Organisational perception on protected areas in Spain across spatial scales and protection levels

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Socioeconomic effects of protected areas in Spain across spatial scales and protection levels

Abstract

Consequences of the legal designation of protected areas (PAs) may be different for different stakeholders, and at different spatial scales. In this study we analysed the organisational perception on the effects of PA designation on sustainability from all sectors of activity in Spain, accounting for PAs' legal stringency. A semi-structured questionnaire was administered to 197 organisations at national, regional (Andalusia), and local scales (two municipalities in the Almeria province, Andalusia) through an online survey. Local stakeholders and the primary, secondary and tertiary sectors were the most concerned about the social and economic impacts of PAs designation on their organisations. On the contrary, organisations at the national or regional scales together with public institutions, the quaternary sector and others miscellaneous perceived chiefly positive effects. Only national organisations perceived increased local social and economic effects from the designation of legally stringent PAs with regard to multiple-use PAs.

Keywords: Europe; institutional view; sustainability; national park; Natura 2000 site; stakeholder

INTRODUCTION

Protected areas: effects beyond nature

Protected areas (PAs) are legally and spatially defined areas set aside primarily for biodiversity conservation. PAs seek to conserve valuable genes, species and habitats that provide a range of benefits to nearby human populations and the society as a whole in terms of ecosystem services (Dudley 2008). They do this by applying a legal and, sometimes, managerial regime that forbids or restricts some human activities that may compromise biodiversity conservation (Schreckenberg et al. 2010; Rodríguez-

Rodríguez et al. 2016). As a result of those limitations, some stakeholders that live, work or use those areas may be affected in their wellbeing (Franks and Small 2016).

Currently, 14.7% of the land surface in the World is covered by PAs (Bhola et al. 2016). The Convention on Biological Diversity (CBD) set the target to reach 17.0% of terrestrial and freshwater ecosystems under protection by the year 2020 (CBD 2010) , so approximately three more million square kilometers will need to be effectively conserved till 2020 to reach the target, with ampler consequences to land and freshwater users. Thus, it is important to identify which stakeholders are affected by PA designation, and how, in order to maximise gains and minimise or compensate losses so human wellbeing, social support for PAs, and nature conservation can be enhanced (Calvet-Mir et al. 2015; Blicharska et al. 2016).

Neither all stakeholders are affected equally by PAs, nor do all types of PAs affect stakeholders equally (Oldekop et al. 2016; Holmes and Cavanagh 2016). Stringent PA regulations forbidding or restricting most human activities are likely to be more effective at conserving biodiversity (Pallares-Blanch 2012; Rodríguez-Rodríguez and Martínez-Vega 2018) but also more impacting on local socio-economy than more lenient, multiple-use regulations. Moreover, stakeholders are likely to have different perceptions on the effects of PAs depending on the scale of the assessment, with local stakeholders being more likely affected by PA regulations (Jentoft et al. 2012; Bennett et al 2014). Nevertheless, the concept of local wellbeing and its monitoring are insufficiently developed by science and are regarded as primary research objectives (Palmer et al. 2015; Breslow et al. 2016; Corrigan et al., 2017).

Study background

Assessing the socioeconomic effects of PAs has been a long-lasting research topic that could be traced back to the late 1980s with the *sustainable development* concept, which accounts for environmental, social and economic issues (UN 1987). In the mid-2000s, the Programme of Work on Protected Areas recognised the essential role of PAs at conserving biodiversity and called Parties to the Convention on Biological Diversity to: "Assess the economic and socio-cultural costs, benefits and impacts arising from the establishment and maintenance of protected areas, particularly for indigenous and local communities, and adjust policies to avoid and mitigate negative impacts, and where appropriate compensate costs and equitably share benefits in accordance with the

national legislation" (CBD 2004). Following on that call, the CBD called on Parties to ensure that PAs contribute to poverty eradication and sustainable development (CBD 2008). More recently, the CBD further insisted that, by 2020, valuable ecosystems contributing to human wellbeing are safeguarded considering the needs of local communities and other stakeholders (Aichi Target 14) through equitable PA management (Aichi Target 11) and ensuring fair benefit sharing from biodiversity (Aichi Target 16; CBD 2010). By 2010 there were a number of studies and methods to assess the social impact of conservation actions, although they had different objectives and used different methods and assumptions thus providing little consistent evidence on the socioeconomic effects of PAs (Schrekenberg et al. 2010). Thus, the CBD's socioeconomic mandate remains unfulfilled and the socioeconomic effects of PAs are still largely unknown globally (Bhola et al. 2016) and at European scale, with environmental and social effectiveness indicator systems being scarce and urgently needed (Blicharska et al. 2016). Some methodologically detailed initiatives such as the Integrated Marine Protected Area Socioeconomic Monitoring and Assessment Framework (Rodríguez-Rodríguez et al. 2015a) or the Social Assessment of Protected Areas (Franks and Small 2016) have been recently developed to help to fill that gap.

The Spanish case: The need for sustainable development

Between 2008 and 2014, Spain went through a deep economic crisis deriving from a long-lasting unsustainable economic growth model based on mass construction and tourism that resulted in broad land use changes with serious implications for nature and people (Montes et al. 2011; Jiménez et al. 2012). Unemployment reached 27% of the active population in the first quarter of 2013 (INE 2018), with severe effects on wellbeing through widespread poverty, evictions, emigration, social exclusion and decreasing salaries which, in addition to reduced public services and state support, worsened living conditions for most (Jiménez et al. 2012; ADGSS 2017). Thus, it is paramount to explore more sustainable ways of development for a country with vast natural and cultural resources. Spain is a highly biodiverse country (Médail and Quézel 1999). PAs cover 27.3% of its land and freshwater area (Múgica et al. 2016), one of the broadest national terrestrial PA coverage in the world (UNEP and IUCN 2018). Apart from its large amount of territory under biodiversity protection regulations, Spain has 46 sites included in the UNESCO World Heritage List, being the third country in the world with more such sites (Spanish Government 2018; UNESCO 2018).

Objectives

In this study we sought to: 1) ascertain the views on the environmental and socioeconomic effects of PAs by a wide range of organisations from all sectors of Spanish society at three complementary scales: national, regional (Andalusia) and local (Almeria, Andalusia); 2) identify the stakeholders most affected by PA designation in Spain; 3) gather the views of stakeholders on the effects of different PA regulations (stringent regulation versus multiple-use regulation) on local social and economic variables; 4) determine the local socioeconomic aspects perceived to be most affected by the designation of PAs; and 5) analyse response consistency across spatial scales, socioeconomic guilds and respondent organisations. Results will assist not only scientists but also territorial planners, PA managers and decision-makers to make more informed and equitable decisions for greater sustainable development in the country.

MATERIALS & METHODS

Data collection

A reduced but comprehensive number of social (n=16) and economic (n=12) variables that influence local sustainability was derived (Appendix S1) after an initial, non-exhaustive literature review. They were classified in social or economic categories according to the Statistic Yearbook of Spain (INE 2016). The items represented by those variables define basic social and economic conditions for human wellbeing at national and international scales (INE 2016; EUROSTAT 2018; World Bank 2018) and are also policy-relevant (EEC 1992; CBD 2010). We tried to show a balanced representation of effects of PAs on local communities. Thus, we classified those variables from an, *a priory*, subjective perspective in *negative* and *positive* variables to local social or economic sustainability. Using the literature reviewed and our experience as a starting point, we also identified a comprehensive number of socioeconomic sectors and guilds that may be affected by PA designation in Spain. In order to reduce reported biases towards positive or negative effects of PAs (Schreckenberg et al. 2010) and provide a balanced picture of the perceived effects of PAs by the Spanish society, we preliminarily classified those guilds as ‘positively affected’ (48%), ‘negatively affected’ (48%), and ‘uncertainly affected’ (4%) by PAs (Appendix S1). Ecological farming and

125 stockbreeding organisations of the primary sector were identified for additional analysis
126 given their likely different perceptions on the topic.

127 We then identified relevant organisations belonging to those guilds. At national and
128 regional scales, we used criterion sampling whereby a maximum of five of the most
129 representative meta-organisations per guild and scale was identified (e.g. associations,
130 federations or ministries). Organisations were selected on the basis of our previous
131 knowledge and purposive online search. At local scale, a preliminary GIS analysis was
132 done to select a recently-designated, non-overlapping PA. The Special Area of
133 Conservation of Sierra de Cabrera-Bedar, in the south-easternmost part of the Almeria
134 province (Andalusia region), was selected. This area is a multiple-use, Natura 2000 site
135 and was thus classified within PAs of medium level of protection. Among the seven
136 municipalities in the PA, we selected those with at least 66% of their territories inside
137 the PA for being the ones more likely affected by its designation: Bedar (71.4% of its
138 territory in the PA) and Turre (78% of its territory in the PA). Two online business
139 repositories were used to quota sample a maximum of three organisations per
140 municipality and guild: Universia (2016) and Expansión (2016). Those business-type
141 stakeholders were complemented with guild-purposive online search to identify non-
142 commercial organisations (e.g., environmental NGOs; local councils, etc.). The whole
143 set of socioeconomic sectors, guilds and organisations identified by scale can be
144 consulted in Appendix S2.

145 Each of those organisations was contacted by phone, explained the aim of the survey
146 and asked to participate providing the views of their respective organisations, in order to
147 maximize representation (Dillman et al. 2015). A semi-structured, online questionnaire
148 was created using Survey Monkey software. The survey was piloted prior to its
149 administration, amended accordingly and administered between the 5th of June and the
150 5th of July of 2017. A link to the questionnaire was sent to the respondents who agreed
151 to fill it in via e-mail. The whole initial sample included 119 national organisations, 65
152 regional organisations, and 13 local organisations. Two reminders were sent to non-
153 respondents.

154 The questions and definitions in the survey were the same at the three scales (Appendix
155 S3). The only changes referred to the scale-related introductions to some questions.
156 Organisations were queried about their institutional view on three main subjects: 1)

PAs' general effects (environmental, social and economic); 2) the effects of PAs on their organisations; and 3) the intensity of PA effects on the socio-economy of the municipalities where they are designated. Response options were also the same across scales, the only difference being that local stakeholders were not asked to assess the local effects of PAs of high level of protection, as they were only asked about Sierra de Cabrera-Bedar Natura 2000 Site.

[Fig. 1. Conceptual outline of the study]

Data analysis

Closed-ended responses on the perceived general and organisational effects of PAs were numerically coded for statistical analysis according to the following ordinal scale: 'very negative effect' = -2; 'negative effect' = -1; 'No effect' = 0; 'positive effect' = 1; and 'very positive effect' = 2. The intensity of PA effects on local socio-economy was coded on an entirely positive ordinal scale for valid mean comparison purposes, as we tried to ascertain variation in the (absolute) value of the set of socioeconomic variables as a result of PA designation, not the direction of such variation (*i.e*. increase or decrease of the variable): 'large decrease', 'large increase' = 2; 'No effect' = 0; 'slight decrease', 'slight increase' = 1. For communication purposes, the range of continuous mean values of the perceived intensity of PA effects was split into equal intervals using quartiles: 0–0.50/0–0.50 (no effect: 0–3% increase/decrease of the variable's baseline value); 0.51–1 (slight effect: 3–6% perceived increase/decrease); 1.01–1.50 (moderate effect: 6–10% perceived increase/decrease); and 1.51–2 (large effect: >10% perceived increase/decrease). Indicators for which moderate or large effect of PAs was averagely perceived by stakeholders at any scale of assessment or protection level were selected for creating a socially-relevant local PA socioeconomic assessment system for being the most likely influenced indicators by PA designation at local scale.

Differences in the organisational perception of the social and economic effects of PAs of medium and high levels of protection were analysed at national and regional scales via paired T-tests or Wilcoxon-signed-rank tests, depending on the normality of the differences between both levels of the factor 'protection'. We assumed that the same

188 organisation's representative responded to the whole survey. Differences in the
189 organisational views of the local social and economic effects of PAs among
190 organisations at different spatial scales were assessed via ANOVA tests or Kruskal-
191 Wallis tests, according to the normality and homocedasticity of variables. Significance
192 level for all tests was set at 0.05. Open responses were codified in a number of limited
193 options. In cases when the same respondent gave different reasons for their responses,
194 they were considered individually and summarized according to the number of mentions
195 each codified response had among all respondents. For analysing response time, we just
196 considered responses that were completed on the same day of being started.

197 For analysing perceived general effects of PAs, effects on organisations, and local
198 effects, when more than one complete response was obtained by the same organisation
199 for a given scale, we retained the response that took longer to be answered, assuming
200 that a more careful reply to the questions was given. For analysing response
201 consistency, all duplicated responses were used to test internal organisational response
202 consistency. In order to avoid comparing responses by the same person, we made sure
203 that each of those organisationally duplicated responses had been made from a different
204 I.P. address.

205 We analysed response consistency on the perceived intensity of PAs of high level of
206 protection on local socioeconomy on three analytical dimensions: 1) within guilds
207 (same scale: national; different organisations), for the following guilds of similar
208 foreseen response to the topic: research, environmental NGOs, mining, and hunting; 2)
209 between spatial scales (same organisation; different scale: national vs regional), for the
210 following organisations: COAG (farming organisation) and SEO-Birdlife
211 (environmental NGO); and 3) within organisations (same organisation; same scale:
212 national or regional; different respondent), for the following organisations: RADA
213 (legal representatives; national scale), AAMA (rangers; regional scale), and Ecologistas
214 en Acción-Andalucía (environmental NGO; regional scale). We codified the original
215 responses on an ordinal, increasingly positive scale: 'very negative effect' = 1; 'negative
216 effect' = 2; 'No effect' = 3; 'positive effect' = 4; and 'very positive effect' = 5. To test
217 for differences in response consistency, we used Kruskal-Wallis tests after checking the
218 non-normality of the original and log10-transformed variables, for a significance level
219 of 0.05. All the statistical analyses were done using SPSS v.23 and Microsoft Excel.

RESULTS

Response rate

The response rate was 33% for the national survey (n=39), 35% for the regional survey (n=23), and 46% for the local survey (n=6). The median time to complete the survey was 18 minutes at national scale, 26 minutes at regional scale, and 16 minutes at local scale.

Sample characterization

The sample of selected organisations was balanced according to their foreseen preliminary stances on PAs (with a slightly greater initial selection of 'positive' organisations) and economic sectors, though at local scale primary and quaternary sector organisations were absent. On the contrary, there was a stark difference in the size of organisations between national and regional scales, on one side, and local scale, on the other (Table 1).

Table 1. Main characteristics of responding organisations

Main characteristics		National organisation (n)	Regional organisation (n)	Local organisation (n)	N (%)
Median membership (number of members)		> 250	>250	1 to 9	
Preliminary stance on PAs	Positive	19	13	4	36 (52,9%)
	Neutral	3	1	0	4 (5,9%)
	Negative	17	9	2	28 (41,2%)
	N (%)	39	23	6	68 (100%)
Sector	Primary	8	4	0	12 (17,6%)
	Secondary	4	3	2	9 (13,2%)
	Tertiary	16	4	1	21 (30,9%)
	Quaternary	6	1	0	7 (10,3%)
	Institutional	3	6	2	11 (16,2%)
	Miscellaneous	2	5	1	8 (11,8%)
	N (%)	39 (57,4%)	23 (33,8%)	6 (8,8%)	68 (100%)

General effects of PAs

The organisational perception of the sustainability of protected areas was 'globally' positive at national and regional scales but slightly negative at local scale. At all scales, the environmental dimension was the best rated, followed by the social dimension and the economic dimension, respectively (Table 2). The perception of the global sustainability of PAs was the greatest by the quaternary sector and the lowest by the primary sector. The main stated reasons in favour of PAs by national, regional and local organisations were that PAs enhance economic development and nature conservation, respectively. Restrictions to socioeconomic activities and insufficient local engagement were stated as PAs' main drawbacks.

Table 2. Organisational perception of the environmental, social and economic effects of protected areas in Spain by spatial scale and economic sector (on a -2 to +2 scale)

Nat: National; Reg: Regional; Loc: Local; Prim: Primary; Eco-P: Eco-Primary; Sec: Secondary; Tert: Tertiary; Quat: Quaternary; Inst: Institutional; Misc: Miscellaneous

		Sector							
Mean perceived effect	**Scale**	**Prim**	**Eco-Prim**	**Sec**	**Tert**	**Quat**	**Inst**	**Misc**	**All**
Environmental	Nat	0.88	2.00	1.50	1.56	1.83	2.00	2.00	1.51
	Reg	0.75	1.00	1.33	1.25	2.00	1.67	1.60	1.39
	Loc			0.00	-1.00		1.00	2.00	0.50
Social	Nat	0.13	0.50	1.25	0.81	1.50	2.00	2.00	0.97
	Reg	0.50	0.00	1.00	1.00	2.00	1.17	1.00	1.00
	Loc			-1.50	-1.00		0.00	2.00	-0.33
Economic	Nat	0.13	0.50	0.50	0.56	1.33	1.67	2.00	0.74
	Reg	0.50	0.00	0.33	0.25	2.00	0.83	0.60	0.61
	Loc			-1.50	-2.00		0.50	2.00	-0.33
Global (sustainability)	Nat	0.38	1.00	1.08	0.98	1.56	1.89	2.00	1.08
	Reg	0.58	0.33	0.89	0.83	2.00	1.22	1.07	1.00
	Loc			-1.00	-1.33		0.50	2.00	-0.06

Effects of PAs on organisations

On average, at national scale all economic sectors except the primary sector perceived to be positively affected by PAs. The most positively affected sector was 'Miscellaneous', represented by environmental NGOs. At regional scale, all sectors

perceived to be positively affected by PAs. Only the quaternary sector, represented by journalists, perceived not to be affected by PAs. At local scale, both the secondary sector and the 'Miscellaneous' sector perceived not to be affected by PAs. The construction company perceived to be negatively affected whereas the cheese manufacturer business perceived to be positively affected. The organisations that provided some reasoning for that perception stated little or no effect of PAs on their activities (Table 3).

Table 3. Perception of the effects of protected areas on Spanish organisations by sector and scale, and main stated reason

	National scale		Regional scale		Local scale		
Sector	Mean perceived effect on own organisation	Main stated reason	Mean perceived effect on own organisation	Main stated reason	Mean perceived effect on own organisation	Main stated reason	n
Primary	-0.13	Restrictions to socioeconomic activities	0.75	Increased burocratic work			12
Eco-Primary	1.50	Greater environmental awareness	1.00	Positive. if there are incentives to eco-friendly businesses			3
Secondary	0.25	Restrictions to economic activities	0.67	It clarifies limitations to activities	0.00	No effect	9
Tertiary	0.25	PAs do not affect their activity directly	0.50	It increases economic activity	-2.00		21
Quaternary	0.83	It increases research	0.00			Journalists are not sufficiently considered in PAs	7
Institutional	1.67	PAs contribute substantially to nature	0.83	Socioeco-nomic development	1.00	Economic development; Little effect	11

		conservation				on daily tasks	
Misce-llaneous	2.00	PAs are one of their goals	1.20	PAs are one of their goals	0.00		8
All	0.46	Restrictions to socioeconomic activities	0.78	Socioeco-nomic development	0.00	No effect	68

Effects of PAs on local communities

Mean perceived change of social and economic indicators

Table 4 shows the average valuation of the intensity and direction of change of social and economic indicators in the municipalities where PAs are designated at the three surveyed scales. Eight socioeconomic variables were perceived to vary the most for both protection levels of PA designation and at most scales: 'residents' environmental awareness' (social), 'restrictions to local property rights' (social), 'number of regulation breaches & sanctions' (social), 'scientific and technical research activities in/on the site' (social), 'local bureaucracy' (economic), 'local quality of life' (economic), 'local tourist activity' (economic), and 'residential construction' (economic).

Table 4. Mean perceived change in the value of social and economic indicators at local scale as a result of protected area designation (on a +2 to -2 point scale)

Note: PAs of MLP: protected areas of medium level of protection; PAs of HLP: protected areas of high level of protection. *Sierra de Cabrera-Bedar Special Area of Conservation.

Social indicator	**National scale**		**Regional scale**		**Local scale**
	PAs of MLP	**PAs of HLP**	**PAs of MLP**	**PAs of HLP**	**PAs of MLP***
Vulnerability of local populations to natural disasters	-0.42	-0.50	-0.60	-0.50	-0.17
Residents' age	0.00	-0.06	0.15	0.20	0.17
Number of local health infrastructures	0.03	-0.03	0.11	-0.05	-0.50
Number of local security and justice infrastructures	0.08	-0.03	0.05	0.00	-0.50
Number of local education infrastructures	0.18	0.10	0.33	0.17	-0.33
Number of residents	0.18	-0.11	0.14	-0.48	-0.33

Educational degree of residents	0.19	0.25	0.24	0.10	-0.17
Local traditions	0.22	0.24	0.52	0.48	0.33
Local cultural, recreational and sport offer	0.32	0.51	0.89	0.79	0.33
Health of residents	0.46	0.53	0.89	0.94	-0.33
Number of local (non-commercial) associations	0.53	0.67	0.95	0.91	0.50
Residents' participation in local environmental decisions	0.59	0.56	0.85	0.90	0.33
Number of regulation breaches & sanctions	0.89	1.22	1.14	1.27	-0.17
Restrictions to local property rights	1.03	1.58	1.24	1.48	0.50
Residents' environmental awareness	1.05	1.30	1.14	1.36	0.50
Scientific and/or technical research activities in/on the site	1.06	1.43	1.18	1.64	0.25

Economic indicator	**National scale**		**Regional scale**		**Local scale**
	PAs of MLP	**PAs of HLP**	**PAs of MLP**	**PAs of HLP**	**PAs of MLP***
Residential construction	-0.26	-0.43	-0.74	-1.26	-1.20
Number of local transport infrastructures	0.03	-0.03	-0.09	-0.36	-0.50
Number of local technological infrastructures	0.11	0.29	0.05	-0.10	0.33
Local taxes	0.26	0.39	0.50	0.43	0.33
Residents' income	0.29	0.46	0.52	0.45	-0.40
Number of local enterprises and businesses	0.44	0.84	0.59	0.53	-0.50
Local quality of life	0.46	0.74	1.00	1.14	-0.33
Local employment	0.53	0.67	0.47	0.55	-0.20
Local council's budget	0.54	0.94	0.95	1.00	-0.60
Prize of local products and services	0.64	0.86	0.65	0.80	0.00
Local bureaucracy	0.71	1.00	1.05	1.19	0.17
Local tourist activity	1.13	1.54	1.50	1.29	0.20

Perceived change in local indicator values across scales and protection levels

The mean perceived change in the intensity of local social effects was significantly greater for highly protected PAs than for PAs of medium level of protection for national stakeholders, from 0.45 ± 0.37 to 0.57 ± 0.53 ($Z = -2.272$; $p = 0.023$). Also, there was a statistically significantly higher mean perceived intensity of local economic effects of

highly protected PAs with regard to PAs of medium level of protection for national stakeholders, from 0.45 ± 0.30 to 0.68 ± 0.40 ($t_{(11)}$ = -6.319; p < 0.000). There were no statistically significant differences in the mean perceived intensity of local social or economic effects between PAs of high and medium levels of protection for regional stakeholders.

Effect of scale on stakeholder perception

There were no statistically significant differences in organisational perception of the intensity of local social or economic effects of PAs of medium level of protection across the three spatial scales. Neither were there statistically significant differences in organisational perception of the intensity of local social or economic effects of PAs of high level of protection between national and regional scales.

Response consistency

Within socioeconomic guilds

There were statistically significant differences in the valuation of the socioeconomic effects of PAs of high level of protection within three of the four analysed guilds, except for research, were responses across organisations were consistent: Environmental NGOs ($\chi^2_{(1)} = 4.59$; $p = 0.03$); Mining ($\chi^2_{(1)} = 6.34$; $p = 0.01$); and Hunting ($\chi^2_{(1)} = 8.05$; $p = 0.01$).

Between spatial scales

There were statistically significant differences in the valuation of the socioeconomic effects of PAs of high level of protection between spatial scales for some organisations. Regional COAG (farming organisation; $\chi^2_{(1)}=4.47$; $p = 0.03$) stated greater perceived effect than its national representative. However, there were no statistically significant differences for SEO-Birdlife (environmental NGO).

Within organisations

There were no statistically significant differences in the valuation of the socioeconomic effect of PAs of high level of protection on local communities within organisations.

DISCUSSION

Perceived general effects of Spanish PAs

The perceived general effects of the designation of Spanish PAs by Spanish organisations are positive on average. However, differences are apparent among territorial scales and sustainability dimensions. Firstly, there was a general gradient in the perceived sustainability of PAs across all scales: environmental sustainability > social sustainability > economic sustainability. Such gradient has been shown for chiefly local stakeholders at European scale (Blicharska et al. 2016) and also for national organisations in north-European marine environments (Rodríguez-Rodríguez et al. 2015b), which suggests a socially consistent perception pattern on the sustainability of (M)PAs, at least in Western Europe.

Local stakeholders were the most critical towards the general effects of PAs even though when they were only asked about a multiple-use, leniently regulated Natura 2000 Site. Some authors suggest overemphasis on local drivers of environmental degradation by territorial planners, managers and decision-makers which may result in unnecessarily harsh restrictions to local activities and inequitable compensation to the most sensitive groups (Palmer et al. 2015; Suding et al. 2015). Additionally, insufficient and/or poor quality local involvement in PA planning and management processes leading to feelings of marginalisation is a broad concern Europe-wide (Ferranti et al. 2014; Blicharska et al. 2016), and in Spain (Rodríguez-Rodríguez et al. 2017). Genuine, representative local stakeholder engagement in PA designation proposals results in good sustainability outcomes and broad acceptability (Pérez de Oliveira et al. 2013). Thus, responsible authorities should make adequate effort to adequately engage the most critical local stakeholders in PA initiatives in order to facilitate implementation and enhance socioeconomic outcomes (Oldekop et al. 2016).

Perceived effects of PAs on socioeconomic sectors and guilds

Two clearly differentiated opinion groups were apparent. On the one hand, public institutions (governance, PA managers and surveillance), the quaternary sector (essentially research centres) and the miscellaneous sector (chiefly the environmental NGO guild) generally had a positive stance towards PA contribution to socioeconomic and nature conservation outcomes, as shown previously (Rodríguez-Rodríguez et al.,

344 2015b). In contrast to the study by Rodríguez-Rodríguez et al. (2015b), here the
345 hospitality guild stated consistently positive effects from PA designation across scales.
346 This aligns with previous claims that accommodation makes one of the largest
347 expenditure categories for travellers to PAs (Eagles et al. 2002). Apart from
348 accommodation businesses, catering activities have also been mentioned as benefiting
349 most from visitors to PAs (Alló et al. 2010).

350 On the other hand, some sectors and guilds perceived that PAs had a negative effect on
351 their activities. The primary sector mostly perceived to be negatively affected at
352 national scale due to restrictions to socioeconomic activities, but perceived to be
353 positively affected at regional scale. Primary and secondary sector guilds and
354 landowners greatly depend on natural resource use. Thus, they are among the most
355 negatively affected guilds by PA regulations (Alló et al. 2010; Kati et al. 2015;
356 Blicharska et al. 2016), especially in historically-used European cultural landscapes
357 (Järv et al. 2016). In turn, ecological farming organisations consistently perceived to be
358 positively affected by PAs across scales, probably as a result of their competitive
359 advantage given by PA regulations over non as nature-friendly farming business (Basha
360 et al. 2015) and the suggested greater environmental awareness of local populations
361 near PAs (Štraus et al. 2010). Farmers, environmental managing agencies and
362 landowners were considered the most influential stakeholder groups on farmland
363 biodiversity issues at regional and local scales in other European settings (Hauck et al.
364 2016), which suggests that their consideration in land management issues in Europe is
365 paramount.

366 It is noteworthy that some guilds of the secondary sector, such as construction or
367 mining, that are often the primary targets of PA regulations (Spanish Government 2007,
368 2014; Järv et al. 2016) due to their serious effects on biodiversity (Forman and
369 Alexander 1998; McKinney 2002; Brooks et al. 2014) did mostly not perceive to be
370 affected by PAs in Spain at regional and local scales, or even stated positive effects of
371 PAs on their organisations at national scale. Recent studies have shown that land
372 artificialisation processes, to which both guilds largely contribute, were generally lower
373 in Spanish PAs than in surrounding areas (Martínez-Fernández et al. 2015), whichever
374 their levels of protection (Rodríguez-Rodríguez and Martínez-Vega 2018). In contrast to
375 results in other European countries where MPAs were considered as impediments to
376 resource extraction (Rodríguez-Rodríguez et al. 2015b), construction and mining

377 organisations in Spain seem to have assimilated the actual impact that PA regulations
378 have on their activities and adopted (or at least, state) a pragmatic approach to existing
379 *status quo*.

380 In turn, some guilds of the primary sector (hunting), and tertiary sector (recreation) felt
381 generally negatively affected by PAs in Spain at different scales. Organisations
382 pertaining to both guilds stated restrictions to their activities by PA regulations as their
383 main effect. In a review on management effectiveness of European PAs, Nolte et al.
384 (2010) identified recreational activities as the major threat to those areas. Thus,
385 evidence points to the need of regulating organized or spontaneous recreational
386 activities in European PAs to limit their impact on natural and cultural heritage
387 (Blicharska et al. 2016). The recreation guild seems largely unaware of or unable to
388 benefit from the alleged new opportunities generated by new regulatory frameworks and
389 the suggested benefits to their activities from increased tourism in PAs (Phillips 1998;
390 Christiansen and Conner 1999; Alló et al. 2010).

391 Our results are coherent with a recent study that also showed that national organisations
392 from the primary sector (fishers), secondary sector (the aggregate industry) and also
393 tertiary sector (recreation) perceived to be negatively affected by MPA designation in
394 northern Europe, whereas organisations in the quaternary (research), institutional
395 (governance and MPA managers), and miscellaneous sectors (environmental NGOs)
396 perceived to experience a positive effect from MPAs (Rodríguez-Rodríguez et al.
397 2015b).

398 **Perceived effect of PAs on local socioeconomic variables**

399 Half of the variables that were perceived to vary most by Spanish terrestrial
400 stakeholders coincided with those that were perceived to vary most in intensity by
401 marine stakeholders in the UK and France: 'residents' environmental awareness',
402 'number of regulation breaches & sanctions', 'scientific and technical research activities
403 in/on the site', and 'local tourist activity' (Rodríguez-Rodríguez et al. 2015b), which
404 suggests a common pattern of socially perceived local effects of PAs regardless of their
405 major environment. Other variables perceived to vary most in intensity have also been
406 mentioned in the European literature on PA designation constraints: 'local bureaucracy'
407 (Järv et al. 2015; Blicharska et al. 2016), 'restrictions to local property rights' (Rekola et
408 al. 2000), residential construction (Järv et al. 2015); and benefits: 'local quality of life'

409 (Järv et al. 2015). In other parts of the world, and using a carefully designed research
410 framework, Andam et al. (2010) found that PAs in some tropical countries resulted in
411 alleviated poverty in surrounding communities when compared to suitable control
412 communities.

413 Interestingly, local employment was not considered to vary much as a result of PA
414 designation in Spain. In contrast to common claims (Dudley et al. 2013), Spanish PAs
415 are not perceived to provide a strong-enough alternative to the usual employment-
416 creating sectors for local development despite the intensity of the recent economic crisis
417 in the country and the need to diversify its economy (INE 2016; Jiménez 2012; ADGSS
418 2017). Further studies should confirm such perceptions.

419 A highly participative local socioeconomic assessment system of PAs was devised.
420 Although perceived intensity of effects does not equal organisational importance, which
421 should have been studied separately (Rodríguez-Rodríguez et al. 2015b), five of the
422 eight socioeconomic variables perceived to vary most by Spanish stakeholders were
423 included under priority indicators for marine stakeholders in the UK and France
424 (Rodríguez-Rodríguez et al. 2015b), which suggests that a broadly applicable, socially
425 relevant and efficient Local Socioeconomic Assessment System of PAs could be
426 developed based on the aforementioned eight indicators. This system would help to fill
427 the gap in social effectiveness research in European PAs (Blicharska et al. 2016).

428 **Perceived effects of PAs across protection levels**

429 National organisations tended to assign greater effect to PAs of high level of protection
430 than to PAs of medium level of protection, whereas regional stakeholders did not
431 perceive such difference in local effect intensity. The small size of and discontinuous
432 management activities in many nature reserves in Andalusia, and the fact that, to date
433 (April of 2018), there are only two national parks in the region: Doñana National Park
434 and Sierra Nevada National Park, might have made most regional stakeholders identify
435 regional PAs with multiple-use PAs, likely perceived as generating less intense
436 ecological (Oldekop et al. 2016) and socioeconomic effects (Holmes and Cavanagh
437 2016).

438 **Perceived effects of PAs across spatial scales**

Spatial scale does not seem to influence perception on the intensity of local socioeconomic effects of PAs in Spain. These results contrast with those by Ferraro (2002), who suggests uneven distribution of costs and benefits from establishing PAs in Madagascar across spatial scales, with most opportunity costs born to local residents but most benefits in terms of tangible (e.g. tourism) and intangible (ecosystem services) assets generated at other scales (regional and national). In developing regions of the world, local dwellers and PA users tend to identify PAs with restrictions to natural resource use and harsher living conditions (Ferraro 2011; Kelboro and Stellmacher 2015). In Spain, the central national park administration provides subsidies to compensate local populations for opportunity costs from the designation of those highly protected PAs (Spanish Government 2014). However, to our knowledge, there is no such consistent economic compensation applied to any other PA category in the country. In our case, we think that local stakeholders might not have had a different opinion from that by regional or national stakeholders for having been asked about a leniently regulated, recently managed multiple-use Natura 2000 site that is unlikely to have caused intense local socioeconomic effects.

Response consistency

Organisations in the same guilds generally provided different valuations of the socioeconomic effects of PAs on local communities even if the assessed guilds might be thought to have a similar view on the topic, such as environmental NGOs. Thus, surveyed organisations' responses on the topic are little representative of those of the same guild, resulting in undue generalisations. These results are consistent with previous studies in other settings which suggested (Calvet-Mir et al. 2015) and showed (Rodríguez-Rodríguez et al. 2015b) that organisation classification in categories is often more a conceptual artifact than an empirical reality. In contrast to the study by Rodríguez-Rodríguez et al. (2015b) in which scientific organisations rated the importance of socioeconomic indicators for MPAs differently, here Spanish research organisations showed a consistent perception of the effects of PAs on local socio-economy. The fact that scientific organisations in the study by Rodríguez-Rodríguez et al. (2015b) were from different countries may have increased response divergence.

Response consistency by the same organisation across scales was organisation-specific, which suggests that it should not be taken for granted. Responses by respondents of the

same organisation at the same spatial scale showed consistency, which suggests non-substantial inter-personal bias and the use of organisations as a valid unit of analysis in perceptual studies related to local socioeconomic effects of PAs in Spain.

Methodological considerations

The non-random selection of the organisations taking the survey means that generalisations from our findings should not be made and, when they are, they should be made with caution. Though the survey's sample included a wide selection of meta-organisations that were supposedly representative of their guilds, a larger sample would have been needed mainly at local scale to enhance societal representation.

Some no-responses to the survey were noteworthy, especially among local stakeholders who are the ones most likely experiencing the limitations and opportunities of PAs (Coad et al. 2008; Blicharska et al. 2016). For instance, the a priori highly-affected local primary sector was absent from this analysis. This resulted from the inexistence of primary sector organisations in the consulted online local business repositories. Also, even though the broad spectrum of major political organisations was invited to participate in the survey (n=5, at national and regional scales), only one political response by a regional green party was obtained, suggesting low political interest in the topic (Kati et al. 2015; Rodríguez-Rodríguez et al. 2015c).

Finally, sector and guild-result comparison across scales should be made with much caution, as different numbers of organisations and even sectors completed the survey at different scales.

CONCLUSION

There is broad social perception of the environmental benefits of PAs in Spain. However, the social and, chiefly, economic benefits of PAs are more contested, mostly at local scale and among tertiary, secondary and primary sector organisations. Input from those stakeholders should be the primary target of responsible authorities to smooth PA implementation processes and make them not only environmentally, but also socially and economically sustainable (Oldekop et al. 2016). Broad support to PAs as a public policy in Spain can be inferred from the quaternary sector, the institutional

sector, and some miscellaneous organisations, mostly environmental NGOs. Legal stringency of PAs was only perceived to impact locally by national stakeholders, although it could not be assessed at local scale.

A number of local socioeconomic indicators were perceived to vary most after the designation of PAs in Spain, regardless of regulation stringency and the spatial scale of respondents and would make a socially relevant PA socioeconomic assessment system. Responses on perceived local socioeconomic effects of Spanish PAs showed low consistency among socioeconomic guilds and spatial scales for the same organisations, and reinforces previous claims that stakeholder classification in socioeconomic sectors or guilds in PA sustainability studies is more a conceptual artifact than a reality (Rodríguez-Rodríguez et al., 2015b). However, intra-organisational consistency at a given scale was found, which suggests non substantial inter-personal bias and adequacy of organisations as a valid unit of analysis in socioeconomic studies on PAs in Spain. We hope that these results may help to steer current territorial development towards greater sustainability in a time when recent unsustainable dynamics seem to reappear in the country.

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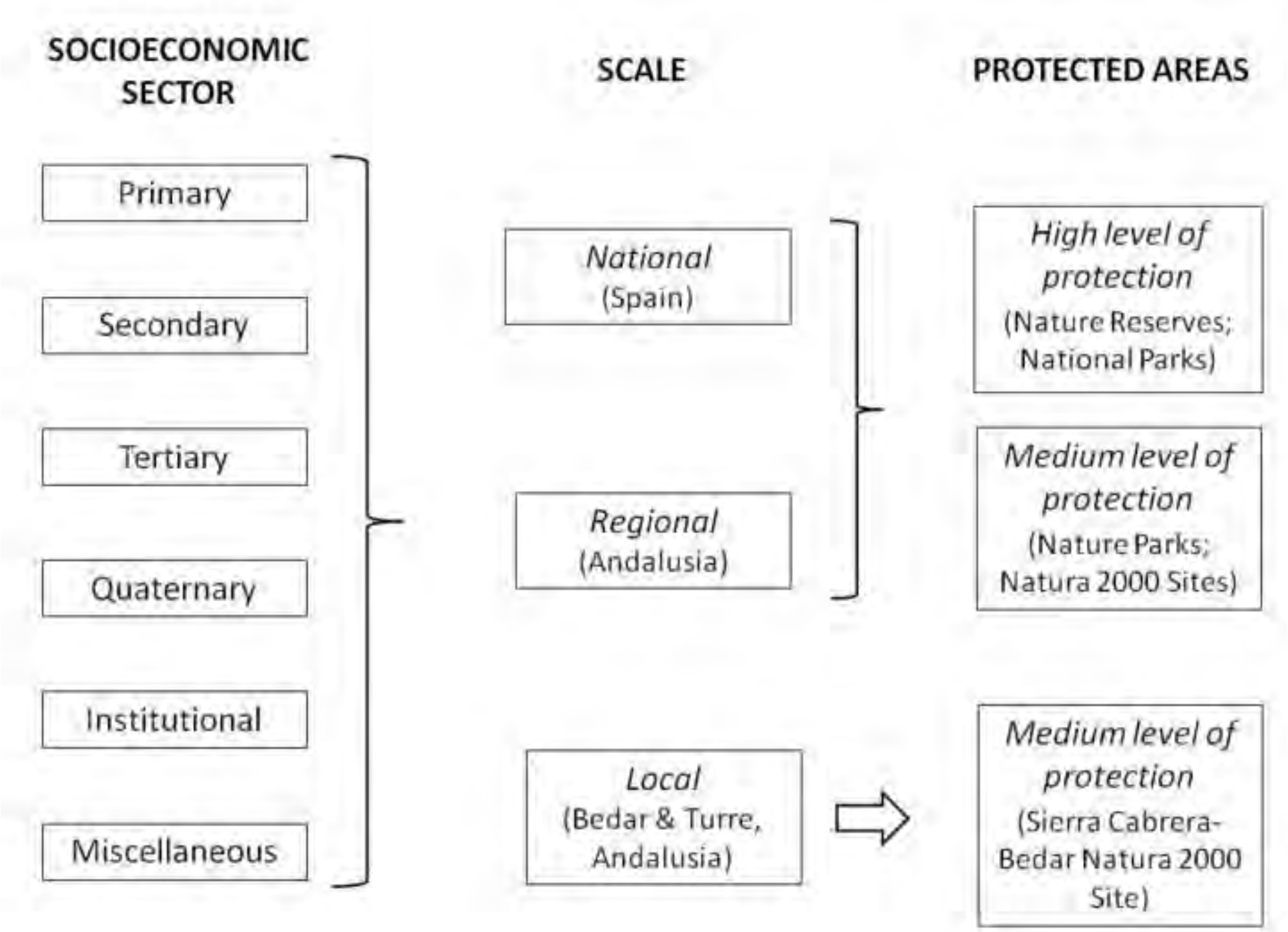
Figure



Response to the editor

We would like to thank Prof. Keskitalo for her comments to improve the manuscript. Please, find below the changes we made accordingly:

- We structured the Introduction a bit differently, including four sub-sections. Among them, a "Study background" section better contextualising our research from the point of view of policy and research was included.

- We also clarified the significance of the indicators used in Materials & Methods, adding a number of new relevant references (in "Data collection").

- We modified the title to a more straightforward and appealing one.

- Finally, we slightly modified the Abstract and keywords for greater clarity and accurateness.

Please note that the requested additions, while enhancing the clarity and context of the study, have slightly increased the number of words and references in the manuscript.

We hope to have adequately addressed Prof. Keskitalo's concern and that our manuscript can proceed, if so considered, to peer-review.

Looking forward to hearing from you.

Yours,

Dr. David Rodríguez-Rodríguez

Ambio

Socioeconomic effects of protected areas in Spain across spatial scales and protection levels

--Manuscript Draft--

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Abstract:	Consequences of the legal designation of protected areas (PAs) may be different for different stakeholders, and at different spatial scales. In this study we analysed the organisational perception on the effects of PA designation on sustainability from all sectors of activity in Spain, accounting for PAs' legal stringency. A semi-structured questionnaire was administered to 197 organisations at national, regional (Andalusia), and local scales (two municipalities in the Almeria province, Andalusia) through an online survey. Local stakeholders and the primary, secondary and tertiary sectors were the most concerned about the social and economic impacts of PAs designation on their organisations. On the contrary, organisations at the national or regional scales together with public institutions, the quaternary sector and others miscellaneous perceived chiefly positive effects. Only national organisations perceived increased local social and economic effects from the designation of legally stringent PAs with regard to multiple-use PAs.