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Trends in management plans and guides: 25 years of experience from Southern France

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Trends in management plans and guides: 25 years of experience from Southern France

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This study analysed 14 management plans and guidelines from a 25-year period to understand trends in conservation planning. A Rosetta Stone Analysis was used for the systematic comparison of plans and guidelines. Management plans incorporated management philosophies, management scenarios, opportunities for infrastructure, and plans for data collection by 2000. As of 2010, they incorporated ecosystem services, stakeholders' objectives and methods for storing and analysing data. The results demonstrate the complex nature of management plans, with an important workload for site managers. Recommendations for future planning include adjustments in planning timeframes and a better identification of conservation targets from initial stages.

Keywords: conservation strategies; planning; protected areas; trends

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1. Introduction

Effective environmental governance depends on forming management plans and creating an effective environmental management regime to implement them (Sampford 2002). Past studies (Dearden, Bennett, and Johnston 2005; Stoll-Kleemann, De La Vega-Leinert, and Schultz 2010) have shown substantial changes in environmental governance during recent decades with increased stakeholder participation and greater attention to formal accountability mechanisms. Despite this progress in environmental governance, it has been suggested that priority setting and planning at much finer scales is necessary to allow implementation on the ground or in the water (Sodhi and Ehrlich 2011). Protected area management and evaluation reports insist upon the need to improve the application and use of planning and evaluation to deliver good and consistent management (Leverington *et al.* 2010). Successful strategies in conservation planning and management require clear conceptual frameworks (Sutherland *et al.* 2004; Teofili and Battisti 2011). Since the mid-1970s, a multitude of guides and methodologies have been developed to help land managers improve and adapt their planning techniques (Nilsen and Tayler 1997; Thomas and Middleton 2003; Réserves Naturelles de France 2006; Conservation Measures Partnership 2007; Ramsar Convention Secretariat 2010). As Graham, Amos, and Plumptre (2003) have shown, many of the frameworks follow the steps of standard rational planning, recognising a hierarchy of decisions that need to be made, ranging from inventories and analysis to development of a management concept

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(strategic decisions), and implementation and operations (tactical decisions). Despite these similarities, new management guidelines continue to be developed, raising questions on the content and the reasoning behind the changes.

Management guides are handbooks for conservation planning. The guides are designed to facilitate land managers in the development of effective and efficient management plans (Dale *et al.* 2000). Management plans are documents that describe the management approach and goals for natural areas over time in order to set a framework for decision making (Thomas and Middleton 2003). They address both species and habitats in order to plan for the overall biodiversity of a site (Anderson *et al.* 2002). Management plans are fundamental for public accountability (Dearden, Bennett, and Johnston 2005) as they encapsulate objectives and the activities that help to achieve them. In addition, Schindler *et al.* (2011) showed that management plans (where they do exist) can be the most important source of information uptake by local conservation managers. The management plan has become a key tool for biological conservation and what is not in a plan tends to be considered unimportant (Welch 2005). Establishing a trustworthy plan for environmental management is like putting together a puzzle with many pieces, because management deals with a range of factors concerning not only nature, but also the humans that may be impacted (Renberg *et al.* 2009) and the existing environmental governance schemes in place (Ernoul and Wardell-Johnson 2013).

Management plans are widely used and in many cases required under national or international legislation and conventions such as in Natura 2000 areas, Ramsar sites, National Parks and Nature Reserves (Schindler *et al.* 2011). The existence and implementation of management plans are considered crucial components when evaluating the state of protected areas (Mugisha and Jacobson 2004; Leverington *et al.* 2010). Worldwide studies of protected areas have shown that more than two thirds of protected areas required both the preparation and implementation of a management plan (Dearden, Bennett, and Johnston 2005). Despite the prevalence of management plans, Buckley *et al.* (2008) highlighted the enormous variety, with important differences in levels of detail and frameworks used. Although management plans should be succinct documents (Thomas and Middleton 2003), they have become complex as they attempt to respond to multiple objectives, including legal obligations (Réserves Naturelles de France 2006), fund raising (Thomas and Middleton 2003), as well as providing clear health and safety guidance for visitors and staff (Eurosite 1999) and communicating with other agencies and stakeholders (Chatterjee, Phillips, and Stroud 2008).

Despite the many similarities among the various frameworks, it has been difficult for site managers and conservation organisations to compare and share experiences given the varying terminologies and definitions used in each framework. In order to facilitate sharing and learning between sites, it became necessary to create a common lexicon for biodiversity conservation in order to improve understanding and exchange experiences (Salafsky *et al.* 2008). In response to this deficit, the Conservation Measures Partnership was established in 2002 and it created a Rosetta Stone methodology that presents an analysis of project management systems used by conservation organisations (Conservation Measures Partnership 2007).

Given the decades of experience in developing management plans and now a common terminology, it is possible to analyse management plans and guidelines in order to determine their similarities and differences. This study analysed seven management plans from Southern France (Figure 1) and seven management guidelines (both international and French national guides) from a 25-year time period to understand the trends in

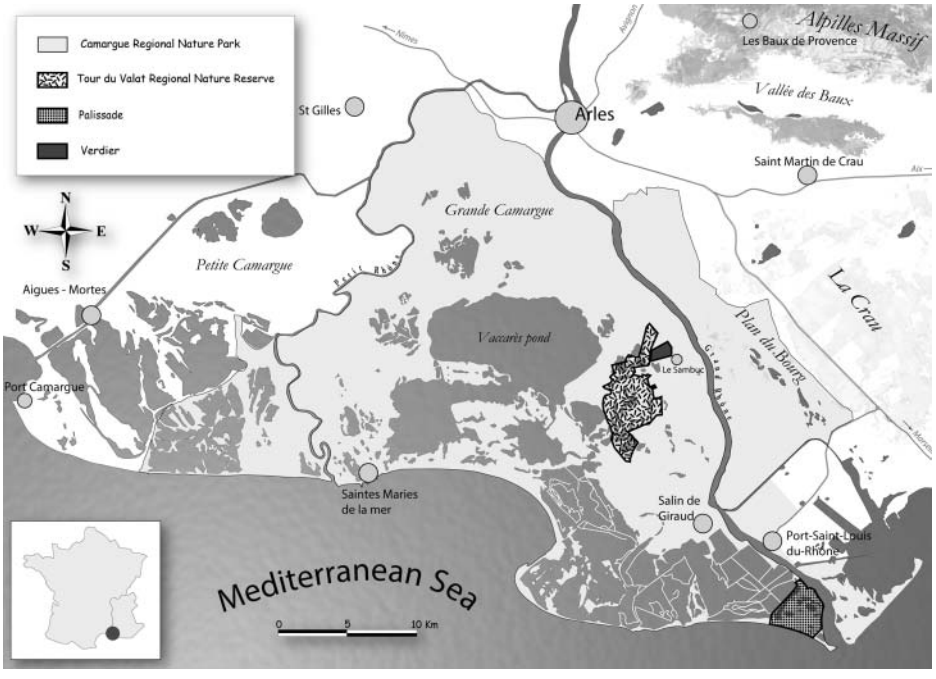

Figure 1. Geographical location of the management plans studied from Southern France.

management planning and determine the gaps and opportunities for the future. Considering the importance and overarching acceptance of the French Natural Reserve (RNF) guide in France, this study made an in-depth analysis of the evolution of the RNF guides between 1998 and 2006 to determine what changes were made over this time period. This analysis can contribute to the development of new planning guides and strategies to improve the efficiency and effectiveness of conservation management in the field.

2. Methodology

2.1. Management plan and guide selection

Considering that the first protected area management plans for nature reserves in France were established in the mid-1980s, we selected seven published management plans from 1986 to 2011 that could demonstrate the changes and trends in management planning. The management plans covered four sites in Southern France. Three of the management plans were for one extensive private reserve, two of the plans were for a public reserve and the other plans were community managed land and a natural regional park. The seven guidelines were selected over the same time period and included both international guides and French national guides. Two guides were selected from the French Nature Reserves (Réserves Naturelles de France 1998, 2006) and two were French *Natura 2000* guides (Valentin-Smith 1998; Souheil *et al.* 2011). The international guides included a Eurosite guide (Eurosite 1999), the Ramsar guidelines (Ramsar Convention Secretariat 2010), and the Open Standards for the Conservation of Biodiversity guide (Conservation Measures Partnership 2007).

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2.2. Criteria for evaluation

The 'Rosetta Stone' approach was used to analyse the selected documents. As the historic Rosetta Stone enabled scholars to decipher for the first time the meaning of the hieroglyphs through the comparison of different languages, the Conservation Measures Partnership Rosetta Stone Analysis is the result of an exercise that compares various management systems used by conservation organisations. It enables practitioners to translate from one system to another and also to learn from one another so that they can refine and improve their systems over time (Salafsky, Margoluis, and Redford 2001). The Rosetta Stone Analysis was used for the systematic comparison of the selected management plans and guidelines. The variables were selected from the authors' previous work and knowledge of management plans and guidelines. The analysis was based on 68 variables spread over four sections: site description and diagnostic (43 variables); management planning (19 variables); adaptive management (one variable); and communication (five variables) (Table 1). The quantity of variables selected for the evaluation process gave more weight to the site diagnostic component than planning and implementing components. This decision reflects our past experience with management plans, demonstrating the priority given to site diagnostics in both management plans and management guidelines. The evaluation grill was tested by having two collaborators independently evaluate the same management plan. The indicators that received differing scores by the evaluators were then discussed in a participative meeting by the evaluation team and the definition and understanding of the indicators were clarified. The management plans were then evaluated by one single member of the evaluation team and the management guidelines were distributed and evaluated by the different members of the team.

2.3. Overall data analysis

To minimise variation in how variables were analysed, the study did not take into account the quality or the quantity of information for each variable. The variables were evaluated only by their presence or absence in the management plan or guide with 0 representing complete absence and 1 representing presence. Using Excel, we tabulated the most common variables individually and by section. We then ranked them by overall frequency, and then by frequency for guides and management plans separately. The variables were then organised by time series, identifying the critical changing points for each variable (overall and by plan or guide).

2.4. In-depth analysis of French Nature Reserve guide

An in-depth analysis of the two versions of the RNF guide was made by the evaluation team made up of seven conservation scientists and practitioners (the authors of this manuscript) to evaluate the changes in variables between the 1998 and 2006 guides. Following the same procedure for the overall analysis, the variables that had changed (either been added or omitted) from the 1998 and 2006 guides were identified. Each member of the panel then ranked the variables that had changed on a scale of 1−3 with 1 representing 'not important' and 3 representing 'great importance' for management planning. The results were discussed in an open forum and then a collective vote was taken to establish a final ranking.

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Table 1. Presence or absence of variables found in management plans in Southern France and management guides over a 25-year period, classed by type of document and given in chronological order.

	Management plans							Management guides								
Management plan/Guide	TdV plan 1986–1990	Palissade plan 1999–2003	TdV plan 2007–10	Palissade plan 2008–13	Camargue Natural Park Charter 2010	Verdier plan 2011–2015	TdV plan 2011–2016	RNF 1998	French Natura 2000, 1998	Eurosite 2001	RNF 2006	Ramsar 2010	Open Standards 2010	French Natura 2000, 2011	Total no.	Total %
Management plan is obligatory	0	0	1	0	1	0	1	0	1	0	0	1	0	0	5	36%
I. SITE DIAGNOSTIC	33	27	39	29	37	39	39	29	35	38	30	32	40	39	486	
A. Perimeter for the management plan	3	3	3	3	3	3	3	3	3	3	3	2	3	3	41	
Geographic locality is given	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	93%
Site perimeter established and boundaries	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Definition of boundries explained (protection status, ownership, ecological unity).	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
B. Understanding the context	17	15	19	15	15	19	18	17	15	19	16	14	18	19	236	
B.1. Anyalsis of the situation	1	1	2	1	2	2	2	2	1	2	2	0	2	2	22	
Legal context and status	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	93%
Use of previous management plan evaluation.	0	0	1	0	1	1	1	1	0	1	1	0	1	1	9	64%
B.2. Environment and natural patrimony	16	14	17	14	13	17	16	15	14	17	14	14	16	17	214	
Evalaute existing knowledge	1	1	2	2	2	2	2	2	0	2	2	2	1	2	23	
Existing knowledge on natural patrimony taken into account	1	1	1	1	1	1	1	1	0	1	1	1	1	1	13	93%
Needs for increased knowledge identified	0	0	1	1	1	1	1	1	0	1	1	1	0	1	10	71%
Understanding the site functioning	4	4	4	3	2	4	4	4	4	4	2	1	4	4	48	

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Table 1. (*Continued*)

	Management plans							Management guides								
Management plan/Guide	TdV plan 1986–1990	Palissade plan 1999–2003	TdV plan 2007–10	Palissade plan 2008–13	Camargue Natural Park Charter 2010	Verdier plan 2011–2015	TdV plan 2011–2016	RNF 1998	French Natura 2000, 1998	Eurosite 2001	RNF 2006	Ramsar 2010	Open Standards 2010	French Natura 2000, 2011	Total no.	Total %
Factors influencing the ecological evolution of the site (erosion, sedimentation, salinisation, etc.)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Historical evolution of the site (ownership, land use, etc.)	1	1	1	1	1	1	1	1	1	1	1		1	1	13	93%
Existing infrastructure	1	1	1	1	0	1	1	1	1	1	0	0	1	1	11	79%
Global site analysis	1	1	1	0	0	1	1	1	1	1	0	0	1	1	10	71%
Description of the patrimony	11	9	11	9	9	11	10	9	10	11	10	11	11	11	143	
Habitats identified	1	1	1	1	1	1	1	0	1	1	1	1	1	1	13	93%
Ecological unit considered	1	1	1	1	0	1	1	1	1	1	0	1	1	1	12	86%
Bird inventories	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Reptile and amphibian inventories	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Mammal inventories	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Other species inventories	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Other patrimony (historical, culture, geology, archeology, etc.)	1	0	1	0	1	1	1	1	0	1	1	1	1	1	11	79%
Evaluation of the natural patrimony value	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Red list or other protected species taken into account	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
State of conservation for natural patrimony	1	0	1	0	0	1	1	0	1	1	1	1	1	1	10	71%
Links outside of site	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	93%
C. Actors and public	4	3	6	4	7	7	7	4	7	7	4	7	7	7	81	
Stakeholder identification	1	0	1	0	1	1	1	0	1	1	0	1	1	1	10	71%
Management authorities	0	0	1	1	1	1	1	0	1	1	1	1	1	1	11	79%

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Table 1. (*Continued*)

	Management plans							Management guides								
Management plan/Guide	TdV plan 1986–1990	Palissade plan 1999–2003	TdV plan 2007–10	Palissade plan 2008–13	Camargue Natural Park Charter 2010	Verdier plan 2011–2015	TdV plan 2011–2016	RNF 1998	French Natura 2000, 1998	Eurosite 2001	RNF 2006	Ramsar 2010	Open Standards 2010	French Natura 2000, 2011	Total no.	Total %
Groups that could be impacted or influence the site	1	0	1	0	1	1	1	1	1	1	0	1	1	1	11	79%
Socio-economic activities in the site	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Socio-economic activities around the site	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Stakeholders' objectives	0	0	0	0	1	1	1	0	1	1	0	1	1	1	8	57%
Interaction between actors and natural patrimony	0	1	1	1	1	1	1	1	1	1	1	1	1	1	13	93%
D. Threats	2	2	3	2	2	2	2	2	3	1	2	2	3	3	31	
Direct threats	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Indirect threats	1	1	1	1	1	1	1	1	1	0	1	1	1	1	13	93%
Prioritization of threats	0	0	1	0	0	0	0	0	1	0	0	0	1	1	4	29%
E. Stakes, opportunities and site potential	6	3	8	5	9	8	9	2	6	7	5	6	9	7	90	
Targets	1	1	1	1	1	1	1	0	1	1	1	1	1	1	13	93%
Prioritisation of stakes	1	0	1	0	0	0	1	0	1	0	1	0	1	1	7	50%
Socio-economic stakes	1	1	1	1	1	0	1	0	1	0	1	1	1	1	11	79%
Patrimonial stakes	1	1	1	1	1	1	1	0	1	1	1	1	1	1	13	93%
Environmental education stakes	1	0	1	1	1	1	1	0	1	1	1	1	1	1	12	86%
Ecosystem service stakes	0	0	0	0	1	1	1	0	1	0	0	1	0	1	6	43%
Potentialities for nature interpretation	0	0	1	1	1	1	1	1	0	1	0	0	1	0	8	57%
Socio-economic potentials	0	0	1	0	1	1	1	0	0	1	0	0	1		6	43%
Biological potentials	1	0	0	0	1	1	0	1	0	1	0	1	1	1	8	57%
Infrastructure potentials	0	0	1	0	1	1	1	0	0	1	0	0	1	0	6	43%
F. Management scenarios	1	1	0	0	1	0	0	1	1	1	0	1	0	0	7	

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Table 1. (*Continued*)

	Management plans							Management guides								
Management plan/Guide	TdV plan 1986–1990	Palissade plan 1999–2003	TdV plan 2007–10	Palissade plan 2008–13	Camargue Natural Park Charter 2010	Verdier plan 2011–2015	TdV plan 2011–2016	RNF 1998	French Natura 2000, 1998	Eurosite 2001	RNF 2006	Ramsar 2010	Open Standards 2010	French Natura 2000, 2011	Total no.	Total %
Existing management scenarios	1	1	0	0	1	0	0	1	1	1	0	1	0	0	7	50%
2. MANAGEMENT PLANNING	10	5	12	11	7	12	14	5	10	15	3	13	19	11	147	
2.1 Activity planning	0	0	1	0	1	1	1	0	1	0	0	1	1	1	8	
Management philosophy	0	0	1	0	1	1	1	0	1	0	0	1	1	1	8	57%
2.1.1 Goals and objectives	2	2	2	2	2	2	2	3	1	2	2	3	3	2	30	
Goals	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Objectives	1	1	1	1	1	1	1	1	0	1	1	1	1	1	13	93%
Results chain analysis	0	0	0	0	0	0	0	1	0	0	0	1	1	0	3	21%
2.1.2 Defining the means	5	3	6	5	3	5	7	2	6	10	1	4	10	6	73	
Activities identified	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	100%
Roles and responsibilities clarified	1	0	1	0	1	1	1	0	1	1	0	1	1	1	10	71%
Existing human resources	1	1	0	1	0	1	1	0	0	1	0	0	1	0	7	50%
Human resource needs detailed	1	1	1	1	0	0	1	1	0	1	0	1	1	0	9	64%
Organisational chart	0	0	1	0	0	0	1	0	0	1	0	0	1	0	4	29%
Detailed existing funding	0	0	1	0	0	0	1	0	0	1	0	0	1	0	4	29%
Funding needs	0	0	1	1	0	0	1	0	1	1	0	1	1	1	8	57%
Funding plan	0	0	0	0	0	0	0	0	1	1	0	0	1	1	4	29%
Training needs	0	0	0	0	0	1	0	0	1	1	0	0	1	1	5	36%
Partners	1	0	0	1	1	1	0	0	1	1	0	0	1	1	8	57%
2.2 Monitoring and evaluation plan	3	0	3	4	1	4	4	0	2	3	0	5	5	2	36	
SMART indicators	1	0	1	1	1	1	1	0	1	1	0	1	1	1	11	79%
Data collection methods	1	0	0	1	0	1	0	0	1	1	0	1	1	1	8	57%
Data collection plan	0	0	1	0	0	1	1	0	0	1	0	1	1	0	6	43%
Roles and responsibilities for data collection	1	0	0	1	0	1	1	0	0	0	0	1	1	0	6	43%

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Table 1. (*Continued*)

	Management plans							Management guides								
Management plan/Guide	TdV plan 1986–1990	Palissade plan 1999–2003	TdV plan 2007–10	Palissade plan 2008–13	Camargue Natural Park Charter 2010	Verdier plan 2011–2015	TdV plan 2011–2016	RNF 1998	French Natura 2000, 1998	Eurosite 2001	RNF 2006	Ramsar 2010	Open Standards 2010	French Natura 2000, 2011	Total no.	Total %
Data storage and treatment	0	0	1	1	0	0	1	0	0	0	0	1	1	0	5	36%
3. ADAPTION	0	1	0	0	1	1	0	1	0	1	1	1	1	0	8	
Adaptive management	0	1	0	0	1	1	0	1	0	1	1	1	1	0	8	57%
4. COMMUNICATION	2	0	0	0	2	2	0	0	4	5	0	1	5	5	26	
Dissimenation strategy	1	0	0	0	1	1	0	0	1	1	0	1	1	1	8	57%
Human resources for dissemination	1	0	0	0	1	0	0	0	1	1	0	0	1	1	6	43%
Human resources for communication	0	0	0	0	0	0	0	0	1	1	0	0	1	1	4	29%
Knowledge and information necessary for communication	0	0	0	0	0	1	0	0	0	1	0	0	1	1	4	29%
Funding for communication	0	0	0	0	0	0	0	0	1	1	0	0	1	1	4	29%
5. ANNEXES	1	0	1	0	1	1	1	1	1	1	1	1	1	1	12	
Bibliography, maps, aerial photos	1	0	1	0	1	1	1	1	1	1	1	1	1	1	12	86%
Total variables	46	33	53	40	49	55	55	36	51	60	35	49	66	56	684	
Total%	67%	48%	77%	58%	71%	80%	80%	52%	74%	87%	51%	71%	96%	81%	71%	

3. Results

3.1. Overall results

Of the 68 variables considered, 13 were found in all of the management plans and guides (Table 2) and 39 variables were found in the majority (50% to 93%). There were eight variables that were found in less than 30% of the plans or guides (Table 2). All of the guides and guidelines included a higher percentage of variables from the site diagnostic as compared to actual site management and planning. Only two guides (Open Standards and Eurosite) contained more than 60% of the planning variables.

3.2. Temporal trends

When analysing the temporal changes in management plans and guides over the 25-year period, we could identify the evolution of several variables. The expectations and objectives of local stakeholders were not found in the selected plans or guides prior to 2000. After 2000, the management plans began to incorporate management philosophies, management scenarios, opportunities for infrastructure and plans for data collection. As of 2010, the selected management plans began incorporating ecosystem services, objectives of the stakeholders and the methods for storing and analysing data.

3.3. Comparison of management plans and management guides

Clear differences in variables can also be found between management plans and guides. Despite the recommendation of several management guides, none of the management plans included: the results chain analysis, a detailed financial plan, identification of human resources and funding for communications, nor the identification of training needs. The guides set a higher standard for management planning as 18 variables were common for all the guides as opposed to 13 for all the management plans. The variables that were present in all the guides but not all of the plans include: an analysis of the interactions between the stakeholders and the natural patrimony, links with the processes and functioning outside of the site, adaptive processes, clear management objectives and an analysis of the evolution of the site. The most complete guide according to this study was the Open Standards for the Practice of Conservation. This guide included all of the variables except ecosystem services stakes, management scenarios and the identification of priorities to improve knowledge concerning the site.

3.4. An in-depth analysis of the French National Reserve guide

The in-depth analysis of the evolution of RNF guides between 1998 and 2006 highlighted the trends in conservation planning in France. The variables that were not present in 1998 but were added to the RNF 2006 guide included the identification of socio-economic stakes (although some plans nevertheless included them earlier on), official authorities, conservation state for natural patrimony and environmental education stakes. The exercise prioritising stakes was also included. When analysing the relevance of these additional variables, the identification of social-economic stakes, definition of the conservation state for natural patrimony, the identification of habitats and the prioritisation of stakes were considered as highly important. The other variables were considered to be less important because they gave standardised information or were not relevant for all sites.

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Table 2. Frequency of variables found in management plans in Southern France and management guides over a 25-year period.

Always/Almost always found (between 93−100%)	Frequently found (between 50−86%)	Less frequently found (between 31−49%)	Rarely found (≤30%)
• Geographic locality is given • Site perimeter established and boundaries • Definition of boundaries explained (protection status, ownership, ecological unity) • Legal context and status • Existing knowledge on natural patrimony taken into account • Factors influencing the ecological evolution of the site (erosion, sedimentation, salinisation, etc.) • Historical evolution of the site (ownership, land use, etc.) • Habitats identified • Bird inventories • Reptile and amphibian inventories • Mammal inventories • Other species inventories • Evaluation of the natural patrimony value • Red list or other protected species taken into account • Patrimonial stakes • Socio-economic activities in the site • Socio-economic activities around the site • Links outside of site • Interaction between actors and natural patrimony	• Use of previous management plan evaluation • Global site analysis • State of conservation for natural patrimony • Other patrimony (historical, culture, geology, archeology, etc.) • Management authorities • Potentialities for nature interpretation • Biological potentials • Ecological unit considered • Environmental education stakes • Socio-economic stakes • Prioritisation of stakes • Existing infrastructure • Needs for increased knowledge identified • Groups that could be impacted or influence the site • Stakeholder identification • Stakeholders' objectives • Existing management scenarios • Management philosophy • SMART indicators • Existing human resources • Human resource needs detailed • Partners • Roles and responsibilities clarified • Funding needs	• Management plan is obligatory • Ecosystem service stakes • Socio-economic potentials • Infrastructure potentials • Data collection plan • Data storage and treatment • Roles and responsibilities for data collection • Human resources for dissemination training needs	• Prioritisation of threats • Results chain analysis • Detailed existing funding • Organisational chart • Funding plan • Human resources for communication • Knowledge and information necessary for communication • Funding for communication

(*continued*)

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Table 2. (*Continued*)

Always/Almost always found (between 93−100%)	Frequently found (between 50−86%)	Less frequently found (between 31−49%)	Rarely found (≤30%)
• Targets • Direct threats • Indirect threats • Goals • Objectives • Activities identified	• Data collection methods • Adaptive management • Dissemination strategy • Bibliography, maps, aerial photos		

The inclusion of habitats in the 2006 guide coincided with the establishment of the European Habitat Directive and Natura 2000 network (Mücher *et al.* 2009), allowing the sites to better incorporate into the new initiative. The 1998 guide used ecological functional units to help determine the sites' conservation objectives rather than specific habitats. Ecological functional units are ecologically homogeneous tracts of land at the intended scale, which can be mapped by simultaneously considering land attributes, such as landforms, soil, vegetation, as well as human alteration of them (Zonneveld 1989). They may contain many different habitat types listed by the EU Habitat Directive and have been shown to be effective in determining conservation management strategies (Geneletti and van Duren 2008). Despite their importance, this concept was no longer found in the 2006 guide. The use of ecological functional units found in the 1998 version was considered extremely important because ecological functional units helped to manage a complex of habitats that create a complete working structure (Johnson *et al.* 2010; Ioppolo, Saija, and Salomone 2013). This concept allowed the site managers to identify the unit that should be conserved and to manage the associated habitats accordingly (Mörtberg, Balfors, and Knol 2007). Other variables were previously present in the 1998 guide; however, they were no longer present when the new 2006 guide was published. These variables include: potential for interpretation, biological potential, justification of management scenarios, overall site analysis, and identification of local stakeholders. The authors regretted that the overall site analysis and biological potential were eliminated.

4. Discussion

The commonalities found amongst the plans and guides could be in part due to the influence of regional and international agreements (Rochette and Billé 2012) that require certain standards and have in consequence led to the development and promotion of multiple planning guides and training workshops. Given the importance of management plans for public accountability, it has become indispensible for protected areas to incorporate different aspects of planning in order to maintain continued funding opportunities (Thomas and Middleton 2003). Despite the use of management plans for funding, previous evaluations have shown that lack of detailed financial planning has had a negative impact on conservation management (Ervin 2003) and has led to a deficit of information relating to the costs of biodiversity conservation (Armsworth *et al.* 2011).

One variable that was absent from all of the evaluated management plans was result chains (see Margoluis *et al.* 2013 for more on results chains). This aspect of planning is

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highly important as it makes assumptions about how the project will contribute to reducing threats, leading to the conservation of priority targets (Foundations of Success 2007). The absence of result chains and prioritisation of threats could lead to operational activities that have little impact on nature conservation on the ground (Leverington *et al.* 2010). This is intensified as conservation planners have devoted considerable resources to representing the elements of biodiversity within a system of conservation areas, but traditionally have paid only scant attention to the factors responsible for the long-term persistence of conservation targets (Groves *et al.* 2002).

The temporal changes in management plans and guides over the 25-year period show that the expectations and objectives of local stakeholders were not integrated into the selected plans or guides prior to 2000. Extensive research (as seen through Himes 2007; Milligan *et al.* 2009; Waudby, Petit, and Robinson 2012; Guiral 2013) has shown that stakeholders and conservation managers' perceptions pertaining to site management are at times divergent, yet extremely important to take into consideration for successful project implementation. The addition of this variable in management plans and guides is a positive contribution to this strategy and has the potential to improve environmental governance within the sites (Andrade and Rhodes 2012; Young *et al.* 2013).

After 2000, the management plans began to incorporate management philosophies, management scenarios, opportunities for infrastructure and plans for data collection. As of 2010, the selected management plans began incorporating ecosystem services, objectives of the stakeholders and the methods for storing and analysing data. We acknowledge that the sampling size and location of management plans may bias the results, and management plans in other locations may have incorporated these elements at an earlier date. However, these trends in management plans mirror those found in scientific conservation literature, with an increasing number of articles devoted to ecosystem services (Schwartz *et al.* 2000), participatory processes (Andrade and Rhodes 2012) and scenario building. The incorporation of ecosystem services into conservation planning has allowed site managers to consider the complex interactions between the structures, processes and services of an ecosystem across the landscape (Paavola and Hubacek 2013), although it has also been argued that this shift in reasoning from biodiversity to ecosystem services may have a negative impact on nature conservation (Reyers *et al.* 2012). Scenarios span the range of uncertainty of climate change and biotic response modelling, capturing important management variables (Hannah, Midgley, and Millar 2002). This process permits conservation planners to develop more resilient conservation policies when faced with uncontrollable, irreducible uncertainty (Peterson, Cumming, and Carpenter 2003).

All of the guides and guidelines allocated more effort to increasing knowledge about the site as compared to actual site management planning. The site diagnostic is extremely important to help determine management objectives (Thomas and Middleton 2003) and to have one document that embodies the 'memory of the site' (Bioret 2003). Despite the importance of the site diagnostic, this knowledge does not necessarily contribute to the hands-on management of the sites or improve the environmental governance. The planning component of the management plan sets the framework for the daily/weekly/yearly activities that will be carried out. There is some speculation that over-detailed work plans and financial planning may give way to 'gardening' in protected areas (Bioret 2003), yet without a clear work plan and confirmed funding, the risks increase of having management plans that are not implemented.

RNF guides are dominant for protected sites in France. The in-depth analysis of the guides from 1998 and 2006 demonstrated an increased importance given to

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socio-economic factors, habitats and existing conservation state. Despite these advancements, the removal of ecological functional units was a step backwards. In the 2006 guide, conservation targets were set in individual habitats (as seen in Natura 2000 terminology) which could lead to the complete working structure found in ecological functioning units to be overlooked (Johnson *et al.* 2010). Other setbacks in the 2006 guide were the absence of overall site analysis (in favour of habitat analysis) and biological potential (limiting restoration activities).

5. Conclusions and recommendations

This study has allowed us to identify the major trends in conservation planning by analysing selected management plans and management guidelines. The results confirm the complexification of management plans as shown previously by Zanon and Geneletti (2011), with an important workload for site managers (Bioret 2003). Despite substantial growth in the field of conservation planning, the speed and success with which conservation plans are converted into conservation action remains limited (Reyers *et al.* 2010). At this point it seems imperative to identify the essential components of management plans and protected area planning to determine how to make the process more effective on the ground. The first component that we will address is the timeframe for management plans. Given that the site diagnostic is very cumbersome and the elements may not change drastically over a five-year period, we recommend separating the diagnostic from the operational management activities. In our analysis, we divided the management plan into site diagnostic and planning categories. The planning component could be further broken down into long-term strategic goals and short-term operational activities. When doing this, we propose one document that includes the site diagnostic and the long-term strategic goals. This document could serve as a reference document for the site and have a longer duration than the operational planning. Two distinct documents with two distinct timescales would shift the weight between the diagnostic and planning, placing more importance on actual site management.

The second component that should be addressed is the identification of conservation targets from the initial stages (as recommended in the Open Standards). This selection process allows the site manager to focus the diagnostic and the management activities on priority targets rather than being overwhelmed by the complexities and details of the site (Groves *et al.* 2002). The selection of conservation targets will also bolster communication for the site and help prioritise actions. The incorporation of these changes in protected area management planning could facilitate the elaboration of management plans in the future and redirect the formal planning process into a more operational planning tool for effective environmental governance.

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