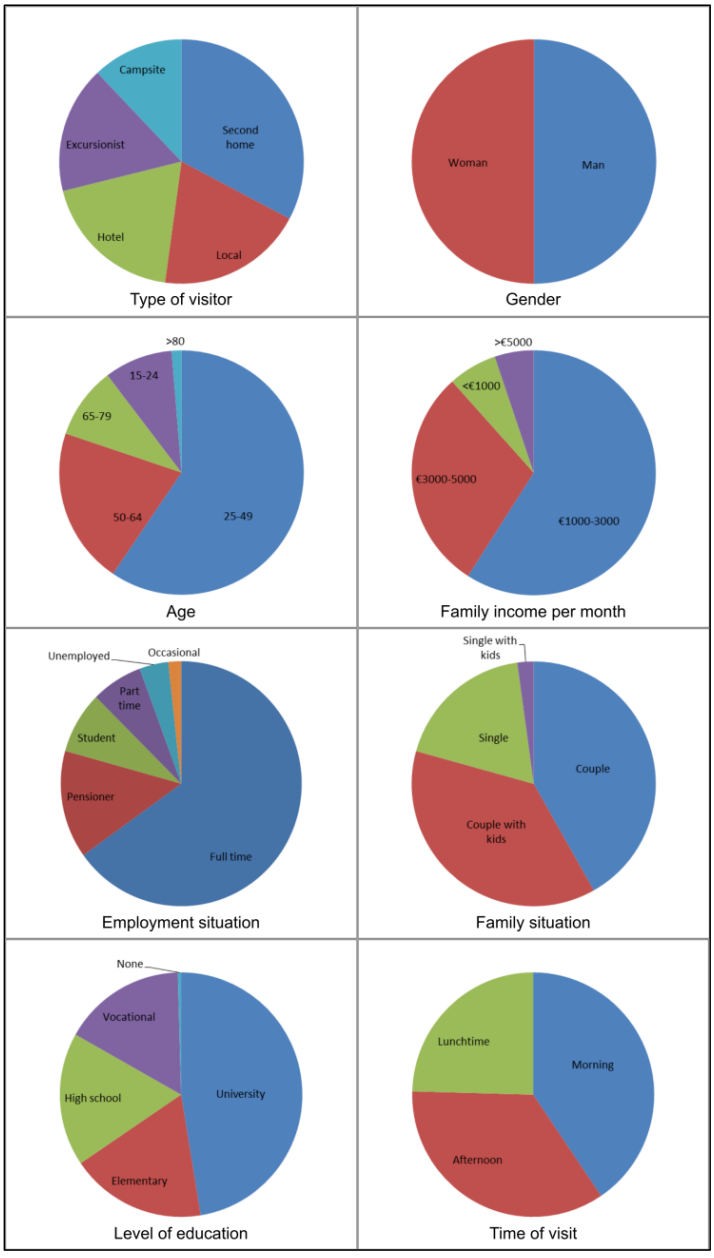
698 Figure 3



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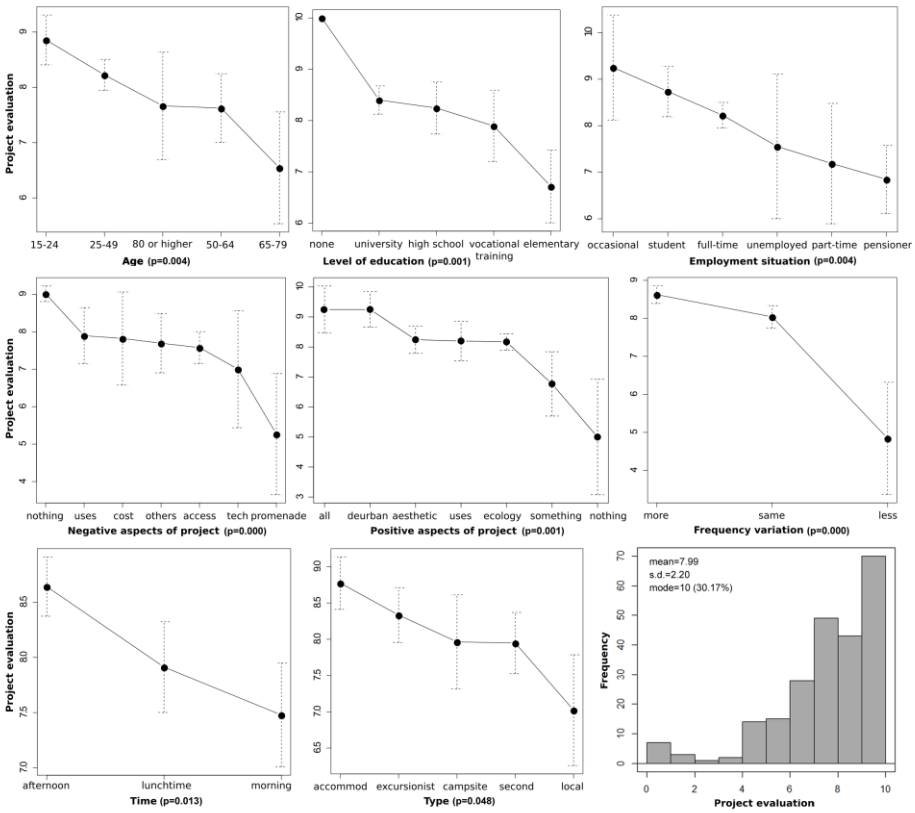
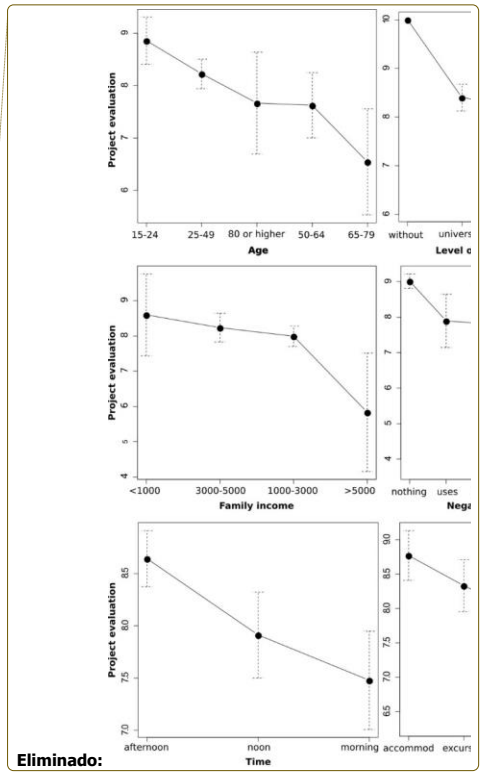
700 Figure 4





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