



## VISITOR MANAGEMENT IN PROTECTED AREAS: A MULTI-SCALE AND MULTI-METHOD ANALYSIS IN THE AFTERMATH OF THE COVID-19 PANDEMIC

**Maria Esperanza Medina Chavarria**

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ROVIRA i VIRGILI

# Visitor Management in Protected Areas

A multi-scale and multi-method analysis in the  
aftermath of the COVID-19 pandemic

MARIA E. MEDINA-CHAVARRIA



DOCTORAL THESIS

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UNIVERSITAT ROVIRA I VIRGILI

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**Visitor Management in Protected Areas**

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Doctoral Thesis

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Vila-seca

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FAIG CONSTAR que aquest treball, titulat "Visitor Management in Protected Areas: A multi-scale and multi-method analysis in the aftermath of the COVID-19 pandemic", que presenta Maria Esperanza Medina Chavarria per a l'obtenció del títol de Doctor, ha estat realitzat sota la meva direcció al Departament de Geografia d'aquesta universitat.

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HAGO CONSTAR que el presente trabajo, titulado "Visitor Management in Protected Areas: A multi-scale and multi-method analysis in the aftermath of the COVID-19 pandemic", que presenta Maria Esperanza Medina Chavarria para la obtención del título de Doctor, ha sido realizado bajo mi dirección en el Departamento de Geografía de esta universidad.

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I STATE that the present study, entitled "Visitor Management in Protected Areas: A multi-scale and multi-method analysis in the aftermath of the COVID-19 pandemic", presented by Maria Esperanza Medina Chavarria for the award of the degree of Doctor, has been carried out under my supervision at the Department of Geography of this university.

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Maria Esperanza Medina Chavarria

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## Contents

Abstract .....	1
Resumen .....	3
Resum.....	5
<b>Part 1: Introduction .....</b>	<b>7</b>
Chapter 1: Research presentation .....	9
1.1. Background.....	9
1.2. Research aims .....	12
1.3. Dissertation outline.....	14
<b>Part 2: Theoretical framework .....</b>	<b>17</b>
Chapter 2: Protected Areas and tourist mobilities.....	19
2.1. Contested human- nature relationship .....	19
2.2. Contextualizing visitation within Protected Areas management.....	22
Chapter 3: Visitor management.....	27
3.1. The role of visitor management in Protected Areas .....	27
3.2. The multifaceted purpose of visitor management .....	28
3.3. Evolution of frameworks and paradigms on visitor management.....	30
Chapter 4: Crisis and adaptation .....	35
4.1. Crisis-driven changes in the context of tourism .....	35
4.2. Adaptability of Protected Areas as social-ecological systems .....	37
4.3. The crisis of the COVID-19 pandemic.....	38
<b>Part 3: Methodology .....</b>	<b>41</b>
Chapter 5: Research design .....	43
5.1. Pragmatic paradigm and mixed methodology .....	43
5.2. Research strategies .....	46
5.2.1. Documentary research .....	46
5.2.2. Case: Semi-structured questionnaires and focus group .....	48
5.2.3. Survey .....	50
<b>Part 4: Empirical Cases .....</b>	<b>53</b>
Chapter 6: The impact of COVID-19 in protected areas management: A review of emerging challenges, responses, and future research lines in the post-pandemic context.....	55
6.1. Introduction .....	56
6.2. Method.....	57
6.3. Findings .....	59
6.3.1. Group A: Description of the studies .....	59
6.3.2. Group B: Multiscale effects of the pandemic on PAs.....	62

6.3.3. Group C: Changes in the public use of PAs .....	64
6.3.4. Group D: Managerial adaptation during the pandemic.....	67
6.3.5. Group E: Rethinking PAs management at a mid- and long-term .....	69
6.3.6. Group F: Emerging research agenda.....	70
6.4. Discussion.....	70
6.5. Conclusion .....	72
Chapter 7: The response to increasing numbers of visitors to Catalonia’s protected natural areas during the COVID-19 Pandemic: a review from publications in digital media. ....	75
7.1. Introducció.....	76
7.2. Revisió de literatura.....	78
7.2.1. Gestió de los flujos de visitantes en Espacios Naturales Protegidos .....	78
7.2.2. Turismo de proximidad y Espacios Naturales Protegidos .....	79
7.2.3. Los efectos de la pandemia en Espacios Naturales Protegidos.....	80
7.3. Contexto territorial .....	83
7.3.1. Área de estudio .....	83
7.3.2. Espacios Naturales Protegidos en el contexto de la COVID-19.....	85
7.4. Fuentes y métodos .....	86
7.5. Resultados.....	91
7.6. Discusión .....	95
7.7. Conclusiones.....	97
7.7.1. Consideraciones finales .....	97
7.7.2. Limitaciones.....	98
7.7.3. Futuras líneas de Investigación.....	98
Chapter 8: Managing visitor flows in protected areas in a context of changing mobilities: An analysis of challenges, responses, and learned lessons during the pandemic in Tarragona Province (Spain).....	101
8.1. Introduction .....	102
8.2. Methodology.....	106
8.2.1. Study area.....	106
8.2.2. Method .....	108
8.3. Results .....	110
8.3.1 Preliminary stakeholders’ views: Change in priorities and short-term measures..	110
8.3.2. Managers’ experiences: Emerging topics discussed.....	112
8.4. Discussion.....	118
8.5. Conclusions .....	120
Chapter 9: Factors influencing visitors' acceptance of traffic management strategies in the Ebro Delta Natural Park, Catalonia.....	123
9.1. Introduction .....	124

9.2. Background.....	125
9.2.1. Visitor and traffic management in natural and protected areas .....	125
9.2.2. Understanding visitors’ perceptions of flow and traffic management.....	127
9.3. Methods .....	129
9.3.1. Study area.....	129
9.3.2. Data collection and sampling.....	131
9.3.4. Variables .....	132
9.3.5. Empirical approach .....	134
9.4. Results .....	135
9.4.1. Descriptive statistics .....	135
9.4.2. Ordinal logistic regression .....	137
9.5. Discussion.....	140
9.6. Conclusions .....	143
<b>Part 5: Discussion and Conclusions .....</b>	<b>145</b>
Chapter 10: Discussion.....	147
10.1. Main findings.....	147
10.2. Theoretical and practical contributions of the research.....	153
Chapter 11: Conclusions .....	157
11.1. Final remarks .....	157
11.2. Limitations.....	159
11.3. Future research lines .....	160
<b>References .....</b>	<b>163</b>
<b>Appendix .....</b>	<b>181</b>



## List of figures

Figure 1. Theoretical framework.....	14
Figure 2. Ecosystem services from Protected Areas .....	20
Figure 3. Evolution of Visitation Paradigms.....	24
Figure 4. Definitions of Visitor Management .....	27
Figure 5. Scopes of Tourism Crises .....	36
Figure 6. Stages of the systematic literature review.....	58
Figure 7. Distribution of locations examined in the articles reviewed.....	62
Figure 8. Espacios Naturales Protegidos en Cataluña.....	84
Figure 9. Cantidad de artículos consultados según mes de publicación. ....	91
Figure 10. Distribución de medidas aplicadas en los ENP: protocolos sanitarios (a), información y educación ambiental (b), control de aforos (c), gestión de visitantes dentro del ENP (d) y gestión de los accesos a los ENP (e). ....	92
Figure 11. Acciones implementadas en accesos a ENP: Parc Natural del Montseny (izquierda) y Espai Natural de les Guílleries (derecha). ....	94
Figure 12. Infografía de la campaña "Parcs Naturals sí, però”amb civisme" .....	95
Figure 13. Protected Areas of the Tarragona Province according to the Law 12/1985 and the Plan of Areas of Natural Interest of Catalonia. ....	107
Figure 14. Issues ranked by stakeholders before and during the pandemic.....	111
Figure 15. Study area- The Ebro Delta. ....	129
Figure 16. Management measures implemented at the Ebro Delta Natural Park: (Top left) Advice on regulated areas between the Eucalyptus Beach and the Trabucador Beach. (Top right) Park meter installed at La Marquesa Beach. (Bottom left) Multi-tiered fee scheme implemented at Trabucador Beach. (Bottom right) Control barrier installed at Trabucador Beach.....	131
Figure 17. Survey locations.....	132

## Appendix

Figure A. 1: Example of Academic Articles Selection and Systematic Revision Process ....	181
Figure A. 2: Example of database about articles published in digital media. ....	182
Figure A. 3: Example of emerging codes interactions to determine thematic patterns from the PAs Managers focus group through Atlas.ti. ....	183
Figure A. 4: Semantic Network developed through Atlas.ti showing the relationship among the codes and dimensions used in the thematic analysis.....	184
Figure A. 5: Example of variables included in the Ordinal Logistic Regression Model .....	185

UNIVERSITAT ROVIRA I VIRGILI

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THE COVID-19 PANDEMIC

Maria Esperanza Medina Chavarria

## List of tables

Table 1. Research objectives and research questions.....	12
Table 2. Publications summary .....	14
Table 3. Research design.....	45
Table 4. Research questions and themes of analysis in the systematic literature review. ....	59
Table 5. Summary of the articles reviewed and findings per thematic group.....	60
Table 6. Descriptive attributes of the articles reviewed. ....	61
Table 7. Variación en el número de visitantes en Julio y Agosto del año 2020 con respecto al mismo período de 2019 en ENPE gestionados por el DTS de la Generalitat de Catalunya .....	86
Table 8. Espacios Naturales de Protección Especial incluidos en el análisis. ....	88
Table 9. Acciones implementadas en los ENP, reportadas por medios de comunicación digital.....	90
Table 10. Number of interventions per participant .....	110
Table 11. Pre-established categories and coding dimensions .....	112
Table 12. Emerging thematic units .....	113
Table 13. Variables .....	133
Table 14. Descriptive statistics of the sample by type of visit, sociodemographic characteristics, and acceptance of measures implemented in parking lots. ....	136
Table 15. Results of ordinal logistic regression .....	139



## List of Acronyms

COVID-19	Coronavirus disease of 2019
BCN	Barcelona
CAQDAS	Computer-assisted qualitative data analysis software
DTS	Departamento de Territorio y Sostenibilidad
ECOS	Ecotourism Opportunity Spectrum
ECST	European Charter of Sustainable Tourism
EDNP	Ebro Delta Natural Park
EIN	Espacios de Interés Natural
ENP	Espacio natural protegido
ENPE	Espacios Naturales de Protección Especial
IUCN	International Union for Conservation of Nature
LAC	Limits of Acceptable Change
PA- PAs	Protected area (s)
PAVIM	Protected Area Visitor Impact Management
PEIN	Plan de Espacios de Interés Natural
PNIN	Paraje Natural de Interés Nacional
ROS	Recreation Opportunity Spectrum
SES	Social-ecological system
TOMM	Tourism Optimization Management Model
TOS	Tourism Opportunity Spectrum
VAMP	Visitor Activity Management Process
VERP	Visitor Experiences and Resource Protection
VIM	Visitor Impact Management
VM	Visitor Management

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# Abstract

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The development of nature-based tourism in protected areas has provided benefits for financing their functioning and increasing users' awareness about the values offered by nature. However, interest in protected areas has also sparked conflicts among stakeholders due to differing perspectives on how these areas should be valued, used, and/or enjoyed. The COVID-19 pandemic has worsened such conflicts by causing changes in visitor behavior, eventually resulting in the degradation of ecosystems and overcrowding. Because of such situations, adaptive visitor management plays a crucial role in addressing stakeholder tradeoffs and enhancing users' experiences through providing assistance, information, and environmental education, and attending to visitor distribution in crowded areas.

This dissertation pays attention to the disproportionate consequences of the pandemic on visitor flows, which triggered several transformations in management strategies. The study aims to analyze the effects of the COVID-19 pandemic as a catalyst for change in the complex visitor management process in protected areas. For this, a mixed methodology combining quantitative and qualitative data collection is employed. This approach enables a thorough examination and incorporation of data from both primary (stakeholders, visitors) and secondary sources (official statistics, news in the media). Herein, a variety of techniques, such as content analysis, theme analysis, and statistical procedures were used in the interpretation of the data. Additionally, a multiscale perspective has been adopted. First, the dissertation argues and brings attention to the global-scale impact of the pandemic on protected areas management. Second, managers' and stakeholders' responses have been analyzed at regional (Catalonia) and local (Province of Tarragona) scales. Finally, visitors' attitudes toward implemented management measures in a specific site (Delta del Ebro Natural Park) have been explored.

The dissertation explores the relationship between protected areas and tourism, the concept and purpose of visitor management, and the role of crisis and adaptation in the development of tourism in protected areas. The findings have confirmed the multilevel global implications of the sanitary crisis, which extended to both the overall management of protected areas and to public usage within these areas. Subsequently, it has emphasized the need to adopt multidisciplinary and multiperspective approaches for an in-depth understanding of the implications identified, especially related to the management of visitor uses. It further revealed the strong reliance regional and local policies have on the control and regulation of visitors. Moreover, it confirmed that the pandemic intensified existing structural issues, such as a lack

of coordination among stakeholders or bureaucracy as well as emerging issues related to visitors' behavior and overcrowding. Furthermore, the important role of satisfaction in explaining visitors' responses towards management measures has been underscored. In conclusion, the dissertation offers valuable insights for addressing functional visitor management and enhancing managers' and stakeholders' proactivity and their ability to foresee changes in the post-pandemic context. This study also contributes to the understanding of the adaptability of protected areas as social-ecological systems in the face of a contemporary crisis.

## Resumen

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El desarrollo del turismo de naturaleza en áreas protegidas ha generado beneficios que han permitido financiar el funcionamiento de estas áreas y, a su vez, concienciar a los usuarios sobre la necesidad de los ecosistemas. Sin embargo, este interés en las áreas protegidas también ha generado conflictos entre los actores implicados, debido a sus diferentes percepciones sobre cómo deberían valorarse, utilizarse y/o disfrutarse. La pandemia de la COVID-19 ha agravado estos conflictos, causando cambios en el comportamiento de los visitantes, que eventualmente resultaron en aglomeraciones e impactos negativos en los ecosistemas. La gestión adaptativa de visitantes es crucial en el momento de abordar los intereses de los actores involucrados y también en mejorar las experiencias de los usuarios, mediante asistencia, información, educación ambiental, y una adecuada distribución de los visitantes para evitar aglomeraciones en algunas áreas.

Esta tesis de doctorado presta atención a las consecuencias que, a raíz de la pandemia, se generaron en los flujos de visitantes en áreas protegidas, lo cual desencadenó una serie de transformaciones en las estrategias de gestión. El objetivo del estudio es analizar los efectos de la pandemia de COVID-19 como catalizador de cambio en el complejo proceso de gestión de visitantes en áreas protegidas. Para lograr este objetivo, se emplea una metodología mixta que combina la recolección de datos cuantitativos y cualitativos. Este enfoque permite una exploración exhaustiva y la incorporación de datos tanto de fuentes primarias (agentes y visitantes), como secundarias (estadísticas oficiales y noticias en los medios de comunicación). Para interpretar los datos se implementaron diversas técnicas, como el análisis de contenidos, el análisis temático y procedimientos estadísticos. Además, se ha adoptado una perspectiva multiescalar. En primer lugar, la tesis ha permitido discutir sobre el impacto a escala global de la pandemia en la gestión de áreas protegidas. En segundo lugar, sobre la respuesta de los gestores y los agentes implicados, tanto a escala regional (Cataluña), como local (Provincia de Tarragona). En tercer y último lugar, sobre las actitudes de los visitantes hacia las medidas de gestión implementadas en un espacio natural protegido, como es el Parque Natural del Delta del Ebro.

La tesis ha cubierto la relación entre las áreas protegidas y el turismo, el concepto y propósito de la gestión de visitantes y el papel de la crisis generada por la COVID-19, y la adaptación a la misma, en el desarrollo del turismo en áreas protegidas. Los hallazgos han confirmado las implicaciones globales a varias escalas de la crisis sanitaria, que se afectó tanto a la gestión

general de las áreas protegidas como al uso público dentro de estas áreas. Posteriormente, se ha enfatizado la necesidad de adoptar enfoques multidisciplinares y desde una variedad de perspectivas para comprender en profundidad las implicaciones identificadas, especialmente relacionadas con la gestión de los usos de los visitantes. Además, se ha revelado una fuerte dependencia de las políticas regionales y locales en materia de control y regulación de visitantes. Así mismo, se confirmó que la pandemia intensificó tanto cuestiones estructurales existentes, como la falta de coordinación entre los agentes implicados o la burocracia; como conflictos emergentes relacionadas con el comportamiento de los visitantes y las aglomeraciones. En esta tesis también se ha subrayado el importante papel de la satisfacción a la hora de explicar la respuesta de los visitantes a las medidas de gestión. En conclusión, la tesis ha ofrecido información valiosa para abordar la gestión funcional de visitantes, así como mejorar la proactividad y la capacidad de los gestores de espacios protegidos y del resto de agentes implicados para prever cambios en el contexto post-pandemia. Este estudio también ha contribuido a comprender la adaptabilidad de las áreas protegidas como sistemas socio-ecológicos frente a una crisis contemporánea.

## Resum

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El desenvolupament del turisme de naturalesa en àrees protegides ha generat ingressos que han permès finançar la seva gestió, alhora que ha contribuït a conscienciar els usuaris de la necessitat de preservar aquests espais. No obstant, l'interès en aquestes àrees protegides també ha generat conflictes entre els diferents agents que hi actuen, a causa de les seves diferents percepcions sobre com s'haurien de valorar, utilitzar i/o gaudir aquestes àrees. La pandèmia de la COVID-19 ha agreujat aquests conflictes, i ha causat canvis en el comportament dels visitants, amb grans aglomeracions en alguns espais naturals protegits, que van comportar impactes negatius en els ecosistemes naturals. La gestió adaptativa de visitants és crucial a l'hora d'abordar els interessos dels actors involucrats i millorar les experiències dels usuaris, mitjançant assistència, informació, educació ambiental, i una adequada distribució del visitants per evitar que hi hagi àrees molt concorregudes.

En aquest sentit, aquesta tesi de doctorat es focalitza en les conseqüències que la pandèmia ha tingut en els fluxos de visitants en àrees protegides, cosa que va desencadenar una sèrie de transformacions en les estratègies de gestió. L'objectiu de l'estudi és analitzar els efectes de la pandèmia de COVID-19 com a catalitzador de canvi en el procés complex de gestió de visitants en àrees protegides. Per assolir aquest objectiu, es fa servir una metodologia mixta que combina la recollida de dades quantitatives i qualitatives. Aquest enfocament permet una exploració exhaustiva i la incorporació de dades tant de fonts primàries (agents i visitants), com secundàries (estadístiques oficials i notícies als mitjans de comunicació). Per interpretar les dades es van implementar diverses tècniques, com ara l'anàlisi de continguts, l'anàlisi temàtica i procediments estadístics. A més a més, s'ha adoptat una perspectiva multiescalar. En primer lloc, la tesi ha argumentat sobre l'impacte a escala global de la pandèmia en la gestió d'àrees protegides. En segon lloc, s'ha analitzat la resposta dels gestors dels espais naturals protegits i de la resta d'agents involucrats, tant a escala regional (Catalunya) i local (Província de Tarragona). En tercer i darrer lloc, s'han analitzat les actituds dels visitants en relació a les mesures de gestió implementades en un espai natural protegit específic, com és el Parc Natural del Delta de l'Ebre.

La tesi ha cobert la relació entre les àrees protegides i el turisme, el concepte i el propòsit de la gestió de visitants, i el paper de la crisi generada per la COVID-19, així com l'adaptació a la mateixa, en el desenvolupament del turisme en àrees protegides. Els resultats han confirmat les implicacions globals i a diverses escales de la crisi sanitària, que es va estendre tant en relació

a la gestió general de les àrees protegides com també a l'ús públic dins d'aquestes àrees. Posteriorment, s'ha emfatitzat la necessitat d'adoptar enfocaments multidisciplinaris i des d'una varietat de perspectives per comprendre amb profunditat les implicacions identificades, especialment relacionades amb la gestió dels usos dels visitants. A més, han revelat una forta dependència de les polítiques públiques regionals i locals en matèria de control i regulació de visitants. Així mateix, es va confirmar que la pandèmia va intensificar tant qüestions estructurals existents, com la manca de coordinació entre els agents amb competències i/o interessos, o la burocràcia; com a conflictes emergents relacionades amb el comportament dels visitants i les aglomeracions. En aquesta tesi també s'ha subratllat el paper important de la satisfacció a l'hora d'explicar la resposta dels visitants a les mesures de gestió. En conclusió, la tesi ha ofert informació valuosa per abordar la gestió funcional de visitants, i millorar la proactivitat i la capacitat dels gestors i de la resta d'agents per preveure canvis en el context postpandèmia. Aquest estudi també ha contribuït a comprendre l'adaptabilitat de les àrees protegides com a sistemes socioecològics davant d'una crisi contemporània.

# Part 1: Introduction

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# Chapter 1: Research presentation

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## 1.1. Background

The growth of leisure time, mobility, and environmental awareness over the last decades has posed challenges for organizations involved in protected areas (PAs) management (Bushell & Eagles, 2007). The significant increase of tourist activities in PAs resulted in approximately 8 billion yearly visitors in PAs worldwide, an estimated USD 600 billion in tourism expenditures and USD 250 billion in global surplus (Balmford et al., 2015). Despite these economic benefits, the interest in PAs has brought about conflicts among various stakeholders who have differing viewpoints on the value, usage, or enjoyment of these areas (Palomo et al., 2014). *The location, diversity, intensity and duration of the activities* performed in natural areas are determinant in the impacts of tourism in these spaces (Newsome et al., 2002, p. 83). For this reason, natural systems require ongoing and updated planning processes that allow managers to track these impacts and apply appropriate responses to the varying conditions of usage. In light of this, management and governance must constantly adjust, requiring a number of mechanisms to make their adaptability possible. These processes or strategies need to be varied and customized to the unique characteristics of the local and regional context in order to guarantee sustainability (Walker et al., 2004).

Within these PAs' planning process stands visitor management (VM). This practical tool aims to regulate visitor numbers and types of mobilities and activities as well as mitigate potential negative outcomes of tourism and recreation in a destination (Alubel et al., 2021). Nevertheless, there exist several issues that hinder visitor management due to their complexity, resistance to solutions, and difficulty to be defined. Such issues have been referred to as “*wicked problems*” (McCool & Stankey, 2003, p. 122; Strickland-Munro et al., 2010, p. 500). These problems are inherent to evolving social processes and relationships within a system, which are usually interconnected and intricately grounded to a spatial and temporal context (Scherrer & Doohan, 2014).

Among these problems, two situations stand out as the sources of escalating tensions in PAs. On one side, Høyer (2000) argued that tourism's unsustainable nature stems from movement, referring to the significant increase of various types of mobilities to and around destinations. On the other hand, Haukeland et al. (2013) addressed the incremental negative effects on PAs caused by a large number of visits. These authors warned that such increase may escalate into

a “loving parks to death” situation in which PAs can no longer manage the repercussions of visitation. In this sense, the combination of both hypermobility and over-visitation has stimulated the concentration of visitors in space and time, resulting in concerns such as overcrowding and seasonality effects on destinations (Glasson et al., 1995). Together with these problems, the socioeconomic and environmental context of a destination affect the vulnerability of management structures in PAs and their capacity to adapt and develop effective VM strategies (Romagosa et al., 2015). This vulnerability became particularly evident during the recent COVID-19 pandemic, which stands out as the most widely discussed crisis of the present century. The relative novelty and sudden burst of this phenomenon points to the fact that we live in an era of fast and spread mobilities (Hall et al., 2020), facilitating its dispersal to a wide geographic surface, including PAs and their surrounding communities. As such, the effects of the pandemic were “*immediate, dynamic, and disruptive*” (Beery et al., 2021, p. 1), impacting daily lives, health care, education, work, global markets, and mobilities, and encouraging changes in consumers’ perception of destinations and transport (Hall et al., 2020).

The need for a comprehensive grasp of the effects of the pandemic, as pointed out by several authors in the early stage of the crisis, has served as a basis and key motivation for undertaking the present research. The imminent transformations observed in PAs, particularly regarding the types of mobilities and the visitor flows, have resulted in consequences for the functioning of these areas. Subsequently, this dissertation addresses the need for understanding the aftermath of these transformations, especially for the development of adaptative and effective management of visitors, their behavior, and their impacts. Furthermore, PAs are dynamic systems by nature; therefore, it is critical to assess if they have the capacity of adjusting to and benefitting from change (Walker et al., 2004).

The challenges witnessed during the COVID-19 pandemic substantiate the assertion that dynamic and challenging issues add complexity to VM in PAs. The development of the pandemic crisis and the magnitude of its implications within the tourism industry has called for multi and cross-disciplinary contributions for its understanding (Cheer et al., 2021). In a context like this one, academic contributions play a pivotal role in advancing the limited understanding of the evolving cause-effect relationships of the crisis and the broader societal implications of the recent emerging “wicked problems”. Moreover, PAs, as complex and adaptive spaces, involve strongly linked components and processes that operate at various scales pertaining to geographical territories, landscapes, and stakeholders whose inputs are included on the planning and governance of PAs (Palomo et al., 2014). Understanding the complexities of PAs require a departure from solely technical-rational approaches to embrace pluralism, a shift that can be

attained through inclusive dialogue among stakeholders, multidisciplinary perspectives, and broader public engagement (McCool & Stankey, 2003). This dissertation embraces the pluralism suggested by scholars by adopting a multiplicity of methodological approaches. This has allowed an approximation from both primary and secondary sources and the inclusion of managers', stakeholders', and visitors' actions and perceptions. Through this research, both managers' and visitors' perceptions and experiences are valued, emphasizing the importance of their participation for the enhancement and legitimization of decision-making processes within PAs (Ghoddousi et al., 2022).

Given the widespread impact of the pandemic on global mobility and travel, it was reasonable to conduct this research through a comprehensive lens that encompasses a multi-scale analysis of the effects of this crisis at local, regional, and international levels. The international scale has been accomplished by analyzing the emerging academic literature in the first two years dealing with problems related to the pandemic in PAs around the world, providing indicators that enable comparisons on a broader scale. Furthermore, from a practical stance, a multi-scale approach demands the integration of public governance structures and the perspectives of private sectors and communities to achieve sustainability and adaptability of tourism policies and planning (Romagosa, 2020). Thus, to obtain a nuanced comprehension of specific issues of VM implemented in PAs, the study delves into regional and local scales, with Catalonia and the Province of Tarragona as study areas, respectively. Finally, the study of visitors' characteristics and attitudes at a site-level scale yields important insights to design a cohesive management of tourism, recreation, and transportation that incite positive behavioral changes in PA users (Scuttari et al., 2019).

It is relevant to mention that the study areas included in this multi-scalar analysis have been chosen taking into consideration several research projects promoted by the regional, local, and national governments and developed by the Group on Territorial Analysis and Tourism Studies (GRATET) from Rovira i Virgili University, Spain. These projects had an interest in analyzing the adaptation of complex tourism destinations in the face of contemporary environmental, social, and economic transformations. Moreover, some of them were thought to understand these transformations in specific study areas of the Province of Tarragona. As seen, the contributions of this dissertation will provide valuable insights to managers, policymakers, and researchers to help comprehend the relationship between visitors' behavior and their impacts, as well as to assess the effectiveness of their management strategies and enhance their adaptability and capacity to address disruptive drivers of change (Ghoddousi et al., 2022; McCool & Lime, 2001).

## 1.2. Research aims

As mentioned before, the interest of this research revolves around the management of visitors in PAs after the adaptations introduced in response to the mobility disruptions associated with the pandemic. The overarching aim of this dissertation is to analyze the effects of the COVID-19 pandemic as a catalyst for change in the complex visitor management process in protected areas. As summarized in Table 1, three specific objectives (SO) have been set to reach the full understanding of this aim. It is noteworthy that the approach to define the specific objectives is intrinsically related to the multiscale perspective adopted in this dissertation.

**Table 1.** Research objectives and research questions

General Objective		
To analyze the effects of the COVID-19 pandemic as a catalyst for change in the complex visitor management process in protected areas		
Specific Objectives	Research questions	Territorial Scale
SO1: To understand the general impact of the pandemic on the management of PAs.	RQ1: What are the key challenges, actions and future research endeavors diagnosed by academic literature in managing PAs during the pandemic?	Global scale
SO2: To explore the role of media in communicating and identifying the adaptations of VM practice in PAs in the face of the COVID-19 pandemic	RQ2: In reaction to the increase in visitors to PAs in the first year of the pandemic, what measures were taken, implemented, and communicated to the public?	Regional scale: Catalonia
SO3: To analyze the effects of the pandemic on the management of visitors and the adaptation to emerging threats in PAs.	RQ3: How has the pandemic disrupted VM strategies put in place in PAs?	Local scale: Province of Tarragona
SO4: To analyze visitors' attitudes towards regulations implemented in protected areas in a post-pandemic scenario.	RQ4: How do different visitors' sociodemographic, behavioral, and perceptual characteristics influence their acceptance of management measures in a PA?	Site scale: Delta del Ebro Natural Park

The specific objectives of the research are stated as follows:

### **SO1: To understand the general impact of the pandemic on the management of PAs.**

For this study, an enquiry of what has been said in academic literature about changes in PAs management is conducted. This allows for finding and explaining the prevailing and emerging challenges for stakeholders. Furthermore, understanding the link between the disruptive effect

of the pandemic and current management models in natural areas allows a further comprehension of the course of actions taken in recent years. In this sense, through a systematic literature review, the state of the arguments was explored, highlighting methodologies, challenges, and research gaps related to the management of PAs during and after the pandemic.

- *RQ1: What are the key challenges, actions, and future research endeavors diagnosed by academic literature in managing PAs during the pandemic?*

**SO2: To explore the role of media in communicating and identifying the adaptations of VM practice in PAs in the face of the COVID-19 pandemic.**

Unlike the early stages of the pandemic, which were marked by decreased mobility because of restrictions and social distancing measures, the period following the easing of these restrictions witnessed a surge in proximity tourism. Naturally, both visitors and residents rushed to PAs, leading to a notable increase in crowds throughout 2020 and 2021. In response to this thriving trend, the significant adaptations made to the VM approach to address these new challenges are examined through an exploration that encompasses a review of media coverage.

- *RQ2: In reaction to the increase in visitors to PAs in the first year of the pandemic, what measures were taken, implemented, and communicated to the public?*

**SO3: To analyze the implications of the pandemic on the management of visitors and the adaptation to emerging threats in PAs.**

Going beyond the mere description of how the pandemic unfolded in PAs, this objective delves into the pertinent factors that impacted VM response, herein examining the challenges faced by stakeholders, especially managers, in putting specific measures into place. For this objective, this research engages with stakeholders and managers of PAs with an emphasis on concerns related to emerging challenges and the implementation of VM measures. Considering the local dimension of the phenomena, this study aims to address the following question:

- *RQ3: How has the pandemic disrupted VM strategies put in place in PAs?*

**SO4: To analyze visitors' attitudes towards regulations implemented in protected areas in a post-pandemic scenario.**

With this objective in mind, the focus of the study shifts to the site-scale examination of the phenomenon of interest, with the users of a specific PA taking center stage. At this juncture, we delve into variables associated with sociodemographic attributes and visitors' behavior and perception, gathering data that enables the construction of user profiles and the understanding

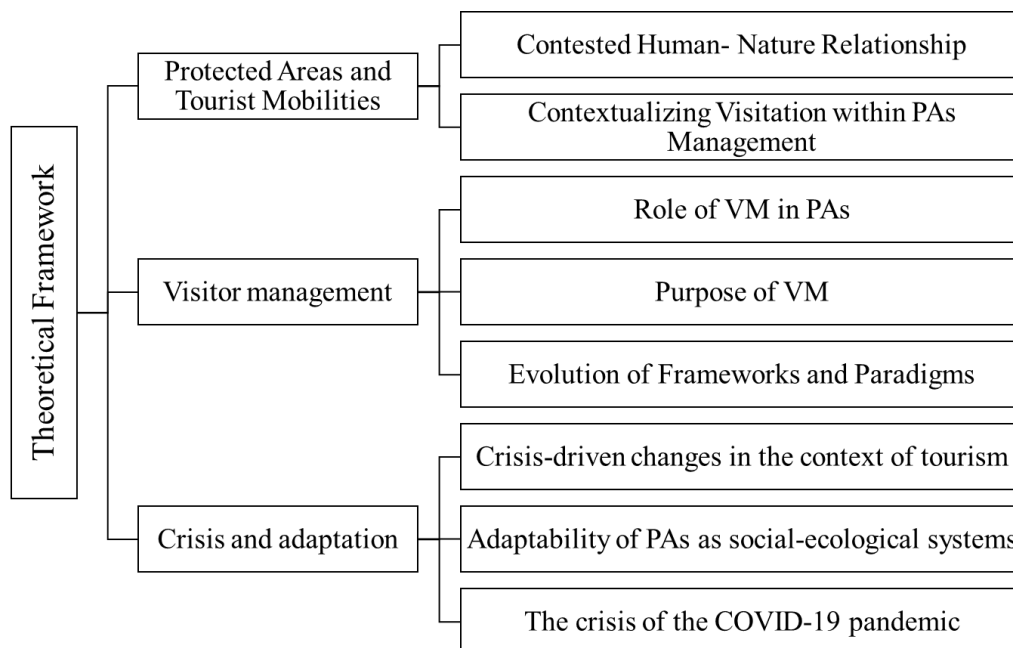
of their attitude towards implemented VM strategies in the area. Through this undertaking, the following fundamental question is addressed:

- *RQ4: How do different visitors' sociodemographic, behavioral, and perceptual characteristics influence their acceptance of management measures in PA?*

### 1.3. Dissertation outline

This dissertation consists of five parts and eleven chapters, which are organized as follows. Part 1, Introduction, contains one chapter on which the background, aim, specific objectives, and research questions guiding this multiscale study are established. Moving forward, Part 2, Theoretical framework, delves into the theoretical notions that underpin this research (Figure 1). This part emphasizes main concepts for this research such as PAs and Tourist Mobilities (Chapter 2), Visitor Management (Chapter 3), and Crisis and Adaptation (Chapter 4).

**Figure 1.** Theoretical framework



Part 3, Methodology, establishes the methodological and epistemological approach adopted to complete this study. In this sense, Chapter 5 describes pragmatism as the paradigm guiding the development of this research as well as the reasoning for pursuing a mixed method dissertation. Additionally, the tools and techniques implemented for the data collection and the empirical analysis used on this research are explained: Documentary Research, Semi-structured questionnaires, focus group, and survey. The research instruments suggested in the

methodological design were approached both sequentially and simultaneously during the dissertation preparation process.

Part 4, Empirical cases, comprises four chapters based on manuscripts published, accepted, and submitted into academic journals. Table 2 elaborates on the relation between manuscripts and chapters integrated into Part 4, describing their objectives and research questions and stating to which specific objective of the dissertation it is related.

Chapter 6, related to SO1, constitutes a systematic literature review of articles published in 2020 and 2021. Through a thematic analysis, the information and relevant findings extracted pertaining to PAs in the context of the pandemic are systematically broken down. This chapter works to understand scholars' global perspective on the ecological, social, and economic impacts of external drivers of change on the management and use of PAs. It also guides the identification of research gaps that subsequently supports the following chapters of this dissertation.

Chapter 7 and Chapter 8 shift the focus to regional and local scales. In Chapter 7, which is related to SO2, news retrieved from digital media published during the initial year of the pandemic are compiled and analyzed. By scrutinizing the information communicated to the public, management measures implemented in PAs of Catalonia are identified. This allows for an exploration of the implications of the pandemic on these types of areas. Chapter 8, related to SO3, engage in a participatory process with stakeholders and managers of PAs of the province of Tarragona (south of Catalonia, Spain). Through a thematic analysis, a deeper understanding of the relationship between the VM measures implemented and the existing and emerging challenges constraining the functioning of PAs in the province is achieved. Chapter 9, related to SO4, presents a case study conducted in 2022. Through the analysis of survey results from visitors, it examines the relationship between visitors' profiles and their level of agreement with the visitor and traffic management strategies implemented in the Ebro Delta region (Province of Tarragona, Spain) during the pandemic, which remained active until 2022. Through this case study, the characteristics of visitors that most effectively explain visitors' acceptance or rejection of the measures implemented on specific parking areas of this region are identified.

Finally, Part 5: Discussions and Conclusions makes up the last chapters of this dissertation. Chapter 10 discusses main findings related to the dissertation research questions and the theoretical and practical contributions of the research. Finally, in Chapter 11, the conclusions of this research are described, establishing final marks, limitations, and suggestions for future research.

**Table 2.** Publications summary

	<b>1<sup>st</sup> Publication (Chapter 6)</b>	<b>2<sup>nd</sup> Publication (Chapter 7)</b>	<b>3<sup>rd</sup> Publication (Chapter 8)</b>	<b>4<sup>th</sup> Publication (Chapter 9)</b>
<b>Title</b>	The impact of COVID-19 in protected areas management: A review of emerging challenges, responses, and future research lines in the post-pandemic context	Response to the Increase of Visitors in the Protected Natural Areas of Catalonia intimes of Covid-19: A Review based on Publications in Digital Communication Media (Respuesta al aumento de visitantes en los espacios naturales protegidos de Cataluña en tiempos de COVID-19: una revisión a partir de publicaciones en medios de comunicación digitales)	Visitor Management Practice in Protected Areas of the Tarragona Province (Spain): Adaptation to Post-Lockdown Emerging Challenges	Factors Influencing Visitors' Acceptance of Traffic Management Strategies in the Ebro Delta Natural Park, Catalonia
<b>Aim</b>	To identify central issues related to the management of PAs during the COVID-19 pandemic, chiefly by integrating and analyzing emerging research concerns related to that context.	To analyze the response of the managers of PAs of Catalonia to the increase in the number of visitors during the post-lockdown stage and after the easing of mobility restrictions implemented due to the COVID-19 pandemic, as reported by digital media.	To analyze the management of changing visitor flows in the PAs of the Tarragona Province driven by the pandemic, as experienced by managers.	To examine the relationship between visitors' profiles and their degree of agreement with the implemented visitor and traffic management strategies within a region that encompasses a protected area.
<b>Research questions</b>	<ul style="list-style-type: none"> <li>- What approaches have been used to analyze implications of the pandemic in the management of PAs?</li> <li>- What has the COVID-19 pandemic implied for PAs?</li> <li>- What gaps in knowledge about PAs in relation to the pandemic need to be addressed in future research?</li> </ul>	<ul style="list-style-type: none"> <li>- What measures have been implemented and communicated to the public in response to the increase in visitors to the PAs?</li> </ul>	<ul style="list-style-type: none"> <li>- To what extent has the pandemic disrupted visitor management in the PAs of Tarragona Province?</li> <li>- What strategies did visitor managers implement to cope with the emerging challenges?</li> <li>- What learnings remained for the future of VM in the PAs of Tarragona?</li> </ul>	<ul style="list-style-type: none"> <li>- To what extent do visitors in the Ebro Delta accept or reject the implemented traffic management measures??</li> <li>- Which characteristics can most effectively explain a visitor's acceptance or rejection of the implemented traffic management measures?</li> </ul>
<b>Data Source</b>	Articles extracted from the Scopus database.	News from digital media	Semi - structured questionnaires Focus Group	Survey
<b>Objective related</b>	SO1	SO2	SO3	SO4

## Part 2: Theoretical framework

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## Chapter 2: Protected Areas and tourist mobilities

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### 2.1. Contested human- nature relationship

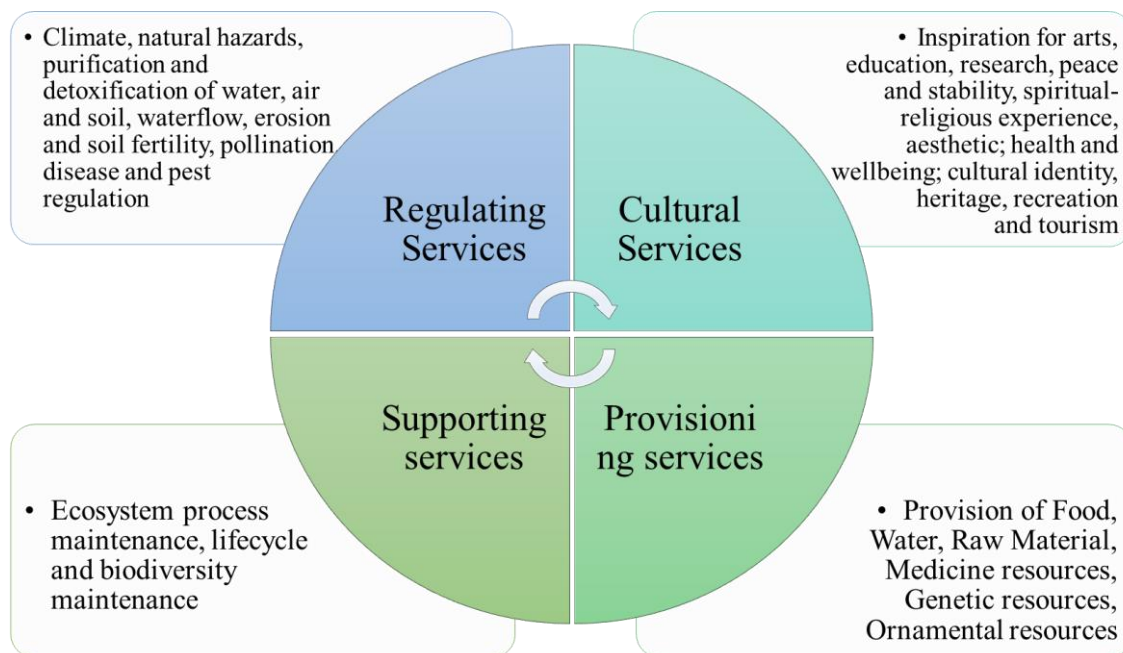
When the term Protected Areas (PAs) was initially introduced at the end of the 19<sup>th</sup> century in a time of increasing outdoor recreation in these spaces, it was thought of as a concept to define spaces aimed at exclusively protecting and conserving nature and biodiversity (Weaver & Lawton, 2017). This meant that PAs were associated with natural environments on which a variety of landscapes, wildlife, and ecological processes exist with a relative absence of human-related alterations (Newsome et al., 2002). However, in some cases, this definition also perceived PAs as “islands,” isolated territories on which human interventions or interactions were inconceivable. Eventually, the need to add dynamism and adaptability to the management of these areas prompted the realization of the importance of adding social and territorial dimensions, leading to the continuous evolution of their conception (Palomo et al., 2014). Today, PAs are defined as complex socio-ecological systems in which the human-nature relationship and their mutual interdependencies evolve (Ghoddousi et al., 2022; Strickland-Munro et al., 2010).

The International Union for Conservation of Nature -IUCN- defines a protected area as a “*clearly defined geographical space recognized, dedicated and managed, through legal and other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values*” (Dudley, 2008, p. 8). This definition acknowledges the role of PAs as extending beyond its ecological considerations and recognizes the various contributions or services that nature provides to humanity, as highlighted by Ghoddousi et al. (2022). PAs are vital elements for biodiversity conservation and the alleviation of ecosystem fragmentation (Palomo et al., 2014). Because of their value, there has been consistent advocacy for the expansion of areas dedicated to PAs (Becken & Job, 2014), which will require innovative management programs and strategies. The Convention on Biological Diversity proposed the proportion of Earth’s surface made up of PAs be increased to 17% (Secretariat of the Convention on Biological Diversity, 2011). This percentage eventually increased to 30% of coverage expected to be achieved by 2030, aligning with Target 3 of the Kunming-Montreal Global Biodiversity Framework (CBD, 2022).

The tangible and intangible services that PAs provide have been defined as ecosystem services (Stolton et al., 2015), a concept often used as indicators to guide effective management of

natural areas (Palomo et al., 2014). As described in Figure 2, these services not only entail necessary ecological function, but also include services to support and improve social and individual livelihoods. The term ecosystem service comprises fundamental components critical for human existence, while also providing opportunities to promote well-being, inspiration, education, recreation, and the development of cultural identity (Romagosa et al., 2015; Stolton et al., 2015). Consequently, a range of activities that can be done in PAs arise, requiring strategic measurement and management to keep the balance between the PAs' crucial conservation function and ability to meet human needs connected with these areas.

**Figure 2.** Ecosystem services from Protected Areas



Source: Stolton et al. (2015)

Furthermore, given the intricate interconnections identified between the social and the natural systems within and surrounding PAs, and the interdependencies between people and the services provided by these territories, PAs have been recognized as social-ecological systems (Cheer & Lew, 2017, p. 10). This means that biophysical and human components and processes are linked across multiple scales (Palomo et al., 2014). As socio-ecological systems, PAs assume overlapping social, economic, and ecological functions that answer to both a variety of societal expectations and ecological integrity goals (Voll & Luthe, 2014). Within these systems, the boundaries between nature and societies are usually based on arbitrary delimitations, and the dynamics within them can cause both beneficial and detrimental impacts to one another (Ghoddousi et al., 2022). Although the preservation of wildlife species and the ecosystems they

inhabit is considered the imperative function for the creation of PAs (Spenceley et al., 2015), their establishment has also been driven by its disposition of making the day-to-day benefits provided by natural spaces accessible to people. These benefits include the preservation and restoration of cultural heritage (Phua et al., 2021); adjustment and regulation of factors in response to existing threats (Cumming et al., 2021; Hockings et al., 2020); economic development; social and cultural inspiration; environmental awareness (Anand & Kim, 2021); appreciation of natural landscapes and soundscapes (Qiu & Zhang, 2021); education; and psychological and physical wellbeing (Jones et al., 2021).

Nevertheless, when the boundaries within social-ecological systems are exceeded, four major constraints emerge as detrimental stressors for PAs: (1) the growth of human population and resource consumption leading to increasing degradation and conversion of natural habitats to other uses; (2) diminished financial capacity of PAs; (3) greater reliance and priority on visitor-based revenue over environmental governance; and (4) rising demand for outdoor and nature-based recreation resulting in concentration of tourism in PAs, particularly in those in the proximities of urban areas or popular destinations (Weaver & Lawton, 2017). The effect of these four constraints can be mitigated through effective management. This is further conditioned by structural elements such as staff and funding, or contextual elements such as the geographical situation, extension and remoteness of PAs, socioeconomic conditions, and governance policies (Ghoddousi et al., 2022). Moreover, other conditions should be considered to achieve such effectiveness, such as isolation of the PAs, societal disconnection, institution rigidity, and power struggles among stakeholders and external drivers of change that spread at a regional or global scale (Palomo et al., 2014).

The interactions between humans and wildlife challenging the functioning of PAs (Voll & Luthe, 2014) underscore the debate surrounding the conflicting priorities of conservation and use of PAs. On the one hand, it poses significant ongoing and unresolved issues between different interest groups and the management of these areas. These challenges stem from their intricate and unpredictable character, the continued resistance to solutions, the diverging values among stakeholders, and the lack of understanding of cause-and-effect relationships between human activities and nature (McCool & Stankey, 2003). The management of PAs entails the delineation of a set of proactive steps defined to achieve the intended purposes for which these areas were instituted (Thomas & Middleton, 2003). But also, an integral element of PA management involves comprehending the synergies and conflicts arising from the diverse demands of various stakeholders, while also navigating the trade-offs of these relationships and building on emerging opportunities (Stolton et al., 2015).

On the other hand, it draws attention to the limited understanding of the array of interactions within PA features, resulting from a tendency of research to emphasize either the social or ecological aspects of these systems (Cheer & Lew, 2017; Ghoddousi et al., 2022). For Newsome et al. (2002), two approaches influence the perception and understanding of human-nature conflicts, and thus their study as well. One anthropocentric approach puts humans at the center, in charge and as main beneficiaries of nature, so that resources can be accessed through science and technology. And the other, the ecocentric view, with a strong focus on sustainability and conservation, recognizes the inherent value of biodiversity as vital for all life. This ecocentric approach argues that all human-centered approaches are unsustainable, suggesting that growth is not always beneficial and calling for a change to the economic and political system. However, new reasonings have been added to complement these views. For instance, Büscher and Fletcher (2019) claim that it is necessary to create and adopt governance policies that correspond to the pressures of the present time. These authors propose a post-capitalist approach based on a political ecology perspective defined as convivial conservation, focused on equity, environmental justice, and structural change, through which both the human-nature dichotomy and the commodification of nature are rejected. As seen, there is an agreed necessity to foster a cohesive connection between individuals and PAs, encouraging their integration towards a genuine partnership (Voll & Luthe, 2014). Such a partnership would help overcome the disconnection that has long characterized human-nature interactions (Palomo et al., 2014). This is especially pertinent because many PAs are situated in regions with a long tradition of agriculture and well-preserved cultural landscapes, where human activities have also played a role in shaping habitats and landscapes. Nurturing these relationships can facilitate people's transition from passive observers to active participants in the sustainability of PAs.

## 2.2. Contextualizing visitation within Protected Areas management

Biodiversity holds significant importance in the tourism industry as it critically contributes to the design of tourist products and serves as a compelling component for travelers in search of scenic landscapes, diverse flora and fauna, and distinctive terrain features (Haukeland et al., 2013; Strickland-Munro et al., 2010). Consequently, “*the conservation of the natural resource is essential to the planning, development and management*” (Newsome et al., 2002, p. 15) of nature-based tourism and recreation. While the designation of PAs is pivotal in the management

of natural areas, it is crucial to address VM within the broader spectrum of management issues to ensure the sustainability of PAs as tourism and recreation destinations (Newsome et al., 2002).

During the 1960s, public interest in outdoor recreation and appreciation of nature experienced growth (Lausche, 2011). From the 1980s to the 2000s, tourism in natural areas increased from 2% to 20% of overall tourism-related mobilities (Newsome et al., 2002). Over time, a diverse array of recreational users has emerged, categorized based on the activities they engage in or the landscapes they visit; for instance, nature-based tourism, wildlife tourism, adventure tourism, ecotourism, and so forth. PA tourism “*fits within the broader undertaking of natural area tourism, which provides an alternative to traditional mass tourism*” (Strickland-Munro et al., 2010, p. 501). Subsequently, visitors have become sources of funding for the conservation function of PAs, as well as a sustainable development strategy and the continued preservation of these areas (Newsome et al., 2002).

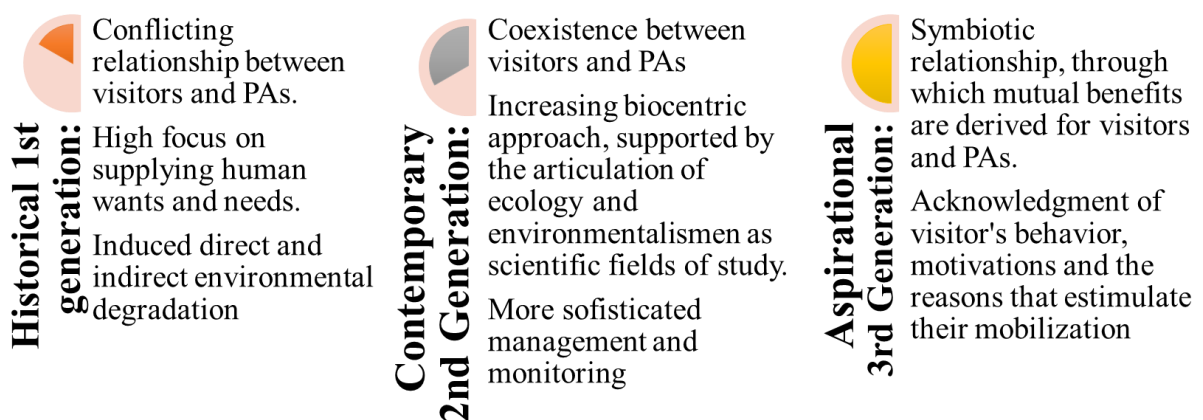
However, tourism and nature-based recreation can behave unpredictably, encouraging changes in natural areas and hindering the functioning of their environmental qualities (Coppes & Braunisch, 2013; Newsome et al., 2002). The relationship between tourism and nature conservation in PAs has been considered to have two possible ends: conflict or symbiosis (Newsome et al., 2002). Regarding the first end, it assumes that the increasing number of visitors and the encroachment of natural areas leads to a conflictive relationship. Several studies have shown that visitation and tourism activities in natural areas have various negative impacts on ecosystems. The severity of these impacts may worsen in the future, since nature-based tourism is one of the fastest growing sectors of international tourism (Haukeland et al., 2013). The growing popularity might eventually result in overcrowding inside PAs, free-ranging into and disturbance of sensitive areas, and pollution of local ecosystems (Coppes & Braunisch, 2013), thereby placing stress on these areas’ management capacity.

The perceived role of tourism in PAs brings about debatable positions among researchers. One such streamline of ideas has been that visitors, and particularly satisfied visitors, are essential for the existence of PAs (Bushell & Eagles, 2007, p. 9). This perceived primacy of visitors’ satisfaction infuses further conflicts of interests when it comes to the prioritization of the functions of PAs. For instance, some emerging issues are the prioritization of recreational use over the production of renewable energy, or the demand for untouched nature versus the promotion of multicultural landscapes that hold historical and cultural value (Voll & Luthe, 2014). The second mentioned end, on the other hand, suggests that nature and tourism can potentially collaborate, forming a symbiotic relationship on which each enhances the other

(Newsome et al., 2002). For example, tourism can work as a bridge between conservation and development, and nature can serve as a destination for visitors.

Budowski (1976) furthered these nature- tourism relationships, arguing the existence of an additional stage called coexistence. At this stage, tourist activity and nature conservation function indifferently from one another, either due to administrative barriers or a lack of understanding between the two fields. This stage functions dynamically, and changes in the natural areas can encourage a transition towards either one of the two ends mentioned before, conflict or symbiosis. Moreover, Weaver and Lawton (2017) characterized visitation to PAs as an unfolding paradigm and proposed a three- generation framework to understand and improve the relationship between visitors and PAs (Figure 3). The first historical generation of this visitation paradigm corresponds to the early institutionalization of PAs, centered on meeting human needs and the stimulation of outdoor recreation. In this generation, ecosystems faced a fast degradation, with consequences that spurred the transition to the second generation of the visitation paradigm, on which current VM approaches lay. Weaver and Lawton (2017) further contended that this generation is defined by the dominant assumption that visitor impacts in PAs are inherently negative, resulting in the prevalence of containment, control, and restriction strategies to manage visitors. This has caused a prioritization of the management and monitoring of visitors and their environmental impacts for sustainability purposes. While the second generation of Weaver and Lawton’s paradigm has had a positive impact on the coexistence between PAs and visitors, there is still potential for improvement to ensure mutual benefits in this relationship.

**Figure 3.** Evolution of Visitation Paradigms



Source: Weaver and Lawton (2017)

To address this, Weaver and Lawton (2017) have proposed a third generation of the visitation paradigm, herein introducing a model that considers visitors' understanding of motivation and mobilization as a tool to engage them in PAs management. This approach not only shields PAs from potential harm caused by visitors but also enriches them through visitor actions, as they are encouraged to engage and participate in the enhancement of PAs management and the restoration of degraded natural ecosystems. The authors further emphasize important opportunities by collecting information about latent motivations on visitors that drive their actions and behavior. While acknowledging potential criticism to their perspective, Weaver and Lawton (2017) clarified that this third generational model is particularly suited for specific spatial contexts, such as PAs located near urban and tourism hubs in economically developed regions.

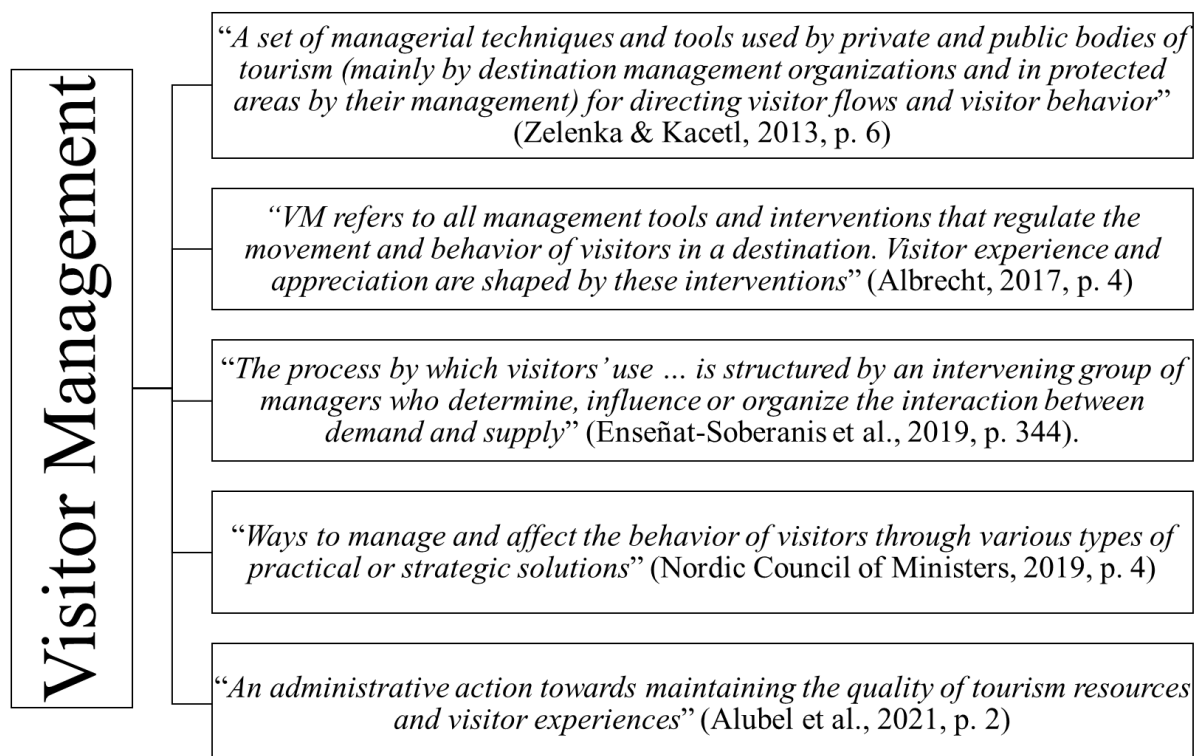


## Chapter 3: Visitor management

### 3.1. The role of visitor management in Protected Areas

The multifunctional character of PAs, where nature, residents, and visitors come together, necessitates a holistic management approach (Voll & Luthe, 2014). VM in PAs plays a significant role in alleviating conflicting tensions between visitors' needs and the use of natural resources, thereby enhancing the quality of surrounding landscapes (Kebete & Wondirad, 2019). VM emerges as a multidisciplinary concept, typically associated with tracking and controlling individuals within a location while considering the features and functions of that particular place. Although VM has been addressed in several studies, only a limited number of them have provided a clear definition (Figure 4). These definitions commonly focus on the role of VM in shaping tourism experiences by employing techniques that guide and address issues related to visitor flow and behavior. While these definitions offer an approximation of what VM entails, they do not explicitly acknowledge the complexity of VM and its crucial role as a process contributing to the functioning of PAs as socio-ecological systems.

**Figure 4.** Definitions of Visitor Management



Additionally, the notion of shared destination management suggested by Pearce (2021) implies that both destinations and visitors can be jointly managed in order to achieve common goals. Such a notion causes the study of VM to lack a solid theoretical background, given that it often overlaps with destination management studies. VM is indeed at the core of destination management and the sustainable development of tourism (Alubel et al., 2021; Kebete & Wondirad, 2019); however, further studies are needed to better understand how and why this process works. Additionally, when it comes to PAs, VM intersects with management plans that address a broad range of issues, which tend to prioritize ecological matters (Newsome et al., 2002). This results in the frequent omission of visitors and tourism-related actions, compromising the quality of the overall management. Moreover, VM studies usually focus on isolated components of the process, rather than adopting a holistic approach (Albrecht, 2017). VM has the characteristic of adapting to the different underlying philosophies of the stakeholders involved (Glasson et al., 1995). This means that the roles played by the social and political environment, as well as the attitudes and values held by the stakeholders, are determinant for the effectiveness of VM (Hassanli, 2016), especially in the definition of VM policies, norms, and practices. Particularly, in PAs, VM also aligns with the specific regulations and statutory frameworks established in these areas (Albrecht, 2017). Lastly, VM has the potential to enhance the products and services provided to users – facilitating assistance, providing information and education to visitors, and distributing visitor flows in congested areas.

However, complications arise in its implementation. For instance, VM can be considered a limitation to accessing and enjoying the benefits of nature, especially in regions where public access or freedom to roam is considered a fundamental right, such as in the Nordic Countries (A. S. Hansen et al., 2022). Furthermore, the more restrictive management actions are introduced, the higher the chance of perceiving VM as problematic for visitors' experience (Albrecht, 2017; Gundersen et al., 2015). For the specific case of PAs, this means that VM faces challenges associated with maintaining a balance between people's rights, their desire to connect with nature, and the preservation of the environment.

### 3.2. The multifaceted purpose of visitor management

The multifaceted nature of VM is evident in the functions it fulfills, and in the issues it addresses. As suggested by the name of the process itself, visitors are central to the process. Visitors may entail community members, guests, researchers, volunteers, students, workers, commercial

users, and tourists and recreationists – and even those who practice unauthorized activities such as logging and poaching (Spenceley et al., 2015). Furthermore, given the technological advances in communication, VM also gives attention to virtual visitors, as well as to non-visitors, past visitors, and potential visitors to PAs (Weaver & Lawton, 2017). In the most accepted sense, and within the context of this research, visitors are tourists and/or residents that temporarily stopover or stay at PAs for recreational, educational, wellbeing, and inspiration purposes.

VM aims go beyond the anthropocentric approach of making visitors' experiences enjoyable and rewarding (Kebete & Wondirad, 2019). VM serves as a foundation for decision-making, assisting management in navigating the tradeoffs between conservation and recreation through proper organization and use of information sources. In this sense, VM can effectively coexist with conservationist approaches that put nature's preservation at the core of PAs management (Kebete & Wondirad, 2019). Therefore, VM alleviates the tensions between the demands of visitors and the use of natural environments in PAs, enhances the quality of the surrounding landscapes, and reduces the potential degradation of the values that drew visitors to these areas in the first place (Newsome et al., 2002).

Both the concept of VM and the notion of what is actually managed within this process can have different interpretations. As recurrently underscored in literature, VM focuses on use, impact, and/or behavior (Newsome et al., 2002). In this sense, VM works as a tool to determine and regulate the types of uses that can be done in PAs (Bushell & McCool, 2007). These uses may result in potential changes to the values preserved by these areas (Borrie & Bigart, 2021). Thus, they need to be managed to prevent and address the pressure they pose on environmental, social, and local resources (Nordic Council of Ministers, 2019).

As pointed out before, VM may function under the assumption that tourism is an agent of change with inevitable implications that need to be controlled, regulated, or directed. In this sense, VM also addresses the impacts posed on the values and resources in PAs emerging from tourist activity that alter and put pressure on biotic communities (Newsome et al., 2002). The impacts addressed by VM include the increase of noise, air, and water pollution; inappropriate edifications and land use; and damage to the quality of flora, fauna, landscape, and natural resources. VM takes these environmental changes into consideration to determine actions that need to be implemented (Farrell & Marion, 2002). Likewise, this approach considers spatial and temporal parameters to measure the capacity of the PAs to deal with the effects of pedestrian and vehicle congestion as well as the impacts extending beyond the boundaries of the destination (Glasson et al., 1995).

Certain approaches address VM as a process that not only manages visitors' use, but also their behavior (Candrea & Ispas, 2009). Most of the time, this is expressed through the study of visitors' spatial and temporal behavior, usually known as their mobility flows (Enseñat-Soberanis et al., 2019). Visitors to rural destinations such as PAs show a significant dependence on private cars to get around the area (Dickinson & Robbins, 2008); nevertheless, "*private motorized traffic may significantly spoil the recreational quality of tourist experiences on site*" (Scuttari et al., 2019, p. 1). VM addresses this type of behavior by dealing with the issues that lead visitors to adopt this mobility pattern. Moreover, VM has stakes on the adequacy of visitors' mobility options and the effectiveness of transportation systems that could influence the way visitors move in and around PAs (Manente et al., 2000).

### 3.3. Evolution of frameworks and paradigms on visitor management

Various VM models or frameworks serve as the foundation, organization, and information sources for decision-making, aiding management in navigating the tradeoffs between conservation and recreation. VM possesses the capacity to provide managers and planners with the necessary tools to identify, interpret, explain, and address the challenges that PAs encounter (Spenceley et al., 2015). However, this process has gone through an evolution, with heightened interest around the 1970s (Eagles et al., 2002), when wilderness areas of the USA experienced a large increase in outdoor recreation, and wildlife managers needed to figure out how to manage the sudden changes in wilderness areas.

By then, the carrying capacity approach was adopted to define the number of visitors who may use a PA without causing unacceptable alterations to the physical features of the place while still achieving an intended quality level of the recreation experience. This approach was widely applied to heritage sites via a subjective lens, based on the visitors', local communities', and decision makers' perceptions. By identifying volume, density, and market thresholds, it delimited the levels of visitor activity or destination development (Glasson et al., 1995). Over time, this framework was deemed restrictive, built upon boundaries, constraints, and usage limits grounded in unrealistic expectations. It placed great emphasis on visitor numbers, neglecting the economic, cultural, and socio-political dimensions of tourism phenomena, and raising questions about inequity in the distribution and rationing techniques employed (McCool & Lime, 2001). As McCool and Lime noted, specifying carrying capacities based solely on

numerical thresholds “*fails to control, reduce or mitigate impacts [caused by] tourists’ behavior, developer practices and other [environmental] variables*” (2001, p. 380). It also lacked previous specification of management goals, objectives, and parameters, leading to an unclear application and unknown results.

Since the carrying capacity approach offered an oversimplified view of visitor impact, the Recreation Opportunity Spectrum (ROS) emerged as a framework for outdoor recreation managers and policymakers (R. N. Clark & Stankey, 2005). This approach sought to define the opportunities supplied by nature and socio-cultural environments on which recreational uses can be developed. ROS conditioned management processes through standards and regulations (Spenceley et al., 2015), assuming that the best way to assure a quality experience for visitors was to allocate a diversity of settings for recreational opportunities (Yun et al., 2021), encouraging flexible management in coping with emerging changes. Some positive features of the ROS framework prompted the design of alternative models, one of which was the Visitor Activity Management Process (VAMP). This model was focused on target markets and market positions, applied within regional planning. It relied on social science and marketing to find and assess appropriate interpretative and recreational activities for visitors to PAs (Spenceley et al., 2015).

Eventually, the ROS approach was considered static and conceptual, urging the creation of the Limits of Acceptable Change (LAC) approach to facilitate decision-making. This problem-oriented framework, developed by the USA Forest Service in 1985, set accurate standards for the amount and extent of human-induced change deemed acceptable for an area (Stankey, 2015). It examined the likely impact of tourism activities on the destination, advancing the degree of change that can be tolerated. LAC required constant monitoring to guide decision-making in the case that established standards were exceeded, and it sought a deeper understanding of the changes and their major implications for the public (Glasson et al., 1995). The LAC approach was criticized for failing to set realistic standards and detect long-term impacts, which prompted the creation of its variation: the Visitor Impact Management approach (VIM). This framework considered the ecological and social impacts of visitation and their effects on human interactions. It intended to identify undesirable tourism impacts, the factors that caused or encouraged them, and the potential strategies to address them (Glasson et al., 1995), relying on both scientific and subjective judgements (Newsome et al., 2002). However, several limitations hampered its performance. It required a large amount of locally generated information, which was not always available, and it was incapable of keeping up with the variability of impacts over time.

VIM was then integrated into the Visitor Experiences and Resource Protection (VERP) framework (McArthur, 2000), created by the United States' National Parks Service in 1997. VERP was also based on LAC and VAMP principles. It adopted a multidisciplinary focus on spatial planning of the resources and social conditions that affect visitors' expected experiences, such as crowds (Stewart, 2019). As a particularity, it implemented indicators and qualities standards that integrated both social and ecological dimensions on carrying capacity issues (Spenceley et al., 2015). Finally, in the late 1990's, the Tourism Optimization Management Model (TOMM) emerged – the first framework materialized outside North America. It aimed to monitor and quantify the benefits and impacts of tourism, assessing emerging issues and alternatives for future sustainable tourism in Australia (McArthur, 2000).

These are only some examples of the frameworks that guide VM in PAs. As it might be expected, new approaches keep emerging, and innovative concepts continue to be added to the listed frameworks. However, as described above, most of the new approaches are built on the principles of models such as Carrying Capacity, ROS, and LAC (Newsome et al., 2002), with adaptations associated with the territory on which it is planned to be implemented. Some frameworks that emerged afterward are Tourism Opportunity Spectrum (TOS) and Ecotourism Opportunity Spectrum (ECOS) (Qaddhat et al., 2021), Protected Area Visitor Impact Management (PAVIM) (Farrell & Marion, 2002), and Visitor Use Management Framework (Interagency Visitor Use Management Council, 2016), among others.

Nevertheless, carrying capacity remains a central concept in VM, having been applied to social, psychological, physical, and biological disciplines. According to Glasson (1995), this concept, when correctly integrated into the management framework, can capture the perspectives of the community (their capacity to absorb the negative effects of tourism), of the visitors or tourists (their capacity to enjoy a quality experience in relation to the number of visitors), and of the political or managerial capacity (the organizational ability of the destination to coordinate and direct visitors, which allows cooperation between stakeholders).

Despite the predominant emergence of these models from management systems of North America and Australia, the principles governing their execution have disseminated globally. However, notable examples of similar frameworks have emerged in the European context, mostly functioning as networks that, although not yet fully achieved, aim for the implementation of multilevel, participatory, and scaled governance and management (Rodríguez-Rodríguez et al., 2021). For instance, frameworks supporting and guiding the implementation of VM in European PAs are the Natura 2000 Network or the European Charter of Sustainable Tourism (ECST). Particularly, the ECST, established in 1995 as a certification

system, sets sustainable development and responsible tourism targets in PAs. Currently, it serves as a model for guiding governance in PAs, relying on communities and local stakeholders' engagement, all while aligning with conservation and local welfare objectives (Leung et al., 2018). Nevertheless, limitations are associated with these frameworks; on one side, the Natura 2000 network still lacks input from local stakeholders (Rodríguez-Rodríguez et al., 2021), and the ECST requires clearly defined management structures in charge of handling the certification process that sometimes is only available for certain PAs.

The evolution of VM frameworks has been addressed in this chapter because it reflects the wickedness of the variable and difficult to solve issues inherent in this process. Nevertheless, these well-established frameworks have served as guidelines since the early emergence of nature-based tourism in PAs. Moreover, it falls upon decision-makers to establish the most suitable approach to meet the needs of PAs (Spenceley et al., 2015) and integrate it into comprehensive environmental protection planning. Regardless, several elements should be addressed before, during, and following the management process. According to Newsome et al. (2002), such elements include territorial scales, the type and availability of information, stakeholder expectations, the level of responsibilities held by managers, integration with other planning processes, and intended outcomes.



## Chapter 4: Crisis and adaptation

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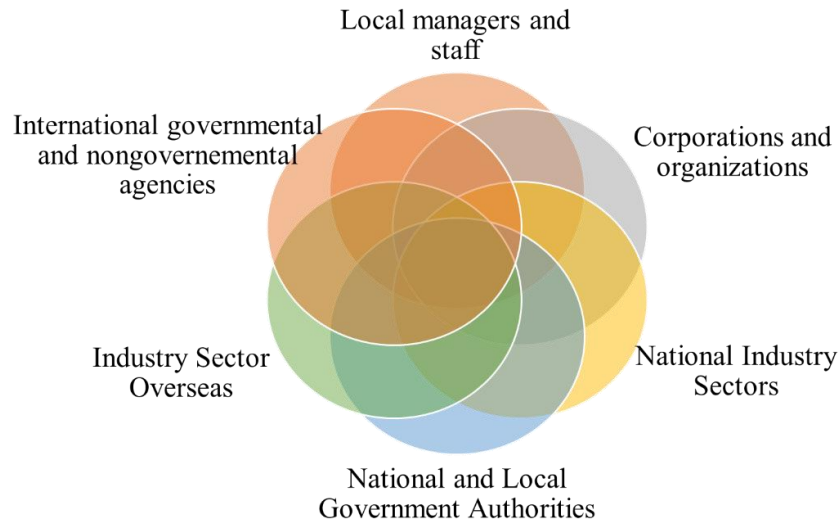
### 4.1. Crisis-driven changes in the context of tourism

The biophysical, social, and political contexts of PAs are conditioned by change, complexity, and uncertainty (McCool & Khumalo, 2015). For Becken and Job, “*the simultaneous analysis of global and local drivers of change will generate a deeper understanding of impact processes and response implication*” (2014, p. 1). According to Cheer and Lew (2017), socio-ecological systems such as PAs can face both slow and fast changes which vary mainly on their measures over time and space. These authors explain that slow changes are gradual variations over time, which can result in extinction or relocation of elements within a system and can potentially cause cultural shifts or major cumulative transformations. While fast changes are sudden and often unexpected events that require an immediate response from the system (Strickland-Munro et al., 2010), its implications depend on its response capacity within a given context. In this sense, tourism and climate change have been typified as drivers of slow change. In contrast, the recent COVID-19 pandemic qualifies as a driver of fast change, which unequivocally called for adaptations in management processes in PAs. These fast and slow changes are triggered by different types of crises. For tourism, crises are “*temporarily troublesome*”, mostly inducing “*short and medium-term disruptions*” (Cheer et al., 2021, p. 279).

The interpretation of what constitutes a crisis has mostly referred to the unexpectedness, urgency, and danger that such phenomenon entails (Henderson, 2016). Henderson (2016) analyzed the impact of local, regional, and global crises on the development of tourism, which has a heightening effect on uncertainty and insecurity in destinations. This author has further addressed the multiplicity of domains in which crises are intrinsic and extrinsically developed. For instance, the pandemic has been described as a combination of natural disaster, socio-political crisis, economic crisis, and tourism demand crisis (Zenker & Kock, 2020). However, for Henderson (2016), health threats and hazards such as the recent COVID-19 pandemic are encompassed within the environmental domain of crises. This author also acknowledged the capacity of crises to stream on different scopes within the management and governance structures that organize a destination (Figure 5). Moreover, Henderson (2016) noted that infectious or communicable diseases have the ability to spread rapidly, triggering a fast and sudden deterioration of collective health and wellbeing difficult to control and/or contain. This

is heightened by modern travel patterns, which have driven the dissemination of the COVID-19 virus and facilitated its quick global spread (Benjamin et al., 2020).

**Figure 5.** Scopes of Tourism Crises



Source: Henderson (2016)

Henderson (2016) suggests that the unpredictable nature of crises, prone to repeat in the future, underscores the importance of management readiness. Henderson (2016, p. 108) suggests that during a crisis, “*resultant fears among tourists may be magnified out of proportion,*” so occasionally, managers and policy makers have to “*react to perceptions and not realities*”. Henderson emphasizes the market’s sensitivity to uncertainty, urging stakeholders to cautiously address information transmitted to visitors that may cause anxious feelings, such as fear and panic. Moreover, for Henderson, “*the question is not whether a crisis will have to be faced, but when and what the reaction should be*” (2016, p. 9). Effective crisis management requires clarity in how responsibilities are allocated and accepted, transparency in the information transmitted, and defined mechanisms to assist emergencies. Moreover, the collective need to respond to these crises and to reach a wider audience can potentially encourage major interactions among public health sectors, travel and tourism organizations, and education systems. As Henderson posits, during a crisis, change is unavoidable, although it sometimes can be beneficial when the system’s adaptability and capacity of innovating to cope with crises are triggered. This is relevant in the current context, in which the COVID-19 pandemic has been considered as the “*precursor for environmentally derived crises that will be more intense, longer running and more onerous for global communities to contend with*” (Cheer et al., 2021, p. 279).

## 4.2. Adaptability of Protected Areas as social-ecological systems

In addition to heightened connectivity and mobilities between people and places, tourism and globalization also contribute to the volatility, dynamicity, and uncertainty that define today's society (Strickland-Munro et al., 2010). Cheer and Lew (2017) stress the importance of understanding how nature and humans continually adapt to shifting contexts, in which complexity is added to social-ecological systems (SES) such as PAs. These systems are credited with qualities such as adaptability and transformability (Walker et al., 2004). These traits are critical in coping with sociopolitical, economic, and cultural disruptions (Palomo et al., 2014) brought about by factors associated with population development, energy consumption, climate change, and land use changes (Becken & Job, 2014).

Walker et al. (2004) refer to adaptability as an attribute that depends on the social component of a SES. Here, the managing entity (community, organization, or individuals) plays a crucial role in the capacity of a SES (such as PAs) to take on disturbance as well as reorganize and deal with disruptions (Cheer & Lew, 2017). Adaptation of these systems can be understood as a process that navigates through four phases of an adaptive cycle (Fath et al., 2015). In this cycle, a system grows in the first phase after surpassing critical thresholds, starting with enough resources to function and develop. When growth is regulated, the system operates at a stable pace, reaching the equilibrium or consolidation phase, with the adjacent risk of becoming inflexible due to a lack of innovation. But if and when substantial, abrupt disturbances occur – such as the fast changes caused by the pandemic – the system may struggle to function and fall into chaos. Depending on the connectedness of the system's components and the response capacity cultivated through systemic memory, it may either turn to collapse – the third phase – or reorientation – the fourth phase – to navigate crises successfully. These phases not only move within a predetermined loop, but also branch, jump, and interact across different levels (Walker et al., 2004), adding dynamism to SES, including PAs. Navigating through these phases of the adaptive cycle requires the systems to have adaptive management and an adaptive governance (Walker et al., 2004).

In this last regard, Worboys et al. (2015) emphasized the role of governance in creating the proper conditions for management to be adaptive, by representing the perspectives expressed by diverse stakeholders through mandate, policy and multi-level institutions. Moreover,

Worboys et al. (2015, p. 325) provided an on-point definition of what adaptive management entails:

*“Managing adaptively means that we decide, monitor, reflect, learn and decide again. And again. Managing adaptively means that we move towards expanding understanding and developing wisdom—both forms of learning geared towards the future, not focused on the past. Managing adaptively means that organisational cultures and institutions must in many cases also change, away from perceiving conservation as a routine, and towards being ever changing”.*

The adaptation approach of PAs has traditionally focused on returning an area to its usual carrying capacity after degradation (McCool & Lime, 2001), emphasizing the number of people that can fit in an area rather than the desired conditions of use. However, there could be several capacities within a PA depending on the purpose for which an area was established. This capacity tends to be higher when spaces for socialization are created. Thus, participation and collaboration among several stakeholders and visitors’ behavior can be channeled through an integral and proactive solutions approach, engrained through adaptive VM (Nordic Council of Ministers, 2019). This adaptive management is a non-linear approach (Strickland-Munro et al., 2010) that also recognizes the essential role of monitoring visitors and the establishment of indicators associated with their uses, impacts, and experiences (Leung et al., 2018).

Further reflection is needed to understand the implications of drivers of change on a complex “process” such as VM, and how these changes encourage new forms of stewardship and collaboration for sustainability (Voll & Luthe, 2014). Thus, it is relevant to assess whether managers have the necessary tools and resources to develop a creative strategy to address contentious problems and understand emerging challenges and opportunities, particularly in PAs and in VM strategies. In the same way, it is important to consider if the individuals involved in PAs management are able to share ideas challenging usual approaches through mutual participation, as well as if the role of bureaucracy and management structures is effective enough to foster adaptability (McCool & Khumalo, 2015).

### 4.3. The crisis of the COVID-19 pandemic

The outbreak of the COVID-19 pandemic in 2020 caused several transformations in global mobility patterns and people’s behavior. Worldwide governments’ early reactions to the pandemic resulted in border closures, quarantines, curfews, and domestic lockdowns, which quickly halted international mobility. A significant loss in global tourism revenues was reported

in several PAs (Anand & Kim, 2021; Díaz-Sánchez & Obaco, 2021; Molteni, 2022), which necessitated adaptations in the management of these areas.

In Spain, a state of emergency was declared in March 2020, and with the subsequent halt of travel, the number of visitors to natural spaces was minimal in the first trimester of the health crisis. In May 2020, considering the evolution of pandemic regional indicators, the government began a de-escalation plan to return to “normal”. Mobility was gradually restored in the country by June 2020 (López de Miguel & Sánchez, 2020, Bigorra, 2020). In this time, Spain introduced a series of basic measures recommended to mitigate the risk of contagion, such as the mandatory use of masks in common areas, limitations on group sizes, physical distancing, and other restrictions tailored to each space, including natural areas. Similar actions were taken in PAs around the world. PAs promoted alternative remote engagement, implementing virtual visits, designing visual materials, and providing real-time information on social media (Jones et al., 2021; Miller-Rushing et al., 2021; Waithaka et al., 2021).

For some, the pandemic was an opportunity to transition towards environmental, economic, and social sustainability, as well as promote more responsible travel and tourism practices (McNeely, 2021). With worldwide economies threatened by the lack of international mobility, domestic tourism was promoted as a solution to boost rural economies and mitigate leakage from international tourism-related incomes (Hall et al., 2020; Lebrun et al., 2021). The redirection towards proximity tourism was considered as an opportunity to lower environmental impacts of international travel, reducing pressure on popular host territories and contributing to a generation of a socially fairer economic model (Cañada & Izcarra, 2021). Moreover, it was seen as an opportunity to highlight the role of natural areas as safe spaces in the face of the virus spread (Fletcher et al., 2021).

After the implementation of these new travel restrictions, global mobility patterns transformed. Establishing and managing health measures to contain the virus was not the only challenge PAs faced during the pandemic. People’s turn to natural and rural areas in the proximities of urban areas resulted in record visitations to multiple PAs, especially to those near urban populations (Ioannides & Gyimóthy, 2020; Jones et al., 2021; Primack & Terry, 2021; Romagosa, 2020). For instance, bookings in the mountains of Spain increased by 20% from 2019 to 2020 (González-Domingo et al., 2021), and at least 11 PAs in Catalonia increased or even doubled in its number of visitors during the summer of 2020, in comparison to the previous year (Departament de Territori i Sostenibilitat, 2020). This surge in visitors was attributed to the “social need” of leaving urban areas after lockdown, but the restrictions placed on traveling to

different regional or international locations encouraged visitors to gather in rural spaces closer to urban areas.

Recent research not only confirms the significant rise in outdoor recreationists, but also highlights a critical increase in new or inexperienced outdoor recreation participants (Beery et al., 2021). Due to their poor knowledge of PA conduct codes, these individuals exhibited behaviors that were incompatible with the sensitivity of PAs (Cahyadi & Newsome, 2021; Moore & Hopkins, 2021). Eventually, PAs experienced overcrowding, parking and traffic collapse, conflicts between visitors and residents, vandalism, littering, and ecological damage (McGinlay et al., 2020; Molteni, 2022). The implications of the pandemic were noticed in PAs management approaches. The changes triggered by mobility restrictions in visitors' social behavior, consumption, and leisure patterns in PAs encouraged new management strategies related to access restrictions, crowd control, marketing, among others (Jones et al., 2021; KC, 2021; Lebrun et al., 2021). The effectiveness of management entities in handling visitor flows was key in mitigating the potential negative effects of increased visitors, while leveraging the benefits deriving from a greater social appreciation of proximity tourism.

The report of there being few lasting effects of the pandemic in visitors' outdoor behavior (Beery et al., 2021) underscores the adaptation capacity shown by management entities in the face of drivers of change. It points to their efforts to return to "normal" behavioral patterns from before the pandemic. This also meant a quick return to typical unsustainable mobilities to and in natural areas. As cautioned by Hall et al. (2020), the public, the tourism industry, and policymakers have disregarded learnings from past experiences – a repeated behavior from past crises. As Cheer et al. argued, the pandemic has exposed "*how little we really know about how to deal with such extraordinary crises and its aftershocks*" (Cheer et al., 2021, p. 279). Global experiences have underscored the significance of coordination, collaboration, and communication among academics and practitioners involved in the management of PAs. These experiences have also highlighted the need for multidisciplinary research and management approaches to address socio-economic-environmental challenges within and around PAs (Hewlett et al., 2024), as well as the need for studying visitors' travel intentions and behavior adaptation in PAs driven by perception, motivation, and experience (Qiu et al., 2021; Ramli et al., 2021; Yang et al., 2021).

## Part 3: Methodology

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## Chapter 5: Research design

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### 5.1. Pragmatic paradigm and mixed methodology

Paradigms emerge from a collective vision of the social world considered meaningful and appropriate to understand a phenomenon shaped by the beliefs and actions of the researcher's community (Morgan, 2014). Within these philosophical paradigms, "*post-positivism claims that the world exists apart from our grasp of it*" (Morgan, 2014, p. 1048), relying on confirmatory and deductive quantitative methods. On the other hand, constructivism contends that the "*world is created by our conceptions of it*" (Morgan, 2014, p. 1048), implementing exploratory and inductive qualitative methods (Maarouf, 2019). The dominance of these stances in research defines how the social world is seen, the place of individuals in this world, and the range of emerging relationships between these individuals (Pansiri, 2005). The methodological approaches of these paradigms offer unique advantages; for instance, quantitative methods facilitate faster and more precise data collection and analysis (Ahmed, 2010), whereas qualitative methods yield in-depth insights into complex phenomena or abstract concepts such as motivations, profiles, or conflicts (Pansiri, 2005).

Alternatively, pragmatism has emerged as a philosophical paradigm embraced within the social and behavioral sciences (Morgan, 2014). The intersubjectivity of pragmatism is justified by the acknowledgement that social reality can be captured through both subjective and objective stances, transitioning to a perspective in which the sources of our beliefs, the meanings of our actions, and our experiences are interpreted to build reality (Pansiri, 2005; Saleem Parvaiz et al., 2016). Through a practical stance, individuals, including researchers and stakeholders, define the issues that matter the most to them and pursue them in ways that are most significant to their context (Morgan, 2014). In this dissertation, a pragmatist perspective can generate meaningful and tangible outcomes that can be implemented in practical settings through adaptable and socially shaped ideas designed to cope with particular and irreplicable circumstances in physical environments (Ñaupas Paitán et al., 2018), such as those caused by the COVID-19 pandemic.

Furthermore, usually, a phenomenon may be known through the study of its context and described from generalizations, but sometimes, these generalizations do not function in changing contexts in which prior knowledge or theorization is low. Pragmatism accepts the existence of both one reality and different realities built through social actors' perceptions,

allowing researchers to approach the study context separately from prior circumstances through these actors' experiences. In this way, reality is elucidated, and new knowledge is created (Saleem Parvaiz et al., 2016), which can be eventually compared to other contexts. Furthermore, pragmatism represents a holistic research approach founded on the application of mixed methods (Pansiri, 2005), positioned in the middle of a two-ended continuum (Maarouf, 2019). This means that qualitative and quantitative methods are compatible with each other, equally important within the research process, and their strengths support and enrich each other's findings by triangulation (Maarouf, 2019; Saleem Parvaiz et al., 2016). While the utilization of both methodologies poses a challenging approach that demands time and effort, their integration facilitates the mitigation of disadvantages associated with their use. In the context of this research, pragmatism allows for the identification and understanding of VM strategies implemented in PAs during the pandemic, as well as the perception of managers and stakeholders of emerging challenges from a qualitative approach. This understanding of practical implications on VM results in the construction of knowledge of the current reality, which continues to be studied from visitors' standpoint through a quantitative approach. The application of mixed methods allows a dialogue that encourages reciprocal learning between such methods, providing relevant tangible information for decision-making processes (Voll & Luthe, 2014).

This dissertation is developed under the pragmatism scope because its practicality and emphasis on application of this paradigm is not only appropriate for social research, but also adds a critical perspective to tourism research (Morgan, 2014; Saleem Parvaiz et al., 2016). McCool and Stankey (2003) have suggested that complex, ambiguous, and uncertain VM issues need to be addressed through an approach grounded in the triangulation of different methodological approaches. Moreover, there exists an increasing need for methodological diversity in response to the blurred boundaries of all the elements that compose the tourism value chain (Morgan, 2014). This research addresses these needs while furthering understanding of the consequences and meaning of drivers of change in society. Its undivided multi method aims for a relevant study of the phenomenon of interest – the transformations on VM in PAs after the pandemic – by being oriented towards the usefulness of the outcomes and practical implications for stakeholders to solve emerging problems, usually stated as “*what works*” (Mandić, 2021, p. 6). This also means that how and why we approach the study of the phenomenon in a given way are significant in defining the research objectives and questions (Maarouf, 2019), and the interpretation of the outcomes obtained is influenced by the instruments used to corroborate and validate the evidence (Pansiri, 2005).

**Table 3.** Research design

<b>Related Chapter</b>	<b>Chapter 6</b>	<b>Chapter 7</b>	<b>Chapter 8</b>		<b>Chapter 9</b>
<b>Objectives</b>	SO1	SO2	SO3		SO4
<b>Research Questions</b>	RQ1	RQ2	RQ3		RQ4
<b>Method Approach</b>	Qualitative	Qualitative	Mixed Methods		Quantitative
<b>Research Strategies</b>	Documentary Research: Systematic Literature Review	Documentary Research: Secondary Data Systematic Review	Semi structured questionnaires	Case: Focus Group	Surveys
<b>Sources</b>	Scopus	Digital Media	Stakeholders related to VM in PAs and Managers of PAs of the Province of Tarragona	Managers of PAs of the Province of Tarragona	Visitors to Ebro Delta Region
<b>Year of data</b>	2020, 2021	2020	2021		2022
<b>Analytic Method</b>	Thematic analysis	Content analysis	Thematic analysis		Descriptive Statistics + Ordinal Logistic Regression
<b>Geographic scale</b>	Global Scale	Regional Scale: Catalonia	Local Scale: Tarragona		Site Scale: Ebro Delta Region

Table 3 summarizes the research design applied in this study, in which the relationship between chapters, objectives, research questions, and approaches are presented. As previously stated, a comprehensive understanding of the effects of the pandemic are reached throughout and by the end of the analysis, through the convergence and validation of different methods (Adu, 2018). As seen in Table 3, the mixed methodology applied in this research involves the collection of both quantitative and qualitative data, taking advantage of the virtues of both approaches. The design and implementation of both methods to measure and understand the same phenomenon leads to an enriching process of corroboration and confirmation (Pansiri, 2005) that serves well the research purposes of this dissertation. The data has been collected sequentially and simultaneously between 2020 and 2022, although separately from each other, given the characteristics of the objectives expected to be achieved. The sources selected in this research are focused on obtaining the most updated information to draw informed conclusions from the recent context. This research design has allowed the findings to undergo reciprocal assistance for their multistage integration, explanation, and interpretation. In this sense, the methods of analysis are also under the pluralism scope that characterizes pragmatism. Finally, the geographic scales associated with each chapter are once again detailed, underscoring the multiscale approach adopted in this dissertation.

The following section elaborates on the research strategies utilized in this dissertation, as mentioned in Table 3: Documentary Research, Case, and Surveys, as well as their link with the objectives, research questions, and territorial scales devised in the dissertation introduction.

## 5.2. Research strategies

### 5.2.1. Documentary research

The first of the research strategies applied in this study was documentary research, used to answer the first and second research questions of this dissertation. This qualitative approach evidences a phenomenon occurred through the use, review, and evaluation of documents that portray text, images, or data that has not been collected or produced by the researcher (Bowen, 2009; Tight, 2019). It is considered the most widely used method in social sciences, presenting the advantage of situating the documents consulted in a temporal and social context, which can afterwards be structured within an analysis framework for its interpretation (Ahmed, 2010). Documents included in this process are accessible through printed materials or virtually (computer-based and/or available online) and provides information about “*social facts*

*produced, shared and used in socially organized ways*” (Bowen, 2009, p. 27). Furthermore, the data obtained have provided a knowledge foundation, working as a guideline in the selection and design of further research instruments to solve existing knowledge gaps (Bowen, 2009).

Documentary research fits within the mixed-method approach that frames this research (Bowen, 2009). The documents used in this dissertation were virtually accessible, including articles published in academic journals and news published in digital media. The analysis of both types of documents have worked as a means to shape the reality of the current contexts through the events reported in them (Ahmed, 2010). As with any other technique, this research strategy has required robustness, rigor (Schryen, 2015), and appropriate adherence to ethics. For this, the documents consulted comply with four advised quality criteria: authenticity (genuine, not staged, verified authorship), credibility (trustworthiness and expertise, independent and prepared beforehand), representativity (relevant within the totality of relevant documents), and meaningful, clear, and comprehensible insights (Ahmed, 2010; Bowen, 2009). As suggested by Ahmed, these four criteria “*should rather be seen as all interdependent and the researcher cannot adequately use one criterion to the exclusion of others*” (2010, p. 2).

Nevertheless, this method does not come without criticism, given its dependence on the subjectivity and personal judgement of the researcher in its interpretations (Kleinheksel et al., 2020). Online information has also been criticized due to its volatility and for being too easily accessible, causing issues of trust and sometimes inaccuracy. This is especially relevant for the information gathered from news on digital media, which can be updated or deleted over time. However, documentary research has strengths that should also be considered. For this study, knowledge of the effects of the pandemic has been accessed from different geographical contexts: global and regional (Catalonia) and temporal (2020 and 2021). Moreover, the fact that the documents consulted have been created within their own frameworks of theory, belief, and knowledge ensures that the content of the documents and the data collected is less influenced by the researcher (Ahmed, 2010).

The documentary research developed for this dissertation has gone through an analytic and interpretative process that involves three interacting components before, during, and after the documents analysis: (1) data reduction through the continuous structuring, translation, and interpretation of the information into significant themes and patterns, (2) display of data through the analysis and presentation of the data, and (3) drawing and verification of conclusions (Ahmed, 2010). In this study, two types of analysis approaches have been implemented. First, a thematic analysis from the systematic literature review of academic articles was implemented to identify and understand the research gaps related to the development of the pandemic in PAs

of the global context. Thematic analysis is a “*creative way of identifying the salient themes in a structured manner*” (Rambaree et al., 2021, p. 7) to aid interpretation (Brooks et al., 2015) through the coding and uncovering of theme patterns that become categories of analysis. In this sense, the articles in multidisciplinary academic journals allowed for pulling together existing evidence and information on emerging challenges caused by the pandemic in the management of PAs in the global context. It also allowed for the identification of research gaps, crucial to the development of this research.

Second, a content analysis from a review of news published in digital media was performed. The use of this type of secondary source allows insights into the effects of the pandemic as a lesser-known social phenomenon and a contemporary driver of change. Furthermore, information transmitted through media works to construct public opinion, vital for the construction of a reality (T. Hansen, 2020; Henderson, 2016). Content analysis has been defined as “*the process of organizing information into categories related to the central questions of the research*” (Bowen, 2009, p. 32). This approach is usually associated with the quantification of the frequency of terms to provide a picture of the documents reviewed that can be afterwards used in statistical analyses (Kleinheksel et al., 2020). However, “*as the naturalistic qualitative paradigm became more prevalent in social sciences research and researchers became increasingly interested in the way people behave in natural settings, the process of content analysis was adapted into a more interesting and meaningful approach*” (Kleinheksel et al., 2020, p. 27). Thus, the implementation of content analysis in this research, besides identifying the frequency of VM measures implemented in PAs in Catalonia, also argues the VM approach used and the possible implications of the information that was communicated to the public through the media.

### 5.2.2. Case: Semi-structured questionnaires and focus group

A natural step after the documentary research was enriching the study through the selection of a case and implementing tools to gather first-hand data. This case aimed at answering the third research question of this dissertation through the interpretation of stakeholders’ and manager’s lived experiences and perceptions of PAs during the pandemic. In doing so, the geographical scale changes to a local level by considering the Province of Tarragona as the area of interest for this study. This strategy provided a snapshot of the experiences of key actors, who provide familiarity and knowledge of the context under investigation. In line with the pragmatic and mixed-method approach adopted in this research, the case presented is an opportunity to

highlight relevant concepts and principles (Kling, 2022) related to the development of VM in PAs and offer in-depth understanding of the challenges experienced by PA managers during the pandemic. The dissertation benefits from this research strategy, since cases are considered a proper strategy when the research is focused on contemporary phenomena within a temporal and spatial frame (Farquhar, 2012). Furthermore, the use and interpretation of data collected from multiple sources is valuable in increasing the credibility and validity of the overall research (Çakar & Aykol, 2021).

The exploration strategies used in this qualitative stage of the research consisted of (1) semi structured questionnaires, defined as a type of qualitative research interview that lists themes and questions adapted to the specific organizational context of the participant (Saunders et al., 2009) with exploratory and explanatory purposes within the research process; and (2) focus groups, defined as a non-standardized group interview involving between four and eight participants purposely selected, “*where the topic is defined clearly and precisely and there is a focus on enabling and recording interactive discussion between participants*” (Saunders et al., 2009, p. 344). Focus groups extract the intricacies of complex experiences and the underlying reasoning behind an individual's behavior, beliefs, perceptions, and attitudes through guided and interactive discussions. This method has allowed for an exploration of the full spectrum of participants’ perspectives. They are then able to elaborate on their contributions to the discussion while considering other participants’ points of view (Powell & Single, 1996).

Furthermore, the development of this case and the use of these two instruments fit within the phenomenological approach, which has been considered appropriate in tourism research. Phenomenology studies contexts as they appear to be in order to come to an essential understanding of and give meaning to realities through a description of human consciousness and experience (Hills, 2013; Starks & Trinidad, 2007). Phenomenology is interested in four aspects of the human experience related to (1) spatiality –places such as PAs–, (2) relationality – lived relationships–, (3) temporality –time in which the studied phenomenon is developed–, and (4) corporeality –the way individuals move through the space (Ye et al., 2009). Due to its flexibility, phenomenology can be situated within different philosophical and theoretical paradigms chosen by the researcher, including pragmatism. “*In recent decades a philosophical encounter between [pragmatism and phenomenology] has emerged, overcoming to some extent a longstanding mutual exclusion*” and improving their compatibility (Bourgeois, 2002, p. 568). As stated by (Gallagher, 2022, p. 6), “*not only is the phenomenology ... in some parts pragmatic, but also pragmatism from near the start, at least in part, and in some specific sense, was phenomenological*”. In this sense, the intersubjectivity spectrum through which the

relationship between “subjects” and “objects” are studied in phenomenology fits within the pragmatic approach implemented in this research (Pernecky & Jamal, 2010).

### 5.2.3. Survey

This research has taken a quantitative turn to answer the fourth research question through a statistical analysis of data collected through a survey among visitors of a PA in the Province of Tarragona. This also represents a change in territorial scale, now focused on the Ebro Delta Natural Park, the most visited PA of the Province. Given the complex human-nature interactions in this Natural Park, it represents an interesting opportunity for an empirical approach. The significant increase in tourism caused pressures in sensitive areas of the Natural Park and the subsequent degradation of beaches and vegetation. Multiple regulations were introduced; however, the survey paid attention to the attitude of visitors towards specific traffic management measures, aiming to answer the fourth research question of this dissertation. As presented in Table 3, this empirical stage involved the application of a non-experimental survey, which allowed for a collection of information that would solve gaps within social and behavioral research (Golledge, 1997). Surveys are commonly used in the collection of quantitative data associated with a deductive approach. This method has been used in a variety of contexts to study visitor attributes, their experiences, preferences, and behavior (Scuttari et al., 2019). Through this, knowledge of these non-observable variables (Maarouf, 2019) has been created, and the subsequent results are useful in informing and guiding the suitable creation and application of management strategies.

For this research, a questionnaire was created to gather data related to visitors’ sociodemographic attributes, the characteristics of their ongoing visit at the Delta, affinity with environmental issues and natural areas, and perception variables in order to determine if they were suitable to explain visitors’ attitude towards VM strategies implemented in the Ebro Delta Natural Park. Moreover, since a more personalized level of contact might translate into a higher response rate (Newsome et al., 2002), the survey was conducted personally in different locations of the Natural Park. This instrument was oriented to learn about the distribution of the studied characteristics among the surveyed (Monje Álvarez, 2011). The development of this survey involved the selection of a sample that represents the population of visitors to the Ebro Delta, selected through simple random sampling. The inclusion of this quantitative strategy helps to increase the transferability, generalizability, and reliability of the mixed method approach adopted in this research (Çakar & Aykol, 2021).

The collection of a large amount of data that can be standardized allows for comparison through descriptive and inferential statistics (Saunders et al., 2009). This research relies on an ordinal logistic regression as a method to assess the relationship between the mentioned characteristics/variables and visitors' acceptance of VM measures introduced in specific parking areas of the Natural Park.



## Part 4: Empirical Cases

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## Chapter 6: The impact of COVID-19 in protected areas management: A review of emerging challenges, responses, and future research lines in the post-pandemic context

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### **Abstract**

The COVID-19 pandemic and the multiple associated changes on human activities and mobilities have implied the emergence of (new) challenges for the sustainable management of protected areas. With the objective of identifying and categorizing those challenges, the responses implemented and the future implications we developed a systematic literature review on the implications of COVID-19 crisis for protected areas management. Based on 56 articles published in 2020 and 2021, our findings offer (a) descriptions of the studies conducted, (b) multiscale effects of the pandemic on Protected Areas, (c) changes in the public use of Protected Areas during the pandemic, (d) managerial adaptation during the pandemic, (e) rethinking Protected Areas management at a mid- and long-term, (f) and an emerging research agenda on Protected Areas. Overall, our results show broad agreement about the pandemic's early cascading effects, both positive and negative, on the management of Protected Areas and the behavioral and mobility patterns of their users. Three years have passed since the start of the pandemic, from which decision makers can leverage several lessons to be prepared for future crises; especially when it comes to achieving compatible levels of resilience and adaptability between the users of these areas and the institutions in charge of Protected Areas management.

### **Keywords**

Protected area, environmental management, COVID-19, literature review

## 6.1. Introduction

Protected areas (PAs) are systems that enable economic development, the promotion of sociocultural and pro-environmental values, the enjoyment of natural land- and soundscapes, the boost of psychological and physical health, between other benefits (Cumming et al., 2021; Jones et al., 2021; Qiu & Zhang, 2021). PAs act as drivers for adaptation of regions threatened by the exploitation of nature resources, the transformation of landscapes, and even the outbreak of disease (Hockings et al., 2020; Ma et al., 2021). The conservation and restoration of ecological and cultural heritage particularly depends on the existence of such areas (Phua et al., 2021). As such, PAs management is done under strict conservation-focused policies and tends to be conditioned by several socio-political and economic factors (Díaz-Sánchez & Obaco, 2021; Smith et al., 2021). In that sense, PAs are highly susceptible to disruptions related to their geographical location, management capacity, governance, and funding sources (Mandić, 2021; Miller-Rushing et al., 2021).

PAs have been favored with a growing public support and interest, after the flourishing of outdoor recreation in the 1960s and ecotourism in the 1980s (KC, 2021). However, both despite and somewhat because of such increased popularity, many PAs have experienced environmental damage and degradation, conflicts between users, and pollution (Cahyadi & Newsome, 2021; Spenceley et al., 2021). The financing of PAs management has been a topic of discussion, especially for those PAs highly dependent of tourism as a primary source of income, for the irregularity of such industry makes PAs more vulnerable to contemporary changes such as the ones caused by the pandemic (Meredith et al., 2021; Souza et al., 2021).

In March 2020, COVID-19 was declared a pandemic, the first of the 21st century. Because of the multiple policies introduced to cope with the health crisis and the subsequent shift in global mobility flows, PAs experienced changes in their operation conditions and use patterns (Jones et al., 2021; Smith et al., 2021; Waithaka et al., 2021). As noted by Jenkins et al. (2021), the pandemic was an experiment that exposed underlying constraints in the management of PAs and the involvement of different stakeholders in response to contemporary crises.

In the context of this study, PAs are understood as natural landscapes, officially recognized and managed to fulfill conservation functions, concurrently providing values and services for humanity (McGinlay et al., 2020). These areas are typically designated within national or regional legal frameworks, which establish various protection categories and regulate the types of uses to which PAs may be subject. As suggested, PAs provide means for sustainable livelihoods and the quality of life of the adjacent communities that are inseparably linked to

their geography, resources and services. Given these conditions, this article aims to identify central issues related to the management of PAs during the COVID-19 pandemic, chiefly by integrating and analyzing emerging research concerns related to that context. To that aim, we conducted a standalone systematic literature review that assembles existing evidence and information on the topic as it has emerged. In our review, we sought out literature able to provide answers to three research questions:

- Q1: What approaches have been used to analyze implications of the pandemic in the management of PAs?
- Q2: What has the COVID-19 pandemic implied for PAs?
- Q3: What gaps in knowledge about PAs in relation to the pandemic need to be addressed in future research?

Including the foregoing introduction, this article is structured in five sections. Next, in Section 2, we describe the method and steps followed in our study. In Section 3, we summarize the major findings of our systematic literature review, which we further discuss in Section 4. Last, in Section 5, we present our conclusions, as well as future research lines.

## 6.2. Method

To analyze the literature addressing PAs during the COVID-19 pandemic, we conducted a standalone systematic literature review. Firstly, we conducted a query in Scopus, an accessible multidisciplinary database encompassing a wide variety of scholarly journals, which allowed us to set publication dates of both 2020 and 2021 as a preliminary filter. Furthermore, we selected this database to ensure that the articles included have undergone quality control and a peer-review process, which warrants their credibility and relevance. From there, our query was based on the criterion of “Title, abstract or keywords” provided by the database using the following combination of terms:

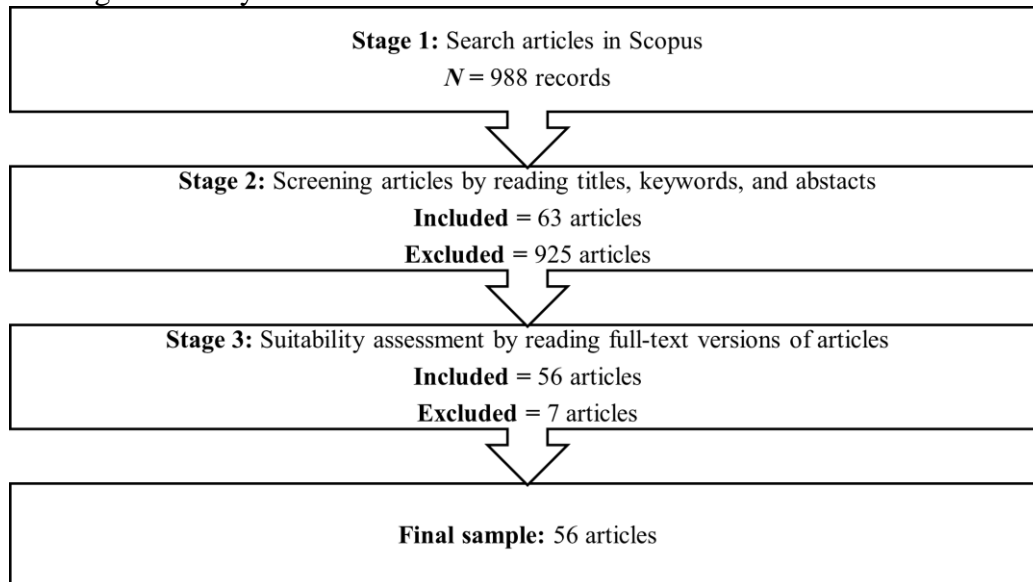
(Covid-19) OR (coronavirus) OR (pandemic) OR (SARS-CoV-2) AND (conserved areas) OR (protected areas) OR (natural areas) OR (national parks) OR (protected natural parks)

In the second stage, we implemented a screening process based on a common-sense evaluation of the consistency of the titles, keywords, and abstracts of the articles with our topic of interest. To be specific, the articles had to provide relevant information on PAs before the pandemic, compare such information with a mid-pandemic situation, and/or examine emerging issues and the response of management entities after the beginning of the pandemic. Furthermore, we did not limit this study to a specific territorial domain and have included articles that investigate

the phenomenon of interest at an international, national or site scale. Moreover, concerning the locations studied, research settings in the articles had to be natural areas with official protection; therefore, we excluded articles presenting research conducted on urban parks, coastal and rural areas that have not been classified as any type of PA. We also excluded articles addressing topics beyond the scope of research on PAs in relation to the pandemic or discussing themes in highly specific fields within applied sciences, chemistry, biology, and medicine, among others. As a result of the second stage, the number of viable articles dropped from 988 to 63.

In the third stage of the literature review, we imported the articles into Mendeley reference manager software and read their full-text versions to assess their suitability for the review. As a result, 56 articles remained, excluding seven lacking consistent information related to the context of the review. Figure 6 outlines the various stages followed in the review.

**Figure 6.** Stages of the systematic literature review.



To obtain data of interest, we catalogued the articles, extracted, dissected the information therein, pulled and coded relevant findings from the text. We grouped the findings according to six groups with our research questions in mind (Table 4). The first group, (a), describes features extracted from the articles, including type of publication, temporal distribution, territorial scale, study location(s), methodology, and data source(s). After reviewing the content of the articles, we identified implications of the pandemic discussed from different viewpoints and at different scales and thereafter categorized them accordingly in Groups (b)–(e), as shown in Table 4. Sixth and last, Group (f) summarizes the research gaps within the articles reviewed.

**Table 4.** Research questions and themes of analysis in the systematic literature review.

<i>Question</i>	<i>Group of findings</i>
Q1	a. Description of the studies
Q2	b. Multiscale effects of the pandemic on PAs c. Changes in the public use of PAs d. Managerial adaptation during the pandemic e. Rethinking PAs management at a mid- and long-term
Q3	f. Emerging research agenda

### 6.3. Findings

Following, findings will be described as mentioned in the groups identified in Table 4. As for Table 5, it lists the articles that populated our review and indicates which findings were drawn from which article(s) according to Groups (b), (c), (d), and (e).

#### 6.3.1. Group A: Description of the studies

As shown in Table 6 we reviewed 56 articles, 46 of which presented original research following an empirical approach. By methodology, 28 of the articles used a quantitative methodological approach. Those studies used instruments and data sources such as surveys, public statistics, culturomic metrics, search volume data, topographical information, and use of light at night, sound levels and motion data. In multiple cases, more than one source was exploited. The quantitative data was subsequently used to construct indexes and statistical models to explain the phenomenon studied. By contrast, nine of the articles reported studies involving qualitative research methods, including structured questionnaires, interviews, focus groups, field observations, and content analysis. Across the sample, the use of secondary data was also common, including press articles, official reports, and websites from PA agencies and government entities, along with social media posts. This, due to the novelty of the topic and the limited academic literature on it when the articles were written. Last, nine articles reported mixed methods, usually while combining official statistical data with information provided by managers and staff from PAs.

**Table 5.** Summary of the articles reviewed and findings per thematic group.

Author(s) and year	Group of findings				Author(s) and year	Group of findings			
	b	c	d	e		b	c	d	e
	Anand & Kim (2021)	x					Miller-Rushing et al. (2021)	x	x
Bates et al. (2020)	x	x			Moore and Hopkins (2021)				x
Bhammar et al. (2021)	x		x		Moya Calderón et al. (2021)				x
Cahyadi & Newsome (2021)	x	x	x		Ndlovu et al. (2021)	x		x	
Cumming et al (2021)	x		x		Neupane et al. (2021)	x			
Díaz-Sánchez & Obaco (2021)	x		x		Oberle et al. (2021)	x			x
Falk et al. (2021)		x	x		Phua et al. (2021)	x		x	x
Ferreira et al. (2021)		x			Primack & Terry (2021)			x	x
Harris et al. (2021)		x			Qiu et al. (2021)			x	
Hockings et al. (2020)	x	x	x		Qiu & Zhang (2021)			x	
Hymas et al. (2021)	x				Ramli et al., (2021)			x	
Jenkins et al. (2021)	x	x	x		Reaser et al., (2021)	x			x
Jones et al. (2021)			x		Saladié et al., (2021)			x	
KC (2021)	x	x	x		Samdin et al., (2021)			x	
King et al. (2021)			x		Seong et al. (2021)			x	
Koju et al. (2021)	x				Seong & Hong (2021)			x	
Kovács et al., (2021)		x			Singh et al. (2021)				x x
Kroner et al. (2021)	x		x		Smith et al. (2021)	x	x	x	x
Kupfer et al. (2021)		x	x		Souza et al. (2021)	x		x	x
Lebrun et al. (2021a)		x			Spenceley et al. (2021)	x	x	x	x
Lebrun et al. (2021b)		x			Sumanapala & Wolf (2021)			x	x x
Lee et al. (2021)		x			Tan et al. (2021)				x
Loos (2021)	x		x		Terraube & Fernández-Llamazares (2020)	x			
Ma et al. (2021)		x	x	x	Terry et al. (2021)			x	
Mandić (2021)		x		x	Waithaka et al. (2021)	x		x	x
McGinlay et al. (2020)		x	x	x	Xiao et al. (2021)			x	
Meredith et al. (2021)		x		x	Yang et al. (2021)			x	
Miller et al. (2021)		x			Zukerman et al. (2021)			x	

**Note:** (b) multiscale effects of the pandemic affecting PAs, (c) changes in the public use of PAs, (d) managerial adaptation in PAs during the pandemic, and (e) rethinking PAs management at a mid- and long-term

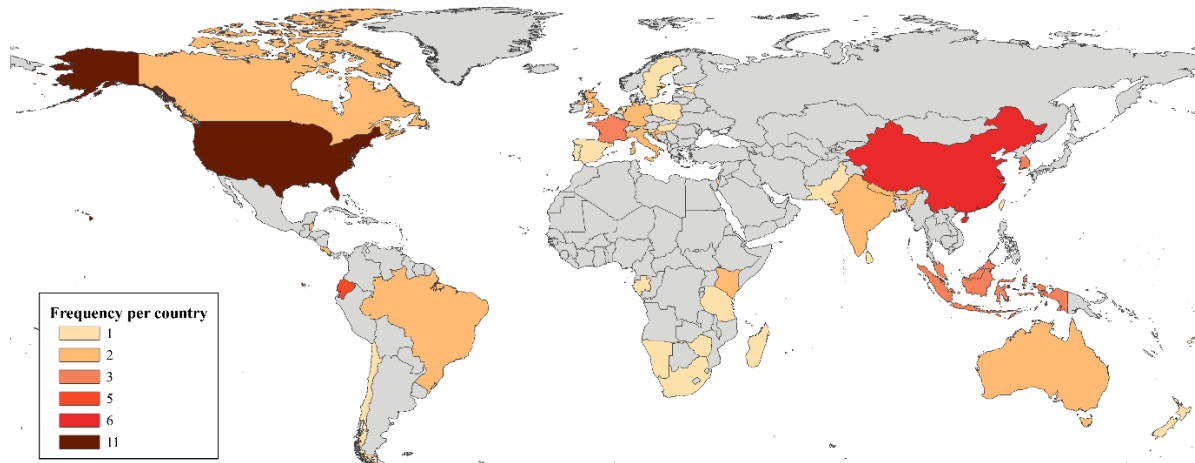
**Table 6.** Descriptive attributes of the articles reviewed.

<b>Attribute</b>		<b>Number of articles</b>
<b><i>Type of article</i></b>		
Research paper		40
Review papers		8
Other		8
<b><i>Methodological approach</i></b>		
Quantitative		28
Empirical	Qualitative	9
Mixed		9
Conceptual		10
<b><i>Publication date</i></b>		
2020		4
2021		52

In relation to the geographical approach adopted on the reviewed articles, twelve of the studies reported analyses from an international perspective, in cases located in two or more countries or regions of the world. Between those, four provided a global overview of the impacts of the pandemic; four provided information from cases in multiple countries on every continent except Antarctica; two presented analyses at the continental level, and the remaining two contrasted cases in two countries each. Along other lines, 10 of the articles presented national-level analyses, whereas 25 presented site-level ones. In the articles analyzing cases at the international, national, and local levels, forty-one countries were represented. The countries included relatively often in academic studies were the United States -U.S.- (11), China (6), and Ecuador (5). As Figure 7 shows, there was a spread scholar interest according to geographical domain. Although, countries from Latin America; Africa; Eastern and Southern Europe; and West, North, and Southeast Asia, and Oceania, have remained underexamined. The 10 remaining articles presented studies following a conceptual approach, thus do not examine specific locations or regions.

The production of academic work increased significantly in the second year of the pandemic, with 52 articles published in 2021. Nonetheless, in the 46 empirical articles, the temporality of the data varied. Four of the articles presented data collected exclusively before the pandemic and used it to explain current behavioral patterns or to predict future events. In 26 articles, the presented studies analyzed data predominantly collected between April and October 2020; while in 15 articles, the studies collected data both before and during the pandemic, mostly between 2019 and 2020, to measure and compare pandemic-induced changes or impacts. Last, one article presented a study that analyzed data collected in both 2020 and 2021.

**Figure 7.** Distribution of locations examined in the articles reviewed.



Author's own elaboration

### 6.3.2. Group B: Multiscale effects of the pandemic on PAs

#### *The role of PAs in mitigating future health risks*

Although the pandemic has been called an unprecedented event, past epidemics had comparable impacts, including the decimation of local populations and macroeconomic and social challenges and adaptations in Asia, Africa, and South America (Anand & Kim, 2021; Hymas et al., 2021). Reaser et al. (2021) have noted that during the introduction of agriculture and the domestication of wild animals for livestock, similar zoonotic spillovers were experienced. These authors considered that the causes behind the global spread of pathogens were human encroachment upon natural habitats, unregulated changes in land use, and intensified wildlife trade. Despite such a checkered past of humans and nature, Oberle et al. (2021) and Terraube & Fernández-Llamazares (2020) have characterized PAs as pivotal tools in implementing nature-based solutions and in containing the effects of novel diseases.

#### *Environmental implications in the early stage of the pandemic*

Several articles underscored the positive environmental impacts of the temporary cessation of manufacturing activities, urban traffic and travel. Such impacts included the reduction of disturbances and sound levels in and around PAs (Miller-Rushing et al., 2021), improved air and water quality, decreased water usage, and a decline in roadkill of wild animals (Phua et al., 2021; Smith et al., 2021; Terry et al., 2021; Waithaka et al., 2021). In view of those trends, Bates et al. (2020) have encouraged collective and multidisciplinary research approaches to address the emerging changes in human mobility and their impacts on ecosystems. The

pandemic period in question was also an opportunity to evaluate behavioral changes in wildlife. On that count, Zukerman et al. (2021) in Zimbabwe, and Koju et al. (2021) in Nepal, found that reduced tourism-related disturbances brought positive benefits for wildlife. In absence of visitors, wildlife roamed to more favorable locations in search of water and food; or reproduced at a greater rate.

In relation to changes on human activity on PAs, fourteen of the articles mentioned a severe growth of illegal activities attributed to the deviation of security personnel and other complex socioeconomic drivers (Phua et al., 2021; Smith et al., 2021), especially in countries of Africa and Latin America (Hockings et al., 2020). Mining, grazing and logging, charcoal burning, wildlife poaching, and fishing of high-value species, have all intensified in the first year of the pandemic (Cahyadi & Newsome, 2021; Loos, 2021; Miller-Rushing et al., 2021; Ndlovu et al., 2021; Neupane et al., 2021; Souza et al., 2021; Spenceley et al., 2021). The increase of communities' dependence on the extraction of natural resources and on cross-boarders trespassing to engage in those activities (Bates et al., 2020; Cumming et al., 2021; Koju et al., 2021)) raised alarm over the unsustainable use of land and resources. Along similar lines, several tourism areas were likely to be converted into new settlements and agricultural lands (Waithaka et al., 2021).

#### *Country-level economic impacts on PAs*

Even before the pandemic, PAs faced managerial, structural, and systemic constraints (Bhammar et al., 2021). The pause of worldwide productive sectors and industries during the pandemic caused the narrowing of public budgets, tourism revenues, development aids, and philanthropic funding. As expected, fundamental operations in PAs were disrupted, which spurred them to cut costs and to delay, if not cancel, current and near-future conservation projects (Smith et al., 2021; Spenceley et al., 2021). Phua et al. (2021) and Waithaka et al. (2021) have studied the state of terrestrial and marine PAs at a regional and global level. According to their findings, during the early stage of the pandemic, countries in Africa and Latin America reported cuts in employment and salaries, and in Asian countries patrol, research, and monitoring were affected. By contrast, countries in North America, Europe, and Oceania did not face such impacts on government funding but did witness an important reduction in tourism revenue that caused shifts in operational priorities.

In the literature, the role of tourism as a catalyzer and booster for economic development, communities' participation, improvement of local livelihoods, human–wildlife conflicts

reduction, and reduction of pressure on land and marine landscapes has been acknowledged (KC, 2021; Meredith et al., 2021). However, during the pandemic, tourism was both a driver and a victim of the virus's spread and the subsequent pause of international mobility. Per Díaz-Sánchez and Obaco (2021), the drastic reduction of tourism to the Galapagos Islands in Ecuador meant a loss in revenues by 35% to 55% in the first year of the pandemic. During the same period, a higher percentage (+70%) of income loss was reported by Mandić (2021) near Croatia's Plitvice Lakes National Park. Anand and Kim (2021) found that the reduction in economic activities and in tourist mobility around PAs prompted variation in the night-time use of lights in Africa, while in Nepal, many tourism entrepreneurs forcedly retreated to agricultural work (Neupane et al., 2021).

On a more positive note, Jenkins et al. (2021) have found that the context favored collaborative approaches between different agencies of territories (e.g., county, state, and federal partners) toward the sustained use and management of resources in a PA of the U.S. Beyond that, Cahyadi and Newsome (2021) have shown that Indonesia's government established strategies to support its tourism industry in terms of finances, education, operation, marketing, and health regulations. Nevertheless, Kroner et al. (2021) cast doubt on recovery packages focused on economic recovery that undermined conservation efforts in the process. Indeed, they found that various countries began subsidizing extractive and polluting industries and eased access to permits needed to build new infrastructure near or inside PAs, while limiting and reducing budgets for environmental protection.

### 6.3.3. Group C: Changes in the public use of PAs

#### *Perceived health effects of PAs*

Given the COVID-19 pandemic's relationship with health-related issues, it is no surprise that the perceived benefits of PAs for people's well-being were a topic in the articles reviewed. As a case in point, Ferreira et al. (2021) conducted an exploratory analysis of COVID-19's on outdoor tourism practices in Portugal's Peneda-Gerês National Park and found that, among domestic tourists, there was an emerging perception that outdoor spaces were less conducive to the spread of the virus. Jenkins et al. (2021) similarly detected a correlation between the resurgence in visitors to PAs and the need to cope with the psychological and physical impacts of isolation. By extension, Lee et al. (2021), Qiu & Zhang (2021) and Qiu et al. (2021) analyzed the perceived restorative effects of PAs during the pandemic. Their findings include the effectiveness of forests as spaces for relieving stress and the fascinating stimuli of natural

soundscapes on people that have experienced mental fatigue, loneliness, and sadness in their everyday environments due to lockdowns.

#### *Perceived risks and protective behaviors in PAs*

The analysis of perceived risks of visiting PAs was another widely examined topic in the articles reviewed. Therein, Ramli et al. (2021) have found a moderating effect of perceived risk in the relationship between revisit intention and the demographics characteristics of visitors, their motivation, and destination image. Samdin et al. (2021) have added that perceived risks can be divided into ones related to expected services and others to visitors' safety and found that the availability of health- and safety-related information had become the most relevant predictor of perceived risks. In other analyses, Seong & Hong (2021) and Seong et al. (2021) identified an optimistic bias and a more positive social attitude toward natural outdoor settings and PAs, where they perceived fewer risks than in urban areas. According to Falk et al. (2021), domestic tourists' adaptation has derived from protective travel behaviors developed during the pandemic. Tourists and visitors were more aware of the hygienic and sanitary conditions of tourism sites and preferred areas with lower economic activity density such as those surrounded by national parks. Moya Calderón et al. (2021) as well as Ma et al. (2021) have added that travel costs also derived adaptation among domestic visitors when adjusting their behavior to hazards such as the pandemic.

Additionally, Xiao et al. (2021) have stressed concerns about health risks associated with overcrowded spaces and analyzed social carrying capacity with a focus on visitors' tolerance to encounters in PAs. They found that COVID-19 prevention strategies implemented within parks have significantly impacted the tolerance to crowds and served to enhance visitors' positive emotions regarding pandemic-associated risks. In addition, Jenkins et al. (2021) have reported that first-time visitors perceived crowding differently than repeat ones, and the incorporation of safety guidelines may have negatively influenced visitors to divert to non-established trails to avoid crowds.

#### *Shift of domestic visitors to nearby destinations*

In their respective studies in Hungary and the U.S., Kovács et al. (2021) and Kupfer et al. (2021) identified a shift in the mobility-related trends of domestic visitors who showed considerable interest on inland rural destinations, including PAs. Moya Calderón et al. (2021) have reported that domestic visitors in Costa Rica felt relatively safe on the outdoors in relation to the spread

of the virus and expressed a stronger sense of solidarity with the local economy. According to the articles reviewed, the restrictions on international travel and lack of alternative leisure activities in cities were behind such trends (Ferreira et al., 2021; McGinlay et al., 2020; Moore & Hopkins, 2021).

Tan et al. (2021) found that despite the vulnerability of short-distance markets, they have exhibited stronger adaptability and recovery rates than long-distance markets in China. Similarly, Yang et al. (2021) discovered that during the pandemic, domestic visitors to PAs in the U.S. preferred shorter stays in closer destinations, in contrast to their behavior during other crises, such as wildfires, when they chose to further travel and longer stays. To understand the recent increase in domestic tourism, Lebrun et al. (2021b) and Lebrun et al. (2021a) found significant relationships between memory, physical activity and education, and between arousal and the experience of residents when visiting PAs of France and China. Furthermore, extraordinary contexts such as the pandemic have a moderating effect on such relationships; that should be considered by managers in the design of experiences for domestic visitors.

Concerns related to visitors' actions have also emerged. Cahyadi and Newsome (2021) identified a lack of environmental awareness among domestic tourists in Indonesia, especially in relation to the cleanliness of tourism sites, and underscored an egocentric approach to visiting PAs, in which the dominant focus is personal enjoyment, not learning or discovery. To that, Moore and Hopkins (2021) added that a lack of familiarity with park regulations can explain conflicting behaviors among visitors. In further analyzing compliance with public health guidelines, Harris et al. (2021) observed that adolescents and young adults were more likely to adopt risky or carefree behavior in the early stages of the pandemic; however, that likelihood dropped from 90% to 60% in Miller et al.'s (2021) analysis conducted later that same year, probably due to a better understanding of the pandemic.

#### *Consequences of increased visitation at PAs*

As high interest in PAs eventually translated into overcrowding, multiple areas reported record visits, parking and traffic problems, conflicts between visitors and residents, and increased vandalism and littering (Kupfer et al., 2021; Ma et al., 2021; Miller et al., 2021; Souza et al., 2021; Spenceley et al., 2021). Consequences mentioned in the studies reviewed were disturbances to ecologically sensitive and remote areas, waste management issues, habitat fragmentation, microclimate disruption, reports of aggressive animal behavior and increased number of accidents and rescues performed in natural area (Kovács et al., 2021; Saladié et al.,

2021; Sumanapala & Wolf, 2021). In like manner, urban PAs received special attention due to their proximity to large human populations (Moore & Hopkins, 2021; Primack & Terry, 2021). These areas suffered trampling of vegetation, erosion, the widening of existing trails, and the unauthorized creation of new trails, as well as more noise pollution due to high-speed traffic on typically empty roads (Terry et al., 2021).

#### 6.3.4. Group D: Managerial adaptation during the pandemic

*Managerial constraints and measures implemented in response to pandemic-associated risks.*

Following the declaration of the pandemic, multiple PAs adapted their operation mechanisms. Surveillance, training, and planning sessions were held remotely, while scientific research, wildlife monitoring, and fieldwork were halted, which led to a rise in desk-based research (Hockings et al., 2020; Ndlovu et al., 2021; Phua et al., 2021). Although the circumstances allowed enhanced data sharing and the consolidation of projects, some stakeholders did not have the means to adapt to virtual communication (Smith et al., 2021). The initial lack of vital administrative staff, park rangers, and seasonal support staff, as well as the reallocation of duties hindered the capacity to respond to emergencies (Miller-Rushing et al., 2021; Waithaka et al., 2021). Enforcement capacity was reduced, while the maintenance of infrastructure and other routine management tasks were postponed or abandoned. Furthermore, per Bates et al. (2020) and Singh et al. (2021), the work overload on staff and the fear of contagion affected their PAs staff's health, causing symptoms of fatigue, anxiety, and stress. Furthermore, the staff faced difficulties accessing medical aid during the first months of the pandemic.

After several countries lifted their mobility restrictions, concern was to prevent contagion and guarantee the welfare of staff and visitors. Frequent sanitizing, use of facemasks, installation of barriers, and cash payments bans were among the protocols mentioned in the articles reviewed (Ma et al., 2021; Souza et al., 2021). Attending to the social distancing and health protocols imposed by governments, PAs were encouraged to provide low-density outdoor activities (Miller-Rushing et al., 2021). Some PAs completely or partly closed their facilities, reduced day-use quotas, limited group activities, or implemented reservation systems (Jenkins et al., 2021; Moore & Hopkins, 2021). They also introduced educational material, signage, and codes for responsible recreation (Cahyadi & Newsome, 2021; Kupfer et al., 2021; Spenceley et al., 2021; Sumanapala & Wolf, 2021; Waithaka et al., 2021). PAs from the U.S. reduced access to research facilities and collections, and implemented smaller field teams, causing an increase on the use of vehicles for individual trips (Miller-Rushing et al., 2021). Smith et al. (2021) and

Phua et al. (2021) identified a stronger collaboration between management authorities and security forces, volunteer corps or the community itself, to make up for the decrease in patrolling capacity and the increase in illegal activities in the vicinity of PAs.

#### *Public engagement with PAs*

Activities to enhance community engagement with PAs and moderate interactions between humans and biodiversity were affected during the pandemic, including the cancelation or limitation of environmental education and cultural events (Smith et al., 2021). In some PAs web-based activities were implemented, incorporating webinars, live webcams, and digital tours. Social media became an important means to share visual materials, allowing public participation in conservation-related issues, and providing real-time information about park visitation (Jones et al., 2021; Moore & Hopkins, 2021; Waithaka et al., 2021). Miller-Rushing et al. (2021) found that despite the sharp decrease in public interest in PAs, there was higher remote engagement. This contributed to the increase of visitors to PAs after the eventual lockdown ease.

#### *Response of PAs managers to the increase in visitation.*

The high numbers of visitors in PAs made new management adaptations complicated. In response to overcrowding and noncompliance with regulations, the authorities introduced and enforced additional protocols to manage visitors' flows to and within those areas (McGinlay et al., 2020). These protocols involved the application of early booking systems, timed entries, one-way paths and alternative paths, the reduction on the carrying capacity of facilities and mobile applications to monitor the number of users on the same path (Jones et al., 2021; Miller-Rushing et al., 2021; Primack & Terry, 2021; Spenceley et al., 2021). Such changes in mobility dynamics sparked interest in analyzing management strategies. On that topic, Jones et al. (2021) gathered the residents' perspectives on the suitability of strategies to manage the reopening of a PA in Croatia. Among their results, residents expressed discontent with unrestricted access. They preferred a phased reopening of the area; however, they were concerned that the strategy was insufficient to control crowds. Along similar lines, KC (2021) has mentioned the need to adapt marketing strategies to mitigate overtourism but still encouraged domestic tourism, as well as the co-creation of experiences with visitors. Falk et al. (2021) have supported those notions and pointed to the importance of appealing to the attractiveness of natural value and the health benefits of time spent in nature as means to maximize the benefits of domestic tourism.

### 6.3.5. Group E: Rethinking PAs management at a mid- and long-term

At least 21 articles have made significant contributions to rethinking PAs as social and ecologically resilient areas after the pandemic. Hockings et al. (2020) summarized that possibility in three scenarios. The first one, an eventual return to “normal,” a perspective on which the overall context before the pandemic was already negative and former constraints would remain poorly addressed. The second one, a pessimistic scenario in which the reinterpretation of regulations favors faster economic recovery rather than environmental conservation; and afterwards, the world would face an economic depression and a declining biodiversity. And the third one, a positive transition to a greener economy. KC (2021), King et al. (2021) and Meredith et al. (2021) have discussed the underlying need of fostering strong socioecological systems to cope with the implications of such crises and supported the adoption of a management model that favors people - PAs relationship. With such a model, the adaptation to disease outbreaks would be easier in both the short and long term, and nature-based spaces would become accessible for equitable use and health restoration (Smith et al., 2021).

Kroner et al. (2021), Loos (2021), Mandić (2021) and Spenceley et al. (2021) have drawn attention to the escalation of unemployment and food insecurity in sensitive regions of the Global South, and to the premature decrease in public engagement, revenues, and conservation efforts within PAs, in the global context. On that topic, various recommendations are included in the articles reviewed. For instance, the reinforcement of awareness about conservation (Oberle et al., 2021; Reaser et al., 2021), the training of managers and staff and the professionalization of rangers (Singh et al., 2021), the empowerment of different stakeholders (Cumming et al., 2021; KC, 2021; Waithaka et al., 2021), the use of technologies to enhance remote participation and exchange of ideas and information (Miller-Rushing et al., 2021; Phua et al., 2021), and the update of risk assessments and emergency response protocols to attend the constraints that PAs face (Ma et al., 2021).

Last, concerns related to the role of tourism in communities and the future of the activity were highlighted. Several authors have pondered the opportunity to shift into sustainable financing models that do not rely on large numbers of visitors and proposed complementary measures for economic recovery (King et al., 2021; Sumanapala & Wolf, 2021). Some actions being the creation of alternative revenue streams, income bases, and funding mechanisms; products innovation; thorough assessment of the effects of visitors’ spending; and proper expenditure

and pricing policies (Bhammar et al., 2021; Díaz-Sánchez & Obaco, 2021; Meredith et al., 2021; Souza et al., 2021; Spenceley et al., 2021).

### 6.3.6. Group F: Emerging research agenda

The pandemic and the subsequent recovery stages have provided a wide array of topics for research. Hymas et al. (2021) and Reaser et al. (2021) have heralded the time as an opportunity to develop interdisciplinary studies incorporating multiple dimensions of analysis from fields such as the social sciences, economics, and natural sciences, among others. This integrated approach would allow a deeper understanding of the drivers that trigger challenges in PAs during a crisis (Loos, 2021). In the articles reviewed, authors welcomed the use of innovative methods and tools of research, including culturomic metrics (Souza et al., 2021), iDNA monitoring and remote sensing of biodiversity (Anand & Kim, 2021; Bates et al., 2020; Terraube & Fernández-Llamazares, 2020), individual travel data (Falk et al., 2021), tracking and video records to analyze visitors flows (Phua et al., 2021; Zukerman et al., 2021).

Because most of the data for empirical analysis in the literature reviewed was obtained in 2020, it is plausible to continue with longitudinal studies that monitor and evaluate the pandemic's impacts across longer periods. At the same time, there are opportunities to continue conducting case studies, especially in poorly studied locations, which provide closer, relatable information for managers from other locations (Harris et al., 2021). Likewise, a participatory approach is advised to stimulate the participation of stakeholders and the use of updated information in decision-making processes (Saladié et al., 2021).

## 6.4. Discussion

Among the approaches followed in the reviewed articles, most involved analysis from a pragmatic approach and yielded useful, practical results based on comparable, replicable methods. In the early literature, there is a wide agreement that the pandemic has affected human mobility—causing an “anthropause” according to Koju et al. (2021, p. 2)—that caused a rapid decline in PAs resources and revealed the volatility of tourism as source of income. Several remarks in the articles aligned with statements from Smith et al. (2021), namely that the crisis reinforced management models that neglected local livelihoods, intensifying communities' vulnerability and unequal access to values and services provided by PAs.

At the same time, many problems pinpointed in this review predated the pandemic and had only worsened during this period (Cumming et al., 2021; Loos, 2021). Wildlife trade, overcrowding, disproportioned stakeholders' participation, financial instability, and limited management capacity are only some of the issues that needed and still ought to be addressed. The resolution of many of those issues prior to the conclusion of the pandemic relies on several factors such as political and social determination, the policies and activities promoted in PA's, as well as the markets that are stimulated.

Consistency in emphasizing the importance of implementing adaptive and preventive management empowers the ability to address not only the ongoing challenges faced by PAs, but also to effectively respond to new arising crises (Kroner et al., 2021). The need for carefully thought-out and informed plans for spatial use, (Kupfer et al., 2021; Ma et al., 2021), is presented as an enabler for effective management strategies in the articles reviewed. Meanwhile, using carrying capacity based on a maximum number of visitors as the only instrument of management was considered insufficient by authors such as McGinlay et al. (2020). For it, management approaches based on emotions and/or perceptions such as limits of acceptable change or social carrying capacity surged as proper alternatives (Xiao et al., 2021). Additionally, the pandemic tested the communication capacity and manager's preparedness to keep up with rapid exchanges of information and constant mobilities that characterize modern societies.

As previously mentioned, visitors to PAs have altered their perceptions and behavior during and due to the pandemic, yet there remained a strong desire to engage in outdoor activities. The emerging discussions on travel intention, risk perception, and adaptive behavior have provided valuable outcomes to feed management and marketing strategies that consider visitors' motivations and experiences. The bolstered bond between people and environment, and the fast adaptation of domestic visitors, had been both a call of attention for PAs managers to think of strategic decisions and planning, and to seize this momentum to enhance the acceptance of management measures and regulations introduced during the pandemic. This is especially relevant for PAs placed in regions highly dependent on international tourism markets, as well as in destinations facing problems such as overtourism or environmental degradation.

On another note, in this context, debates on public health issues are not surprising; but the appreciation of PAs potential to positively impact visitor's wellbeing and the subsequent call to integrate these areas to public health strategies emerged as one of the most valuable learnings on this subject-matter. That is, the health crisis was an opportunity to improve PAs management and people's engagement with nature and to acknowledge the increasing discourses of building

greener, healthier, and more sustainable societies, as suggested by Hockings et al. (2020). Last, recalling Hymas et al. (2021) and Reaser et al. (2021), epidemics and pandemics have happened before, but the conditions in which the COVID-19 pandemic developed were different. In this sense, the existence of convenient technologies and means for connectivity, the fast study of the virus with daily follow up and updates, the soon introduction of vaccination; all of this and more has allowed to cope with the consequences of the pandemic, generating learnings that can be leveraged to be prepared for future crisis.

## 6.5. Conclusion

This paper has reviewed mounting concerns related to PAs during the pandemic, with particular focus on the body of research published in the first two years of the crisis. As seen, there was a clearly great interest in analyzing the role of PAs in a context that transformed human mobility and the experiences of people who make use of those areas. The topic has been approached from sundry points of view and on various territorial scales, such that the articles complemented each other and were often in agreement about the needs identified. The global perspective adopted in the literature encompasses the social, ecological, and economic implications of the pandemic for PAs, their management, and public use. Nonetheless, in terms of territorial perspectives, despite the wide representation in areas of study and geographical domains, studies dealing with site-level analysis were predominantly conducted in the so-called Global North.

Full of hope discourses referring to a change in global mobilities towards sustainability and the appreciation of the potential of PAs have stood out. However, many of the recommendations and conclusions identified in this review have been overly general and nonspecific, especially ones from the pandemic's early stages. There is thus ample room for improvement for future research, especially because some articles lacked details about the data sources and methods used, as well as depth in the results and their implications. The articles reviewed have also shed light on the relevance of tourist activity for PAs, as captured by the number of studies analyzing related topics. However, given that most data were collected in the first year of the pandemic, those studies still failed to capture, much less analyze, the changes experienced by visitors in the long term, or the success of actions implemented in response to the pandemic and the possibility of reapplying them hereafter.

The acceleration in the problems that PAs regularly experience remains to be of interest. The understanding of how the implication of a global crisis persists in management and mobilities

and the study of the mechanisms applied to deal with those issues will pertain in future crises. Moreover, the pandemic functioned as means to recognize the capacity of individual resilience and self-determination to adapt to changing contexts; but also, it shed light on the capability of communities to return to their usual routines as soon as mobility obstacles were removed. The remaining questions will be whether this individual adaptive capacity can be effectively translated to the governance institutions in charge of creating management plans and policies in PAs; and whether PAs will be able to thrive despite contemporary, and yet unexpected, changes such as those caused by the COVID-19 health crisis.

As of the writing of this article, after three years, the pandemic has been officially called off. The crisis, that quickly developed into a complex social phenomenon, which effects broadened and conditioned decision-making processes at the government and at the site level; is already over. As quickly it expanded, it seems to be gone, and it is hardly talked about in today's daily news. After vaccination, the full opening of international borders and the recovery of traditional mobilities, what remains is to extract lessons that help to ensure the adaptability of places and destinations in the face of future crises. This makes the studies on post-pandemic transformations in PAs noteworthy and still relevant.

Our review has contributed to further reflection and wider examination of emerging opportunities for the future of PAs. Additional research could also involve the analysis of the reconfiguration of activities developed in PAs and the engagement of stakeholders in their governance and management. Such research could involve analyzing the capacity of governments and managers to adapt to crises, to establish collaborative networks, and to achieve the sustainable, effective functioning of PAs. Future studies could also focus on analyzing visitors' behavior and flow patterns when traveling towards and into PAs, to shed light on the lingering effects of a potential future crisis.

Last, our findings have some limitations that warrant consideration. For one, because most of the empirical studies analyzed information from 2020 or before the pandemic, certain relevant issues remain underexamined. The first year of the health crisis was the most restrictive in terms of mobility, and vaccination began in 2021; thus, analyzing management strategies and visitors' behavior and risk perception in the second and third years of the pandemic may yield additional findings. At the same time, to ensure that the articles reviewed had sufficient academic quality, we limited our review to literature available on Scopus database. Thus, articles published in journals not indexed in that database were automatically excluded. Added to that, most of the articles were written in English -although not exclusively-, meaning that articles written in other languages remain for future review.



## Chapter 7: The response to increasing numbers of visitors to Catalonia's protected natural areas during the COVID-19 Pandemic: a review from publications in digital media.

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Medina-Chavarría, M. E., Gutiérrez, A., & Saladié, Ò. (2022). Respuesta al aumento de visitantes en los Espacios Naturales Protegidos de Cataluña en tiempos de COVID-19: una revisión a partir de publicaciones en medios de comunicación digitales. *Boletín de La Asociación de Geógrafos Españoles*, 93, 1–34. <https://doi.org/10.21138/bage.3183>

### **Abstract**

The article analyzes how managers of Catalonia's protected natural areas responded to extraordinary increases in the numbers of visitors during the post-lockdown stage and easing of restrictions implemented due to the COVID-19 pandemic, as reported by the digital media. A systematic review of 105 news published between May and December 2020 was conducted. The results suggest that actions have been mainly focused on responding to the immediacy of the situation were implemented; these involved short-term solutions linked to the management of carrying capacity and entry to natural protected areas. Actions taken related to information and environmental education were delayed, and actions for managing visitors flows within natural protected areas were scarcely reported by the media. Our study is a first step for the identification and characterization of the strategies implemented by the entities managing protected natural areas and their ability to address the avalanche of visitors. Additionally, it reduces the existing research gap in studies of the impact of COVID-19 on the management of protected natural areas.

### **Key words**

Protected natural areas, COVID-19, visitors, Catalonia.

## 7.1. Introducción

En el primer trimestre del año 2020 la eclosión de la pandemia de la COVID-19 resultó en un fenómeno de rapidísima difusión global. Los gobiernos nacionales respondieron a la propagación del virus a través de medidas de control de la movilidad y la concentración de personas, tales como la prohibición de eventos multitudinarios en espacios públicos, restricciones de movilidad y políticas de confinamiento (Gössling et al., 2020; Ioannides & Gyimóthy, 2020; McGinlay et al., 2020). En varios países de Europa, las restricciones de movilidad fueron gradualmente flexibilizadas dos o tres meses después de la declaración de la pandemia global en marzo de 2020 y de la implementación de medidas más severas, como el confinamiento domiciliario. En su caso, el 14 de marzo de 2020 España declara un estado de alarma que se mantuvo hasta el 21 de junio. Sin embargo, es a partir del 4 de mayo que pone en marcha un plan de desescalada (López de Miguel & Sánchez, 2020); entrando a una etapa de flexibilización de restricciones que se mantuvo hasta finales de octubre, cuando se experimenta una segunda ola de contagios de COVID-19 (del Monte, 2020).

Durante este período de flexibilización se observaron patrones de movilidad diferentes a los reflejados en años anteriores, no solo en las formas y lugares de desplazamientos habituales, sino también en los relacionados a el ocio y el turismo (Landry et al., 2020). Desde el inicio de la desescalada, múltiples espacios naturales protegidos (ENP) de España experimentaron un aumento de visitantes en busca de un “baño de bosque”, fruto de la necesidad de recuperar el contacto con el entorno natural (Gutiérrez, 2020) y de una percepción generalizada de menor probabilidad de contagio de COVID-19 en estos espacios alejados de las ciudades. También resultó determinante la imposibilidad de realizar turismo fuera de la región de residencia debido a las restricciones de movilidad, así como las recomendaciones y promociones de los destinos rurales y de naturaleza locales como “rutas seguras”, por lo que el turismo de proximidad experimentó un notable crecimiento (Cañada & Izcarra, 2021; Departamento de Territorio y Sostenibilidad, 2017; Sader, 2020).

Además de sus funciones de conservación de la biodiversidad y de generación de bienes y valores esenciales, los ENP aportan servicios culturales, no materiales, que incluyen beneficios para la salud mental y física, oportunidades para el turismo y recreación al aire libre, la inspiración artística y espiritual, la educación y la investigación; entre otros. Sin embargo, son espacios sensibles a la presión generada por su uso (Jones et al., 2021; Schirpke et al., 2018; Stolton et al., 2015).

Múltiples estudios han evidenciado el efecto disruptivo de la COVID-19 en la movilidad de las personas y han destacado las acciones que las administraciones públicas han implementado en su intento de adaptarse a las nuevas condiciones. Sin embargo, esta nueva literatura se ha centrado especialmente en transformaciones de grandes ciudades y destinos urbanos (Aloi et al., 2020; Anke et al., 2021; Honey-Rosés et al., 2020; Przybyłowski et al., 2021; Wojcieszak-Zbierska et al., 2020), o bien, han analizado el impacto de la pandemia en ENP, pero basándose en macro-regiones (Anand & Kim, 2021; Kroner et al., 2021; Singh et al., 2021; Souza et al., 2021; Spenceley et al., 2021; Waithaka et al., 2021). Por lo tanto, detectamos la necesidad de estudiar los efectos de la pandemia en la gestión de los cambios en los flujos de visitantes hacia y dentro de los ENP.

A partir de este contexto nuestro estudio parte de la siguiente pregunta de investigación: ¿qué medidas se han implementado y comunicado a la ciudadanía en respuesta al aumento de visitantes en ENP? A partir de esta cuestión el objetivo principal del artículo es analizar la respuesta de los gestores de los ENP de Cataluña al aumento de visitantes experimentado en el período de post-confinamiento a partir de lo informado a través medios de comunicación digitales.

Nuestro estudio permite evidenciar el interés de la explotación de las noticias como fuentes alternativas para realizar trabajos exploratorios y recopilar evidencias iniciales de problemáticas emergentes como las aquí planteadas. De acuerdo con Clark & Nyaupane (2020), la información transmitida por las noticias puede influir en la interpretación de ciertos eventos, así como en las decisiones y opiniones de quienes acceden a ellas.,

El resto de este artículo se encuentra estructurado de la siguiente manera. En la segunda sección se encuentra la revisión de la literatura. En la tercera sección se presenta el contexto general de los ENP en Cataluña. Posteriormente, en la cuarta sección se describen las fuentes y el método adoptados. Los resultados se presentan en la quinta sección 5 y se discuten en la sexta. Finalmente, el artículo concluye con las consideraciones finales, así como las limitaciones detectadas y las futuras líneas de investigación.

## 7.2. Revisión de literatura

### 7.2.1. Gestión de los flujos de visitantes en Espacios Naturales Protegidos

La gestión adaptativa y proactiva de los flujos de visitantes es un factor clave para minimizar los efectos negativos potenciales de las actividades humanas en los espacios protegidos y facilitar una experiencia agradable de quienes hacen uso de los ENP. Esta gestión debe ser capaz de identificar los factores de riesgo para los recursos naturales y los visitantes, reconocer los diferentes grupos de actores que se ven afectados por dicha gestión, y monitorizar los flujos de visitantes, sus patrones de uso y movilidad (Buongiorno & Intini, 2021; Orellana et al., 2012; Puhakka et al., 2017; Rocchi et al., 2020; Stolton et al., 2015).

Una inadecuada gestión de los ENP puede aumentar los impactos negativos de la actividad turística, tales como la destrucción del entorno y de los hábitats de vida silvestre, cambios en el uso del suelo, degradación de la calidad del agua y del aire, o daños en la flora y la fauna local. Éstos pueden ser causados por una mayor perturbación ecológica, contaminación atmosférica y acústica, problemas de masificación o conflictos entre visitantes (Hardy & Aryal, 2020; Leung et al., 2018; Monz et al., 2021; Templeton et al., 2021).

De acuerdo con Mason (2005), la gestión de los visitantes puede seguir dos tipos de enfoques: uno “duro” o uno “suave”. El primero se basa en el control del número de visitantes mediante el indicador de capacidad de carga, adapta los recursos disponibles según este mismo indicador y modifica el comportamiento de los usuarios mediante algún tipo de reglamento. El segundo enfoque da mayor importancia a la gestión de la experiencia del visitante mediante la provisión de información general; la promoción de actividades fuera de temporada alta, de destinos alternativos o de actividades para nichos específicos; y la educación e interpretación ambiental y el uso de códigos de conducta.

Por su parte, Petrić y Mandić (2018) indican que estos enfoques hacen uso de instrumentos institucionales y gerenciales, respectivamente. Diferencian dos grupos adicionales en la gestión: instrumentos económicos (diferenciación de precios, impuestos o cargos turístico-ambientales, pago de entradas, incentivos a los sectores públicos y privados, entre otros) e instrumentos asociados a tecnologías de la información (sistemas de información geográfica o sistemas de apoyo a la toma de decisiones).

Leung et al. (2018) proponen una serie de principios para facilitar los procesos de toma de decisión, destacando la importancia que éstos sean consensuados y aceptados por todos los

grupos afectados. Coincidiendo con Mason (2005), indican que la intensidad de uso no es el único factor de impacto sobre los ENP, sino también el comportamiento de los visitantes, método de viaje, estacionalidad, etc. Por ello, es importante establecer estrategias orientadas a estos factores heterogéneos.

Como se observa, los organismos gestores de los ENP implementan diversos enfoques e instrumentos que se adaptan a las condiciones y características de cada espacio. Así, pueden tomar medidas tempranas que aseguren la preservación de los valores del ENP y la generación de beneficios equitativos para visitantes y residentes. Esto se logra diseñando estrategias de manera colaborativa, apropiadas al contexto rural y/o natural y vinculadas a formas de movilidad más sostenibles (Buongiorno & Intini, 2021; Høyer, 2000).

La coordinación entre las funciones de conservación y el uso recreativo de los ENP puede contribuir al desarrollo local; sin embargo, supone un reto importante para la gestión sostenible de los ENP. Es por esta razón que es importante el constante estudio de la relación del turismo con las transformaciones en los ENP, para optimizar los procesos de toma de decisiones, planificación y gestión (Bhammar et al., 2021; Monz et al., 2021; Romagosa et al., 2015; Templeton et al., 2021).

### 7.2.2. Turismo de proximidad y Espacios Naturales Protegidos

Como apuntan Bel et al. (2014) existe una estrecha relación entre turismo doméstico o de proximidad con la visita al entorno rural. Un comportamiento explicado, por un lado, por el deseo de volver al “pueblo” para visitar a familiares y amistades; y por el otro, por el interés de los urbanitas de visitar espacios que contrastan con su vida en las ciudades. En este contexto, lo que se define como “rural”, concepto en el que interactúan diferentes dimensiones ambientales, económicas e históricas, pero que se resume a todo lo que no es urbano, acoge un amplio rango de prácticas turísticas. Los ENP tienen un papel clave en este turismo en zonas rurales, tienden a ser espacios que concentran interés de los visitantes y flujos, por lo que necesitan de regulaciones que aseguren el bienestar ambiental.

Diferentes estudios han analizado las características y comportamiento del turista doméstico en ENP. Así, por ejemplo, Buckley et al. (2021) identificaron que en los últimos años ha habido un cambio en el turismo doméstico chino, no sólo un mayor interés en ENP, sino también menos uso de excursiones organizadas, y más viajes por cuenta propia. Además, lo define como un mercado joven, de clase media, proveniente de grandes ciudades; pero en este caso mejor informado y correctamente equipado.

Por otro lado, destinos como los geoparques de Indonesia, populares en el mercado internacional, también han experimentado en los últimos años un aumento en el turismo doméstico, que ya se ha visto reflejado en una mayor congestión del tráfico, más residuos, deterioro en la calidad del aire, pisoteo de vegetación y daños en la infraestructura. De acuerdo a Cahyadi y Newsome (2021), el turista doméstico de este país carece de conciencia ambiental, y su interés se basa en el disfrute personal mediante actividades recreativas como picnic, juegos, fiestas y deporte; tendencia que también ha sido identificada en otros destinos.

Esta última característica coincide con lo argumentado por Massida y Etzo (2012) en su análisis sobre los factores determinantes del turismo doméstico en Italia, en el que identificaron una sensibilidad del turista doméstico a los precios entre regiones y destinos. Además, notaron que éste es influenciado por otros factores como la experiencia previa y la calidad ambiental del destino. Entre otras conclusiones, sugieren a los gestores de destinos potenciar iniciativas eco-amigables como una ventaja comparativa en relación con otros destinos; siendo eso compatible con el desarrollo de actividades turísticas en ENP.

El reciente contexto derivado de la pandemia de la COVID-19 y las importantes restricciones de movilidad internacional han derivado en un impacto sin precedentes en la industria global del turismo; pero también han contribuido a impulsar el turismo doméstico, en el que las visitas a ENP juegan un papel clave (Romagosa, 2020). Diferentes autores indican la oportunidad que ello supone para reorientar la actividad turística hacia un modelo basado en el turismo de proximidad que implique un menor impacto ambiental, una menor presión sobre los territorios de acogida y que contribuya a generar un modelo económico socialmente más justo (Cañada & Izcarra, 2021; Fletcher et al., 2021). Más allá de la capacidad transformadora que puedan tener el crecimiento del turismo de proximidad, es indudable que éste genera un incremento de las presiones en los espacios de mayor interés para visitantes. En este sentido, los ENP son un elemento especialmente sensible a estos cambios. Por lo que la capacidad de sus entes gestores para gestionar de forma eficiente los flujos puede resultar un factor clave para mitigar los potenciales efectos negativos del incremento de visitantes y, a su vez, potenciar los beneficios derivados de una mayor valorización social del turismo de proximidad.

### 7.2.3. Los efectos de la pandemia en Espacios Naturales Protegidos

Como se ha comentado anteriormente, los ENP han experimentado un incremento sensible de las visitas en el período post-confinamiento, ya sea por la contribución de los espacios naturales al bienestar físico y mental o bien, por la percepción de menor riesgo de contagio de COVID.

En algunos países se ha llegado a multiplicar los niveles prepandemia (Grima et al., 2020; Ioannides & Gyimóthy, 2020; Landry et al., 2020; Polukhina et al., 2021; Seraphin & Dosquet, 2020; Sung et al., 2021). Esta situación puede conllevar una amenaza importante a la sostenibilidad de los ENP afectados.

Si bien los efectos de la pandemia han sido diversos, los organismos gestores de ENP y académicos del contexto global coinciden que la COVID-19 es un fenómeno extraordinario que ha transformado las formas tradicionales de gestión. En ciertos casos, ello ha generado contradicciones entre la planificación a largo plazo y la evolución imprevisible generada por la pandemia, ya que se han creado escenarios para los que no existían lineamientos de gestión (Templeton et al., 2021).

La adhesión a los protocolos de salud pública y las restricciones de movilidad indicadas como respuesta a la COVID-19, implicaron que algunos ENP experimentaran una reducción súbita de personal y fuentes de ingreso generadas por turismo, situándolos en una posición crítica en el momento de su reapertura y dificultado su papel de conservación (Bhammar et al., 2021; McGinlay et al., 2020; Saladié et al., 2021; Templeton et al., 2021).

El diferente impacto que ha tenido la COVID-19 en los ENP refleja la desigualdad de condiciones relacionadas con la situación socioeconómica de las diferentes regiones del mundo. Por un lado, determinados ENP ubicados en países del Sur Global, cuyo presupuesto es altamente dependiente del turismo, experimentaron un fuerte golpe económico, que se manifestó en la pérdida de empleos directos e indirectos; aumento en la fuga de capital humano capacitado; disminución de la vigilancia y monitoreo de la biodiversidad; aumento de la caza comercial, de subsistencia y furtiva; y aumento en la extracción ilegal de recursos (Hockings et al., 2020).

En los ENP ubicados en países del Norte Global la situación fue mayoritariamente distinta. Con la flexibilización de las restricciones de movilidad, diferentes regiones experimentaron un incremento en el turismo de interior o de proximidad durante la temporada de verano. La imposibilidad de realizar actividades recreativas en espacios cerrados y las restricciones de movilidad hacia destinos tradicionales ubicados fuera del país de residencia estimularon el interés por las visitas en el entorno inmediato, con nuevas demandas y nuevas formas de socialización y consumo (Landry et al., 2020; Romagosa, 2020; Seraphin & Dosquet, 2020).

En el contexto post-confinamiento emergió un turismo de proximidad, interesado en destinos domésticos donde se pudieran realizar actividades como ciclismo, senderismo, visita a monumentos naturales, deportes acuáticos, acampada y cualquier actividad en el entorno rural

en general (Grima et al., 2020; Romagosa, 2020; Vaishar & Štastná, 2020). Este es justo el tipo de experiencias que se pueden realizar en ENP.

El aumento de visitantes incrementó la presión en espacios sensibles, amenazando la integridad y la calidad ambiental del paisaje. McGinlay et al. (2020) resumen los conflictos experimentados por diferentes ENP de Europa en cuatro ámbitos:

- (1) Masificación en ENP; incluyendo la congestión de vehículos en los estacionamientos y caminos, no sólo como resultado del alto número de visitantes, sino también de la resistencia a viajar en transporte público o en excursiones grupales por temor al riesgo de contagio de la COVID-19.
- (2) El surgimiento de un nuevo perfil de usuarios, que en muchas ocasiones tuvo comportamientos problemáticos, sobre todo relacionados al uso de estacionamientos, al distanciamiento y a la gestión de los residuos generados. Estudios recientes como el de Bhammar et al. (2021) y el de Templeton et al. (2021), apuntan que el visitante emergente es menos consciente de su papel en la naturaleza y, en ocasiones, no presta suficiente atención a los protocolos para el control de la COVID-19, como el distanciamiento social y la prohibición de aglomeraciones. Además, estos visitantes no cuentan con suficiente experiencia y conocimiento sobre las condiciones y las regulaciones del espacio en el que estaban. En algunos casos, es la primera vez que visitan estos espacios naturales, teniendo muy poco o ningún acceso a ellos antes de la pandemia, y llegando a los sitios por recomendaciones de terceros o información encontrada en redes sociales.
- (3) Potenciales conflictos entre residentes y visitantes: se multiplicaron los desencuentros con las comunidades aledañas, pues algunos de los nuevos visitantes no han respetado las normas de comportamiento socialmente aceptadas, o, según los residentes locales, representan un riesgo para la salud (Seraphin & Dosquet, 2020).
- (4) Finalmente, los guardaparques han experimentado una mayor carga de trabajo, ya que se aumentó la vigilancia ante comportamientos no deseados, como la disposición de desechos fuera de las zonas indicadas (Singh et al., 2021).

## 7.3. Contexto territorial

### 7.3.1. Área de estudio

España cuenta con un marco jurídico definido para la protección y definición de los espacios naturales del país –Ley Estatal 42/2007, del Patrimonio Natural y de la Biodiversidad-. A su vez, cada comunidad autónoma cuenta con su propio marco institucional para la gestión de estos espacios. Los ENP de Cataluña están regulados por el Plan de Espacios de Interés Natural (PEIN) creado según la Ley 12/1985 (1985), el cual contiene las disposiciones necesarias para la protección y gestión de todos los Espacios de Interés Natural (EIN). Bajo esta figura de protección se encuentran un total de 184 espacios que ocupan 10.246 km<sup>2</sup> de superficie terrestre y 856,37 km<sup>2</sup> de superficie marina (Instituto de Estadística de Cataluña, 2020).

Dentro de esta misma ley se define un nivel de protección superior. Se trata de los Espacios Naturales de Protección Especial (ENPE), que ocupan 2870,60 km<sup>2</sup> de superficie terrestre y 54,20 km<sup>2</sup> de superficie marina; entre los cuales se definen cuatro tipologías geográficas: alta montaña, montaña interior, zonas húmedas y zonas marítimas-terrestres. Actualmente, Cataluña cuenta con 106 ENPE: 1 Parque Nacional, 14 Parques Naturales, 7 Parajes Naturales de Interés Nacional, 79 Reservas Naturales y 5 Zonas Periféricas de Protección Especial (Institut d'Estadística de Catalunya, 2019).

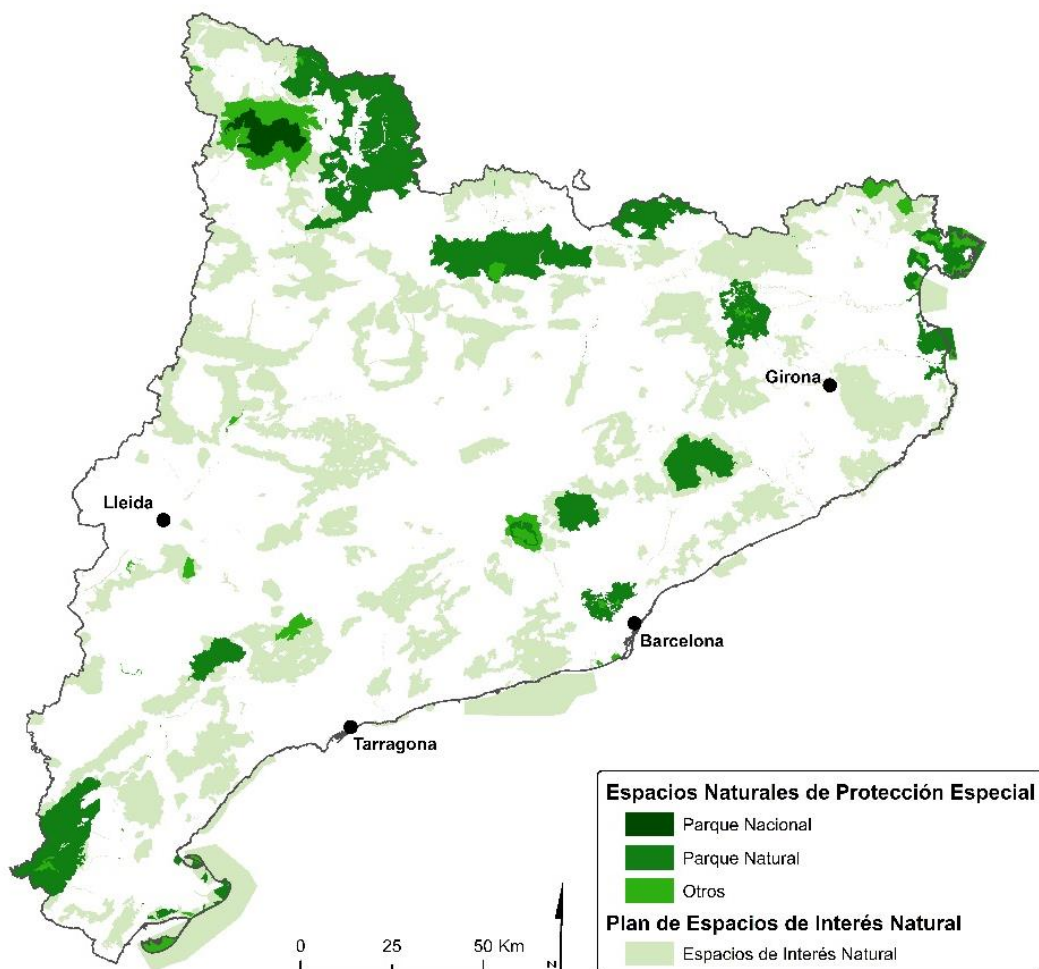
La gestión de los ENP (Figure 8) es realizada por diferentes órganos rectores y de participación en cada caso. Entre estos órganos, se encuentran los departamentos de la Generalitat de Catalunya con competencia dentro del ENP, administraciones locales (diputaciones, ayuntamientos, consejos comarcales), organizaciones de participación civil, empresarial o académica, y otros (Generalitat de Catalunya, 2021a). En el caso de la provincia de Barcelona, cabe destacar el papel que juega la Diputación de Barcelona, titular de un importante número de Parques Naturales.

La prioridad de estos espacios es la preservación de la integridad de los sistemas naturales. En gran parte de ellos se pueden realizar actividades de ocio compatibles con esta misión. Según datos recogidos por contadores ubicados en aparcamientos y senderos de 13 espacios naturales protegidos gestionados por el Departamento de Territorio y Sostenibilidad, en 2019 se recibieron más de 4 millones de visitantes (Generalitat de Catalunya, 2023).

Sin embargo, de acuerdo al Plan de Fomento del Turismo de Naturaleza en los ENP de Cataluña (Cazorla, 2015), el uso turístico que se hace de estos espacios se ha considerado en su mayoría bajo o medio. En este plan se ha diagnosticado que la mayoría de los ENP cuentan con áreas

recreativas e itinerarios suficientes para su uso turístico. Sin embargo, este mismo análisis considera que existe un déficit en instrumentos de planificación, regulación y monitoreo del turismo de naturaleza, así como una necesidad de equipamientos como centros de visitantes para información e interpretación, miradores, observatorios y señalización interpretativa. De igual manera, Cazorla (2015) también señalaba que la mayor parte de la demanda actual de los ENP cuenta con un perfil generalista, cuyo interés son los sitios e itinerarios más emblemáticos, o con un perfil contemplativo, es decir, que visita el ENP como un complemento de su viaje y no como la principal actividad. En cambio, los perfiles activos, educativos y especializados, que concuerdan más con el perfil deseado de visitantes en ENP, suelen ser menos frecuentes.

**Figure 8.** <sup>1</sup> Espacios Naturales Protegidos en Cataluña.



Fuente: Elaboración propia a partir de Hipermapa, SIG corporatiu de la Generalitat de Catalunya.

<sup>1</sup> Más detalles en SIG Espacios Naturales Protegidos de Cataluña (<http://sig.gencat.cat/visors/enaturals.html>)

### 7.3.2. Espacios Naturales Protegidos en el contexto de la COVID-19

A causa del estado de alarma decretado el 14 de marzo del 2020, y la consecuente paralización del turismo; el número de visitantes a espacios naturales fue mínimo entre los meses de marzo y mayo. El 28 de abril el Gobierno de España aprobó un plan de desescalada en cuatro fases que empezó a implementarse el 4 de mayo (López de Miguel & Sánchez, 2020) a partir de los indicadores de evolución de la pandemia por provincias. Cataluña entró el 18 de Junio a la fase 3 de reanudación (Bigorra, 2020), lo que permitió recuperar progresivamente la movilidad. Esto afectó tanto a las ciudades, como los espacios naturales fuera de éstas. En primera instancia, se estableció una serie de medidas y recomendaciones básicas con el objetivo de mitigar el riesgo de contagio (Bigorra, 2020); tales como el uso obligatorio de mascarilla en espacios comunes, limitaciones en el tamaño de los grupos de personas y el distanciamiento físico; además de otras acciones que se ajustaron en dependencia del espacio natural y que serán mencionadas posteriormente en este artículo.

La gestión de las medidas sanitarias derivadas de la pandemia no fue la única problemática con la que tuvieron que lidiar los ENP de Cataluña. A inicios del otoño del 2020, el Departamento de Territorio y Sostenibilidad la Generalitat de Cataluña (2020b) reportó un aumento significativo en el número de visitantes durante la temporada de verano en al menos 11 ENP. Varios de éstos duplicaron el número de visitas recibidas en los mismos meses del año anterior (Table 7). En el mismo comunicado se atribuía el aumento de visitantes a la “necesidad social” de salir de las áreas urbanas después del confinamiento. La flexibilización de las restricciones permitía a los residentes visitar espacios más próximos, pero todavía se limitaba la movilidad hacia destinos en diferentes comunidades autónomas o internacionales.

De acuerdo con este comunicado, las incidencias registradas en los ENP se pueden resumir en tres aspectos: masificación de sitios emblemáticos dentro de los ENP, refiriéndose a aquellos sitios que usualmente concentran la mayor parte de los visitantes como la Platja del Trabucador en el Parc Natural del Delta del Ebro, Sadernes en el Parc Natural Zona Volcánica de la Garrotxa o Els Empedrats en el Parc Natural Cadí-Moixeró, por mencionar algunos; (2) prácticas inapropiadas en determinados espacios, tales como el baño en sitios no autorizados, rutas fuera de itinerarios señalizados o aparcamiento de autocaravanas y acampada libre sin autorización; (3) perturbación y contaminación de los ecosistemas locales, debido a una mayor presencia de bicicletas eléctricas en lugares remotos, visitantes en zonas de cría en fachadas marítimas o aumento de residuos.

En un estudio previo, Saladié et al. (2021) apuntan que estos problemas de sobre-frecuentación se extendieron tanto a espacios naturales no protegidos, como a aquellos protegidos pero que no cuentan con una estructura de gestión formal. Adicionalmente, estos autores identificaron un incremento significativo en el número de accidentes y rescates en los ENP en los meses de verano. Esta problemática fue similarmente relacionada en los medios de comunicación con un déficit de preparación y conocimiento de las rutas, y la falta de precaución del nuevo visitante que llegó a estos espacios (Catalunya Radio, 2020).

**Table 7.** Variación en el número de visitantes en julio y agosto del año 2020 con respecto al mismo período de 2019 en ENPE gestionados por el DTS de la Generalitat de Cataluña

<b>Espacio Natural</b>	<b>Julio 2020</b>	<b>Agosto 2020</b>
Parc Nacional d'Aigüestortes i Estany de Sant Maurici	+10 %	+31 %
Parc Natural de l'Alt Pirineu	+19 %	+25 %
Parc Natural de la Serra de Montsant	+47 %	+20 %
Parc Natural de la Zona Volcànica de la Garrotxa	+29 %	+22 %
Parc Natural de les Capçaleres del Ter i del Freser	+50 %	+80 %
Parc Natural del Cadí-Moixeró	+88 %	+57 %
Parc Natural del Cap de Creus	+82 %	+71 %
Parc Natural del Delta de l'Ebre	-34 %	+121 %
Parc Natural del Montgrí, les Illes Medes i el Baix Ter	-64 %	-53 %
Parc Natural dels Aiguamolls de l'Empordà	-20 %	+3 %
Parc Natural dels Ports	+100 %	+91 %
Paratge Natural d'Interès Nacional de Poblet	+133 %	+88 %

Fuente: Departamento de Territorio y Sostenibilidad, 2020

## 7.4. Fuentes y métodos

Los medios de comunicación digitales aportan información relevante sobre fenómenos sociales de actualidad. Distribuyen información de acceso público, y dependiendo del enfoque con el que traten la información tienen influencia, tanto negativa como positiva, en la construcción de la opinión pública sobre ciertos temas, así como en las intenciones de viaje de los posibles visitantes de un destino. Adicionalmente, el análisis de la información transmitida en los medios de comunicación, al ser una vía de acceso masiva para la ciudadanía, es una fuente de utilidad

para los encargados de tomar decisiones en la gestión de destinos, o en este caso, de ENP (Thirumaran et al., 2021).

Pese a ser una fuente secundaria, la revisión sistemática de la información proveniente de estos medios es un método ampliamente utilizado para comprender situaciones en desarrollo, como la crisis sanitaria actual (C. Clark & Nyaupane, 2020; Phi, 2020; Seraphin & Dosquet, 2020). Así, en el presente estudio se ha seleccionado esta fuente de información por su utilidad como un primer instrumento para identificar las acciones de gestión en ENP como respuesta a los retos emergentes causados por la COVID-19; aspecto sobre el cual, por su emergencia y actualidad, todavía no se ha producido un volumen importante de literatura académica.

Además, esta fuente de información es fácilmente accesible en la Web y los artículos pueden ser ubicados en una línea de tiempo, lo que permite una lectura de la evolución de dichas acciones. Así mismo, mientras no existan suficientes estudios empíricos académicos, estos medios continúan aportando información de la situación actual, cuyos efectos se siguen prolongando en el tiempo.

Para la selección de los artículos se utilizó el motor de búsqueda Google, específicamente desde la sección de Noticias del portal, por su amplia cobertura en la Web, y por su condición de acceso abierto y abierto; lo que facilita la replicabilidad del estudio realizado. Adicionalmente, esta sección presenta los artículos de manera ordenada dando prioridad a aquellos provenientes de medios de comunicación confiables, y cuenta con filtros para seleccionar la información publicada en el período de interés. Se utilizaron las siguientes palabras claves para la búsqueda: Espacios naturales, Coronavirus (o COVID-19), Visitantes y Cataluña (o en su caso, el nombre de cada uno de los ENP de interés para esta investigación), así mismo se utilizó la traducción en catalán de los términos de búsqueda.

El ámbito temporal cubierto por la búsqueda de noticias ha sido desde el inicio de la desescalada (4 de mayo de 2020) hasta el final del mismo año (31 de diciembre de 2020) Se limitó a los primeros 50 resultados obtenidos por búsqueda, que posteriormente fueron filtrados según el contenido de éstos. Se obtuvo un total de 105 noticias al final de la revisión; de las cuales 81 provienen de prensa digital y el resto, de portales multimedia, emisoras de radio y revistas digitales.

En la búsqueda se han incluido los ENP bajo las figuras de Parque Nacional, Parque Natural y Paraje Natural de Interés Nacional (PNIN), para un total de 22 ENP (Table 8). Se eligieron estos espacios porque son aquellos que cuentan con la mayor figura de protección especial; contando con una mayor capacidad estructural e instrumentos para responder a la COVID-19 y su efecto disruptivo. Se han excluido las Reservas Naturales, puesto que son espacios donde

únicamente se permiten actividades con propósito científico; y también las Zonas Periféricas de Protección Especial porque equivalen a las zonas de amortiguamiento de otras figuras de protección.

**Table 8.** Espacios Naturales de Protección Especial incluidos en el análisis<sup>2</sup>.

Espacio Natural	Provincia	Superficie
Parc Nacional d'Aigüestortes i Estany de Sant Maurici	Lleida	139,00 km <sup>2</sup>
Parc Natural de l'Alt Pirineu	Lleida	793,20 km <sup>2</sup>
Parc Natural de la Muntanya de Montserrat	Barcelona	34,94 km <sup>2</sup>
Parc Natural de la Serra de Collserola	Barcelona	81,56 km <sup>2</sup>
Parc Natural de la Serra de Montsant	Tarragona	92,42 km <sup>2</sup>
Parc Natural de la Zona Volcánica de la Garrotxa	Girona	153,10 km <sup>2</sup>
Parc Natural de les Capçaleres del Ter i del Freser	Girona	145,48 km <sup>2</sup>
Parc Natural de Sant Llorenç del Munt i l'Obac	Barcelona	94,09 km <sup>2</sup>
Parc Natural del Cadí-Moixeró	BCN, Girona, Lleida	410,60 km <sup>2</sup>
Parc Natural del Cap de Creus	Girona	138,24 km <sup>2</sup>
Parc Natural del Delta de l'Ebre	Tarragona	76,14 km <sup>2</sup>
Parc Natural del Montgrí, les Illes Medes i el Baix Ter	Girona	81,88 km <sup>2</sup>
Parc Natural del Montseny	Barcelona, Girona	171,26 km <sup>2</sup>
Parc Natural dels Aiguamolls de l'Empordà	Girona	47,32 km <sup>2</sup>
Parc Natural dels Ports	Tarragona	350,50 km <sup>2</sup>
PNIN de Cap Gros-Cap de Creus	Girona	11,79 km <sup>2</sup>
PNIN de l'Albera	Girona	34,66 km <sup>2</sup>
PNIN de la Serra de Rodes	Girona	11,33 km <sup>2</sup>
PNIN de Poblet	Tarragona	24,60 km <sup>2</sup>
PNIN de Pinya de Rosa	Girona	0,49 km <sup>2</sup>
PNIN del Cap de Norfeu	Girona	9,75 km <sup>2</sup>
PNIN del Massís de Pedraforca	Barcelona, Lleida	17,50 km <sup>2</sup>

Fuente: Institut d'Estadística de Catalunya, 2019

<sup>2</sup> Nota: Información generada por el *Institut d'Estadística de Catalunya* a partir de la base cartográfica de los Espacios Naturales de Protección Especial del *Departament de Territori i Sostenibilitat de la Generalitat de Catalunya*

Así mismo, se seleccionaron artículos que cumplieran con los siguientes criterios:

- Mencionaban explícitamente uno o más de los ENP de interés para este análisis.
- Referenciaban las situaciones que representaron un reto para la gestión de los ENP, y que estaban relacionadas con la COVID-19.
- Citaban acciones implementadas por los gestores de los ENP en respuesta a los retos emergentes.
- No contenían publicidad pagada, ni opiniones basadas en ideologías de sus autores.

Una vez seleccionadas las noticias, se realizó a la sistematización de la información, identificando características como fecha de publicación, idioma, sitio web, origen geográfico y tipología del medio de comunicación consultado. Así mismo se registraron fragmentos de las noticias relacionados a la situación que se experimentaba en cada ENP y las acciones implementadas en respuesta a esos eventos.

Una vez ordenada la información, se filtraron las acciones implementadas por ENP en base a su similitud. Posteriormente, a partir de un razonamiento inductivo como el propuesto por Clark & Nyaupane (2020), se clasificaron en cinco categorías de gestión diferenciadas por la problemática a la cual daban respuesta (Table 9):

- (a) Protocolos sanitarios: acciones con el objetivo de disminuir el riesgo de contagio del virus; y que fueron predominantemente implementados desde la reapertura de los ENP a los visitantes.
- (b) Información y Educación Ambiental: acciones implementadas con el objetivo de informar, sensibilizar o concientizar sobre el uso correcto de los ENP, así como de los protocolos sanitarios y de gestión de la movilidad puestos en marcha en estos espacios.
- (c) Control de Aforos: acciones implementadas para controlar el número de visitantes que ocupan las instalaciones del ENP.
- (d) Gestión de Flujo de Visitantes Interno: acciones implementadas para gestionar el comportamiento espacial de los visitantes dentro del ENP.
- (e) Gestión de Acceso de Vehículos a ENP: acciones implementadas con el objetivo de reducir y/o controlar los problemas ocasionados por la llegada masiva de visitantes en vehículo privado.

**Table 9.** Acciones implementadas en los ENP, reportadas por medios de comunicación digital.

<b>Código</b>	<b>Categoría</b>	<b>Acción</b>
<b>a</b>	Protocolos	Intensificación de limpieza y desinfección de equipamientos
	Sanitarios	Carteles y pantallas informativas de protocolos de distanciamiento y sanidad personal
<b>b</b>	Información y Educación Ambiental	Aumento de personal informador y puntos de información Mayor uso de redes sociales en la comunicación Campaña de información, sensibilización y/o educación ambiental
	Control de Aforos	Amenidades cerradas parcial o totalmente (centro de visitantes, sanitarios, alquiler de equipos, hoteles, observatorios) Capacidad limitada en instalaciones de interior (ermitas, refugios de montaña, centros de visitantes) Sistema de Reserva o cita previa Tasa de pago adicional para ciertos espacios Prohibición temporal de actividades (visitas en grupos, picnic, acampada, baño en piscinas naturales, caza)
	Gestión de Visitantes dentro del ENP	Promoción de visitas guiadas Control de la hora de entrada y salida del EN Mayor señalización en zonas conflictivas, indicando itinerarios, áreas sensibles e información para el uso correcto del espacio Información de itinerarios mediante códigos QR/ APP
<b>e</b>	Gestión de Acceso de Vehículos a los ENP	Capacidad de aparcamiento reducido Regulación de entrada según plazas de estacionamiento llenas Habilitación de plazas de estacionamiento adicionales Uso de pantallas en carreteras informando niveles de ocupación Restricción de entrada de vehículos a ciertos espacios Mayor vigilancia civil, forestal o policial Aumento de frecuencia de transporte público (bus, taxi o tren)

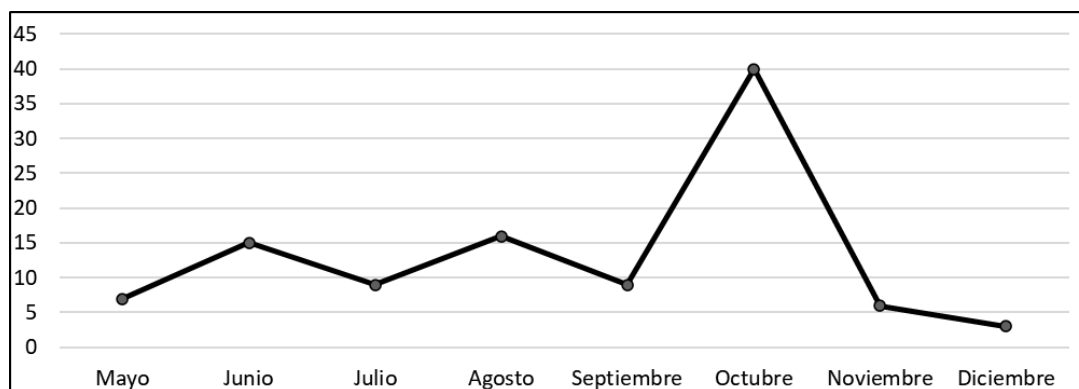
Fuente: Elaboración Propia

Un punto a favor de la confiabilidad de estas noticias es que gran parte de ellas compilan y reciben información proveniente de fuentes diversas como las redes sociales de los ENP, Protección Civil, Agentes rurales, así como de los actores involucrados como vecinos, directores de ENP, ayuntamientos, Diputación de Barcelona, Generalitat de Cataluña y otras organizaciones civiles. Cabe mencionar que el 83% de las noticias consultadas provienen de medios ubicados en Cataluña; con una predominancia del catalán en su redacción (59%).

## 7.5. Resultados

Según se observa en la Figure 9, se pudo identificar que los repuntes en el número de publicaciones en medios digitales guardan relación con los períodos de desescalada, períodos vacacionales y festivos, y el establecimiento de nuevas medidas restrictivas en ENP. El primer pico en número de publicaciones se ve en junio, coincidiendo con el paso a la fase 3 de desescalada en la que se da una apertura a la movilidad entre provincias y Comunidades Autónomas. El contenido de los 15 artículos publicados en este período se enfocaba en dos aspectos: en la primera mitad del mes explicaban los protocolos implementados en los espacios naturales para recibir visitantes, para dar valor a los ENP como sitios de escape de la COVID-19; y en la segunda mitad del mes se reportaban los primeros eventos de masificación en los parques naturales del Montseny y la Zona Volcánica de la Garrotxa. En agosto, período en el que se inician de forma generalizada las vacaciones de verano, se observa un segundo pico de 16 artículos, reportando principalmente problemas de masificación en ENP ubicados principalmente en las provincias de Tarragona y Lleida; con consecuencias importantes como el aumento de contaminación, deterioro ecológico e incluso aumento en el número de accidentes y rescates.

**Figure 9.** Cantidad de artículos consultados según mes de publicación.

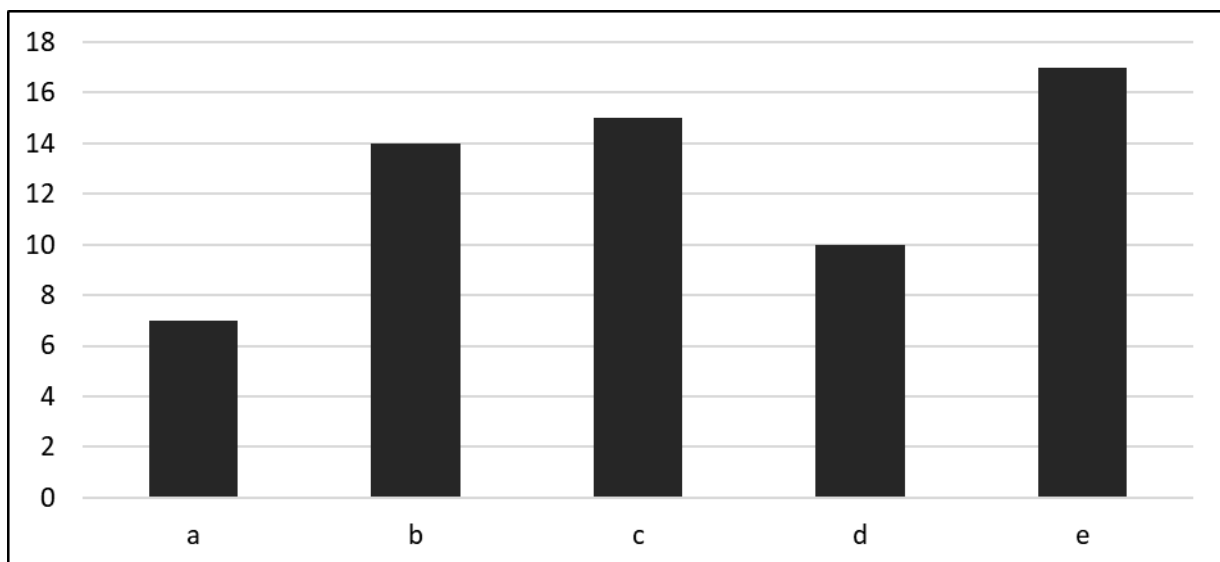


Fuente: Elaboración propia

El 39% de los artículos revisados fueron publicados en octubre. Este incremento considerable coincide con la repetición de la masificación en algunos ENP durante el puente de la festividad del Pilar, con la publicación de un informe de la Generalitat de Cataluña que contenía un análisis preliminar de la situación en los ENP en contexto de pandemia, y con el anuncio de nuevas medidas en diferentes ENP para gestionar el aumento de visitantes. En cambio, en noviembre y diciembre se observa una clara reducción de publicaciones. Ello puede ser consecuencia del decreto del segundo estado de alarma a finales de octubre y la introducción de nuevas medidas de restricción de la movilidad como respuesta a la segunda gran ola de contagios de la pandemia en España.

En la Figure 10 se muestra la distribución de medidas aplicadas en los ENP según las categorías descritas anteriormente y lo transmitido por los medios de comunicación. Los protocolos sanitarios (a) son el cuarto grupo en número de acciones, siendo identificadas en 7 de los 22 ENP de interés. Esta posición puede explicarse, por un lado, porque medidas como el aumento de limpieza y desinfección de superficies se aplica mayormente a espacios cerrados. De igual manera, se tratan de directrices dictadas por organismos superiores, como los gobiernos regional y nacional y autoridades sanitarias, y no por los propios gestores de los espacios naturales.

**Figure 10.** Distribución de medidas aplicadas en los ENP: protocolos sanitarios (a), información y educación ambiental (b), control de aforos (c), gestión de visitantes dentro del ENP (d) y gestión de los accesos a los ENP (e).



Fuente: Elaboración Propia

Por otro lado, este bajo número también puede estar relacionado a la información que los medios de comunicación consideren relevante para su transmisión; pues como se mencionó anteriormente, el enfoque observado en los artículos de los primeros meses permite especular que hubo un mayor interés en comunicar una imagen de seguridad al mercado del turismo nacional. Es decir, eran artículos informativos que describían los destinos de proximidad y destacaban su seguridad (ACN, 2020; Oller Mitjanas, 2020), probablemente en un intento de salvar la temporada turística.

Así, de acuerdo con lo comunicado por las noticias consultadas, hubo una mayor implementación de acciones relacionadas a información y educación ambiental (b), control de aforos (c) y gestión de los accesos (e) fueron las más implementadas en los ENP. En cambio, las medidas relacionadas con la gestión de visitantes dentro del ENP (d) fueron las menos frecuentes en el conjunto (Figure 10).

Al reanudarse el acceso a los espacios naturales, pasado el confinamiento domiciliario, las acciones claves se orientaron al control del número de visitantes. ENP como la Muntanya de Montserrat y la Zona Volcánica de la Garrotxa introdujeron sistemas de reserva previa, con el objetivo de garantizar distancias de seguridad de manera anticipada o la introducción de tarifas de entrada para desmotivar la visita a ciertos espacios, como sucedió en las piscinas naturales del Parque Natural de la Zona Volcánica de la Garrotxa. Sin embargo, fueron la inhabilitación total o parcial de áreas de uso común o la prohibición temporal de actividades las medidas más frecuentemente mencionadas por las noticias en relación con el control de personas dentro de los ENP.

Cuando aumentaron los conflictos por las aglomeraciones y comportamientos incívicos, tanto en los meses de verano como de otoño, la respuesta fue nuevamente la reducción de la capacidad de carga, esta vez concentrada en el número de vehículos que llegaban al ENP. De acuerdo con lo transmitido por las noticias, la medida de contención más frecuente fue la regulación del número de plazas de estacionamiento disponibles. Esta medida se anunciaba a través de redes sociales y pantallas en las vías de acceso que comunicaban que los ENP estaban a su máxima capacidad. Debido a que los visitantes aún hacían caso omiso de las advertencias, se aplicaron acciones más restrictivas, como el apoyo de dispositivos policiales para regular los accesos, prohibición temporal del paso de vehículos y uso de desvíos alternativos (Figure 11).

**Figure 11.** Acciones implementadas en accesos a ENP: Parc Natural del Montseny (izquierda) y Espai Natural de les Guilleries (derecha).



Fuente: Casas, 2020; Diputació de Barcelona, 2020

Con la reapertura de los ENP, los medios de comunicación señalaban las acciones de información centradas en los protocolos específicos de prevención de la COVID-19 y recomendaciones sanitarias aplicadas en los ENP. Sin embargo, en el mes de agosto se empiezan a reportar medidas enfocadas en la educación y sensibilización de los visitantes, que se fortalecieron, mencionándose además un aumento en el número de personal informador en al menos ocho ENP. En noviembre, diferentes medios de comunicación informaron sobre la campaña “Parcs naturals sí, pero amb civisme”, promovida por la Diputació de Barcelona, en respuesta al perfil del usuario diferente del habitual (Figure 12). La campaña se acompañó de recomendaciones, subrayando la necesidad de una planificación de la visita con suficiente antelación.

Con respecto a la gestión una vez dentro de los ENP, se identificaron menos acciones, algunas de las cuales fueron implementadas porque ya estaban planificadas desde antes de la pandemia; por ejemplo, la instalación de plataformas informativas y mejora de señales en el Parque Natural Zona Volcánica de la Garrotxa (Turisme Garrotxa, 2020). En la misma medida en que aumentaron acciones enfocadas en la comunicación mediante informadores y campañas de sensibilización, también lo hizo el aumento de señalización como instrumento de utilidad para gestionar a los visitantes dentro de los ENP, indicando itinerarios y mostrando información para el uso adecuado de los espacios. A partir de las noticias, se identificó que al menos cinco de los espacios apostaron por promover visitas guiadas, destacando el papel activo del guía en la gestión de la movilidad interna.

**Figure 12.** Infografía de la campaña "Parcs Naturals sí, però" amb civisme"



Fuente: Diputación de Barcelona, 2020

## 7.6. Discusión

Estudios previos han señalado la tendencia de acceder a los espacios naturales en vehículo privado, la cual guarda relación con el déficit de conexiones en transporte público y falta de opciones de movilidad activa (Dickinson & Robbins, 2008; Hockings et al., 2020). En el Plan de Fomento de Turismo de Naturaleza en ENP de Cataluña (Cazorla, 2015) se confirma esta insuficiencia de la oferta disponible de transporte público y colectivo de los ENP gestionados por la Generalitat de Cataluña, como consecuencia de una baja frecuencia, limitada capacidad y pocas conexiones. La pandemia agregó complejidad a este patrón de movilidad y fue un factor determinante para que la gestión de los ENP se enfocara en controlar los accesos a éstos y establecer restricciones de capacidad de carga.

Medidas como las restricciones y limitaciones en el aforo pueden tener desventajas y ser menos efectivos en destinos más alejados de las principales áreas urbanas, como son algunos ENP. Como indica Mason (2005), son tipos de gestión “duros” que corren el riesgo de ser ambiguos y abiertos a la interpretación de los usuarios. Por ello, es importante que la gestión sea complementada con más información y educación para dirigir la experiencia del visitante. Los artículos publicados entre mayo, junio y julio no sólo invitaban a visitar los ENP, sino que también ya anunciaban un creciente interés del turismo de proximidad reflejado en el

incremento de reservas en estos espacios. Sin embargo, las acciones orientadas a la información y educación de los visitantes sobre el uso público de estos espacios no se identificaron en las noticias publicadas hasta el final del verano y en otoño.

En este sentido, cabe cuestionar si hubo una falta de capacidad para prever este aumento en el turismo doméstico y sus posteriores consecuencias. Como se ha mencionado anteriormente, el perfil emergente de visitante ha sido asociado con una menor conciencia ambiental; y los espacios naturales, protegidos y no protegidos, resultaron ser una opción de ocio clave, ante las restricciones de uso y acceso a espacios cerrados.

De acuerdo con la información aportada por las noticias, el nuevo perfil de visitante, con comportamiento inapropiado y que prestaba menor atención las indicaciones, fue crucial para la predominancia de medidas más restrictivas. En los casos con mayor presión, conllevó incluso el uso de dispositivos policiales, aplicación de multas y ordenanzas públicas. En este sentido, es apropiado discutir si este comportamiento tiene su raíz en una falta de conocimiento del entorno de parte de los usuarios, lo que reforzaría la necesidad de involucrar a las poblaciones próximas en procesos de educación ambiental continuos, para que se familiaricen con los códigos de conducta correspondientes a estos espacios.

Finalmente cabe destacar la poca mención de acciones enfocadas en gestionar la movilidad de los visitantes una vez dentro de los ENP. Ciertamente, cada ENP cuenta con características físicas y topográficas que pueden condicionar la gestión de la movilidad interna. Sin embargo, como apuntan McGinlay et al. (2020), la distribución planificada de los visitantes dentro del ENP (tanto temporal como espacial) es una solución que minimiza la necesidad de recurrir a acciones como la reducción de la capacidad de carga. De acuerdo con lo discutido, y tomando en cuenta el planteamiento de Mason (2005), se sugiere que el enfoque de gestión continúa siendo de tipo “duro” o institucional, mediante medidas restrictivas y regulatorias. Por el contrario, se manifiesta un déficit en instrumentos de tipo “suave”, que se enfoquen de manera efectiva en transformar el comportamiento de los visitantes, educándoles incluso desde antes de su llegada. Es decir, es necesario reforzar el papel que tienen los ENP como espacios disponibles para la educación y concienciación ambiental; especialmente de aquellas poblaciones de proximidad y que son, en buena parte, las usuarias principales de los mismos. No obstante, es necesario realizar un análisis en mayor profundidad e incorporando la perspectiva de los gestores de los ENP sobre las razones y factores que condicionaron la respuesta a los evidentes retos sobrevenidos.

## 7.7. Conclusiones

### 7.7.1. Consideraciones finales

El artículo ha analizado las respuestas de los gestores de los ENP al incremento de visitantes durante el periodo post-confinamiento por la COVID-19 en Cataluña. El estudio se ha basado en una explotación de fuentes secundarias, noticias en medios digitales. Su relevancia se justifica en que precisamente contienen la información que llega directamente a la ciudadanía y tiene mayor capacidad de influencia en su percepción sobre la gestión de los ENP y en su comportamiento al visitar un espacio natural. Los resultados aportan evidencias en el contexto catalán de algunas de las cuestiones que ya apuntaban los primeros trabajos sobre esta cuestión en otros contextos territoriales (Hockings et al., 2020; McGinlay et al., 2020; Templeton et al., 2021).

Los resultados obtenidos permiten señalar una evidente falta de previsión por parte de los organismos gestores; algo esperado dada la excepcionalidad del contexto derivado de la pandemia. Sin embargo, considerando que los ENP eran una de las principales alternativas de recreación y de escape para la población de las ciudades en un contexto de restricciones de movilidad interregional; se debió prever el aumento importante de visitantes. Esta falta de previsión también conllevó la priorización de la respuesta a los conflictos e incidencias a corto plazo, más que diseñar estrategias a medio o largo plazo.

El contexto post-confinamiento y las restricciones de movilidad internacional han alimentado el turismo doméstico y de proximidad. A su vez, los ENP han sido visitados por nuevos perfiles de visitantes con menos experiencia y conocimiento. Estos visitantes, si no disponen de la preparación necesaria, pueden realizar un uso inadecuado y generar conflicto con el derecho al bienestar y seguridad sanitaria del resto de usuarios y, también, dificultar la función de conservación y preservación ambiental de los ENP. Ello genera nuevos retos para la gestión eficiente de los ENP, retos que se suman a los que ya enfrentaban estos espacios.

En definitiva, la pandemia ha agregado complejidad a la misión habitual de los ENP de balancear la conservación de la naturaleza, con la calidad de vida de sus usuarios y las actividades que en ellos se realizan. Existe la posibilidad de que las visitas hacia los ENP continúen creciendo. En vista que los efectos de la pandemia siguen prolongándose, es importante que se encuentre el equilibrio entre las estrategias de planificación espacial de las atracciones y amenidades en las que se genera mayor flujo, con acciones que influyan en el comportamiento de los visitantes, como la educación ambiental.

Partiendo del contexto generado por la pandemia y a la vista de nuestros resultados, consideramos que se deberían abrir nuevas oportunidades de reinversión para la actividad de recreación en los espacios naturales protegidos de Cataluña. El surgimiento de nuevos perfiles de visitantes puede ser un primer paso para diversificar los productos turísticos. También es necesario llevar a cabo innovaciones que permitan enriquecer el modelo de gestión dependiente de estrategias basadas en la capacidad de carga. La manera en cómo estas oportunidades sean manejadas en el presente, será determinante en las implicaciones que tengan en el medio y largo plazo, en el paso a modelos de gestión más eficientes y sostenibles (Hockings et al., 2020).

### 7.7.2. Limitaciones

Nuestros resultados aportan una aproximación de la dirección principal de los organismos gestores para hacer frente a retos emergentes. Las fuentes utilizadas para este análisis han permitido obtener información de libre acceso, publicada periódica y activamente durante el tiempo de interés. Ello ha posibilitado un análisis sistematizado de la información, contrastable y replicable en otros ámbitos y contextos. La revisión realizada ha permitido identificar acciones que han sido consideradas relevantes en el contexto regional.

No obstante, al verse condicionado por la información disponible en los medios digitales, el método usado en este análisis presenta limitaciones. Algunas noticias suelen publicarse como réplica de otras fuentes o comunicados oficiales. Sería más necesaria la diseminación de información directamente proporcionada por los gestores de los espacios naturales. Así mismo, la información aportada por algunos de los artículos consultados fue poco profunda, pues se limitaban a informar la medida aplicada, pero no el resultado y las implicaciones prácticas de éstas. Aunque algunos artículos incorporan información proveniente de fuentes oficiales, u obtenida mediante entrevistas o consultas breves a gestores, hace falta ampliar la perspectiva de estos dos grupos esenciales: los gestores y los visitantes. La opinión y evaluación de estos grupos sobre las medidas aplicadas son cuestiones que podrán ser abordadas en futuras investigaciones.

### 7.7.3. Futuras líneas de Investigación

La aproximación realizada en este trabajo debe ser complementada con análisis en detalle de casos específicos, a partir de información cualitativa que amplíe mediante entrevistas, talleres o grupos focales, la valoración de los gestores de los ENP en relación con las medidas

implementadas y los resultados de los procesos de monitoreo de estas acciones. Así mismo, se puede analizar el papel de instrumentos “suaves” de gestión, como la educación e interpretación ambiental, para gestionar el flujo de visitantes y valorar la transformación de comportamientos dentro de los espacios naturales.

Otro posible campo de investigación futuro es el estudio del nuevo perfil de visitantes de los ENP. Se puede abordar su estudio mediante técnicas cuantitativas que analicen sus características demográficas, su origen, sus expectativas y preferencias, o su comportamiento espacial. En este sentido, es posible agregar un análisis de los factores determinantes que estimularon el crecimiento del turismo doméstico en ENP. También sería interesante monitorear y proyectar cómo evoluciona este creciente interés por los espacios de naturaleza y sus implicaciones. Del análisis apropiado de la movilidad de los visitantes pueden emerger patrones de comportamiento espacial que ayuden a los organismos gestores a diseñar y planificar la movilidad dentro de los ENP (Orellana et al., 2012), así como identificar oportunidades en el desarrollo de estos espacios como destinos turísticos emergentes capaces de responder al crecimiento del turismo interno o de proximidad.

De igual manera, se puede ampliar el foco de análisis a otras figuras de menor protección o a espacios periurbanos, que no figuran dentro de las figuras de protección especial, pero que son de uso recreativo para las poblaciones próximas. Estudios previos indican que algunos de estos espacios han incrementado notablemente la presión por el aumento de visitantes, especialmente aquellos cercanos a espacios urbanos más poblados (Primack & Terry, 2021; Saladié et al., 2021). Por ello, será de interés analizar cómo las poblaciones locales han hecho uso de estos espacios que no cuentan con estructuras de gestión; ni están enfocados en la preservación de la naturaleza. Finalmente, este artículo aporta un análisis de las acciones de los organismos gestores de los ENP a corto plazo. Abre puertas a futuros análisis que hagan uso de otras fuentes y metodologías y que permitan monitorear, comparar y evaluar las estrategias de gestión a medio plazo y surgidas en respuesta a los nuevos retos planteados por la pandemia y sus efectos a medio y largo plazo.



## Chapter 8: Managing visitor flows in protected areas in a context of changing mobilities: An analysis of challenges, responses, and learned lessons during the pandemic in Tarragona Province (Spain)

M.E. Medina-Chavarria, A. Gutiérrez and Ò. Saladié. Managing visitor flows in protected areas in a context of changing mobilities: An analysis of challenges, responses, and learned lessons during the pandemic in Tarragona Province (Spain), *International Journal of Geoheritage and Parks* (2023), <https://doi.org/10.1016/j.ijgeop.2024.01.005>

### **Abstract**

Protected areas experienced changes in visitor flows after the easing of worldwide mobility restrictions related to the COVID-19 pandemic. The changing context added complexity to the functioning of these areas, so the entities involved in visitor management had to adopt protocols to contain the virus, as well as mechanisms to deal with the consequences of fluctuations in mobility flows in these areas. This study aims to analyze visitor management practices in protected areas of the Tarragona Province in Spain, in the context of the pandemic and as experienced by managers. We utilized a two-phase participatory methodology, initially employing a semi-structured questionnaire and subsequently conducting a focus group. Our findings revealed that concerns hindering visitor management before the pandemic not only remained relevant but worsened during this period. Managers faced organizational concerns, including poor communication among stakeholders or staff limitations. Visitor-related concerns also arose, such as changes in leisure and behavioral patterns that resulted in crowds and damage in sensitive areas. These concerns led to mostly reactive responses, with a strong reliance on strategies such as enforcement and regulation of visitor use and mobility. The findings provide useful information on the management approaches put into practice, as well as on opportunities to improve strategies for the sustainable management of visitors in protected areas.

### **Keywords**

Protected area; Visitor management; COVID-19 pandemic; Natural tourism; Catalonia

## 8.1. Introduction

The management processes implemented in protected areas (PAs) marshal utilize the available resources to achieve variable objectives and tasks in these areas (Worboys et al., 2015). Within these processes, visitor management (VM) aligns actions according to the predetermined uses of natural and cultural resources and spaces (Pachrová et al., 2020); this can be conditioned by the nature of the environment where recreational and tourist activities are promoted (Butler & Boyd, 2000). VM gains relevance as PAs are now less restricted and more open to the development of tourism (Petrić & Mandić, 2018). Sustainable development and sustainable tourism are concepts intricately and inevitably linked to recreation in PAs to such an extent that sustainability is considered the foundation of VM, requiring the establishment of a balance between the scope of regulations, the social satisfaction of visitors, the benefits to locals, and the reduction of the environmental impacts of tourism (Zelenka & Kacetl, 2013).

It is well-known that the management of PAs around the world had to adapt to the changes that occurred as a side-effect of the movement policies and regulations introduced after the declaration of the COVID-19 pandemic (Waithaka et al., 2021). At a certain juncture, the pandemic was perceived as an occasion for global stakeholders to actively engage in addressing persistent economic, social, and ecological challenges, revitalizing the connection between humans and nature, and fostering the sustainable development of communities (McNeely, 2021), including those in and around PAs.

As reported by official sources, after several mobility restrictions were eased in Catalonia, several PAs experienced significant changes in visitor flows and the number of domestic visitors during the summer of 2020 (Departament de Territori i Sostenibilitat, 2020). Inappropriate behaviors, conflicts between residents and visitors, and degradation of natural habitats rose. Similar patterns were seen later, during the Christmas holidays of 2020 and through 2021 (Badell, 2021). As a result, managers' preparedness for such changes was put to the test, a set of adaptations was introduced to cope with the growing number of visitors and the risks related to the pandemic.

To develop an understanding of the VM approach in PAs and the challenges impeding its potential outcomes, we conducted a background check of the relevant literature. The bibliography referenced herein was curated through a commonsense selection process, which includes published academic articles and books addressing subjects such as tourism and recreation studies, visitor management, and the management and governance of PAs.

Visitor management is defined by Albrecht (2017, p. 4) as a set of “*tools and interventions that regulate the movement and behavior of visitors in a destination*” (including PAs). A sustainable VM combines a variety of approaches (Pachrová et al., 2020), most of which aim to influence visitor flows and behavior, minimize their impacts, and maintain both the integrity of PAs environments and the quality of visitor’s experiences (Candrea & Ispas, 2009). Furthermore, VM involves systematic planning of the operational and physical resources necessary to support, control and improve visitors’ experiences while achieving sustainability (Thomas & Middleton, 2003).

Several authors have addressed the multifaceted nature of VM. On one side, recreation ecology studies utilize ecological variables to inform VM and proposes strategies to mitigate environmentally unacceptable changes caused by tourism and recreation (Monz et al., 2013). Within this framework, it is acknowledged that recreation visitation inevitably impacts natural resources. As such, the focus is not on visitors’ behavior but on the spatial distribution, severity, and extent of visitors’ impacts on vegetation, soil, water, and wildlife (Marion et al., (2016)). On the other side, within tourism studies and the destination construct approach, it is assumed that biodiversity conservation is not the sole purpose of several PAs. Consequently, PAs management collectively focuses on conservation alongside other functions associated with culture, well-being, and recreation (Petrić & Mandić, 2018). In a similar vein, VM places visitors and their experiences and behaviors at the core of the process. This is reflected in the consulted literature. For instance, the hard and soft approaches examined by Mason (Mason, 2005) place visitors as subjects that can either be controlled through regulation policies and enforcement or influenced through education and interpretation. Candrea and Ispas (Candrea & Ispas, 2009) proposed approaches centered on the reduction of visitor impacts, summarizing them on the management of supply, demand, resources, and space usage. Manning and Anderson (Manning & Anderson, 2012) also emphasized that VM aims to regulate or influence visitors’ behavior, differentiating VM practices based on the level of directness of the action and the extent of freedom of choice granted to visitors. Petrić and Mandić (Petrić & Mandić, 2018) summarized VM strategies applied to PAs as destinations, and classified the tools to control visitor flows as institutional, economic, managerial, or information-technologies-based. Breiby et al (2022). suggested that VM could be approached through resource, activity or community-based techniques, with each approach respectively centered on the ecological conditions of the space, visitor behavior, or scientific knowledge and the participation of stakeholders.

The existing literature addressing VM strategies, and its impacts is extensive. VM regulates, prohibits, limits, diversifies, and concentrates visitors through multifunctional strategies applied to conditions of use (Leung et al., 2018), traffic (Petrić & Mandić, 2018), price policies and reservation systems. Zoning emerges as a mechanism to concentrate or distribute recreational activities within the desired boundaries in PAs (Petrić & Mandić, 2018). Simultaneously, enforcement helps ensure visitor compliance with pre-existing regulations (Eagles et al., 2002). This strategy has also been considered under “hard” and “soft” perspectives, distinguished by the level of legal bidding of the interventions used to promote compliance (Pendleton, 1998). These perspectives range from punitive measures for law violations, such as fines, citations or imprisonment, to non-punitive measures, such as conduct codes, signage, and environmental education (Leung et al., 2018). Additionally, other alternatives, such as marketing, can yield beneficial outcomes by enhancing cooperation among stakeholders and local communities, and by establishing realistic visitor expectations prior to their arrival at the protected area (PA) (Worboys et al., 2015). Once recreation occurs in PAs, monitoring visitors’ distribution, their motivations, perceptions, and potential impacts can help inform future VM plans and strategies (Cope et al., 2000).

Nevertheless, the success of these strategies may be threatened or impaired by several barriers. Some issues may arise within the scope of the managing organization, either during the planning process or during the implementation of strategic lines of action (Eagles et al., 2002). Engrained failures or deficits in the organization or its management practices can lead to a critical situation where VM in PAs cannot adapt to changes (Ritchie, 2008). Threats can also come from external disruptions that represent hazards not only to personal security and safety (Eagles et al., 2002) but also to the integrity of PAs. External drivers of change (such as the pandemic) may influence the attitude towards acceptable changes or carrying capacity limits in PAs (Kainthola et al., 2021), yielding adaptations in VM strategies. Furthermore, potential impacts on visitors, such as seasonality or spatial concentration in PAs, can lead to overcrowding. However, it is important to note that this approach could potentially increase the risk of overtourism scenarios. Overtourism occurs when the limits of acceptable change within PAs are exceeded, overwhelming the capacity of host communities and management, and hindering visitors from achieving their expectations (González-Domingo et al., 2021). The increasing demand for PAs as recreational and healing environments (Jenkins et al., 2021) also puts pressure on vegetation, animal populations, and landscapes (Eagles et al., 2002; Pachrová et al., 2020), and affects residents’ quality of life through traffic congestion or increasing waste disposal (Cahyadi & Newsome, 2021).

These disruptions can undermine VM response capacity and decision-making processes (Phua et al., 2021). Furthermore, when these disruptions cause sudden and unexpected changes, also known as fast changes (Cheer & Lew, 2017), reactive responses are activated, further exacerbating existing challenges within the organization. Additionally, such fast changes can cause a deviation of VM from its usual ways. For instance, during the pandemic, the surge in “recreation-driven” visitors to PAs in the United States forced managers to pay more attention to previously under-visited remote areas (Templeton et al., 2021), or, occasionally, assign traffic management and surveillance duties to staff otherwise dedicated to interpretation programs (Miller-Rushing et al., 2021).

This study aims to analyze the management of changing visitor flows in the PAs of the Tarragona Province driven by the pandemic. It also furthers the research lines proposed by Medina-Chavarria et al. (2022) in relation to PAs managers’ perceptions of the emerging challenges in the period of interest. It follows a phenomenological approach, carried out through a two-phase participatory process. The first exploratory phase pays attention to the opinions of a variety of stakeholders and serves as a precedent for the next step, while the second phase gives special focus to the experiences and perspectives of managers. Three research questions guided this study are the follows:

1. To what extent did the pandemic disrupt VM in the PAs of Tarragona?
2. What are the strategies that visitor managers implemented to cope with the emerging challenges?
3. What are the lessons for the future of VM in the PAs?

The purpose of the first question is to put into perspective the challenges experienced within four PAs of Tarragona, comparable with both mountain and coastal regions. The second question provides knowledge about the practices applied to visitor flow management from the actual experiences of the managers during this context of fast-growing pressures. The third question provides suggestions for future endeavors in VM in PAs. These suggestions contribute to academics and practitioners interested in the sustainable management of PA and the VM approaches adopted by Mediterranean PAs in the context of changing tourist flows.

## 8.2. Methodology

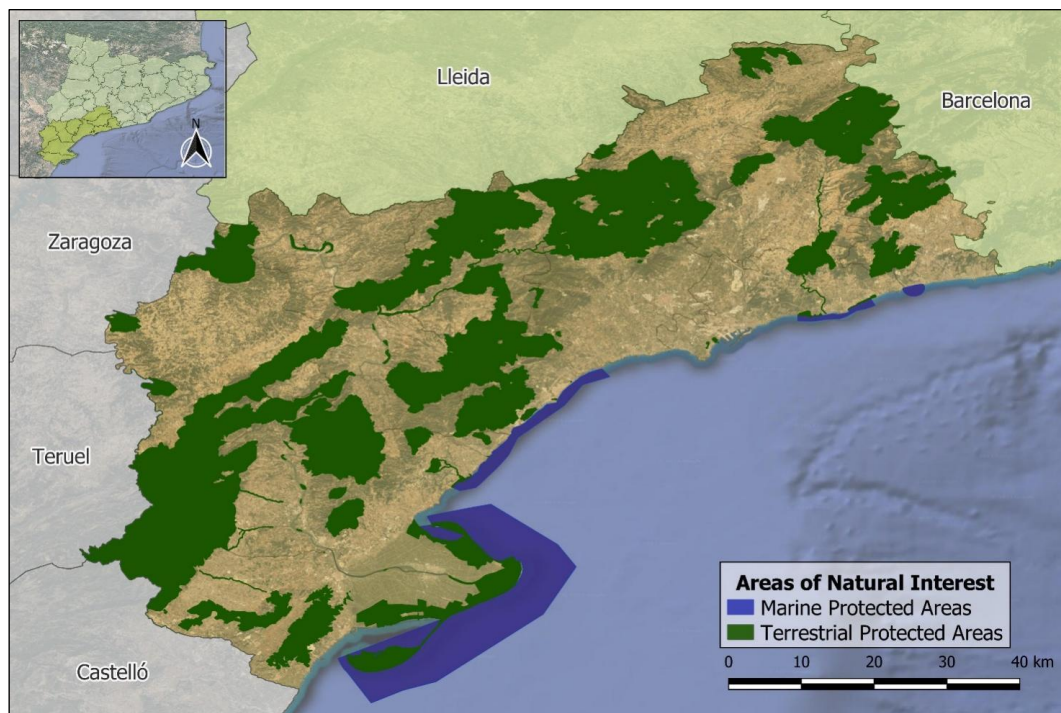
### 8.2.1. Study area

With an area of 6,306 km<sup>2</sup>, Tarragona Province is a province of Catalonia located in the northeast of Spain. The PAs network of Catalan, regulated by the Plan for Spaces of Natural Interest (PEIN, its acronym in Catalan) and Law 12/1985, was created as a mechanism to conserve biodiversity and preserve areas of natural and cultural interest in the territory (Parlament de Catalunya, 1985). Currently, every area within the PEIN is also part of the Natura 2000 Network. PEIN encompasses a range of Specially Protected Natural Spaces (ENPE, its acronym in Catalan), which are subject to specific protection regimes, regulations, and management structures. These areas hold significant importance for science, ecology, culture, education, and recreation. There are four categories of ENPE in Catalonia: national parks, natural parks, natural sites of national interest, and nature reserves. Both Law 12/1985 and the PEIN establish the conditions associated with the sustainable use of natural resources as well as the regulations for land use and constructions in accordance with the rural characteristics of the landscape (Institut Cerdà, 2015). In 2018, the Generalitat created the Natural Heritage and Biodiversity Strategy of Catalonia, framed under the sustainable development paradigm and the fight against climate change that orients its actions and policies until 2030. This strategy aims to reconcile the current tourism model with the socioeconomic activities of the territory, to boost stakeholders' participation in the governance of nature conservation, to improve surveillance and law enforcement, and to raise awareness about the impact of human activities on nature through education, training, and citizen engagement platforms (Generalitat de Catalunya, 2018). It also acknowledges the growing interest of PAs in tourism and outdoor sports markets, where the PAs themselves serve as the main motivation for visiting rather than being secondary activities.

Almost 33% of Tarragona Province's territory is part of the PEIN, covering approximately 2,072 km<sup>2</sup> of its surface (Figure 13). The ENPE areas in Tarragona Province encompass an area of around 599 km<sup>2</sup>, with 517 km<sup>2</sup> covered by natural parks, 25 km<sup>2</sup> covered by natural sites of national interest, and the remaining 57 km<sup>2</sup> covered by nature reserves (Statistical Institute of Catalonia, 2023). The PAs of the province are significantly humanized areas in which natural, residential, and productive settings converge. Their management is expected to be comprehensive and capable of accommodating these different settings (Direcció General del Medi Ambient i la Biodiversitat, 2014).

In the Catalan territory, PAs steering bodies are diverse. With the exception of the PA located in the province of Barcelona, their management is overseen by the Generalitat. Alongside, the governing structure includes the participation of a variety of stakeholders. Hence, the governance of PAs in Tarragona Province includes several units from the Generalitat, the provincial council, local administrative entities, and, depending on the PA, it also includes the private sector, landowners, agricultural and environmental organizations, and universities or research institutions. It is noteworthy that not every PA included in the PEIN count has its own management structure. However, those included in the ENPE group do have such a structure and could be co-managed with smaller connected areas. In this sense, the PAs included in this study were Delta de l'Ebre Natural Park (covering an area of 74 km<sup>2</sup>, co-managed with eight nature reserves), Els Ports Natural Park (covering an area of 350 km<sup>2</sup>, co-managed with one nature reserve), Serra de Montsant Natural Park (covering an area of 92 km<sup>2</sup>), and Poblet Natural Site of National Interest (covering an area of 25 km<sup>2</sup>, co-managed with two partial nature reserves).

**Figure 13.** Protected Areas of the Tarragona Province according to the Law 12/1985 and the Plan of Areas of Natural Interest of Catalonia.



Author's own elaboration, from Cartographic and Geologic Institute of Catalonia, Generalitat de Catalunya

The management of the pandemic in Spain entailed a scaled introduction of mobility restrictions. During the first state of alarm, a hard lockdown was introduced, which lasted from

April to June 2020. This lockdown was subsequently eased with the establishment of an escalated action plan that led to a “new normal,” allowing residents to travel around the country. Following the adaptations in national mobility guidelines, the government of Catalonia (also called the Generalitat) reported changes in domestic visitor flows during the summer of 2020 in several PAs of the territory (Departament de Territori i Sostenibilitat, 2020b). For instance, coastal and marine PAs saw a decrease in the number of visitors in July 2020, while PAs located in the countryside experienced an increase in visitation, in comparison to the previous year. This increase ranged from 10% at the Aigüestortes i Estany de San Maurici National Park to a remarkable 133% at the Monestir de Poblet Natural Site of National Interest. Furthermore, all PAs in Catalonia experienced a similar increase in visitor numbers in August 2020, ranging from 3% at the Aiguamolls de l’Empordà Natural Park to a significant increase of 121% in visitor numbers at the Delta de l’Ebre Natural Park. As seen, the PAs in Tarragona Province were among those that experienced the higher increase of visitors during the mentioned period. In the same report, the Generalitat pointed to a rise in conflictive behaviors, especially between residents and visitors, as well as an increase in degradation of natural habitats. A second state of alarm was called from October 2020 until May 2021, implementing measures such as a curfew, limitations in the size of gatherings, and mobility restrictions applied to both municipal levels and among coexistence bubbles. Despite these regulations, similar mobility patterns to those observed in the summer were observed later, during the Christmas holidays of 2020 and throughout 2021 (Badell, 2021). As a result, managers' preparedness for such changes was put to the test, and a set of adaptations was introduced to cope with the growing number of visitors and the risks related to the pandemic.

### 8.2.2. Method

This analysis followed a phenomenological (Pernecky & Jamal, 2010) and descriptive approach based on experiences of stakeholders and managers to understand the effects of the changes in visitor flows on VM of PAs in Tarragona Province during the pandemic. The data were collected through a two-phase participatory process. In both phases, the participants were informed about the objectives of the study and provided their written and oral consent for the use and publication of the information described in this manuscript for scientific research purposes. In the first phase, an exploratory semi-structured questionnaire was administered to stakeholders selected based on their degree of involvement and participation in the management or governance of Tarragona Province’s PAs. The purpose of this questionnaire was to gather

insights into the challenges and actions implemented in response to the changes in mobility during the pandemic. This questionnaire entailed both open and closed questions and was thoughtfully structured in three sections. The first and second section collected stakeholders' perceptions concerning VM practices before and during the pandemic. As for the third section, it captured their expectations for the post-crisis period. Due to the movement restrictions in force at the time, the questionnaire was distributed via e-mail in April 2021. On this phase, the response of 13 stakeholders was received, including PA managerial and technical staff of four PAs of Tarragona Province, representatives of the Generalitat from the Territorial Office of Environmental Action and Assessment and the Rural Agents Brigade (the agency in charge of surveillance, monitoring, environmental education, rescues, and emergencies care), and public servants from local administrations (which organize services of garbage collection and dictate some price, access, and carrying-capacity policies in municipal infrastructures through public ordinances). The findings gathered in this phase served as the framework to structure and analyze the focus group on the subsequent phase.

The second phase entailed a focus group conducted in June 2021. In this phase the number of participants was reduced to the entities in charge of VM within the PAs. Since the focus group was convened before the removal of mobility restrictions, it was developed in a virtual format. Furthermore, it was moderated by a professional facilitator who was external to the research team, based on the design suggested by the researchers. In this sense, the content of the focus group was guided by the objective and research questions of this study. The participants included four PAs representatives, selected by their own management teams, and one representative of the Municipal Assistance Office of the Provincial Council, which supports PAs management through project grants and other interventions, and also manages smaller natural areas.

The analysis of the results was conducted with ATLAS.ti, a computer-assisted qualitative data analysis software (CAQDAS), which has been used in similar studies for the in-depth capture of stakeholders' experiences and perspectives on specific phenomena (Breiby et al., 2022; Pan et al., 2022; Templeton et al., 2021). We ID-coded the respondents consistently to identify the number of interventions per participant, with a result of 118 interventions in total (Table 10).

Subsequently, we processed the transcript using axial coding, based on both deductive and inductive reasoning. To this end, we pre-established four categories related to our research interests and the information gathered through the exploratory questionnaire: tools and resources, concerns, strategies, and expectations and opportunities. Then, we assigned fifty first-level codes to the data distributed across 175 quotes, which were then reduced to thirteen

coding dimensions. From the emerging patterns of interaction among the different categories, we organized three thematic units.

**Table 10.** Number of interventions per participant

Participant ID	Institution	Area	Interventions
RES1	Delta de l'Ebre Natural Park	Public use technical area	23
RES2	Serra de Montsant Natural Park	Managing- direction area	43
RES3	Els Ports Natural Park	Public use technical area	20
RES4	Poblet Natural Site of National Interest	Managing- direction area	14
RES5	Provincial council	Municipal assistance service	18

## 8.3. Results

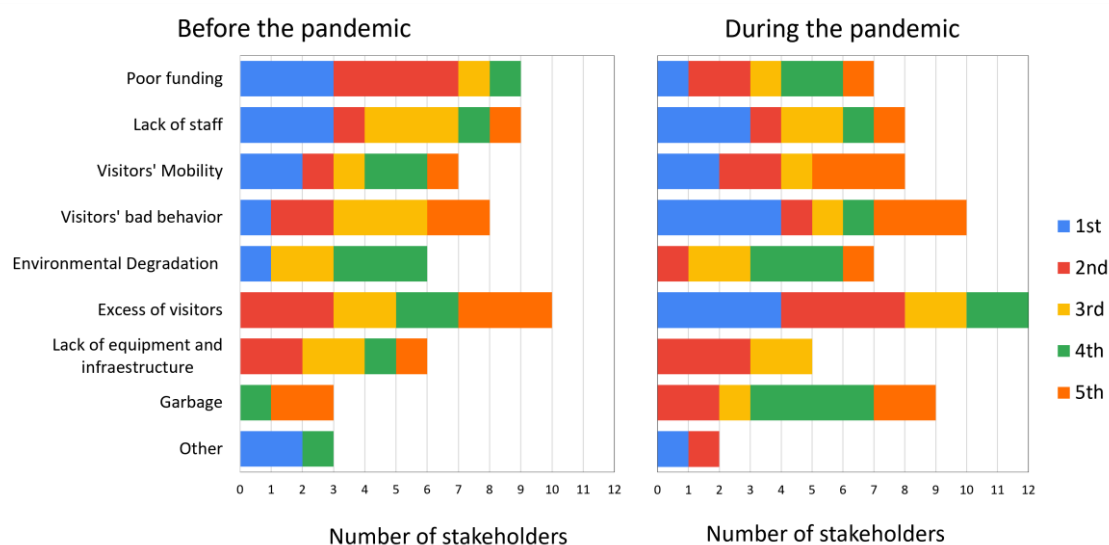
### 8.3.1 Preliminary stakeholders' views: Change in priorities and short-term measures

To understand the extent of the emerging concerns during the pandemic period, the stakeholders were asked to rank the issues that influenced VM before and during the pandemic in order of priority (Figure 14). To obtain this data, a series of concerns were proposed, taking into consideration the organizational, external, and visitor-related concerns proposed in the section of Introduction. However, the stakeholders also added their own answers. Before the pandemic, ten of the twelve participants considered the excess number of visitors as a concern. However, during the crisis, this concern became a priority for 100% of the respondents and ranked predominantly as the first or second priority. This shift in priority was also observed in other issues, such as visitor's bad behavior, garbage management, and mobility flows. These concerns gained equal or greater attention compared to organizational matters. Interestingly, issues related to the organization, such as funding, staff, and equipment, appeared lower in the stakeholders' priority rankings. In turn, the manager's attention turned to visitor-related concerns and the adhered consequences on the territory, which were perceived as problems that had to be addressed in the short term.

When stakeholders were asked about their perception of visitors' profiles, they stated that visitors predominantly traveled in small groups consisting of friends and family, with most of them having a local or national origin. Stakeholders also noted a decrease in the proportion of frequent visitors, which they attributed to the excessive number of people in the PAs. These

new visitors were reported to be unfamiliar with natural environments, resulting in increased litter, damage to vegetation, and inappropriate behavior. According to the stakeholders, the increase in private vehicles, caravans, and motorcycles in specific periods and locations played a crucial role in the decision to prioritize access and parking control in the management of PAs. Conversely, there was a decrease in the use of public transportation to access and traverse within PAs.

**Figure 14.** Issues ranked by stakeholders before and during the pandemic



The study also investigated the temporal nature of the implemented measures. Most of the actions were supposed to be temporary, implemented only during peak visitor periods (summer, Easter, long weekends), or for the duration of the ongoing pandemic. However, specific actions such as zoning and signage remained permanent fixtures. Furthermore, when consulted about whether actions would be implemented in the future, only the respondents among managers and a representative from one municipality confirmed strategies that were already planned. Regarding the origin of the measures, the stakeholders indicated that these actions were mostly of their own initiative—especially for the case of PAs managers—and, to a lesser extent, some were derived from guidelines suggested by the Civil Protection Agency of Catalonia or the Department of Territory and Sustainability of the Generalitat. In addition, the stakeholders stated that visitors tended to find measures related to information and education more acceptable compared to regulations regarding access and parking. Nevertheless, zoning and access limitations were deemed the most effective in managing visitors.

Several factors constrained the capacity of stakeholders to manage emerging challenges. These included limited coordination among stakeholders, the complex topography of some PAs, and

the spatial dispersion of main attractions. Additionally, despite efforts to increase working hours and responsibilities for existing staff, there was still a shortage of personnel for the need of information and environmental education, which was further exacerbated by a scarcity of informative materials.

### 8.3.2. Managers' experiences: Emerging topics discussed

Table 11 summarizes the four pre-established categories, the thirteen dimensions identified in this analysis, and the associated codes. Additionally, groundedness represents the frequency at which a particular code within a dimension was mentioned.

**Table 11.** Pre-established categories and coding dimensions

Pre-established categories	Coding dimensions and codes associated	Groundedness
Tools and Resources	Planning/Decision-making tools: legislation and management plan, stakeholders' participation, indicators	54
	Organizational resources: financing resources, human capital, infrastructure	13
Concerns	Organizational Concerns: communication capacity, planning and monitoring, recreation opportunities, response capacity, staff, stakeholders' collaboration, tasks distribution/definition	76
	Visitor-related concerns: changes in leisure patterns, crowds/overtourism, ecological impacts, environmental awareness, conflicting behavior, underuse/misuse of available facilities	48
	External concerns: conditions of the territory, environmental issues, pandemic, uncertainty and rebound effects	27
Strategies	Enforcement: codes of practice, environmental education and interpretation, signage and interpretative messages, increase informant staff, information points/centers, law enforcement, public order ordinance	33
	Mobility regulation: alternative means of transport, increase parking areas, parking regulation, vehicle restriction	30
	Regulation of visitor use: concentrate visitor use, offering diversification, regulation/prohibition of conflicting activities, use limit	18
	Marketing: messages through media, printed material, website and social media	15
	Monitoring: research and data collection, use of information technologies	14
	Rationing: payment strategies, reservation system	14
Expectations and opportunities	Zoning, barriers, regulating PAs uses	4
	Expectations and opportunities: future lessons, negative perspectives, positive perspectives	37

Furthermore, Table 12 explains the three thematic units that emerged from the analysis of managers’ interventions during the focus group.

**Table 12.** Emerging thematic units

Item	Description
	Concerns reinforced during the pandemic
Emerging thematic units	Managing visitors during the pandemic: prevalence of hard approaches
	Thinking about the future: comprehensive planning and improved synergies

*Concerns reinforced during the pandemic.*

One of the key issues discussed was stakeholders’ poor communication: Dialogue between entities was inconsistent, especially around collaboration to create regulation instruments. Furthermore, managers pointed out the misleading promotions about the public use of PAs (e.g., promoting swimming in natural pools) that could even trigger conflicts between visitors and residents:

*“a series of tour operators, who work throughout the Costa Daurada, are promoting cycling in the natural park a lot... it became a real problem, to such an extent that [the idea of] taking a position against [cycling], stopping it and closing access to bicycles was already spreading through the internal networks of the village” [RES2].*

Managers perceived that their organizational capacity to respond to arising challenges was limited: “helplessness” “stagnation” “inertia” and “bureaucracy” were some of the terms that came up when describing this issue. Despite the advances in the regulations in force at the time of our focus group, the managers experienced constraints to implementing measures approved by the Generalitat.

*“... nowadays many initiatives to regulate ... public use are being launched. But what we have found is that the Generalitat is very slow in terms of regulations and what we are all doing is going to the municipal ordinances” [RES4].*

As they perceived it, the managers lacked both resources and tools, such as guidelines to respond to rapid changes within PAs. To this end, staff shortages were frequently mentioned, and it could be divided in two streams. First, the permanent staff was aware of the problems and needs in PAs; however, they are usually overworked with multiple duties, and had a challenging time getting their work done or meeting with other stakeholders:

*“...when we try to meet with the town halls or trade councils, it can take us up to three months to set a date, because we are few and we are very overwhelmed” [RES3].*

Second, the slow hiring of new staff was also a recurring concern. Seasonal staffing tended to be outsourced, but even if financial resources are available, recruitment tends to be cumbersome:

*“It is clear that this is a problem... we have the economic capacity, but we cannot make arrangements to hire human resources” [RES2].*

This led to a shortage of staff dedicated to providing information about or controlling access to PAs, forcing existing workers to perform tasks beyond their duties. These serious problems influenced the implementation of management actions or the development of new projects.

In another vein, crowds were also among the topics discussed; however, in addition to the number of visitors, managers' concerns extended to the changes in visitor leisure patterns and behavior. In some cases, the shift in seasonality caused the number of visitors to double compared to the same season in 2019. The increase of nationwide visitors meant that PAs were crowded with vehicles and RVs campers, and conflicts with landowners and other users arose, since visitors were parking on private land:

*“[We] have noticed an increase in the visitor[s] .... who are not used to protected natural spaces or whose behavior is the same as in any other sort of natural or peri-urban space” [RES3].*

*“...for three Saturdays [in a row] before Easter, when we were still confined, and the curfew ended at 10 ... We counted how many vehicles were spending the night in the natural park: cars, classic vans, California vans, and motorhomes ... On the first Saturday of Easter, there were more than 550 vehicles staying overnight in the natural park areas! And [this happened even when] the number of spaces to park vehicles in municipal areas of [the six surrounding towns] has been increased” [RES1].*

*“When parking lots are overflowing and vehicles begin to park poorly, it creates problems for any user who tries to pass through a forest track. [Therefore,] in addition [to the roads] not in good condition, there are vehicles that prevent them from passing comfortably” [RES3].*

Managers not only noticed that many visitors were not aware of the correct uses of PAs, but there were also more damage to infrastructures and natural values, as well as an increased dumping of garbage.

*“... I found a bag with cans hanging on a tree by the side of the road, tidily put.... [visitors may think] a street sweeper will stop by to pick it up” [RES2].*

Interestingly, in terms of concerns externally originated, the pandemic was not significantly mentioned as a problem; rather, it was seen as factor exacerbating problems that existed before the spread of the virus:

*“... In the last five years, we have been talking about [overcrowding], then COVID-19 happened, and it has sped up or increased, and it has put [this issue] on the table—that is to say, it gave a certain priority that did not have [before].... Therefore, it is not that we are overwhelmed after [the pandemic]; we were already overwhelmed [by visitors] before. I mean, it never rains but it pours” [RES3].*

Finally, even though the ecological implications of these challenges were not discussed in this group, such factors were recognized as relevant. Some impacts mentioned were vegetation trampling, soil compaction, littering, and greater human waste. In addition, 2020 was the first year in which none of the Bonelli's eagles that nest in Els Ports Natural Park reproduced, although there was no certain evidence that this failure was caused by the increase in human presence.

#### *Managing visitors during the pandemic: Prevalence of hard approaches*

During the pandemic, online public engagement increased, but communication efforts were ineffective. As the managers explained, despite the amount of communication through social media and local news, incoming visitors were still unaware of the regulations in force in PAs. Thus, punitive and prohibitive enforcement strategies to regulate in-place visitor behavior were implemented. Regulatory ordinances were implemented to establish use zones:

*“[Some] municipalities... have approved specific ordinances for the use of the beach: relating to areas for dogs, overnight stays, making fires, etc. [These] regulations are associated with a sanctioning character” [RES1].*

The police department and the Rural Agents Brigade supported surveillance efforts. However, managers considered this type of hard and restrictive approach an issue during the discussion, and they felt that environmental education and information were a better line of action.

*“...a trend that we are taking in the parks and that I have not yet seen clearly: the surveillance issue. There are some parks that have [sided with] the surveillance, hiring guards directly, and not informants” [RES2].*

In one example, one of the PAs installed an automated barrier to regulate the access of vehicles; this system detects car plates to apply differentiated parking payment fees for visitors and residents. However, this brought challenges for the managers, since technology-based mechanisms require technical specifications to function correctly (here, solar energy, connection to a database of vehicles registered with the municipality, an online reservation platform, and a contactless payment system). This PA added three information points, but the same informant staff supervised the order and payment of vehicles parked in the area.

In addition, the territory of this PA was shared by two municipalities that sometimes managed parking areas through different approaches. For instance, according to the PA manager, while one municipality limited parking through schedules or payment systems like the one mentioned above, the other zoned sensitive crowded areas with poles and curbs but did not add payment fees. This increased visitor flows and traffic conflicted within less-restricted areas.

Issues varied in PAs with mountain environments; internal movement was already regulated, but they faced crowds in access points:

*“We do not have problems with people driving on the roads... the tracks have regularized motorized access—that is to say, the tracks have a degree of restriction and either you have an access card or you cannot move on many of the tracks of the park. So, this problem is kind of solved, but... There are three or four main entrances to the park where we do find overcrowding” [RES2].*

Furthermore, the characteristics of the territory conditioned the availability of parking spots, making it impossible to expand parking areas. Instead, these areas have focused on changing the functions of public spaces (i.e., converting an abandoned football field to a parking lot) or limiting non-residents' vehicles. Additionally, to better distribute crowds, they have diversified the recreation opportunities by providing new trails.

*“Since we have no more space to park beyond the village parking lot, we have decided to put up an information panel about the other itineraries that can be done [outside the PA] from there” [RES4].*

However, some of the respondents advised to be cautious when adopting alternative management measures, such as visitor distribution in the area, like the reflection in the following remark:

*“[concentrating visitors] also makes sense, because sometimes a placed is sacrificed, [but] you keep the rest of the space calm and preserve the values” [RES2].*

Finally, monitoring was discussed as not being an implemented strategy but being a need for the current management approach. To this end, only one manager mentioned the addition of automated visitor counters during the pandemic.

### *Thinking about the future: comprehensive planning and improved synergies*

It was clear to managers that many of their constraints were related to a lack of certain resources that were essential for VM. For instance, a comprehensive plan—one that includes measurable indicators or successful practices from other territories and that enhances stakeholders’ collaboration—should be developed:

*“A [management] model must be agreed on. [It is necessary to] realize that you cannot manage a municipality or a park individually without having consequences in what happens in nearby municipalities and spaces” [RES3].*

Participation and consultation between stakeholders were highlighted as ways to coordinate the implementation of strategies related to signaling, environmental education, monitoring, and marketing. *“You have to count on the involvement of the people of the territory” [RES5].* It was a well-articulated description of the need to involve stakeholders in VM and increase managerial capacities through the distribution of expenses, the exchange of knowledge, and even the sharing of technical support between entities.

Managers pointed to the need to have personnel dedicated to communication tasks. If such staff were already included in plans, the organization should prioritize this role, as effective communication with diverse audiences was essential. The potential of monitoring to help in responding faster to challenges that emerge was also recognized. Managers were interested in enhancing information networks within the territory as well as the use of technologies, such as live tracking, remote surveillance, and innovative tools that provided information about visitors. Furthermore, they declared that monitoring should be constant for them to be able to identify visitor motivations, and to understand and predict tourism flows.

It was uncertain if the issues discussed in this group would persist into the future. Some changes would remain, such as the profile of a visitor who was not fully aware of the PA’s conditions and who was not compatible with nature-based activities. Managers indicated the need to find versatile solutions that did not require sanctioning everything and did not restrict the traditional uses that locals had made of these protected areas:

*“[We should show] a little empathy for the woman from the nearby village who can go [to the PA] as she always has” [RES5].*

Finally, managers remained concerned about the lack of will to act and the return to “normal” state without resolving the aforementioned issues.

## 8.4. Discussion

This analysis interprets the experiences and views of PA managers from Tarragona Province, contributing to the understanding of their contextual needs and expectations (Giglio et al., 2019). This phenomenological approach has been adopted on similar analyses. Beery et al. (2021) investigated the perception of outdoor recreational professionals about people’s outdoor behavior during the pandemic and what consequences posed the pandemic to visitor experiences in Sweden. Lo et al. (2022) interviewed experts and stakeholders connected to or influenced by the management of a PA in Spain to determine whether their visions and perceptions of landscape values changed after the pandemic. Stakeholders’ views have also been used to analyze various topics related to their participation in sustainable VM (Welegebriel Asfaw, 2016), their experience with visitor monitoring in outdoor recreation areas (Ankre et al., 2016) and the impact of tourism and recreation on PAs (Belkayali & Kesimoğlu, 2015).

Despite a change in priorities during the pandemic, issues that already hindered VM remained relevant, were accelerated, and continued to be interconnected. Other authors found similar problems concerning managerial involvement, collaboration between stakeholders, and the need for guidelines to response to crises (A. S. Hansen et al., 2022; Petrić & Mandić, 2018; Templeton et al., 2021). In their analysis, Ankre et al. (2016) ) warned that changes in visitor profile and behavior patterns could entail adjustments in the implementation of VM. The shift in seasonality in the PAs of Tarragona Province to months that were not typically overcrowded required the increase or diversion of staff from their essential tasks. The immediacy of the emerging issues and the bureaucracy to hire new staff hindered VM. Thus, adaptation was a challenge for the participants included in this study.

The adoption of restrictive strategies to deal with crowds, such as hard enforcement, could follow from the approach seen in the natural heritage and Biodiversity Strategy of Catalonia, which states the need of implementing actions that systematize social use of and access to nature through the regulation of outdoor sports and excursions, vehicle access, and other activities that may impact the values of the PAs, biodiversity, or private landowners (Generalitat de Catalunya, 2018). However, managers’ attitude toward softer approaches was positive, and in

line with Butler and Boyd's (2000) findings, they found use limits and restrictions more problematic.

The recognition of monitoring as a necessary task to maintain an informed and updated VM, calls for partnerships among stakeholders such as the Provincial Council or universities that enable specialized knowledge and expertise to analyze emerging data (Ankre et al., 2016). Moreover, the acknowledgment of marketing as a strategy to stimulate awareness in visitors is noteworthy, because its capacity to influence expectations, decisions, and behaviors of future visitors, can help to discourage crowds in over-visited places, and enhance the relationship between stakeholders (Leung et al., 2018; Worboys et al., 2015).

The lack of stakeholder engagement and the heterogeneity of the PAs hinder the establishment of management models for the Catalan system, a phenomenon that has already been recognized as a weakness (Direcció General del Medi Ambient i la Biodiversitat, 2014). It is necessary to clarify the competences of the different entities within VM in PAs, as well as to decentralize functions in order to achieve better and faster response capacity. As suggested by Butler & Boyd (2000), a localized and non-generic solution approach is suitable for solving locally arising problems in PAs. To this end, we also agree that management decisions should be less bureaucratic. An inclusive approach—in which stakeholders and other PAs of the territory add their input—is proper too, not only to have diverse perspectives but also to add legitimacy to the decision-making process.

Finally, the pandemic has also exposed the existing lack of resources and coping mechanisms to respond to emerging crises. This is not an isolated event; other scholars have found comparable results in PAs from Europe and the United States (McGinlay et al., 2020; Templeton et al., 2021). The PAs of Tarragona Province have separate plans to deal with specific tasks (such as environmental education and volunteering), and the addition to the Sustainable Tourism Charter provides them with a guideline for planning and managing tourism in PAs. However, holistic frameworks with territorial perspectives, measurable indicators, and engaging policies are still needed. The discussion raised by the managers confirms the finding of Eagles et al. (2002): The success of VM depends on the contributions of various groups of stakeholders who are affected by or benefit from the sustainable development of PAs and their surrounding communities. Additionally, it depends on the understanding of different social, political, and economic contexts.

## 8.5. Conclusions

This study interprets VM practices in the PAs of Tarragona Province within the context of mobility transformations. It gives value to stakeholders' experiences, particularly those directly involved in VM. This phenomenological study enriches the understanding of VM and identifies opportunities to spark adaptive strategies, encouraging stakeholders to re-evaluate the approaches adopted so far. It contributes to the scholarship of VM within the context of rapid changes, in this case driven by the pandemic. Furthermore, it provides a major understanding of the relationships between VM measures that are implemented and issues that are organizationally or externally originated.

While the first phase of this research revealed a consensus among several entities that the pandemic caused a rapid shift of priorities from organizational to visitor related-concerns. The second phase made it evident that the pandemic not only caused new concerns for VM, but also indisputably shed light on and accelerated existing issues affecting PAs. Aside from the surge in visitation, the pandemic affected seasonality and spatial concentration. Though initially perceived as an opportunity, the greater inclination of visitors to carry out activities in natural areas eventually forced managers to solve conflicting behaviors in spaces that were not prepared for the increasing number of users during off-peak seasons. These changes prompted rapid coordination of resources to address emerging challenges, although they were hindered by institutional barriers.

The emerging challenges were a call to attention for governance models. These challenges demanded a closer and more open interaction among managers and stakeholders involved in the governance of the PAs of Tarragona Province. Two concerns arose during this period. First, the unilateral decision by some stakeholders to implement VM measures on the PAs eventually caused unavoidable impacts on visitor flows, which were not always beneficial for all parties involved. Second, excessive bureaucracy reduced the capacity to quickly respond to long-lasting crises such as the pandemic. Communication and collaboration are goals that should be reinforced in VM policies created in these territorial contexts. Regional policies should especially be considered. Although they favor the development of recreation within natural areas, they are still inclined towards a type of hard or direct approach that emphasizes the implementation of limits and regulations. While managers suggested softer approaches that favor a transversal environmental education for residents and visitors, they also hinted at a regenerative approach that fosters a sense of stewardship among visitors and encourages them to participate in restoration and conservation processes within PAs, such as through

volunteering. This is relevant in a context in which PAs face not only the impacts of tourism and incompatible recreational practices, but also the effects of other phenomena such as climate change, encroachment from productive activities, or the presence of invasive species of flora and fauna.

Being at the frontline of the steering organisms, the managers' experience provided valuable lessons for practitioners in similar positions. The managers included in this study emphasized the convergence of different actors and ideas as a means to carry out tasks that had been neglected for a long time. However, what is concerning is that the momentum gained during the pandemic has been lost, resulting in missed opportunities and a continued inclination towards reactive crisis responses. Given the importance of the tourism industry in the social dynamics of Catalonia and the significant coexistence between natural and human environments, PAs that function as tourist destinations require a prepared, competent, informed management and governance structures. This would allow them to face the uncertainties and the lack of resources caused or reinforced by changes experienced in recent years.

The limitations of this study should be noted. The restrictions in force during the data collection period constrained direct contact with stakeholders; some were unavailable to participate. Thus, important topics remain to be studied in future research endeavors. While the findings obtained in this study are valuable, the phenomenological analysis of other collectives can be extended to residents, collaborating consortiums, environmental entities, and visitors, which complement or counter the vision of the managers when dealing with the variable number of visitors in the PAs. The incorporation of this multi-perspective approach would contribute to enhancing shared and visualized public use models, management, and decision-making processes. This can also be furthered by analyzing how the collaboration among academia, industry, residents, and government can induce policies over VM and the promotion of sustainable mobilities in PAs of Tarragona Province.

Although it is not within the scope of this study, it is relevant to mention that some VM measures designed during the pandemic continued being implemented during the holiday seasons of 2021, 2022, and 2023, particularly those aimed at regulating space usage, types of activity, and mobility flows. As national and international tourism flows return to the same numbers prior to the pandemic, the PAs included in this analysis keep receiving significant amounts of visitors—although with less impetus in comparison to the pandemic years—that require constant monitoring and updated management. In this sense, future research can also explore the enduring impact of changes implemented during the pandemic, assessing the ongoing relevance of organizational and visitor-related concerns, as well as studying visitors'

attitudes towards the implemented VM measures. This can be done by examining the spatial and temporal dimensions of behaviors and motivations.

Furthermore, an additional research line could relate to the condition of the staff working in PAs, especially in scenarios like the one presented in this study that require fast adaptations and changes in the number or functions of workers. Situations like this can result in undertrained staff, which is counterproductive for essential workers who are in direct contact with visitors. In this sense, the implications of having undertrained, overworked, and probably poorly motivated staff in PAs is a topic of high interest. Finally, the ecological implications of the changes experienced during the pandemic were not much discussed in the focus group, nor have they been investigated. This is not to say that these implications are disregarded by this study or by PA managers; on the contrary, this type of insight should be considered and integrated in multidisciplinary future research. As previously stated, VM studies do not have a set path, nor must they be limited to a specific approach.

## Chapter 9: Factors influencing visitors' acceptance of traffic management strategies in the Ebro Delta Natural Park, Catalonia

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### **Abstract**

This article examines the relationship between the profile of visitors and their agreement with visitor and traffic management strategies implemented in a region encompassing a protected area. The accompanying study involved a survey of visitors at the Ebro Delta Natural Park in southern Catalonia, Spain, in July and August 2022. The assessment focused on three variables: (1) the acceptance of regulated parking, which involves zoning and delineating areas of use; (2) the acceptance of limited parking, including time limits, limited and rationed carrying capacity, and a reservation system; and (3) the acceptance of paid parking involving rationing through a fee. The survey also gathered data related to visitors' sociodemographic attributes, characteristics of their ongoing visits, their affinity with environmental issues and natural areas, the COVID-19 pandemic's effects on their frequency of visits to natural areas, their perceptions of the quality of parking, and their satisfaction with their visits overall. The results suggest that the acceptance of regulated and limited parking is influenced by country of origin, motivation, type of mobility in the region, and satisfaction with visits. However, the acceptance of paid parking is mostly nuanced by level of education, country of origin, type of accommodation, length of stay, satisfaction, and perception of the quality of parking. Even so, satisfaction is the covariate that best explains the acceptance of the three measures. The analysis provides practical contributions to addressing visitors' attitudes toward management measures implemented in a protected area and the diversity of users according to their profile.

### **KEYWORDS**

Visitor Management, Traffic Restrictions, Rural Area, Environmental Planning, Nature Park, Catalonia

## 9.1. Introduction

After the surge of outdoor recreation in the 1960s and the boom in tourism to witness scenic beauty, the abundance of wildlife, and the resources found in natural landscapes (Budowski, 1976), protected areas (PAs) have gained popularity as destinations for both local and foreign visitors. However, the development of tourism in PAs has been contested due to its potential impact on the areas and the inevitable coexistence of various human activities therein, including recreation, labor, commerce, and traffic activities (Beunen et al., 2006). Meanwhile, the growth in mobility from urban societies has ignited waves of interest in PAs (Haukeland et al., 2013; Weaver & Lawton, 2017) that have only added to concerns for those areas. Dickinson & Robbins (2008) and Jaarsma et al. (2009) have shown that cars have become the primary mode of transport for trips to and within rural and natural destinations. Consequently, the effects of tourism extend beyond the impacts caused by the masses of visitors within PAs and their behavior to traffic-related problems both in and around the destinations. That latter aspect is crucial in communities that struggle with escalating congestion resulting from the influx of cars, which is only worsened by the lack of adequate infrastructure in such areas (Jaarsma et al., 2009).

The demand for natural areas for recreational purposes has required implementing meaningful actions to address those emerging challenges. Restrictive solutions based on limits and carrying-capacity frameworks were included in the first models (Glasson et al., 1995), which continue to serve as the basis for current visitor management (VM) models in PAs. The evolution of those models over the years has driven a shift in attention from establishing limits to addressing the impacts of tourism and onto regulating the types of human uses in PAs (Haukeland et al., 2013). Moreover, in such models, visitors have become a source of revenue for conservation efforts through the application of taxes and fees, a practice that has drawn attention among tourism managers (Bushell & Mccool, 2007). Limiting, if not preventing, car traffic and implementing parking-related policies have also become key tools of VM to keep the areas accessible and enjoyable for users (Regnerus et al., 2007).

In the context of the COVID-19 pandemic and the subsequent lifting of mobility restrictions implemented in 2020, significant adaptations in the recreational behavior of local travelers have been observed, especially during holiday periods. In particular, the increase in domestic tourism to rural areas in Spain as places to socialize and engage in outdoor activities has impacted those areas (Cañada & Izcara, 2021). Against that backdrop, in our study we focused on changes experienced in the Ebro Delta area in Catalonia, where visitors noticeably congregated during

specific holiday periods in 2020 and 2021, especially in zones designated as PAs. The changes in outbound and inbound international mobility flows, the increased promotion of nearby destinations, and the perception of health safety in the area have shaped visitation patterns and the subsequent pressure exerted on delicate areas in the Ebro Delta (Margalef Callau, 2021). At the same time, because traffic-related management measures were widely implemented at this area during those periods, we also examined how visitors perceived those strategies. With the results of our analysis, we contribute to research on traffic management within the framework of VM strategies, the effects of which have not yet been sufficiently explored (Beunen et al., 2006).

The analysis developed in this case study will provide detailed insights into the specificity and complexity of VM in the Ebro Delta Natural Park (EDNP), with the chief objective of examining the relationship between the profile of visitors and their agreement with the visitor and traffic management strategies implemented in the area. To that general purpose, we aimed to answer two questions:

**Q1:** To what extent do visitors in the Ebro Delta accept or reject the traffic management measures implemented in the area?

**Q2:** Which characteristics most effectively explain a visitor's acceptance or rejection of the traffic management measures implemented in the area?

In what follows, Section 2 provides a background on visitor and traffic flow management as well as visitors' behavior and perceptions in the face of management regulations. Next, Section 3 offers an overview on the study area, the Ebro Delta region, after which Section 4 describes the method employed in the study. Section 5 then presents and discusses the results of our fieldwork, after which Section 6 concludes the article by summarizing the most relevant conclusions drawn from the study.

## 9.2. Background

### 9.2.1. Visitor and traffic management in natural and protected areas

VM involves the challenge of maintaining the accessibility of natural and PAs without imposing restrictions that render those areas off-limits for their enjoyment. On the one hand, VM should respect individuals' freedom to make their own choices and engage in activities of their preference (Zelenka & Kacetl, 2013). On the other, VM needs to strike a balance between human

use and the conservation of ecosystems in order to avoid treating PAs as commodities for consumption solely focused on maximizing economic benefits.

VM confronts problems that are both intense and spatially widespread (Martin et al., 2009) considering the capacities of natural, social, and cultural environments. The strategies associated with that process take various approaches, including enforcement, zoning, the regulation of use and access, and limitations on carrying capacity (Bowes et al., 2017; Eagles et al., 2002). Regarding strategies related to access in particular, VM imposes restrictions or limitations based on the sensitivity of the natural area (Foxlee, 2007). Such strategies can also entail imposing market-based fees differentiated for a variety of users.

High volumes of visitors can reduce the quality of experiences among users of PAs, disrupt the well-being of residents and local habitats, and alter local resources in unsustainable ways (Hanley et al., 2002; Marion & Reid, 2007). Excessive visitation also leads to traffic congestion, which strains the unique qualities that make natural areas attractive. Those sources of pressure give rise to physical hazards stemming especially from vehicle emissions, elevated noise levels, and overburdened road capacity (Beunen et al., 2006; Jaarsma et al., 2009). In recent years, VM strategies have placed increased emphasis on recreational traffic flows with the aim to control and mitigate the negative impacts of driving and parking in PAs as well as in other natural and rural areas (Jaarsma et al., 2009). One such strategy has been the implementation of “long walk-in” policies, which, by creating practical limitations, make access more time-consuming and/or restrictive (Hanley et al., 2002). Those policies represent the hard line of VM, which relies heavily on restricting physical and/or financial access to destinations (Buckley, 2003).

Research has shown that parking restrictions are indeed an effective strategy for reducing the number of visitors in overcrowded areas and promoting the physical activity of visitors at the same time (Regnerus et al., 2007). On that count, gateways have been recognized as a VM tool for managing limits placed on load capacity. Establishing gateways involves more than simply placing barriers, for the structures demand strategic consideration in terms of their placement and alignment with other facilities in the area (Beunen et al., 2008).

Although charging fees is a less frequent practice than using gateways in VM, there are various methods for introducing them, as described by Brown (2001), including charging entrance fees, differentiating prices for different types of users, and imposing costs for amenities (e.g., parking) and/or services (e.g., public transportation). However, because visitors tend to adapt to parking fees over time, that strategy’s effect is only temporary.

Along with being an effective means of controlling congestion and influencing visitors’ behavior, fees also operate as a mechanism of funding. Nevertheless, implementing fees comes

with a variety of costs, including for staffing, accounting, and specialist services. Fees may also have unintended effects that impact neighboring areas, and the PAs themselves may not gain any benefits from fees (Hanley et al., 2002). Such drawbacks have led to criticism of fees as a poorly defined and thus controversial measure (Buckley, 2003). Brown (2001) has added that fees may not in fact be allocated to the conservation function of PAs and have been regarded as impractical and culturally inconceivable in destinations where fees have not been imposed in the past. Last, the lack of clear communication about the application of fees often undermines their purpose, for uninformed visitors may continue to engage in detrimental behaviors (Bushell & McCool, 2007). In that sense, the success of traffic and VM strategies can easily be determined by the context, the ways in which they are communicated, and how they are applied in different social groups.

### 9.2.2. Understanding visitors' perceptions of flow and traffic management

In PAs, VM functions as a cyclical process in which the creation of strategies is fueled by information gathered from users within the PA. In that process, studying visitors' opinions and perceptions provides valuable information for decision-making and planning in PAs both before and after the implementation of VM strategies. In particular, visitors' value judgments can be organized to develop management standards that reflect both visitors' range of tolerable conditions and acceptable levels of recreational impacts on the environment (Kuentzel et al., 2008; Vaske & Donnelly, 1992). VM also relies on input from users to establish strategies for controlling, influencing, and prescribing desired acceptable individual and collective behaviors among visitors (Page, 2002; Phongkhieo & Sangchoey, 2019). In turn, visitors' responses to traffic management measures can shift depending on various conditions that can be understood by studying the characteristics that influence their behavior, including sociodemographic and psychographic attributes and/or motivations. To date, research has indeed studied visitors' attitudes toward, awareness of, relationships with, and connections to the environment and specific places (Fredman & Heberlein, 2005; Frost & McCool, 1988; Haukeland et al., 2013). The combined study of those characteristics can elucidate why visitors are more likely to accept, value, and comply (or not) with management measures. According to those differences, visitors can be segmented into groups to capture patterns in their orientation, interests, and activities pursued.

In research in that vein, Weitowitz et al. (2019) have examined how parking characteristics, including capacity limitations or fees charged, can influence the recreational use of natural areas. By contrast, several other studies have examined the influence of demographic and attitudinal variables on visitors' acceptance of regulations and willingness to pay. Brown (2001) has provided examples of how willingness to pay may be influenced by visitors' income, level of education, occupation, and perception of the quality of services offered at the place, as well as by the destination's uniqueness. In an exploratory study on PAs of Sri Lanka, Perera et al. (2015) found that level of education positively affected the acceptance of regulations, namely that visitors with higher levels of education showed more positive attitudes toward the roles and functions of the areas, restrictions imposed on the number of users, the implementation of progressive actions to reduce undesirable recreational activities, and conservation-oriented policies. Song et al. (2021) have also referred to studies showing the positive effect of education and the negative effect of age on willingness to pay. They also found that gender and trip-related factors such as country of origin, experience, and season had varying effects.

Other factors that could influence the acceptance of VM strategies include their perceived effects on visitors' personal freedom, autonomy, and fulfillment of expectations (Frost & Mccool, 1988; Marion & Reid, 2007). It also seems that visitors with a greater appreciation of, experience in, and familiarity with the area accept conservation-oriented management strategies to a greater degree (Arnberger et al., 2012; Gundersen et al., 2015). By contrast, Bayer et al. (2016) found that visitors with less affinity with the place perceive road tolls and parking fees more favorably. Even so, visitors are also more likely to accept fees if they are aware that the efforts supported by the fees will directly benefit the local site (Bushell & Mccool, 2007). Beyond that, outcomes such as those presented by Ervina et al. (2020) indicate that visitors' satisfaction and the quality of services that they perceive are inseparable from the perception of VM measures implemented in an area.

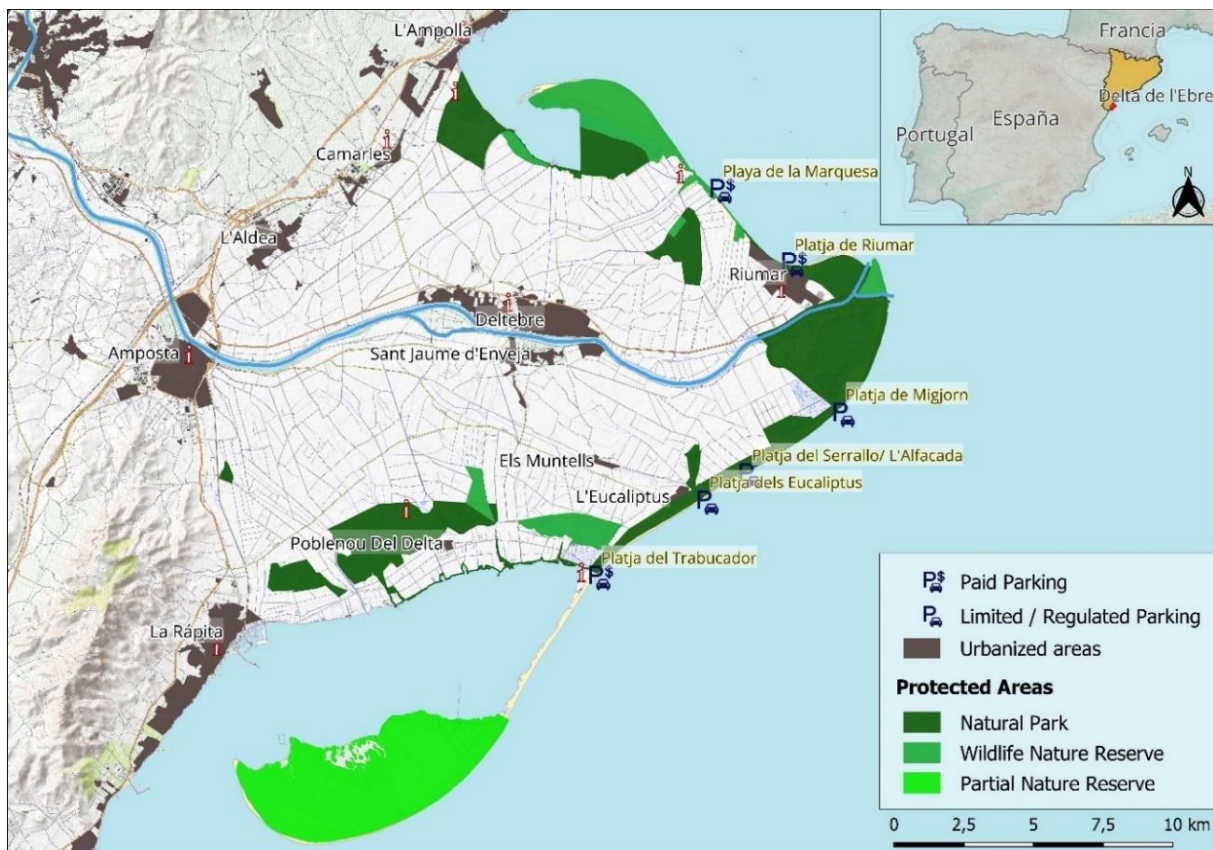
Despite the existing body of literature, studies that integrate demographic, attitudinal, and perceptual factors in outdoor recreation settings are still considered infrequent (SONG et al., 2021). Furthermore, research regarding attitudes and acceptance of Visitor Management (VM) strategies is still needed. The forthcoming analysis aims to make significant contributions to this research field.

## 9.3. Methods

### 9.3.1. Study area

The focal area in our study was the Ebro Delta (Figure 15). Located in southern Catalonia in Spain, the Ebro Delta spans an area of 320 km<sup>2</sup> and has a population of approximately 61,000 inhabitants, spread across seven municipalities. Two of those municipalities, Sant Jaume d'Enveja (encompassing the districts of Els Muntells and Poblenou del Delta) and Deltebre (including the district of Riumar), are situated entirely within the region. The remaining five municipalities—L'Ampolla, La Rápita, Amposta, L'Aldea, and Camarles—are located on the peripheries of the Delta. Among them, the latter two do not encompass PAs within their territorial boundaries (Parc Natural Del Delta De L'Ebre, 2020).

**Figure 15.** Study area- The Ebro Delta.



Authors' elaboration based on information from the Cartographic and Geological Institute of Catalonia

The Ebro Delta is home to a variety of habitats owing to the interaction of natural processes and human endeavors. The region's most sensitive areas, encompassing wetlands, lakes, islands, and coastal ecosystems, were made into a natural park in 1983. Subsequently, areas added in 1986 were designated as natural reserves and wildlife nature reserves. In 2013,

UNESCO incorporated the Ebro Delta and neighboring natural areas into the Biosphere Reserve of Terres de l'Ebre. Recognized as a sought-after destination in the province, the Delta attracts visitors due to its exceptional ecological features and biodiversity and the distinctive sociocultural characteristics of Mediterranean gastronomy, aquaculture, and even rice production. Those features allow a range of recreational and sporting activities, including beach tourism, ecotourism, nature-based tourism, wildlife tourism, water sports, and biking. Nevertheless, the Ebro Delta presents challenges similar to challenges in other natural areas in Spain (González-Domingo et al., 2021), where long distances between key attractions and limited connectivity in public transport options have caused most visitors to rely on private motorized vehicles during their visits.

In the case of the EDNP, the Catalan government reported 265,053 visitors in 2020 and 325,029 in 2021 (Generalitat de Catalunya, 2023). Although those figures were lower than in years prior to the COVID-19 pandemic, visitors were concentrated during specific periods, especially in the summer of 2020 and during Easter and the summer of 2021. With those changes in mobility flows, the municipalities in the region introduced modifications in the design of VM measures to regulate traffic by regulating the parking facilities in the most-affected sites, especially ones within the EDNP (Giralt, 2017). In June 2021, multiple measures went into effect at Trabucador Beach in La Rápita (Figure 16), including zoning, the prohibition of parking and circulation between 11:00 p.m. and 6:00 a.m., a multi-tiered scheme of fees according to the type of motorized vehicle (i.e., in force in July and August), and an online reservation platform (Generalitat de Catalunya, 2021b). In time, the regulations were extended to other areas in the Ebro Delta. Eucalyptus Beach in Amposta and Migjorn and Serrallo Beaches in Sant Jaume d'Enveja zoned the most fragile areas in order to manage traffic and limit parking, while at the Bassa de la Arena in Riumar and la Marquesa Beaches in Deltebre, paid parking areas were established that accommodate payment using an app. All of those spaces also adopted the circulation and parking hours imposed at Trabucador Beach (Generalitat de Catalunya, 2020). Given those adaptations, understanding visitors' uses, characteristics, and perceptions has emerged as being essential for developing knowledge-based VM (Gundersen et al., 2015) and for assisting policymakers with implementing effective on-site actions.

**Figure 16.** Management measures implemented at the Ebro Delta Natural Park: (Top left) Advice on regulated areas between the Eucalyptus Beach and the Trabucador Beach. (Top right) Park meter installed at La Marquesa Beach. (Bottom left) Multi-tiered fee scheme implemented at Trabucador Beach. (Bottom right) Control barrier installed at Trabucador Beach.



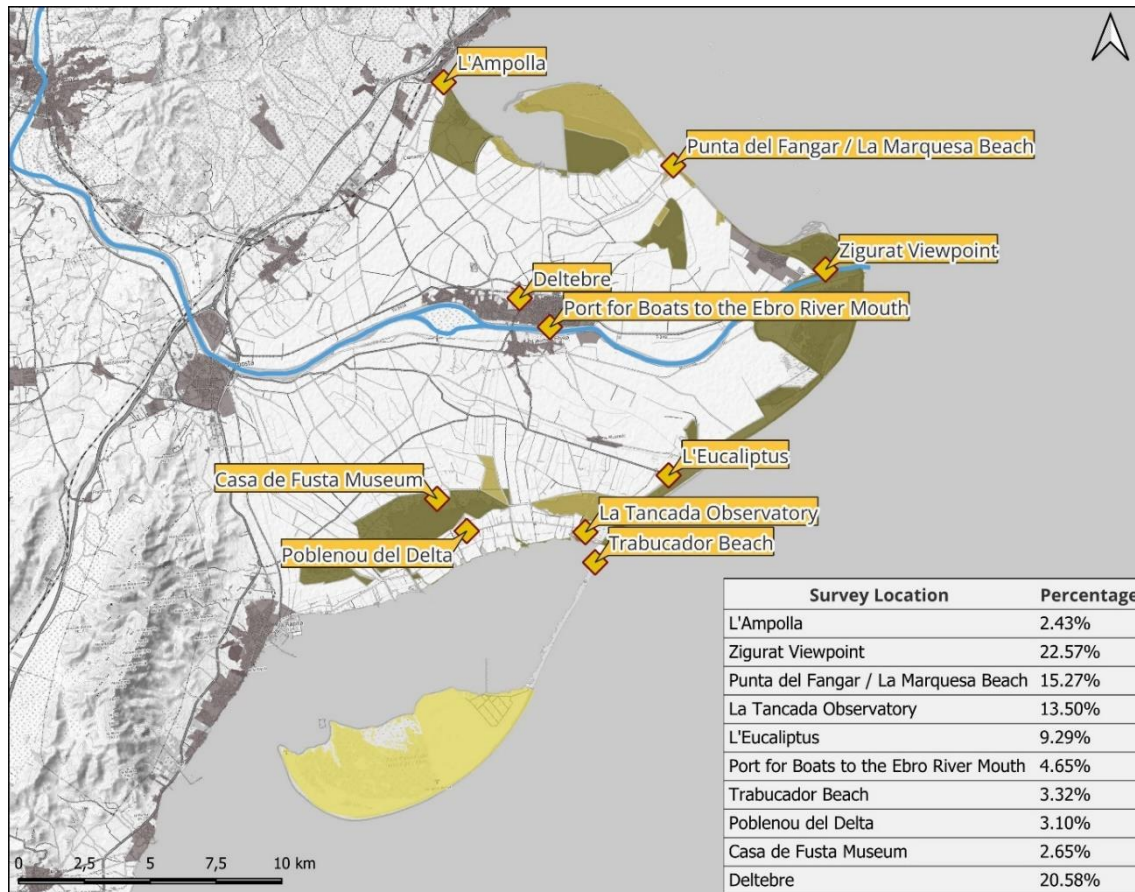
Photos: Maria E. Medina-Chavarria, 2022

### 9.3.2. Data collection and sampling

We collected data for our study by conducting a survey of visitors at the primary tourist sites and/or staying in accommodations in the Ebro Delta. Survey locations were selected following the findings outlined by Paulino and Prats (2013), who performed a content analysis of tourist guides to identify major destinations in the Delta and classify them according to their attractiveness at local, regional, and international scales. Figure 17 details the distribution of surveys conducted per location. The fieldwork for our study took place over a period of five continuous weeks during July and August 2022. Participants were chosen using a simple random sampling technique. In some cases, participants opted to complete the survey online after completing their visit to the Delta. Before taking part in the study, participants were provided with information regarding the study's objective, were required to confirm that they were at least 18 years old and provided their consent to have their data used in our analysis. The

only other criterion for inclusion was having visited at least two tourist sites within the Delta during their current trip. With those criteria in mind, we collected 688 questionnaires. After the data were screened, participants were identified who responded to the items regarding the management measures implemented. Thus, the final sample in our study consisted of 452 individuals.

**Figure 17.** Survey locations



### 9.3.4. Variables

The primary focus of our study was to assess the degree of visitors' acceptance of VM based on traffic management strategies implemented in the Ebro Delta. The assessment placed particular attention on three key variables: (1) the acceptance of regulated parking, which involves zoning and delineating areas of use; (2) the acceptance of limited parking, which includes time limits, limited and rationed carrying capacity, and a reservation system; and (3) the acceptance of paid parking involving rationing through a fee. Participants were requested to rate their acceptance of the implemented parking measures on a scale ranging from 1 (*totally disagree*) to 5 (*totally agree*).

**Table 13. Variables**

<b>Dependent variables</b>					
Acceptance: Regulated parking	Acceptance: Limited parking	Acceptance: Paid parking			
1 = <i>Totally disagree</i>	1 = <i>Totally disagree</i>	1 = <i>Totally disagree</i>			
2 = <i>Slightly agree</i>	2 = <i>Slightly agree</i>	2 = <i>Slightly agree</i>			
3 = <i>Moderately agree</i>	3 = <i>Moderately agree</i>	3 = <i>Moderately agree</i>			
4 = <i>Quite agree</i>	4 = <i>Quite agree</i>	4 = <i>Quite agree</i>			
5 = <i>Totally agree</i>	5 = <i>Totally agree</i>	5 = <i>Totally agree</i>			
<b>Explanatory variables</b>					
<b>Dichotomous variables</b>	Gender: Woman	Origin: Foreign country	Traveling as couple	Traveling with family	Traveling with other options
	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>
	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>
	Level of education: University	Employment status: Employee/self-employed	Motivation: Beach	Motivation: Nature	Motivation: Culture
	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>
	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>
	Accommodation: Hotel	Overnight stay at Delta	Mobility: Motorized private transport	Mobility: Active	Mobility: Other
	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>
	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>
	Visited natural sceneries	Visited beaches	Visited museums	Visited villages	Effect of COVID-19 pandemic on visits to natural spaces
0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>	
1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>	
<b>Continuous variables</b>	First-time visitor	Repeat visitor ( $\leq 5$ times)	Frequent visitor ( $> 5$ times)	Intensity of visits	
	0 = <i>No</i>	0 = <i>No</i>	0 = <i>No</i>		
	1 = <i>Yes</i>	1 = <i>Yes</i>	1 = <i>Yes</i>		
	Age	Group size	Length of stay		
	Frequency of searches for environmental issues	Frequency of visits to natural areas	Perception of parking quality	Satisfaction with visit	
<b>Likert-scale variables</b>	1 = <i>Never</i>	1 = <i>Never</i>	1 = <i>Deficient</i>	1 = <i>Strongly disagree</i>	
	2 = <i>Rarely</i>	2 = <i>Rarely</i>	2 = <i>Poor</i>	2 = <i>Slightly disagree</i>	
	3 = <i>Sometimes</i>	3 = <i>Sometimes</i>	3 = <i>Half</i>	3 = <i>Neutral</i>	
	4 = <i>Frequently</i>	4 = <i>Frequently</i>	4 = <i>Good</i>	4 = <i>Somewhat agree</i>	
	5 = <i>Always</i>	5 = <i>Always</i>	5 = <i>Excellent</i>	5 = <i>Strongly agree</i>	

Five sociodemographic attributes were examined as covariates: gender, country of origin, age, level of education, and employment status. The questionnaire also gathered data about the participants' ongoing visits, including aspects such as travel companions, motivations (i.e., multiple answers possible), accommodation, type of mobility within the region (i.e., multiple answers possible), types of places visited (i.e., multiple answers possible), and the intensity of visits to the EDNP, meaning the number of sites visited by the time of the survey. Although the

covariates in those sections were both categorical and numerical, to facilitate analysis we transformed categorical variables into dichotomous variables. We also included the frequency of searches on environment-related issues and the frequency of visits to natural areas, rated on a scale from 1 (*never*) to 5 (*always*), as other variables in order to capture visitors' affinity with environmental issues and natural areas. To test the effect of the COVID-19 pandemic on visitors' acceptance of the regulations imposed, we introduced a variable to indicate whether the participant increased their frequency of visits to natural areas following the pandemic or not. Last, we included variables to measure visitors' perception of parking quality and their overall satisfaction with their current visits. The variables included in our study are described in Table 13.

### 9.3.5. Empirical approach

The empirical approach employed in our study involved an ordinal logistic regression, following the method suggested by Miravet et al. (2021), Vich et al. (2022), and Campisi et al. (2020). Given its suitability for samples in which the outcome variable is presented on an ordered categorical scale, this model allowed assessing the effect of the covariates that explain visitors' acceptance of traffic management measures in the EDNP. As indicated by those authors, for an ordinal logistic regression to be suitable, the dependent variable should consist of three or more categories with a meaningful order, which in our case was possible with Likert-scale responses.

The coefficients obtained through the model provided valuable insights for interpreting emerging relationships. In general, when a covariate changes its given direction, it triggers a shift toward one of the ends of the scale. Positive coefficients indicate that higher values of the covariate are linked with an increased likelihood of moving to a higher category on the scale of the dependent variable. For instance, when the covariate was positive in our study, the visitor was likely to transition from responding that they *totally disagree* to responding that they *totally agree* with the implemented VM measures. By contrast, negative coefficients generally imply that higher values of the covariate are associated with a decreased likelihood of moving to a higher category. In our study, that dynamic translated to a lower acceptance of the regulation implemented in the area. We performed our ordinal logistic regression analysis in SPSS Statistics (IBM, version 29). Data collected in our study are available from the authors upon reasonable request.

## 9.4. Results

### 9.4.1. Descriptive statistics

The results presented in Table 14 provide an overview of the descriptive statistics of the sample. The observations for dichotomous variables assumed a value of either 0 or 1, and the mean values for those variables correspond to the proportion of participants surveyed who provided a positive response to the item. Regarding demographic attributes, most participants identified as women. The sample had a mean age of 44.19 years, mostly within the range of 36 to 45 years (35%). The most prevalent travel groups among the participants were as couples (33%) or in families (51%), and the average size of the travel group ranged from three to four people per group. A considerable proportion of participants had a university degree (70%) and were employed or self-employed (89%). It is noteworthy that the Ebro Delta is a relevant destination within the national market, representing 86% of the sample.

Approximately 38% of participating visitors were in the area for the first time. By contrast, 41% reported having visited the region five times or fewer, whereas 20% indicated having visited the destination more than five times. At least 80% of participants were staying overnight in the Ebro Delta, with a mean duration of stay of 3.70 nights, and the preferred type of accommodation was a hotel (37%). Other results afford insights into the participating visitors' motivations for visiting, places visited, and types of mobility used to travel within the Delta. At the same time, because responses provided to those items were not mutually exclusive, visitors could have selected more than one choice. On that count, the participants were interested in engaging in activities related to culture (59%), including gastronomy and cultural activities in towns; the coast (85%), including visiting the beach, engaging in water sports, going on a cruise, fishing recreationally, and relaxing; and nature (91%), including observing wildlife and landscapes, hiking, cycling, and photographing nature. At the destination, the most-visited types of places were natural scenic locations (87%), followed by beaches (79%), villages (31%), and museums or interpretation centers (22%). Regarding types of mobility within the Delta, the preferred mode of transport was vehicles, including private cars, motorbikes, and campervans (98%), while a limited proportion opted for active mobility alternatives, including walking or biking (38%). Concerning the intensity of their visits, the participants had visited an average of three to four sites in the Delta.

**Table 14.** Descriptive statistics of the sample by type of visit, sociodemographic characteristics, and acceptance of measures implemented in parking lots.

	<b>Variables</b>	<b>M (N = 452)</b>	<b>SD</b>
<i>Dichotomous variables</i>	Gender: Woman	0.55	0.49
	Country of origin: Spain	0.86	0.34
	Country of origin: Foreign country	0.14	0.34
	Level of education: University	0.70	0.45
	Employment status: Employed/self-employed	0.89	0.31
	Traveling with family	0.51	0.50
	Traveling as a couple	0.33	0.47
	Traveling with another group	0.15	0.37
	Motivation: Coast	0.85	0.36
	Motivation: Nature	0.91	0.49
	Motivation: Culture	0.59	0.29
	Accommodation: Hotel	0.37	0.48
	Overnight stay at Delta	0.80	0.40
	Mobility mode: Motorized private transport	0.98	0.12
	Mobility mode: Active modes	0.39	0.49
	Mobility mode: Other	0.15	0.36
	Visited: Beach	0.79	0.41
	Visited: Museum	0.22	0.42
	Visited: Villages	0.31	0.47
	Visited: Natural scenery	0.87	0.34
	First-time visitor	0.38	0.49
	Repeat visitor ( $\leq 5$ times)	0.41	0.49
	Frequent visitor ( $> 5$ times)	0.20	0.40
Effect of COVID-19 pandemic (i.e., more visits to natural spaces)	0.25	0.43	
<i>Continuous variables</i>	Age	44.19	11.72
	Group size	3.45	2.22
	Length of stay (nights)	3.70	5.41
	Intensity of visits (number of places visited)	3.44	1.78
<i>Likert-scale variables</i>	Acceptance: Regulated parking	4.48	0.99
	Acceptance: Limited parking	4.38	1.07
	Acceptance: Paid parking	3.40	1.64
	Frequency of searches for environmental issues	3.01	1.10
	Frequency of visits to natural areas	3.24	0.98
	Perception of parking quality	4.09	0.86
	Overall satisfaction with the visit	4.81	0.45

As mentioned, visitors' acceptance of the parking-related measures was gauged on a scale ranging from 1 (*totally disagree*) to 5 (*totally agree*). The mean scores for regulated parking and limited parking were 4.48 and 4.38, respectively, both of which indicate a relatively high degree of acceptance. However, for paid parking, the mean acceptance score was only 3.40. Furthermore, regarding the frequency of searches for environmental issues and the frequency of visits to natural areas, rated on a scale ranging from 1 (*never*) to 5 (*very frequently*), the results reflected mean values of 3.01 and 3.24, respectively. A quarter of participants acknowledged having increased their visits to natural areas following the onset of the COVID-19 pandemic. Last, concerning visitors' perceptions of the quality of parking areas and overall satisfaction with their visits, the mean rates stood at 4.09 and 4.81, respectively, rated on the scale ranging from 1 to 5, with 5 being the highest value judgment possible.

#### 9.4.2. Ordinal logistic regression

In developing our ordinal logistic regression, we assumed that satisfaction (SATISF) and perception of the quality of parking areas (QUAPARK) could affect the acceptance of regulations. Thus, we estimated two distinct models for each analyzed measure: one including the variables SATISF and QUAPARK (i.e., Models 1.1, 2.1, and 3.1) and the other excluding them (i.e., Models 1.2, 2.2, and 3.2). The outcomes of the ordinal logistic regressions are detailed in Table 15.

A readily noticeable result was that pseudo  $R^2$  values across the three models considerably increased when SATISF and QUAPARK were introduced in the specifications of the three models. Whereas the coefficient associated with QUAPARK was significant only in Model 3.1 (i.e., paid parking), SATISF was significant in Models 1.1, 2.1, and 3.1. Indeed, SATISF's positive effect was consistently significant at the 1% level across the three models in which it was included. Thus, the increased pseudo  $R^2$  values is essentially attributable to the effect of SATISF. For that reason, SATISF emerged as the main variable to explain visitors' degrees of acceptance.

Models 1.1 and 1.2 provided the estimates portraying the association between the acceptance of regulated parking with the covariates. In both models, individuals who identified as women were less likely than men to accept the implemented regulations. However, that coefficient achieved significance only when SATISF and QUAPARK were omitted in Model 1.2. Regarding visitors' country of origin, foreigners were more likely to accept the regulations than their counterparts in Spain.

Visitors motivated by nature-related interests and/or by cultural factors were more inclined to accept the regulations, although the significance of their acceptance was less pronounced in the former group. Conversely, visitors motivated by coast-related factors did not have any significant outcomes. Individuals interested in environmental issues showed a high likelihood of accepting regulated parking, as did ones inclined toward active mobility options such as walking or biking. Although visitors who opted for motorized mobility represented a substantial majority in the sample, the estimation did not achieve significance; nevertheless, the negative coefficient suggests their reduced likelihood of accepting the regulation. In relation to places visited, the likelihood of accepting regulations decreased among individuals who had visited villages. However, the variable's significance disappeared when SATISF and QUAPARK were not included in Model 1.2.

Models 2.1 and 2.2 yielded estimations for the relationship between the acceptance of limited parking and the covariates. According to the results of Model 2.1, the likelihood of accepting limitations significantly increased when visitors were motivated by cultural factors and/or opted for active mobility. Even when SATISF and QUAPARK were omitted in Model 2, those variables remained significant in relation to the acceptance of limitations. Moreover, visitors motivated by natural features demonstrated a significantly higher likelihood to accept the implemented limitations. Once again, in Model 2.2, foreign visitors appeared to be more likely to accept limited parking as a management measure.

Models 3.1 and 3.2 explored the relationship between the acceptance of paid parking and the covariates and revealed contrasting results. Visitors' motivation and type of mobility were no longer significant in the acceptance of those measures. Instead, visitors with university education and/or from foreign countries were more likely to accept having to pay the fee. Moreover, visitors who stayed overnight in the Ebro Delta were more likely to accept the fee but not if they stayed in a hotel. The number of nights stayed also played a key role in the acceptance of the fee; in particular, longer stays were associated with a decreased likelihood of accepting the fee. Both SATISF and QUAPARK were significant for the acceptance of the fee, which suggests that the likelihood of accepting the fee increased when satisfaction with the visit and/or perceived quality of the parking area increased as well. Moreover, when SATISF and QUAPARK were omitted in Model 3.2, the variable of overnight stay was no longer significant. It is also noteworthy that, in Models 3.1 and 3.2, which concerned paid parking, there was a higher presence of negative estimation coefficients than in the other models.

**Table 15.** Results of ordinal logistic regression

Variables	Model 1.1: Regulated parking, including SATISF and QUAPARK		Model 1.2: Regulated parking		Model 2.1: Limited parking, including SATISF and QUAPARK		Model 2.2: Limited parking		Model 3.1: Paid Parking, including SATISF and QUAPARK		Model 3.2: Paid parking	
	Coef.	Std. error	Coef.	Std. error	Coef.	Std. error	Coef.	Std. error	Coef.	Std. error	Coef.	Std. error
Gender: Woman	-0.35	(0.23)	-0.46**	(0.23)	-0.17	(0.22)	-0.27	(0.22)	-0.19	(0.18)	-0.25	(0.18)
Age	-0.01	(0.01)	0.00	(0.01)	-0.01	(0.01)	-0.00	(0.01)	0.01	(0.01)	0.01	(0.01)
Level of education: University	0.18	(0.25)	0.25	(0.24)	0.02	(0.24)	0.09	(0.23)	0.40**	(0.20)	0.42**	(0.20)
Employment status: Employed/self-employed	-0.24	(0.40)	-0.31	(0.39)	-0.27	(0.38)	-0.31	(0.37)	0.08	(0.31)	0.09	(0.30)
Country of origin: Foreign country	0.94**	(0.40)	0.95**	(0.39)	0.56	(0.35)	0.60*	(0.35)	0.54*	(0.28)	0.54*	(0.28)
Traveling with family	Reference category											
Traveling as a couple	0.26	(0.30)	0.18	(0.29)	0.10	(0.27)	0.04	(0.27)	-0.18	(0.23)	-0.19	(0.23)
Traveling with another group	0.25	(0.33)	0.31	(0.32)	0.03	(0.31)	0.11	(0.30)	-0.11	(0.26)	-0.05	(0.26)
Group size	0.13	(0.08)	0.10	(0.08)	0.06	(0.06)	0.04	(0.06)	-0.07	(0.05)	-0.07	(0.05)
Motivation: Coast	0.09	(0.32)	-0.01	(0.31)	0.18	(0.30)	0.09	(0.30)	0.07	(0.26)	0.07	(0.26)
Motivation: Nature	0.40*	(0.23)	0.52**	(0.23)	0.30	(0.22)	0.42*	(0.22)	-0.12	(0.19)	-0.11	(0.19)
Motivation: Cultural	1.25***	(0.35)	1.24***	(0.34)	0.91***	(0.34)	0.92***	(0.34)	-0.05	(0.33)	-0.01	(0.32)
Frequency of searches for environmental issues	0.26**	(0.11)	0.25**	(0.11)	0.14	(0.10)	0.13	(0.10)	0.13	(0.09)	0.12	(0.09)
Frequency of visits to natural areas	-0.14	(0.12)	-0.16	(0.12)	-0.03	(0.12)	-0.04	(0.12)	-0.04	(0.10)	-0.03	(0.10)
Effect of the COVID-19 pandemic	0.412	(0.28)	0.42	(0.27)	0.27	(0.26)	0.27	(0.25)	0.22	(0.21)	0.22	(0.21)
First-time visitor	Reference category											
Repeat visitor	0.18	(0.26)	0.31	(0.25)	-0.02	(0.25)	0.08	(0.24)	-0.13	(0.21)	-0.17	(0.20)
Frequent visitor	-0.02	(0.32)	0.24	(0.31)	0.01	(0.31)	0.22	(0.30)	0.19	(0.26)	0.22	(0.26)
Motor mobility	-0.42	(1.18)	-0.73	(1.17)	0.27	(0.91)	-0.11	(0.92)	-1.07	(0.92)	-1.38	(0.93)
Active mobility	0.54**	(0.25)	0.50**	(0.24)	0.46*	(0.24)	0.43*	(0.23)	0.27	(0.19)	0.21	(0.19)
Other mobility	-0.22	(0.31)	-0.14	(0.31)	-0.14	(0.30)	-0.06	(0.30)	0.26	(0.26)	0.32	(0.26)
Hotel	0.05	(0.29)	0.01	(0.28)	-0.16	(0.27)	-0.21	(0.26)	-0.39*	(0.23)	-0.41*	(0.23)
Number of nights	-0.02	(0.02)	-0.02	(0.02)	-0.03	(0.02)	-0.03	(0.02)	-0.04*	(0.02)	-0.04*	(0.02)
Overnight	0.40	(0.34)	0.34	(0.33)	0.33	(0.33)	0.28	(0.32)	0.51*	(0.28)	0.44	(0.28)
Intensity of visit	0.07	(0.09)	0.08	(0.09)	0.05	(0.08)	0.07	(0.08)	0.04	(0.07)	0.04	(0.07)
Place visited: Beach	-0.22	(0.32)	-0.07	(0.31)	-0.21	(0.30)	-0.07	(0.29)	-0.03	(0.25)	0.07	(0.25)
Place visited: Museum	0.04	(0.30)	-0.06	(0.29)	0.01	(0.28)	-0.07	(0.27)	0.09	(0.24)	0.09	(0.23)
Place visited: Villages	-0.51*	(0.28)	-0.44	(0.27)	-0.24	(0.27)	-0.18	(0.26)	-0.24	(0.22)	-0.15	(0.22)
Place visited: Natural scenery	0.20	(0.35)	0.32	(0.34)	0.34	(0.33)	0.42	(0.32)	0.29	(0.29)	0.35	(0.29)
Satisfaction	1.15***	(0.23)			1.06***	(0.22)			0.55***	(0.20)		
Perception of parking quality	-0.22	(0.14)			-0.09	(0.13)			0.24**	(0.10)		
Pseudo R <sup>2</sup>	Cox & Snell	0.18	0.12	0.13	0.08	0.10	0.07					
	Nagelkerke	0.21	0.15	0.15	0.09	0.11	0.07					
	McFadden	0.11	0.07	0.07	0.04	0.04	0.03					

\* Significant at 10%. \*\* Significant at 5%. \*\*\* Significant at 1%.

By contrast, variables associated with age, employment status, type of group, group size, frequency of visits to natural areas, prior visits to the EDNP, and intensity of visits were not significant in any of the models. Except in Model 1.1, the four covariates related to the places visited also did not play a key role in the acceptance of any of the three measures.

Last, it must be noted that some variables can gain significance or lose it with the inclusion of SATISF and QUAPARK. Those changes simply reflect the correlations between the covariates.

## 9.5. Discussion

Our exploratory study focused on visitors' acceptance of traffic management measures implemented in the EDNP. To explain that phenomenon, we investigated the sociodemographic profile of visitors, the characteristics of their stays, their affinity with environmental issues and natural areas, and various perceptual variables. First, by estimating models including and excluding the covariates of SATISF and QUAPARK, we confirmed that satisfaction with visits is pivotal to explaining visitors' acceptance of the traffic management measures. Such was not the case for the perception of parking quality, however. It has been proposed that attitude toward management measures is a function of visitors' perceptions (Frost & McCool, 1988). In our study, the relationship of acceptance with the perception of the quality of parking areas was not significant for the acceptance of regulated and limited parking areas but was positively significant for paid parking. That finding means that when visitors perceived a higher quality of parking, they were more willing to pay.

As mentioned, a key finding of our study was that the acceptance of the measures included can be effectively explained by visitors' overall satisfaction. The studies consulted in the literature shed light on the relevance of other variables. For instance, studies have analyzed the positive effect of management measures on visitors' experiences and thus their satisfaction with their visits (Bushell & McCool, 2007; Frost & McCool, 1988; Qaddhat et al., 2021). By considering both our findings and those stated in the literature, it can be assumed that a two-way relationship exists in which satisfied visitors tend to be more willing to accept regulations, and, simultaneously, those regulations have the capacity to improve visitors' satisfaction and, in turn, their overall experience.

Although notable levels of the acceptance of regulated and limited parking were apparent, the acceptance for paid parking was significantly lower, a result that is consistent with the findings of Benkhard et al. (2018) and Martin et al. (2009) in national parks in Hungary and the United States. It is noteworthy that some respondents informally indicated being unaware of the

measures implemented in the Ebro Delta before arriving and were not informed about how the fees would be used afterward. As noted by Buckley (2003), the lack of communication about the purpose of regulations may result in the rejection of such measures.

VM and traffic management strategies can arouse different attitudes from different users. In the results related to sociodemographic variables, domestic visitors emerged as the primary market for the EDNP. Nevertheless, the results also suggest that that group tends to exhibit a lower acceptance of management measures, for the models revealed that foreign visitors are more likely than domestic ones to accept the traffic restrictions. That result is consistent with the findings of Gundersen et al. (2015), who noted that because foreigners tend to have less prior knowledge of an area, they are more susceptible to managers' influence. Among the participants, smaller groups of two to four travelers prevailed. Those groups were usually multigenerational groups, because at least one-fifth of the visitors surveyed were in the company of children less than 13 years old, and at least 10% of respondents were more than 60 years old.

The fact that most visitors surveyed had higher education degrees and obtained income from employers or self-employment supports the assumption that they have a certain level of socioeconomic stability. Although employment status did not influence the likelihood of accepting regulations, the level of education did impact the acceptance of paid parking as a VM strategy. That outcome corresponds with the finding by Song et al. (2021) that education positively affects willingness to pay. That result may have implications for the long term. As noted by Brown (2001), if the implemented fees are too low, then they may not effectively discourage visitation to PAs, especially in the cases of middle- and upper-class individuals who have the economic comfort and time to travel for leisure.

As expected, and as likely inspired by the existence of the EDNP, the primary motivations among participants were nature-related activities. Coast-related activities closely followed, probably influenced by the survey's being conducted during the summer of 2022. The literature contains evidence showing that visitors' preferences for outdoor activities impact their level of support for management actions (Gundersen et al., 2015; Martin et al., 2009). As found in our study, motivations related to natural and cultural factors were significant in increasing the likelihood of accepting regulated and limited parking.

The high affinity with national parks (Arnberger et al., 2012) and the frequency of visits to natural areas (Song et al., 2021) have also been considered as factors that positively affect visitor's attitude toward traffic restrictions and their willingness to pay. However, in our study, the results revealed that being interested in environmental issues or frequently visiting natural

areas did not necessarily mean a higher acceptance of regulations. In fact, the frequency of searches for environmental issues was the only variable that positively influenced the likelihood of accepting regulated parking in Model 1.1 but not the least restrictive measures, including limited parking and paid parking.

Regarding the effect of the COVID-19 pandemic on the frequency of visits to natural areas, only approximately one-quarter of visitors surveyed reported an increase in their visitation frequency. That outcome suggests that the changes reported in visitors' travel behavior during the first two years of the pandemic did not remain consistent. Moreover, visitors who did report such an effect did not express a higher likelihood of accepting any of the management measures studied. Similarly, the frequency of visits to the Ebro Delta did not significantly influence the likelihood of accepting the measures. That finding differs from the implications noted by Gundersen et al. (2015), in which first-timers did show a better acceptance of restrictions than repeat visitors.

Regarding the length of visitors' stays, Song et al. (2021) have suggested that visitors with longer stays may be more willing to pay an entrance fee to a PA, because the cost would be distributed over the entire duration of the stay. However, our results suggest the opposite, for longer stays lowered the likelihood of accepting the regulations. That phenomenon could be attributed to the fact that visitors have to pay every time that they access places with paid parking. Consequently, the fees are not distributed across the days of the stay as in SONG et al.'s study but rather accumulated with each visit to a new destination within the Ebro Delta.

As noted in the introduction, cars remain the main mode of transport in Ebro Delta, and nearly 100% of the participants in our study reported using cars during their stays. However, the mere fact of having practiced active mobility increased the probability that visitors would accept the regulations. Weitowitz et al. (2019), among others, have pointed out that despite the implementation of paid parking as a measure to reduce the number of visitors, PAs have remained significantly busy. Those authors assumed that visitors want to visit popular destinations under any circumstances and that fees might not be enough to deter visitation. Streifeneder and Omizzolo (2017) have also noted that fees do not necessarily discourage motorized traffic, for a substantial proportion of visitors who would rather pay a fee than leave the comfort of traveling in their own private vehicle. Both assumptions can explain why visitors who practiced motorized mobility were less likely to accept the regulations, albeit not significantly so in the models that we estimated.

## 9.6. Conclusions

In our study, we investigated visitors' acceptance of traffic management measures implemented in access points to the EDNP during the summer of 2022 and identified the characteristics that most effectively explain visitors' attitudes. The literature reviewed does not contain evidence from studies that have investigated visitors' perceptions of management measures introduced during the COVID-19 pandemic. In that light, our results provide practical contributions to address emerging issues related to measures that have continued to be functional in the post-pandemic context.

Our study originated in a post-pandemic context, during which the VM strategies studied were developed in response to behavioral changes among visitors observed in 2020 and 2021. Briefly put, visitors reported similar degrees of agreement with regulations and limitations, whereas paid parking was a considerably less-accepted measure. Furthermore, the acceptance of regulated and limited parking was significantly influenced by country of origin, motivation, type of mobility, and satisfaction. By contrast, the acceptance of paid parking was mostly nuanced by level of education, country of origin, type of accommodation, length of stay, satisfaction, and perception of the quality of parking. Even so, our findings confirm that the key predictor of the acceptance of the three measures is satisfaction with visits, for a reciprocal relationship exists between that covariate and the effect of visitor flows and traffic management. Therefore, it is plausible to rely on the level of visitors' satisfaction to measure the success of management strategies introduced, and vice versa.

It is crucial to acknowledge that the increased influx of visitors to the Ebro Delta during holiday periods, coupled with a heavy reliance on private means of transport, poses a significant threat to the sustainability of such an ecologically sensitive region. The Ebro Delta is already grappling with the effects of climate change and overwhelming pressures posed by the tourism industry. With the inevitable recovery of national and international mobilities to levels that may surpass pre-pandemic numbers, managers should implement thoughtful strategies to preserve and protect the Delta from the negative effects of upcoming challenges. As pointed out, VM and traffic management measures are and will continue to be helpful to mitigate the effects of detrimental behavior and incidents on local resources and residents. The complex diversity of land uses and competing interests among both residents and visitors at the Delta calls for knowledge-based solutions to enable comprehensive, adaptive management. The outcomes of our study are thus useful for policymakers responsible for creating alternatives that can enhance the sustainability of visitors and traffic flows within the Delta.

Our findings come with some limitations. Given the extension of the Ebro Delta's territory and the number of destinations therein, many of the surveyed visitors were unaware of the VM measures analyzed in our study and thus decided not to express an opinion about them. That dynamic ultimately reduced the sample included in our data analysis. Furthermore, our findings need to be contextualized within their specific territorial framework and in relation to the evaluated measures. Future studies on other PAs, featuring diverse visitor profiles and alternative measures, would facilitate the comparison of results with those obtained in the Ebro Delta.

Altogether, our findings emphasize that VM and traffic management strategies in the Ebro Delta should continue to be enhanced through information and environmental education. Such efforts open up the possibility of activating new streams of research that explore how those strategies work to improve visitors' acceptance of and compliance with regulations, as well as increase their willingness to pay fees. Moreover, future research can involve similar analyses in other PAs, from which comparable results can help to create informed management policies within larger territories. Studies can also employ participatory models through which respondents can contribute to the co-creation of such policies, namely by evaluating the suitability of current and potential VM and traffic management measures. It is also plausible to delve deeper into the differences in attitudes between diverse groups of residents, visitors, and tourists. Moreover, it would be worthwhile to examine how other factors, including the availability of information, prior knowledge, and visitors' values, may influence visitors' attitudes toward diverse measures and restrictions. Last, in the writing of this article, several measures studied at the Natural Park were lifted. Therefore, it is worth conducting a study involving managers and policymakers in order to gain insights into their decision-making processes and motivations to shift the management approach that has been in place in Spain for the past two years.

## Part 5: Discussion and Conclusions

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## Chapter 10: Discussion

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### 10.1. Main findings

The main purpose of this dissertation has been the analysis of the effects of the pandemic as a factor of driving change over a complex VM process in PAs. This includes the impact of the crisis on PAs management, VM adaptation measures, and visitor behavior and perception in a post-pandemic context. The transversal approach adopted in this research has helped to identify valuable tools for post-pandemic decision-making in PAs. Furthermore, it entails insights and opportunities that might assist in the improvement of the sustainability and adaptability of VM by aiming at a comprehensive grasp of the overall findings. This section provides an overview of the findings associated with the four research questions that guided the study.

#### **RQ1: What are the key challenges, actions, and future research endeavors diagnosed by academic literature in managing PAs during the pandemic?**

To understand the disruptive implications of the pandemic in the global context, the emerging discussions regarding the changes experienced in PAs management has been examined. The first research question in this dissertation was addressed through a systematic literature review, identifying and analyzing central issues related to emerging challenges and stakeholders' response to the crisis, yielding relevant themes and methodologies from the documents consulted. The arguments explored in the literature were multifold, and the comprehensive approach adopted by various authors allowed for a discerning of the effects of the pandemic in various territorial scales, as explained in Chapter 6 of this dissertation.

The results obtained underscores that the changes, complexity, and uncertainty brought about by the pandemic are crucial elements in framing the social, ecological, and economic contexts on which PAs are managed (McCool & Khumalo, 2015). The global significance of the pandemic that affected SES in general moved across the different scopes pointed out by Henderson (2016), mentioned in Chapter 4 of this dissertation. This review has confirmed that the implications of the sanitary crisis not only extended to PAs management, but also to public usage within these areas. Attention has been drawn to the vulnerability of PAs and surrounding communities, where quality has deteriorated due to changes in human uses and behavior. Moreover, the role of the crisis in the transformation of human mobilities and experiences in PAs was noticeably discussed, emphasizing how these mobilities were related to spatial

behavior, engagement, and the changing perceptions of visitors about PAs. The crisis has demonstrated societies' adaptability through the way in which people resumed everyday routines as soon as mobility barriers were eliminated. This further infers that lessons that enhance and effectively translate these individuals' adaptability into governance, management, and planning policies within PAs are necessary, especially amidst contemporary crises.

The review revealed that special attention was given to management issues. This included the adaptability of management structures to changing contexts, the struggles of stakeholders in responding to visitors' behavioral transformation while having a constrained response capacity, and the effectiveness of the measures taken to address the challenges caused by both the pandemic and incoming visitors to PAs. Eventually, the study of the multilevel effects brought by the pandemic was recognized as a complex social phenomenon, encouraging discussions to address societies' course of action towards sustainability.

By addressing this first research question, the acknowledgement of PAs as SES and the crucial role of adapting to crises is being supported. The adaptability and transformability credited to these systems (Walker et al., 2004), critical in coping with sociopolitical, economic, and cultural disruptions (Palomo et al., 2014), were once again highlighted in the literature. However, it ended up underscoring the role of stakeholders and policymakers in benefiting from these qualities. Ultimately, learnings are not only to be leveraged in the face of the pandemic, but also in other circumstances related to societies' development, consumption, and uses, as described by Becken & Job (2014). Finally, the need for multidisciplinary and multiperspective research and management approaches to address socio-economic-environmental constraints in PAs is again highlighted by this study.

**RQ2: In reaction to the increase in visitors to PAs in the first year of the pandemic, what measures were taken, implemented, and communicated to the public?**

As stated in earlier sections, to address the second research question, this dissertation has shifted the focus of its study to a regional dimension. The shifts in mobility patterns of visitors in the region of Catalonia, the increase in proximity tourism, and the crowds in natural areas observed throughout 2020 and 2021 prompted adjustments in VM approaches. By scrutinizing the implementation of VM measures in PAs, question R2 is answered. This research question was addressed through a revision of media coverage from VM strategies implemented in PAs of Catalonia. For this, PAs included in the areas of natural interest of this region were considered, since they use a formal management structure. The analysis determined that the narrative of

media was focused on describing and echoing information about measures implemented in PAs, as conveyed by other sources or official statements.

The media coverage revision revealed its significant role in promoting proximity tourism from urban to rural and natural areas. Indeed, the pandemic has prompted adaptation to practices that have also been implemented in prior epidemic management, health and safety regimes, and the enhancement of public hygiene standards (Henderson, 2016), such as efforts to sell to domestic markets and the promotion of specific sites as safe destinations. Additionally, media has a role in identifying early changes in visitor flows, as it was fast in reporting crowds in PAs and noting the increase of pollution, ecological damages, and risky behavior in visitors in provinces of Catalonia, such as Lleida and Tarragona.

The revision confirmed the reaction of the national and regional government to the spread of the virus; however, health protocols were not among the most mentioned measures since they were mostly designed to contain contagion within closed environments. Furthermore, in the face of mobility flow changes, a tendency to implement “hard” VM strategies was uncovered, aimed at managing mobility and crowds in public spaces through carrying capacity regulations, access control, activities prohibitions, and even law enforcement. This further confirms McCool and Lime’s observations (2001), in which these authors noted stakeholders’ tendency to emphasize the number of people in an area and approach adaptation of PAs by returning them to their usual carrying capacity rather than considering their desired conditions of use. The revision of media articles also revealed a scarce mention of new actions aimed at managing visitors wandering within PAs, as well as insufficient “soft” tools directed at shaping visitors’ behavior through education and interpretation. By situating the measures in a temporal line communicated by the media, it was revealed that “softer” measures were introduced after noticing that a significant number of visitors to PAs were inexperienced in outdoor settings such as these.

This study has been particularly relevant because the information disseminated by the media can significantly impact public opinion and perceptions regarding destination and PAs management approaches, as well as shape visitors’ behavior in natural areas. It also highlights the fact that, despite the media’s agenda, public institutions have an important role in shaping information conveyed to users through the media. Still, since exploration of media coverage was limited to a report of implemented measures without exploring their long-term effects and ramifications, further research on this topic was suitable.

### **RQ3: How has the pandemic disrupted VM strategies put in place in PAs?**

This third research question expanded its focus to include the perception of key stakeholders regarding the management of PAs while reducing the territorial scale to the Tarragona Province in Catalonia. By addressing the following question, this research has advanced the understanding of VM and PAs managers' adaptability in the context of rapid changes. As stated in section 8.2.1, the PAs in the Tarragona Province saw a notable surge of visitors during the pandemic, ranking among the areas with higher visitor increases in Catalonia. In this stage, it was important to highlight concepts related to PAs Management and VM and differentiate relevant factors such as useful resources within the boundaries of the PA for the implementation of VM actions, the problems encountered in the design, and the execution of the management process. It was also important to highlight the necessary tools for the implementation of VM and the solution of emerging management concerns.

According to the thematic analysis discussed in Chapter 8, the pandemic has exposed the deficiency of resources and coping mechanisms to address current and future crises. This study has identified issues such as unilaterally taken decisions or bureaucratic hurdles. As noted by McCool and Khumalo (2015), the ineffectiveness of administrative and management structures poses a threat to the adaptability of PAs. It challenges the already constrained human and financial resources within the management structure, hindering their ability to channel efforts through mutual engagement and amplifying existing issues stemming from both organizational deficiencies and external factors.

Additionally, the pandemic brought concerns related to visitors' seasonality and spatial concentration, causing a shift in priorities away from organizational concerns. The increase of visitors engaging in activities in PAs during off-peak seasons forced fast solutions in unprepared spaces, focused on regulating access and parking. However, this study has further revealed discrepancies between the orientation of regional management policies and managers' perspectives in relation to visitors. While the guidelines imposed by steering organisms called for management focused on regulations and constraints, managers often favored softer approaches to channel visitation and hesitated to enforce strict limits and regulations.

Moreover, the absence of VM standards has been brought up through interactions with PA managers. However, the analysis done in this research indicates that rather than a lack of management standards, the main cause of the constraints faced by PAs was lack of coordination among stakeholders. Several layers of steering organisms exist at the regional and local levels, each of which design their own action policies, sometimes at the expense of neighboring territories, hindering the effectiveness of VM on these PAs.

The study has underlined the necessity of clarifying and decentralizing functions among entities engaged in PAs management, as well as embracing territorial perspectives and implementing measurable indicators and proactive policies to enhance their response capacity. As Henderson (2016) has pointed out, it is necessary to emphasize a clear allocation of responsibilities that enable the implementation of effective management mechanisms. This study has underscored the importance of overarching policies in aligning VM in natural areas (Albrecht, 2017), as well as in systematizing and facilitating potential social uses such as recreational activities, sports, or traffic. The incorporation of the multi-perspective approach into these policies could enrich PAs' public use models, enhance planning and management strategies, and mitigate the need for reactive responses to crises.

Finally, the acknowledgment of the benefits of monitoring and the role of marketing in increasing visitor awareness is consistent with McCool and Stankey's (2003) arguments, which propose addressing the complex "wicked problems" related to VM by striking a balance between stakeholders' participation and scientific inquiry to foster adaptation. Embracing a comprehensive and inclusive approach that considers stakeholders, other PAs in the territory, and the social, political, and cultural context, is determinant for the effectiveness of VM (Hassanli, 2016). It not only ensures diverse perspectives but also enhances the legitimacy of the decision-making process. Being at the forefront of steering organisms, managers' experiences, included in this research, give useful insights for practitioners in comparable positions in other regional contexts.

#### **RQ4: How do different visitors' sociodemographic, behavioral, and perceptual characteristics influence their acceptance of management measures in a PA?**

As emphasized by Weaver and Lawton (2017), collecting information about visitors' latent motivations and behavior offers important opportunities to inform and update VM processes. For the fourth research question of this study, the territorial scale has been once again reduced to a specific PA, the Ebro Delta Natural Park. At this point, the empirical analysis conducted aimed to answer enquiries related to the response of visitors to implemented measures to manage traffic flows in this PA. As explained in Chapter 9, these measures were introduced as an answer to the first wave of visitors to the natural park during the pandemic in 2021 and remained active during the holiday season of 2022. The data collected included profile attributes, characteristics of visitors' trips, and perception variables, which were later included in an ordinal logistic regression model to determine which characteristic could explain visitors' attitudes towards traffic management measures that regulated, limited, and applied a fee for

parking in zones demarcated as a natural park. In agreement with Manente et al. (2000), this stage confirms the stakes that VM has in enhancing visitors' mobility flows and in influencing how visitors move in and around PAs.

As discussed in Chapter 9, visitors have demonstrated a better attitude towards measures that regulate and limit parking, in comparison to the payment of a parking fee. This is not a surprising outcome, as previous research already stated that, first, the more restrictive a measure is, the less it is accepted (Albrecht, 2017; Gundersen et al., 2015); and second, when there is not sufficient information about how fees are being used, users will show greater rejection of this measure. Moreover, this study has confirmed that the acceptance of regulated and limited parking can be similarly explained by factors such as origin, motivation, type of mobility, and satisfaction. Conversely, education level, origin, type of accommodation, length of the stay, satisfaction, and the perceived quality of parking influence the acceptance of paid parking. By looking at the factors involved in explaining the acceptance of the management measures, it seems that paid parking is the most rejected not only due to its restrictiveness, but also due to its impact on the experience of visitors, especially economically speaking. It is important to remember that due to the involvement of different managing municipalities in the Delta del Ebro, parking fees were variable, and they had to be paid every time a visitor used one of those spaces. These could have had an impact on visitors with longer stays or visitors staying in accommodations far from main attractions – those who were frequently using the roads to drive to natural park areas. Nevertheless, this research has mainly underscored the critical role of visitors' satisfaction in effectively explaining the acceptance of the three types of measures analyzed. The findings support the idea that satisfied visitors are more inclined to accept regulations, and those regulations can enhance visitors' satisfaction and their overall experience in the PA.

As suggested by Scuttari et al. (2019), the study of traffic management measures and their effects on visitation is still underexplored in literature. Therefore, the fourth research question addresses traffic management as a VM approach, whereby policies and measures help to mitigate the impacts of motorized mobilities and regulate traffic volumes without necessarily leading to a decrease in the number of visitors to a destination.

## 10.2. Theoretical and practical contributions of the research

In this section, the theoretical and practical contributions of the research are outlined. First, it is important to note that this dissertation acknowledges that many PAs are no longer isolated territories as originally intended (Beery et al., 2021), but rather multifunctional complex systems on which social and ecological benefits are generated through values and services. As pointed out by Strickland-Munro et al. (2010), this system thinking allows for the integration and interpretation of multiscale- multidirectional social and environmental issues, including the biophysical and human processes linked across various dimensions (Palomo et al., 2014). Moreover, McCool and Stankey (2003) add that integrating technical and socio-ecological approaches with society's pluralistic nature is essential in the study of VM processes in PA.

This dissertation offers practical contributions to address functional adaptations in VM in the post-pandemic context. Through chapters 6 and 7, escalating concerns in PAs during the pandemic have been reviewed, with a particular focus on information published within the first two years of the crisis. First, it has highlighted the importance of academic studies on post-pandemic transformations in PA, emphasizing discussions about the reconfiguration of activities within PAs, managers' ability to move forward after crises, and the establishment of collaborative networks that contribute to PAs' sustainable and effective functioning. Moreover, it emphasized the role of media in providing vital information about PAs management and operation, which will afterward frame public opinion. In the age of hypermobility (Müller et al., 2021), both chapters have confirmed the disproportionate consequences of the pandemic on the tourism industry, demonstrating how a lack of information, proactivity, and ability to foresee changes, both in global and regional contexts, have resulted in reactionary responses. In spaces such as PAs or in destinations with multiple attractions, reactional approaches can trigger insufficient solutions or shift problems to other regions while failing to address the root of the problem (Glasson et al., 1995). Similar to the outcomes noticed in this research, recent studies have demonstrated that the pandemic's consequences were not homogeneous across time or between study locations (Ciesielski et al., 2022). The pandemic has brought to light regional disparities in preparedness and recovery capabilities (Cheer et al., 2021). While some areas were already encouraging international mobilities soon after the pandemic restrictions were lifted, others were still dealing with a high number of COVID-19-related casualties.

Besides the role of media coverage, the attention given by the public to a crisis such as the pandemic is conditioned by stakeholders' interest in accelerating a territory's economic recovery (Hall et al., 2020). Because of this, the dissertation has also considered the views of

managers and stakeholders participating in the governance and management of PAs. Managers' actions are influenced by factors that include "*the cause, location and extent of the impact of concern, the cost and ease of implementation of actions and their effectiveness, and the preferences of visitors and managers*" (Newsome et al., 2002, p. 185). In this research, several of these issues have been established as determinant in managing visitor flows, first through stakeholders' answers, and then through confirmation by the managers themselves. As far back as 1976, Budowski (1976) observed that PAs administration and management organizations struggle to adapt to sudden changes in visitor behavior and frequency. In the pandemic context, these struggles continue to exist and were exacerbated by lack of coordination and poor share of knowledge among different territories. While multidisciplinary approaches and stakeholders' plurality should be considered in PAs management (Ghoddousi et al., 2022), if the actions performed by the different agents involved are incoherent, complexity is added to the already challenging issues that impede VM in PAs.

Furthermore, the survey's results presented in this dissertation are crucial in establishing how well managers' experiences corresponded with the actual behavior and attitude of visitors to a PA. As observed in the Ebro Delta Natural Park, motorized mobilities have brought natural areas within easy reach of urban populations and have become the main means of transportation for travel to and within these destinations (Dickinson & Robbins, 2008; Haukeland et al., 2013; Jaarsma et al., 2009), subsequently motivating strategies focused on traffic management (Regnerus et al., 2007). Nevertheless, regulations can sometimes clash with the purpose of making nature available for recreation (Newsome et al., 2002), which leads to conflicting reactions or rejection from visitors. A noteworthy result of this survey was the small percentage of respondents who said that the pandemic influenced how often they visited natural areas. This suggests that the effects of the crisis on people's behavior were transitory and not long-lasting, confirming Cheer and Lew's observation (2017) that rapid and slow changes in tourism destinations caused by temporarily problematic crises mostly induce disruptions in the short and medium term. Moreover, this can also indicate that the continuous increase of visitors to PAs responds to the usual growth of tourism at a higher scale rather than to the behavior patterns observed in the first two years of the pandemic. In this sense, the dissertation has contributed to the understanding of visitors' perceptions of management regulations and the temporary effect of the pandemic.

The multiple results presented in this dissertation have confirmed the complexity of mobility patterns to PAs aggravated by the pandemic at various geographical levels. This not only underscores the increase in the number of visitors, but also of mobilities associated with

motorized means of transport that encouraged hard VM approaches. The findings shed light on how the pandemic triggered changes in human mobilities and the experiences of those who make use of PAs, ultimately having implications on the overall management of PAs. Furthermore, the challenges posed to managers' and stakeholders' preparedness by the unpredictable evolution of the pandemic has been underscored. The insights learned from this research go beyond crisis management to emphasize managers' and stakeholders' adaptability in the face of long-term changes in sensitive environments such as PAs. Understanding the changes experienced during this period enables managers and stakeholders to prepare alleviation efforts for future crises (Powlen et al., 2021). As Henderson (2016) suggests, addressing a crisis requires maximum preparedness, a willingness to accept responsibility and quick action, as well as transparent and effective communication.

As mentioned in the introduction of this dissertation, the COVID-19 pandemic is a sign of potential environmental crises to come, which will be more severe, prolonged, and difficult to deal with (Cheer et al., 2021). The data and insights gathered from this study have been helpful in both understanding managers' approaches during a period still under the effects of the pandemic and visitors' attitudes towards the measures implemented by steering organisms in PAs. Moreover, this research has provided valuable information about the adaptability of VM in PAs and its role in the face of crises while offering insights into the long-term, sustainable management of tourism in these areas.



## Chapter 11: Conclusions

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### 11.1. Final remarks

Within this section, the overarching conclusions of the dissertation are delineated. As previously stated, this research recognizes PAs as SES, which has had important implications for the interpretation of emerging issues in these places. The PAs examined in this dissertation are prime examples of the intricate interactions that characterize them as SES. Such interactions include nature conservation, traditional productive activities, hunting, fishing, and outdoor recreation, both in mountain and coastal environments. These areas have long faced constant pressure stemming from the dense population of the province and its surroundings (Font i Garolera & Majoral Moliné, 1999), as well as from the interests of multiple stakeholders involved in their governance and management. Global changes “*shape, and increasingly determine, the existence of PAs and their function as areas of high conservation value as well as tourism destinations*” (Becken & Job, 2014, p. 1). Understanding PAs as systems and the changes they are exposed to is pivotal in developing adaptive strategies for effectively managing visitors, their uses, and their impacts. This premise has served as one of the foundations and primary reasons for undertaking the present research.

The main strength of this research has been its approximation through a holistic methodology and a pragmatic perspective, which has enabled the incorporation of data from diverse sources and scales, as well as a full examination of the effects of drivers of change on VM in PAs. According to Cheer et al. (2021), the theorization of the global crisis caused by the pandemic demanded multi- and cross-disciplinary methods. As such, the research instruments in this dissertation have been designed to consider both primary (stakeholders, visitors) and secondary sources (official data, news in the media), utilizing a mixed methodology. Several strengths can be noted in the methods used for this dissertation. For instance, the systematic analysis of both types of documentary sources as a method to study contemporary drivers of change can be verified and replicated in various contexts. Conversely, empirical approaches such as those applied in the Province of Tarragona and the Ebro Delta Natural Park (semi-structured questionnaires, focus, and surveys) allowed for a major understanding of the challenges and management strategies identified in the results obtained from the revision of previous documents. This variety of methods has also allowed different approximations for the analysis and interpretation of the data, including content analysis, thematic analysis, and statistical

methodologies. The outcomes obtained are the result of cross learning from the different research strategies implemented (Pansiri, 2005; Voll & Luthe, 2014). The mixed methods approach developed and used to measure and understand different perspectives from the same phenomenon can provide pertinent and tangible information to researchers and decision-makers. Additionally, the multiscale perspective that frames this dissertation increases the potential replicability of outcomes at international, regional, as well as local levels.

This dissertation has addressed the gap related to functional VM issues in the face of a crisis. This topic keeps drawing the attention of practitioners and researchers and will continue being relevant for the post-pandemic context. Recent global media headlines continue to cover instances of overcrowding or hyper-visitation in PAs similar to those reported in 2021 (Agencia EFE, 2022; Ballesterro, 2023; Villanueva, 2023). As noted in The New York Times (2023), “*in place of serenity, many visitors have instead found packed parking lots, congested trailheads, overrun campsites and interminable lines*”. Facing crowds in PAs in the past, managers have introduced carrying capacity-based VM strategies to keep visitor activity or growth within specific bounds (Glasson et al., 1995). Nevertheless, these numerous attempts have failed to cope with the effects of crowds because these boundaries were grounded in unrealistic or uninformed assumptions.

As explained in this dissertation, the deployment of models based on stakeholders’ value judgements and information obtained from visitor monitoring, interpreted and resolved by managers, is essential to overcome VM limitations linked to the establishment of boundaries of usage in PAs. Furthermore, this comprehensive VM is critical for a better understanding of how tourism in PAs can achieve sustainability. To ensure the sustainable future of PAs, it is essential to consider several elements within larger environmental protection planning in natural regions. These elements involve the inclusion of different stakeholders’ perspectives and disciplines and applications (Newsome et al., 2002), the consideration of various geographical scales, as well as the integration of tourism and recreation development. Moreover, this research has addressed visitors’ perceptions and attitudes towards VM. It has emphasized the role of VM in coping with visitors’ “*tyranny of small decisions*” – the collective decisions made by numerous users in PAs (Newsome et al., 2002, p. 149). In this sense, VM has been acknowledged as a tool to lessen unintentional consequences of crowds on natural environments by keeping visitor flows from reaching unsustainable levels of activity from the perspectives of managers and stakeholders. Finally, this dissertation emphasizes that the inclusion of appropriate VM and planning strategies for tourism in natural spaces is imperative, as is the recognition of both environmental results and visitor experiences as central to tourism in natural areas.

## 11.2. Limitations

It is noteworthy to mention that there have been certain limitations in this study. These have been mentioned in Chapter 6, 7, 8, and 9, but they are also summarized per research strategy as follows. In relation to the documentary research strategy used in this dissertation: first, to maintain academic rigor, the systematic literature review performed in Chapter 6 has been restricted to publications listed in the Scopus database. This affected the number and language of the documents examined. Secondly, the information available on digital media, frequently duplicated from other sources, was insufficiently thorough when it came to understanding the long-term consequences of VM measures on a regional scale. A timeframe of analysis was set for both types of documentary research: 2020 and 2021 for the systematic literature review, and 2020 for the assessment of digital media coverage, which might have also led to the exclusion of additional insights from other periods.

Then, during the research stage in which stakeholders' participation was required, direct interaction with them was constrained by the mobility restrictions in place. Further, a few of them could not take part online. Both conditions caused a smaller sample than desired in the application of semi-structured questionnaires, thus a limited representation of certain steering organisms. Similar to other studies that have presented a limited number of participants, transferability to other contexts should be taken with caution (Beery et al., 2021). And third, the sample of visitors surveyed for the empirical part of this study was affected by challenges encountered during the data collection process. This included the fact that various attraction points that served as survey locations were scattered in a large area, that visitation flows fluctuated during the surveying period, and that some visitors were not aware of the VM measures. Moreover, because this stage of the research was done in a coastal PA, the Ebro Delta Natural Park, results may differ in mountain environments, where conditions of access and traffic flows show different patterns.

Nevertheless, it is important to point out that these three limitations highlight that the pandemic has been a substantial element for the analysis done in this dissertation. Not only has it conditioned the selection of sources and application of research strategies, but it has also impacted the overall research interest and approach taken in this dissertation, including pace and timing.

### 11.3. Future research lines

This dissertation has presented multifold contributions to the study and understanding of the adaptations introduced in VM in PAs, along with its relevance in the face of a context of changes. It has also emphasized the need to enhance understanding of the tourism industry within natural destinations, to identify capacity concerns and respond with effective management objectives. Future research endeavors can extend the reflection and examination of the post-pandemic context by expanding on:

1. The influence of adaptive governance and policymakers' stances in decision-making processes as well as the encouragement of new forms of stewardship and collaboration from stakeholders for the sustainability of PAs and the implementation of adaptive VM in such areas.
2. The engagement between PA stakeholders and researchers to comprehend recreation-induced impacts, provide tools for knowledge-based management, and shield decision-making from subjective judgments. This includes the analysis of VM tools and strategies that leverage technological and methodological research innovations, as well as multidisciplinary thinking to enhance the adaptability and effectiveness of VM.
3. The in-depth analysis of visitors', residents', and other PA stakeholders' social perceptions regarding the adaptability of these areas as SES. This can also be extended to a further reflection on the development of regenerative and sustainable tourism practices, as well as the enhancement of attributes such as the resilience, transformability, and preparedness of these systems.
4. The numerous interactions found in PAs that foster the recognition of people as an intrinsic component of nature. This includes further analysis in finding the balance between the inclusion of environmental outcomes and the development of human activities such as tourism within PAs management planning.
5. The reconfiguration of tourism and outdoor recreation related to changes in spatial distribution and behavior patterns among visitors after the pandemic. This also means the findings presented in this dissertation can be broadened to different seasons of the year, for a longer time, as well as in non-coastal environments and natural areas that are not under an official protection figure.
6. The significance of balancing regulations and restrictions with equitable allocation, the distribution of resources and responsibilities among stakeholders, and the appropriate complementary communication strategies between them.

7. The study of visitors' compliance with norms and conventions when engaging in outdoor activities in PAs, as well as their attitude towards VM strategies other than those studied in this research.



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# Appendix

Figure A. 1: Example of Academic Articles Selection and Systematic Revision Process

№	Author(s)	Year	Title	Abstract	Author Key	Index Keywords	Docu	Source title	Publisher	Author	Cited b
1	Anand A., Kim D.	2021	Pandemic induced changes in ecotourism: The importance of COVID-19	The importance of ecotourism: The importance of COVID-19	COVID-19; High Conservation Value	Remote Sensing	Article	Biological Conservation	MDPI AG	558308677	24
2	Bates A.E., Primak	2020	COVID-19 pandemic and associated efforts to curtail the spread of COVID-19	COVID-19 pandemic and associated efforts to curtail the spread of COVID-19	Hurt biodiversity; experiment; nature-s	International Journal of	Review	International Journal of	Elsevier Ltd	121413377	149
3	Cahyadi H.S., Nev	2021	The post-COVID-19 tourism dilem	This paper provides a brief overview of the post-COVID-19 tourism dilem	COVID-19; Geoparks; Impacts; Indonesia	Over-to	Article	International Journal of	KeAi Communications Co	572120638	30
4	Cumming, T., Seid	2021	Building sustainable finance for COVID-19	There is widespread concern about the impact of COVID-19 on the tourism industry	BIOFIN; Conservation finance; Economic crisis; Fiji	Article	Article	Journal of Policy Research	IUCN - International Union	57194426	11
5	Díaz-Sánchez, J.P.	2021	The effects of Coronavirus (COVID-19) on the tourism industry	This research reports the effects of Coronavirus (COVID-19) on the tourism industry	Coronavirus; COVID-19; Ecuador; Galapagos Island	Note	Note	Journal of Policy Research	Routledge	57194019	13
6	Falk M., Hagsten	2021	High regional economic activity	This study investigates employment establishment density in France	France; national parks; Regional	Article	Article	Current Issues in Tourism	Routledge	57222609	8
7	Ferreira F.A., Cost	2021	Perceptions of COVID-19's impact on ecotourism	At a time when the world is recovering from the COVID-19 pandemic, perceptions of COVID-19's impact on ecotourism	COVID-19; Impact; Outdoor tourism; Peneds	Article	Article	Journal of Tourism and Development	Universidade de Aveiro	247239928	1
8	Hockings, M., Duc	2020	Editorial essay: Covid-19 and protected areas	The COVID-19 pandemic is a call to action for protected areas	Conserved areas; Coronavirus; COV	Article	Article	Journal of Tourism and Development	Universidade de Aveiro	571892548	8
9	Hymas O., Rocha	2021	There's nothing new under the sun	In many industrialised societies, there's nothing new under the sun	Archaeology; Brazilian Amazonia; Epidemic	Article	Article	Parks	IUCN - International Union	66029426	80
10	Jones, N., McGinl	2021	COVID-19 and protected areas: A global perspective	During the first wave of the COVID-19 pandemic, protected areas have been highlighted as potential refuges	Conservation; lockdown; overcrowding	Letter	Letter	Conservation Letters	John Wiley and Sons Inc	24466456	12
11	Jones, N., McGinl	2021	COVID-19 and protected areas: A global perspective	During the first wave of the COVID-19 pandemic, protected areas have been highlighted as potential refuges	Conservation; lockdown; overcrowding	Letter	Letter	Conservation Letters	John Wiley and Sons Inc	24466456	12
12	KC B.	2021	Complexity in balancing conservation and economic development	This study highlights ongoing COVID-19 pandemic impacts on ecotourism	COVID-19; ecotourism; Protected area tourism; su	Article	Article	Tourism and Hospitality	SAGE Publications Inc.	57196317	8
13	King C., Iba W., C	2021	Reimagining resilience: COVID-19 and ecotourism	As the COVID-19 crisis unfolds, ecotourism and protected areas are being reimagined	COVID-19; Hiking; parks and protected areas; publi	Article	Article	Current Issues in Tourism	Routledge	572215968	33
14	Koju N.P., Kandel	2021	COVID-19 lockdown frees wildlife	To contain transmission of COVID-19, many countries have implemented lockdowns	biodiversity; poaching; SARS-CoV-2; security; wildl	Article	Article	Ecology and Evolution	John Wiley and Sons Ltd	565141694	13
15	Kroner R. G., Barb	2021	COVID-19 era policies and economic recovery	The COVID-19 pandemic is a call to action for protected areas	COVID-19; Economic recovery; Article	Article	Article	Parks	IUCN - International Union	57217135	15
16	Lebrun A.-M., Su	2021	Domestic tourists' experience in the COVID-19 pandemic	Since December 2019, the COVID-19 pandemic has impacted domestic tourism	Domestic tourism; Experience; Pandemic crisis; Pri	Article	Article	Journal of Outdoor Recreation Management	Elsevier Ltd	553034968	8
17	Loos J.	2021	Reconciling conservation and development	As cornerstones for biodiversity, protected areas are being reimagined	COVID-19; Resilience; Social Article	Article	Article	Basic and Applied Ecology	Elsevier GmbH	37115784	11
18	Ma, A.T.H., Lam,	2021	Protected areas as a space for COVID-19	As COVID-19 has swept across the globe, protected areas are being reimagined	COVID-19; Adaptive management; environm	Article	Article	Landscape and Urban Planning	Elsevier B.V.	57203975	26
19	Mandić A.	2021	Protected area management effectiveness	The decline in economic activity during the COVID-19 pandemic has impacted protected areas	COVID-19; Croatia; Management effectiveness; N	Article	Article	Journal of Outdoor Recreation Management	Elsevier Ltd	571940438	11
20	McGinley, J., Gkon	2020	The impact of COVID-19 on the tourism industry	The COVID-19 pandemic has led to a significant decline in tourism	Biodiversity conservation; Environmental prot	Article	Article	Forests	MDPI AG	571920718	71

Figure A. 2: Example of database about articles published in digital media.

Nº	FECHA	LINK	IDIO MA	ESPACIO	TITULAR	ACCIONES	SITUACION	FRAGMENTOS	SITIO WEB	ORIGEN SITIO WEI	LINK	TIPO
83	23/08/2020	<a href="https://www">https://www</a>	CAT	Cadi	Banyes als gorgs restringits	Disp. Policial (Garotxa)	Comunicado Grupo	La massificació creixent i el risc de contagis de Covid-	El Punt Avui	Girona	<a href="http://www">http://www</a>	Prensa Digital
79	19/07/2020	<a href="https://www">https://www</a>	CAT	Capçalere	Vallter 2000 millora l'encaix al	Recomendaciones generales	Reapertura	l'Estació de Vallter 2000 ofereix mesures de protecció	Diari de Girona	Girona	<a href="https://www">https://www</a>	Prensa Digital
63	24/05/2020	<a href="https://www">https://www</a>	ESP	Montserrat	Montserrat obrirà cuando Barc	Regulacion de accesos a la	Reapertura	El Patronato de la Montaña de Montserrat prevé abri	El Nacional.ca	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
71	24/10/2020	<a href="https://www">https://www</a>	CAT	La Garrotxa	La Zona Volcànica de la Garrotxa, saturada tot i les recoma	Saturacion de estaci	Saturacion de estaci	Les recomanacions del Govern de limitar la mobilitat	El Nacional.ca	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
103	10/05/2020	<a href="https://www">https://www</a>	CAT	Collserola	Es pot anar per Collserola a fer	Recomendaciones / Restri	Reapertura	. Tot i que cal tenir en compte que, en el cas dels pass	TOT Sant Cug	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
104	22/06/2020	<a href="https://www">https://www</a>	CAT	Pinya de R	Reobre el jardí Pinya de Rosa d	Aforo reducido	Reapertura	'horari és des de les 10 del matí fins a les 6 de la tarda	El Punt Avui	Girona	<a href="http://www">http://www</a>	Prensa Digital
10	25/10/2020	<a href="https://www">https://www</a>	CAT	Collserola	Usuaris del Parc Natural de Col	Sant Llorenç del Munt o M	Aumento de vehicul	"Espanta una mica veure tants cotxes i que hi hagi tar	Betevé	Barcelona	<a href="https://www">https://www</a>	Portal Multimedia
26	05/10/2020	<a href="https://www">https://www</a>	ESP	Poblet, De	Hay que limitar el acceso a los	Mayor vigilancia y regulaci	Falta capacidad sanc	"Quiero añadir también el peligro de incendio, mucha	La Vanguardia	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
76	20/07/2020	<a href="http://www">http://www</a>	CAT	La Garrotxa	Aglomeracions a l'Alta Garrotxa	Dispositivo policial / puntos	Aglomeraciones / Cd	A la Vall de Sant Aniol, s'hi han arribat a concentrar m	Ràdio Olot	Girona	<a href="http://www">http://www</a>	Emisora de radio en li
77	08/06/2020	<a href="http://www">http://www</a>	CAT	La Garrotxa	La Garrotxa prendrà mesures p	Sistema de reserva previa /	Alta afluencia de ba	A les Planes d'Hostoles preveuen instaurar un sistema	Ràdio Olot	Girona	<a href="http://www">http://www</a>	Emisora de radio en li
92	30/06/2020	<a href="https://www">https://www</a>	CAT	Montgri	Catorze agents cívics controlen	14 agentes civicos	reapertura	A partir de demà dos guardes rurals vigilaran les princ	Diari de Girona	Girona	<a href="https://www">https://www</a>	Prensa Digital
73	14/08/2020	<a href="https://www">https://www</a>	CAT	La Garrotxa	El turisme rural ha notat menys la crisi del coronavirus i La	El turismo rural ha n	El turismo rural ha n	a partir del juny es va animar, gràcies a la nostra bona	GarrotxaDigit	Girona	<a href="https://www">https://www</a>	Prensa Digital
53	15/10/2020	<a href="https://www">https://www</a>	ESP	Pirineu/ M	El Pirineo y el Montseny se preparan ante un alud de visita	Preparacion pre-rea	Alcaldes de la Garrotxa y el Vallès Oriental estudian m		el Periódico	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
95	20/06/2020	<a href="https://www">https://www</a>	ESP	Montseny	Los vecinos del Montseny denuncian la masificación "inos	Vecinos denuncian r	Alertan de que se organizan carr. eras de coches y mo		el Periódico	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
59	02/10/2020	<a href="https://www">https://www</a>	CAT	Cadi / San	El Gobierno creará un grupo de trabajo para analizar la mas	Comunicado sobre r	Algunas de las soluciones que la secretaria de Medio A		Diari Més	Tarragona	<a href="https://www">https://www</a>	Prensa Digital
8	07/12/2020	<a href="https://www">https://www</a>	CAT	Montseny	Afluència moderada de visitant	Capac. Aparcamiento redu	Poca afluencia a pes	an quedat molt lluny les escenes de finals d'octubre, c	Corporació C	Barcelona	<a href="https://www">https://www</a>	Portal Multimedia
7	22/10/2020	<a href="https://www">https://www</a>	ESP	Montseny	Restringido el acceso al Monts	Control policial de accesos	Carreteras y estacio	colapso en los parques naturales y escenas de picnic r	El Independie	Madrid	<a href="https://www">https://www</a>	Prensa Digital
4	25/09/2020	<a href="https://www">https://www</a>	CAT	Collserola	La massificació als espais natur	Puntos de información fuer	Aumento de residuo	Collserola: Segons les dades facilitades pel parc, entr	Betevé	Barcelona	<a href="https://www">https://www</a>	Portal Multimedia
67	24/06/2020	<a href="https://www">https://www</a>	CAT	Montserrat	Montserrat recupera l'activitat a mig gas, amb restriccions	Reapertura / Poco e	Reapertura / Poco e	Concint amb la reobertura del cremallera i l'aeri, el	Regió7	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
19	02/10/2020	<a href="https://www">https://www</a>	CAT/ E	Poblet / D	Els parcs naturals catalans regu	Control de accesos/ Visitas	Masificacion / Cond	Control als accessos, promoció de les visites guiades i	el Periódico	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
88	07/08/2020	<a href="https://www">https://www</a>	CAT	Delta del	Detecten més deixalles en espa	Campaña de educacion e ir	Basura y conductas	Davant aquestes conductes incíviques, el Parc Natura	Tarragona Dig	Tarragona	<a href="https://www">https://www</a>	Prensa Digital
66	17/07/2020	<a href="https://www">https://www</a>	CAT	Pedraforc	Augmenten els rescats a la mur	ocupación máxima del 75%	Aumento de rescate	Des de la Federació d'Entitats Excursionistes de Catal	Corporació C	Barcelona	<a href="https://www">https://www</a>	Portal Multimedia
82	08/10/2020	<a href="https://www">https://www</a>	CAT	Cadi	Rècord de visitants a La Molina	Protocolo sanitario anticov	una de las temporad	Des d'FGC ho atribueixen, entre altres aspectes, a l'au	Ara	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
9	24/10/2020	<a href="https://www">https://www</a>	CAT/ E	Montseny	El Montseny se vuelve a colaps	Avisos en redes sociales / D	Aglomeraciones	Desde el estallido de la pandemia, y la posterior dese	El Nacional.ca	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
30	16/10/2020	<a href="https://www">https://www</a>	ESP	Montseny	Los municipios del Montseny re	Más seguridad, más inform	PUENTE DEL PILAR,	Desde este fin de semana habrá más vigilancia en las	el Periódico	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
44	25/10/2020	<a href="https://www">https://www</a>	ESP	Montserrat	Nuevo colapso en los parques	Dispositivos policiales Cort	Masificaciones	Desde la Diputación de Barcelona se ha hecho un llan	El Nacional.ca	Barcelona	<a href="https://www">https://www</a>	Prensa Digital
75	29/06/2020	<a href="https://www">https://www</a>	CAT	La Garrotxa	La Garrotxa pren mesures per r	Estacionamientos al 50%	Repunte del turismo	Després de tres mesos d'estat d'alarma, l'estiu de la r	GarrotxaDigit	Girona	<a href="https://www">https://www</a>	Prensa Digital
41	21/06/2020	<a href="https://www">https://www</a>	CAT	l'Empordà	La màgia del paisatge viu i canv	Centro de informacion cerr	COVID	Durant aquestes llargues setmanes de confinament, e	Empordà	Girona	<a href="https://www">https://www</a>	Prensa Digital
96	08/10/2020	<a href="https://www">https://www</a>	ESP	Cadi	La Molina cierra el mejor veran	protocolo sanitario anticov	Record de visitantes	Durante el periodo estival - 24 de junio al 4 de octubr	Turiski	N/A	<a href="https://www">https://www</a>	Portal Multimedia
56	29/08/2020	<a href="https://www">https://www</a>	ESP	PirineusAj	Los alojamientos de Lleida regis	AT Restriccion accesos	Alta demanda hotel	El cliente catalán, seguido a distancia del valenciano, i	agenttravel.e	Madrid	<a href="https://www">https://www</a>	Revista Digital
32	22/10/2020	<a href="https://www">https://www</a>	ESP	Montseny	Catalunya restringirà el acceso	Restriccion de vehiculos	Exceso de vehiculos	El Consorcio Forestal de Catalunya reclamó esta sem	elDiario.es	Madrid	<a href="https://www">https://www</a>	Prensa Digital

Figure A. 3: Example of emerging codes interactions to determine thematic patterns from the PAs Managers focus group through Atlas.ti.

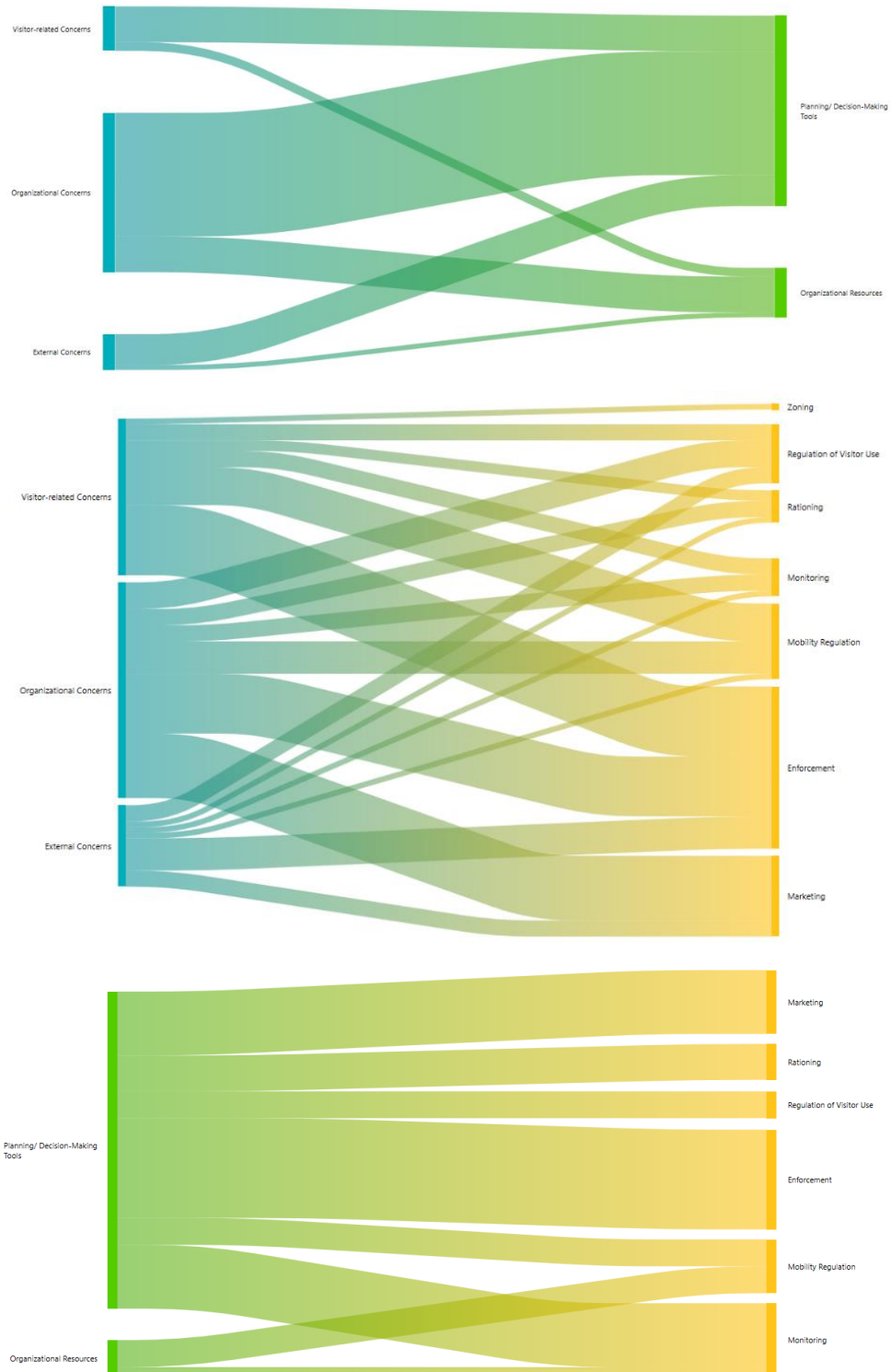


Figure A. 4: Semantic Network developed through Atlas.ti showing the relationship among the codes and dimensions used in the thematic analysis.

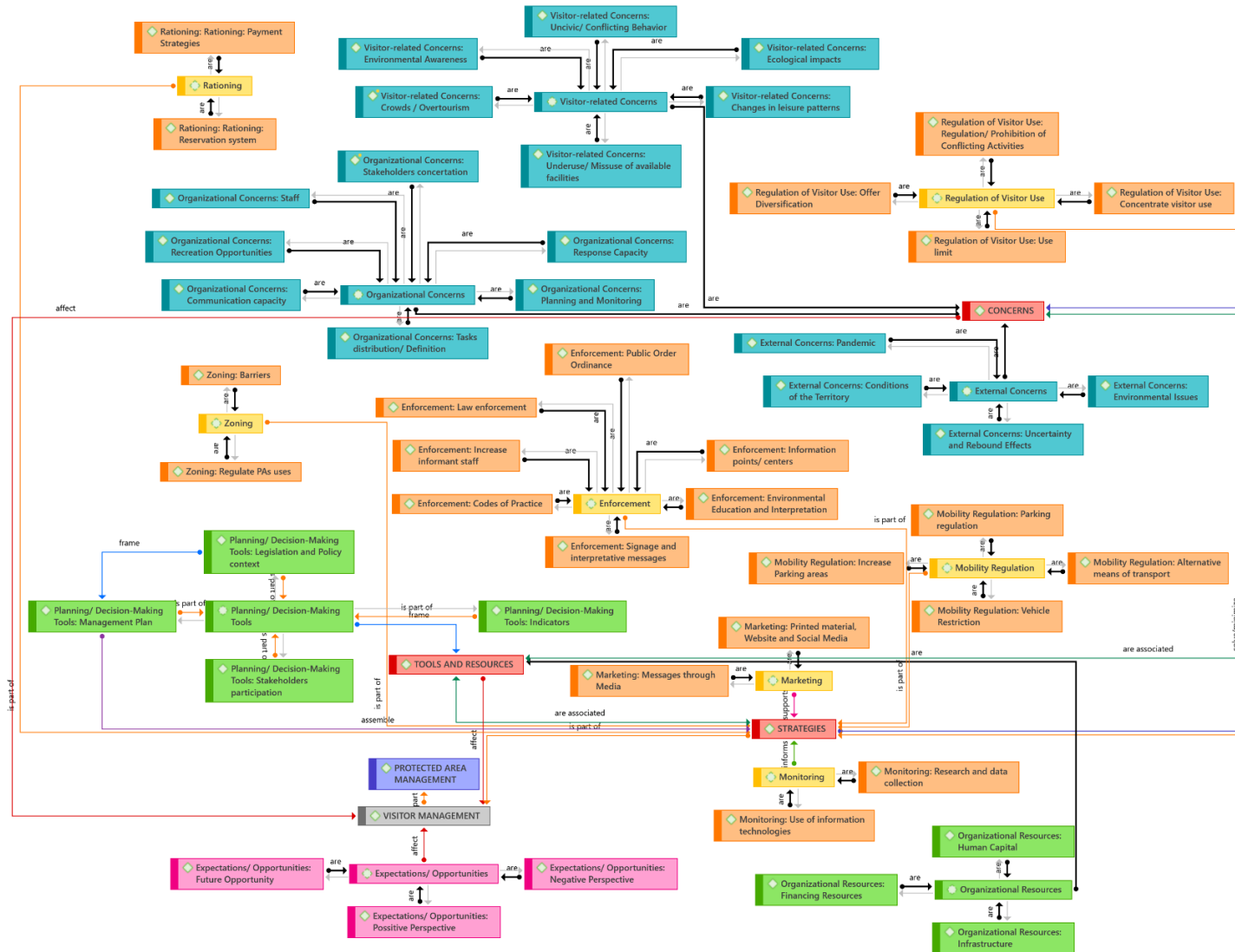


Figure A. 5: Example of variables included in the Ordinal Logistic Regression Model

Modelo\_SPSS.sav [ConjuntoDatos1] - IBM SPSS Statistics Editor de datos

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	Nombre	Tipo	Anchura	Decimales	Etiqueta	Valores	Perdidos	Columnas	Alineación	Medida	Rol
1	CODE	Cadena	17	0	Identificador	Ninguna	Ninguna	17	Izquierda	Nominal	Entrada
2	PARREG	Numérico	1	0	Aceptación: Estacionamie...	Ninguna	Ninguna	12	Derecha	Ordinal	Entrada
3	PARLIM	Numérico	1	0	Aceptación: Estacionamie...	Ninguna	Ninguna	12	Derecha	Ordinal	Entrada
4	PARPAY	Numérico	1	0	Aceptación: Estacionamie...	Ninguna	Ninguna	12	Derecha	Ordinal	Entrada
5	GENDER	Numérico	1	0	Female	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
6	AGE	Numérico	2	0	Age	Ninguna	Ninguna	12	Derecha	Escala	Entrada
7	UNIVERSITY	Numérico	1	0	University education	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
8	WORK	Numérico	1	0	Employee/selfemployed	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
9	DOMESTIC...	Numérico	1	0	Domestic Visitor	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
10	FOREIGNER	Numérico	1	0	Foreigner	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
11	FAMILY	Numérico	1	0	Travelling with the family	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
12	COUPLE	Numérico	1	0	Travelling with couple	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
13	OTHERGR...	Numérico	1	0	Travelling with other options	Ninguna	Ninguna	12	Derecha	Nominal	Entrada
14	GRSIZE	Numérico	2	0	Group size	Ninguna	Ninguna	12	Derecha	Escala	Entrada
15	LEISURE	Numérico	1	0	Beach and sun	Ninguna	Ninguna	12	Derecha	Nominal	Entrada

	CODE	PARREG	PARLIM	PARPAY	GENDER	AGE	UNIVERSITY	WORK	DOMESTIC- VIS	FOREIGNER	FAMILY	COUPLE	OTHERGRO- UP	GRSIZE	LEISURE
242	2022-07-30_01_05	5	5	1	0	30	0	1	1	0	1	0	0	3	1
243	2022-07-30_01_08	5	5	5	0	39	1	1	1	0	0	0	1	1	1
244	2022-07-30_01_09	5	5	2	0	25	1	1	1	0	0	1	0	2	1
245	2022-07-30_01_10	5	5	1	1	39	1	1	1	0	0	1	0	2	1
246	2022-07-30_01_12	5	5	1	0	63	1	0	1	0	0	1	0	2	1
247	2022-07-30_01_13	5	5	5	1	58	1	1	1	0	1	0	0	4	1
248	2022-07-30_01_13	5	5	5	0	33	1	1	1	0	1	0	0	4	1
249	2022-07-30_01_14	5	5	2	0	41	0	1	1	0	0	1	0	2	0
250	2022-07-30_01_16	3	3	3	0	59	1	1	1	0	1	0	0	2	1
251	2022-07-30_02_03	5	5	5	0	54	0	1	1	0	1	0	0	4	1
252	2022-07-30_02_13	5	5	5	0	44	1	1	1	0	1	0	0	9	1
253	2022-07-30_02_18	2	2	1	0	47	1	1	1	0	1	0	0	4	1
254	2022-07-30_02_20	1	1	1	0	40	1	1	1	0	0	1	0	2	1
255	2022-07-30_02_21	1	1	1	1	37	1	1	1	0	0	0	1	2	1
256	2022-07-30_02_25	5	5	5	1	51	1	1	1	0	0	0	1	4	0
257	2022-07-30_02_32	4	4	2	1	26	1	1	1	0	1	0	0	3	0
258	2022-07-30_02_34	4	4	1	1	45	1	1	1	0	1	0	0	10	1
259	2022-08-01_01_01	5	5	5	1	50	1	1	1	0	0	0	1	4	1
260	2022-08-01_01_05	4	4	1	1	35	1	1	1	0	1	0	0	4	1
261	2022-08-01_01_07	5	5	5	0	42	1	1	1	0	1	0	0	4	1
262	2022-08-01_01_08	5	5	1	1	31	0	0	1	0	1	0	0	4	1
263	2022-08-01_01_13	5	5	5	1	38	0	1	1	0	1	0	0	2	1
264	2022-08-01_01_14	5	5	5	1	37	1	1	1	0	1	0	0	4	1
265	2022-08-01_01_15	5	5	1	0	19	1	1	1	0	0	0	1	7	1
266	2022-08-01_01_17	5	5	5	0	44	1	1	1	0	1	0	0	5	1
267	2022-08-01_01_18	5	5	3	0	37	0	1	1	0	0	1	0	2	1
268	2022-08-01_02_17	3	3	3	1	48	1	1	1	0	1	0	0	3	1
269	2022-08-01_02_18	4	4	4	0	24	1	1	1	0	1	0	0	5	1
270	2022-08-01_02_19	3	3	3	0	58	0	1	1	0	0	0	1	6	1

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