



What should be evaluated from a manager's perspective? Developing a salient protected area effectiveness evaluation system for managers and scientists in Spain



D. Rodríguez-Rodríguez^{a,b,*}, J. Martínez-Vega^c

^a Centre for Marine and Coastal Policy Research, Marine Institute, Plymouth University, Drake Circus, Plymouth, Devon PL4 8AA, UK

^b Universidad de Málaga, Andalucía Tech, European Topic Centre-Universidad de Málaga, Campus de Teatinos s/n, 29071 Málaga, Spain

^c Institute of Economics, Geography and Demography, Spanish National Research Council (IEGD-CSIC), C/Albasanz, 26-28, Madrid 28037, Spain

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ABSTRACT

The System for the Integrated Assessment of Protected Areas (SIAPA) was developed as a tool to improve our knowledge on the status and trends of protected biodiversity. In order to increase SIAPA's salience and use, representatives of the main managerial and scientific protected area (PA) institutions of Spain were surveyed using a structured questionnaire. PA network managers and scientists showed a high degree of consistency in rating the most important SIAPA indicators: 'Appropriateness of protection legislation', 'Degree of fulfilment of management objectives' and 'Effectiveness of public participation bodies', respectively. However, PA managers perceived the 'State of conservation' as the most determinant factor to ascertain overall PA effectiveness whereas for scientists 'Management' was the most important factor. Most managers and one scientist suggested including the indicator 'Change in extent of focal habitats' in the SIAPA and comparing management effects inside and outside PAs. The methods and results of this study intend to streamline and standardise PA evaluation efforts in Spain and guide future developments of PA evaluation systems elsewhere.

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1. Introduction

Protected areas are at the forefront of global biodiversity conservation efforts (Chape et al., 2008). As a result of the importance given to assessing PAs' conservation performance, a framework for evaluating management effectiveness was developed by the International Union for the Conservation of Nature (IUCN; Hockings et al., 2000) and a large number of PA evaluation systems and tools has been developed in Europe (Nolte et al., 2010) and worldwide (Leverington et al., 2010a). In 2010, the Convention on Biological Diversity (CBD) set the target to evaluate at least 60% of the world's protected area by 2015 (CBD, 2010a). Additionally, the CBD's Aichi Target 11 states the need to 'conserve areas of particular importance for biodiversity through systems of PAs that are effectively and equitably managed, ecologically representative and

well-connected' (CBD, 2010b). However to date just 29% of nationally designated PAs have been evaluated on their management effectiveness globally (Coad et al., 2013) and many of these evaluations rely on the subjective judgement of PA managers through tools like the Rapid Assessment and Prioritization of Protected Areas Management (Ervin, 2003) or the Management Effectiveness Tracking Tool (Stolton et al., 2007).

The System for the Integrated Assessment of Protected Areas (SIAPA; Rodríguez-Rodríguez and Martínez-Vega, 2012) was originally developed to help to fill the gap in PA effectiveness evaluation in Spain (Múgica and Gómez-Limón, 2002) and, more immediately, in the Autonomous Region of Madrid (ARM) given the important pressures jeopardising biodiversity conservation in the region (Rodríguez-Rodríguez, 2008). The development of the SIAPA was scientifically-led with a relatively wide input from a range of stakeholders (Rodríguez-Rodríguez and Martínez-Vega, 2012), although PA managers' participation was limited to the PA managers of the ARM, which may have compromised its representation and salience at the Spanish scale (Rodríguez-Rodríguez et al., 2015). Two versions of the original SIAPA were developed: a Complete Model made of 43 indicators, and a Simplified Model made of the 28 most highly rated indicators of the Complete Model, aimed at increasing salience and implementation efficiency

* Corresponding author at: Universidad de Málaga, Andalucía Tech, European Topic Centre-Universidad de Málaga, Campus de Teatinos s/n, 29071 Málaga, Spain. Tel.: +34 951953102.

E-mail addresses: david.rodriguez-rodriguez@plymouth.ac.uk, davidrr@uma.es, davidrg@yaho.es (D. Rodríguez-Rodríguez), javier.martinez@cchs.csic.es (J. Martínez-Vega).

(Rodríguez-Rodríguez and Martínez-Vega, 2012). The SIAPA was first tested on the 10 PAs of the ARM (Rodríguez-Rodríguez and Martínez-Vega, 2013a). However, limited interest in the tool shown by its intended users in the ARM and the rest of Spain (Rodríguez-Rodríguez et al., 2015), prompted us to adapt the SIAPA to better meet the needs of the country's PA managers and network managers in order to promote the use of objective, systematic PA evaluations in Spain. These kinds of evaluations are even more relevant in a country with unusually high levels of biodiversity in the European context (CBD, 2014): the Spanish territory spans across 4 biogeographical regions: Mediterranean, Alpine, Atlantic and Macaronesian (EEA, 2006); one-hundred and eighteen habitats in the Annex 1 of the Habitats Directive; 263 species in the Annex 2; and 125 species in the Annex 1 of the Birds Directive occur on Spanish land and waters (MAGRAMA, 2015); Spain is the country that contributes most to the Natura 2000 network in terms of absolute area with 1448 Sites of Community Importance and 598 Special Protection Areas which together cover 27.27% of the country's terrestrial and marine area (MAGRAMA, 2015).

With the aim of presenting the SIAPA to potential end users, improving it, and adapting it to users' needs, we organised a national workshop in Madrid. The workshop's main aim was to assess the possibility of using the improved version of the SIAPA resulting from the workshop as a common, standardised PA evaluation system in Spain. This paper reflects some of the results from that workshop. The objectives of this study were manifold: (1) to identify the indicators and indexes of the SIAPA considered most important for PA network managers and scientists in Spain for assessing PA effectiveness in order to increase the SIAPA's salience among end-users; (2) to validate the greater salience of the Simplified Model of the SIAPA versus the Complete Model among Spanish PA network managers and scientists; (3) to assess the consistency in the ratings of the SIAPA indicators and indexes by PA network managers and scientists attending the workshop and the original SIAPA stakeholders, to estimate the national representation of the SIAPA; (4) to determine the consistency in the ratings of the indicators and indexes of the SIAPA between PA network managers and the PA network manager of the ARM, as a possible indication of the ARM's environmental specificity with regard to the rest of the country, as suggested during the workshop; and (5) to discuss possible improvements to the SIAPA and PA evaluation systems in general so that conservation outcomes can be more accurately attributed to management actions.

2. Materials and methods

2.1. Workshop development and questionnaire administration

We organised a national workshop on PA effectiveness evaluation through a collaboration agreement between the BBVA Foundation and the Spanish National Research Council in May 2013 (Europa Press, 2013). Invitees included over 50 representatives from national, regional and local PA networks, research institutions, environmental NGOs, local government organisations, environmental foundations and the International Union for the Conservation of Nature (IUCN; IUCN-World Commission on Protected Areas and Spanish IUCN Committee). Even though participation in the workshop was voluntary, 26 organisations attended. They are shown in appendix A in the supplementary material. Eight weeks before the workshop, every invitee was sent the complete electronic version of the monograph explaining the methodological development of the SIAPA in Spanish (Rodríguez-Rodríguez and Martínez-Vega, 2013b) to allow them to familiarise with it in advance.

In the workshop, we presented the methodology underpinning the SIAPA (Rodríguez-Rodríguez and Martínez-Vega, 2012) and circulated a structured questionnaire with closed ended questions (appendix B in the supplementary material). Participants were asked to rate each indicator and index of the SIAPA on a Likert-type scale from 1 to 5 points where 1 = not important; 2 = slightly important; 3 = moderately important; 4 = rather important; and 5 = very important, according to their importance for defining the partial indexes (state of conservation; planning; management; social and economic context; social perception and valuation; and threats to conservation) or the global effectiveness index where they were included, respectively (Rodríguez-Rodríguez and Martínez-Vega, 2012). Optional open-ended questions gave the participants the possibility of suggesting new indicators or indexes that were not currently included in the SIAPA and of making comments.

Here, we analysed the responses by the two main stakeholder groups attending the workshop as potential end users of the SIAPA: (1) PA network managers, represented by 11 of the 17 regional PA network manager institutions of the country and the two representatives of the national institutions coordinating management, monitoring and reporting activities in the Spanish network of national parks (the National Parks Autonomous Body; OAPN) and Natura 2000 sites (Ministry of Environment); and (2) scientists, including one representative from three of the main research institutions working on PAs in Spain: EUROPARC-Spain, the Spanish Observatory for Sustainability (OSE), and a Spanish representative of the IUCN-World Commission on Protected Areas. The sample of managers present at the workshop managed 1026 PAs, mostly terrestrial. These PAs represent 59.9% of Spain's nationally designated PAs and 82.1% of the terrestrial area protected. They span across three biogeographic regions: Mediterranean, Alpine and Euro-Siberian (EEA, 2006).

We compared the ratings of these two priority groups attending the workshop (PA network managers and scientists) with the ratings of two other groups of interest: the original SIAPA stakeholders and the PA network manager of the ARM, to elicit possible representation issues with the first version of the SIAPA (Rodríguez-Rodríguez et al., 2015). Original SIAPA stakeholders included: the PA network manager of the ARM, the OSE and the National Ministry of Environment for rating indicators; and, additionally, the Catalan Institute of Natural History, the Department of Ecology of the Faculty of Biology of the Complutense University of Madrid and the NGO Ecologistas en Acción for rating the 6 SIAPA partial indexes.

2.2. Indicator prioritisation

We compared the ratings given to the SIAPA indicators by PA network managers and scientists. The 43 indicators ($n=12$ managers) and 6 partial indexes ($n=11$ managers) in the Complete Model of the SIAPA were ranked according to the decreasing degree of agreement on their importance by the group of PA network managers using the increasing coefficient of variation (CV) of their responses. Thus, indicators with the highest means and lowest standard deviations (resulting in lowest CVs) were ranked as the most important for the respondents. The CV is considered a robust estimate of inter-observer precision and is widely used for that purpose (Euser et al., 2008), even in non-normal distributions of data (Bonett, 2006). For the group of scientists, given the low number of cases ($n=3$) that resulted in a number of SIAPA indicators having a CV=0 due to the unanimity of responses, we estimated the degree of agreement by ranking the indicators using three tiered criteria: (a) decreasing means; (b) increasing CVs; and (c) decreasing number of responses for each indicator. The difference in order in which each indicator was ranked by both groups according to their decreasing degree of consensus (i.e. indicator ranking by PA

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