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## A global review of legal protection mechanisms for the management of surf breaks

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## A global review of legal protection mechanisms for the management of surf breaks

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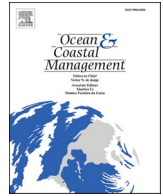


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## Review

# A global review of legal protection mechanisms for the management of surf breaks

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## ABSTRACT

Legal protection has become essential for managing the world's surf breaks much as it has for other marine and coastal protected areas. This paper presents the first systematic review of global developments in this field. We used a keyword literature search and thematic content analysis to characterise legal protection mechanisms that are designed for surf breaks or have been specifically applied to address surf break protection needs. They are currently found in six countries, protect over 500 surf breaks, and include examples of single-location mechanisms (e.g., Malibu in USA, Punta de Lobos in Chile) and national-level protection mechanisms addressing multiple surf breaks (e.g., New Zealand and Peru). Across all examples we identified 63 discrete themes that can be drawn upon to design and communicate protection measures and present these in a typology that highlights contributing ideas. Thematic analysis identified a major distinction between process and outcome-based requirements. More comprehensive protections can be recognised by attention to a wider range of threat classes and in the detail provided for decision support, with the two ideally working together to identify the minimum assessment requirements for development proposals. Variation in levels of protection is a key topic for consideration as is the process by which locations are identified or qualified for legal protections to apply. There is also a need to evaluate the effectiveness of provisions already in place, carrying with it the need for outcomes-based monitoring which is currently rare.

## 1. Introduction

From traditional roots in Hawai'i and Peru the pursuit of surfing and surf tourism has become a major contributor to community wellbeing and economic activity at many locations and scales (Buckley 2002a; Lazarow et al., 2009; Peryman and Orchard 2013). Surf breaks are the natural features that support these activities, all of which may be defined by the practice of harnessing and riding waves (Walker 1974). Mostly these are recreational activities but include the traditional navigation skills of mariners for travel on wave exposed coasts and essential rescue skills in these environments today. Despite their importance as a natural and generally finite resource, many surf breaks have become degraded by anthropogenic pressures and development patterns. In response, surfers and coastal communities have mobilized grassroots campaigns and established new non-governmental organisations (NGOs) to protect surf breaks. They include many regional and national level initiatives (e.g., National Surfing Reserves programme in Australia, Surfbreak Protection Society in New Zealand, Hazla por tu Ola in Peru, Fundación Rompientes in Chile), and international NGOs (e.g., Save the Waves, Surfriider Foundation, Surf & Nature Alliance, Surfers Against Sewerage), supported by a network of research groups and institutions.

These collective efforts have spearheaded most of the major developments in surf break protection that include improving public awareness of their protection needs (Nelsen et al., 2013; Orchard 2017a).

Although non-statutory approaches have achieved some protection outcomes, there is demonstrable need for enforceable legally-binding mechanisms to ensure effective protection of surf breaks (Orchard 2020; Reiblich 2013; Santos 2018). Evidence includes the growing list of surf break degradation examples and the ongoing prospect of incompatible coastal developments being proposed without protections in place. In New Zealand, for example, surf breaks of 'national significance' including Mangamaunu and Aramoana already have a high level of protection under the law yet have remained exposed to recent threats from poorly planned development proposals involving land reclamation, seawall construction, dredging and offshore spoil deposition (Mead and Atkin 2019). These cases have required considerable NGO advocacy and input to avoid adverse effects, demonstrating the difficulty of achieving effective protection in practice. Legal protection status has greatly enabled the eventual resolution of development proposals through considering effects that developers may not otherwise have recognised or addressed in their plans.

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Legal protection mechanisms are emerging as one of the key tools to address the above issues alongside other natural resource management needs. To date, however, there has been no systematic review of the now-considerable set of international developments in this field. The purpose of this paper is to address this need from a global standpoint, by providing an overview of legal protection mechanisms that have been applied to date and are specific to the management of surf breaks. We then use content and thematic analyses to assess commonalities and differences between the approaches and develop a typology of legal protection mechanisms that describes variations in their conceptual

basis. We conclude by identifying some of distinguishing features that have evolved to date, and discuss their implications for future developments in this field.

## 2. Methods

### 2.1. Systematic review

Legal protection mechanisms meeting the scope of this review were identified using a comprehensive keyword search completed March

**Table 1**

Research literature on the legal protection of surf breaks from 1994 (representing the earliest known publication) to March 2022 (Aguilar Espinoza et al., 2018; Baxter, 2018; Cabrera and Abessa, 2020; Eberlein, 2011; Edwards and Stephenson, 2013; Edwards, 2013; González and Carillo, 2020; Hume et al., 2019; Llantada and Serafini, 2021; Londoño, 2020; Machado et al., 2018; Rennie, 2018; Salamone, 2017; Santos, 2020; Surfbeats, 2020; Ware et al., 2017).

Date	Title	Article type*				Reference
		J	R	S	O	
1994	Legal protection of surf breaks: putting the brakes on destruction of surf	■				Oram & Valverde (1994)
2001	Law of the surf forum number 1	■				Fitzgerald & Clarke (2001)
2009	Working towards the protection of surf breaks					Skellern et al. (2009)
2009	Guidance on environmental impact assessment			■		Surfers Against Sewage (2009)
2009	Sustainable management of surfing breaks: Case studies and recommendations	■				Scarfe et al. (2009)
2010	The WAR Report Waves Are Resources					Butt (2010)
2010	Draft Auckland Regional Policy Statement background report-Surf breaks					Coombes & Scarfe 2010
2011	Implications of the New Zealand Coastal Policy Statement 2010 for New Zealand communities					Orchard (2011)
2011	The scarcity and vulnerability of surfing resources: An analysis of the value of surfing from a social economic perspective in Matosinhos, Portugal				■	Eberlein (2011)
2011	Identification of surf breaks of national significance	■				Peryman (2011c)
2011	Planning tools for surf breaks				■	Peryman & Skellern (2011)
2011	Surf break protection: Planning implications of the NZCP5 and the need for a collaborative approach				■	Sherow (2011)
2011	Bay of Plenty surf break study				■	Peryman (2011b)
2011	Surf break identification and protection in the Gisborne District				■	Peryman (2011a)
2013	Surf break co-management: Options for the protection and enhancement of surf breaks in New Zealand				■	Edwards (2013)
2013	Assessing the potential for surf break co-management: evidence from New Zealand	■				Edwards & Stephenson (2013)
2013	Paradise lost: threatened waves and the need for global surf protection	■				Nelsen et al. (2013)
2013	Greening the tube: Paddling toward comprehensive surf break protection					Reiblich (2013)
2013	Planning approaches for the management of surf breaks in New Zealand				■	Skellern et al. (2013)
2013	Understanding the values associated with New Zealand surf breaks and implications for management	■				Peryman & Orchard (2013)
2014	Applying an effects-based approach to the sustainable management of surf breaks	■				Rennie et al. (2014)
2014	Liberalizing Nirvana: an analysis of the consequences of common pool resource deregulation for the sustainability of Fiji's surf tourism industry	■				Ponting & O'Brien (2014)
2015	Regulating "Nirvana": Sustainable surf tourism in a climate of increasing regulation	■				Ponting & O'Brien (2015)
2015	The green room: A surfing-conscious approach to coastal and marine management	■				Ball (2015)
2015	Protecting surf breaks and surfing areas in California				■	Blum (2015)
2015	Surf breaks of regional significance in the Greater Wellington region				■	Atkin & Mead (2017)
2016	Reservas de surfe e a proteção da sociobiodiversidade	■				da Silva et al. (2016)
2017	Surfing towards marine conservation? An Examination of World Surfing Reserves as marine conservation practice				■	Salamone (2017)
2017	Lessons for the design of surf resource protection – the Australasian experience	■				Orchard (2017a)
2017	A nested socio-ecological systems approach to understanding the implications of changing surf-reef governance regimes in Fiji	■				Mach & Ponting (2017)
2017	Contested surf tourism resources in the Maldives	■				Buckley et al. (2017)
2017	Methodology – Identifying regionally significant surf breaks in Northland				■	Northland Regional Council (2017a)
2017	Application of methodology. Identifying regionally significant surf breaks in Northland				■	Northland Regional Council (2017b)
2017	Regional significance criteria for the assessment of surf breaks				■	Orchard (2017b)
2017	Surf breaks of regional significance in the Waikato region				■	Atkin & Mead (2017)
2017	Sustainable resolution of conflicts over coastal values: a case study of the Gold Coast Surf Management Plan	■				Ware (2017)
2017	Surfing values in coastal management: Gold Coast Surf Management Plan – a case study	■				Ware et al. (2017)
2018	Rhino Chasers and Rifles: Surfing under the Public Trust Doctrine	■				Reiblich & Reineman (2018)
2018	Dream waves Peru: Laguna de olas artificiales para la práctica del surf				■	Aguilar Espinoza et al. (2018)
2018	Governing locally for sustainability: public and private organizations' perspective in surf tourism at Aljezur, Costa Vicentina, Portugal	■				Machado et al. (2018)
2018	The seduction of fast track recovery legislation - the Mangamaunu surf break saga	■				Rennie (2018)
2018	Reservas de surfe: uma análise jurídica da governança do espaço marinho-costeiro				■	Santos (2018)
2018	The approaches to classifying surf breaks in New Zealand				■	Baxter (2018)
2019	The legal regime of natural sports facilities within the maritime-terrestrial public domain: special attention to surfing	■				Londoño (2020)
2019	Development of the regional significance concept for surf break management in Aotearoa New Zealand	■				Orchard et al. (2019)
2019	The legal protection of surf breaks: An option for conservation and development	■				Monteferrri et al. (2019)
2019	Surfing and marine conservation: Exploring surf-break protection as IUCN protected area categories and other effective area-based conservation measures	■				Scheske et al. (2019)
2019	A transdisciplinary framework proposal for surf break conservation and management: Bahía de Todos Santos World Surfing Reserve	■				Arroyo et al. (2019)
2019	Managing issues at Aotearoa New Zealand's surf breaks	■				Mead & Atkin (2019)
2019	An overview of changing usage and management issues in New Zealand's surf zone environment	■				Hume et al. (2019)
2019	Management guidelines for surfing resources				■	Atkin et al. (2019)
2020	Organization and legal protection of maritime natural spaces: special reference to sports uses in surf zones				■	Rodríguez (2020)
2020	Is it necessary to regulate the practice of surfing during the summer?	■				González & Carillo (2020)
2020	Piedra Del Viento de Topocalma is the new nature sanctuary in O'Higgins				■	Surfbeats (2020)
2020	Autodiagnóstico para seleção de reservas de surf: um protocolo de análise. A rapid protocol for the preliminary selection of sites with potential to be surfing reserves	■				Cabrera & Abessa (2020)
2020	Legal protection of New Zealand's surf breaks: top-down and bottom-up aspects of a natural resource challenge	■				Orchard (2020)
2020	Indicators to measure pressure, state, impact and responses of surf breaks: The case of Bahía de Todos Santos World Surfing Reserve	■				Arroyo et al. (2020)
2020	Uso Recreativo na Estratégia de Gestão do Sistema Costeiro-marinho: o Exemplo da Proteção dos Surf Breaks	■				Santos (2020)
2021	First steps at first point: protecting California surf breaks and the Malibu historic district	■				Blum & Orbach (2021)
2021	Issues of conflict management in a context of increasing surf tourism	■				Knaap & Vanneste (2021)
2021	La ordenación y gestión de las instalaciones deportivas naturales en el medio acuático. Especial referencia al surfing				■	Trueba & Rodrigo (2021)
2021	Informe de Observaciones al Proyecto de Ley de Protección de Rompientes				■	Barros et al. (2021b)
2021	Marco Institucional y Competencias Borde Costero en Chile				■	Barros et al. (2021a)
2021	Use of socioenvironmental criteria to assess the certification potential of a surfing reserve in southern Brazil	■				Llantada & Serafini (2021)
2022	The institutional foundations of surf break governance in Atlantic Europe	■				Rode (2022)

2022 for the terms ‘legal’, ‘legislation’, ‘regulation’, ‘policy’, and ‘protection’ in combination with the term ‘surf\*’, and an additional Spanish keyword search for ‘rompientes’ and ‘ley’. Initially these searches were completed in both the Scopus and Google Scholar search engines, which returned primarily research articles in the results. Therefore, we conducted additional grey literature searches using the Google search engine to identify other potentially relevant studies and popular media that might reference other legal protection mechanisms within the scope of the study. We also considered references contained within all of the abovementioned search results. The combined search results were then evaluated against the scope of the study to identify articles describing legal protection mechanisms that either include specific provisions for surf breaks, or have been applied for the protection of surf breaks. Lastly, the relevant legal instruments were identified and retrieved for further analysis as described below.

## 2.2. Classification of protection mechanisms

Each legal mechanism was evaluated using content and thematic analysis following Boyatzis (1998). Descriptions of each legal instrument were compiled into a standardized format that included details of the objectives, scope, and implementation using the original wording translated into English where required. The resulting dataset (comprised of 11 protection mechanisms from five countries) was then coded for thematic analysis. The major themes that emerged were then used to construct a typology that collectively describes characteristics of the legal protection concepts that have emerged to date. Lastly, each of the legal instruments was classified against the typology to identify commonalities and differences, potential gaps, and overarching themes.

## 3. Results

### 3.1. Research literature

From the systematic review we identified a database of 65 articles that are considered to represent the primary research literature on the topic of legal protection for surf breaks (Table 1). This compilation excludes conference proceedings and other presentation types that generally refer to other studies. Other articles that were identified using the search terms but deemed out of scope for the current study are represented in the ‘wider protection’ category of literature shown in Fig. 1. They include several surf science studies that intersect with the topic of surf break protection by describing principles or methodology for characterising the oceanographic aspects of waves (e.g., Atkin and Greer 2019; Butt 2010). This field is also related to the topic of artificial

surf break design (Mead 2001; Ng et al., 2015) that includes potential applications as a mitigation measure for climate change (Hawai'i Revised Statutes 2009–2021). Additionally, there is an increasing body of ‘surfonomics’ literature that addresses the economic value of surf breaks and related arguments and supporting reasoning for their protection (see [www.savethewaves.org/surfonomics/](http://www.savethewaves.org/surfonomics/)).

The foundational study of Oram and Valverde (1994) appears to be the first comprehensive investigation of the legal protection of surf breaks, and it considerably pre-dates all other literature found in this review. The next period of considerable research activity coincided with review of the New Zealand Coastal Policy Statement (NZCPS) 1994 under the Resource Management Act 1991 that took place over a lengthy timeline between 2003 and 2010. The proposed inclusion of statutory policies for surf break protection intersected with other work on surf break management (e.g., Scarfe et al., 2008, 2009), and also resulted in a large body of grey literature including public submissions, hearings evidence and Board of Enquiry reports that are not reflected in either the research literature or popular media search results identified in this review, but have been previously summarized (e.g., Peryman Skellern 2009; Skellern et al., 2009; Skellern et al., 2009, 2013; Orchard 2020). These legislative and research developments also appear to have catalysed interest in the subject worldwide; including international research interest in the New Zealand case (e.g., Sherow 2011) and studies looking at the potential for similar developments elsewhere (e.g., Ball 2015; Blum 2015; Nelsen et al., 2013; Reiblich 2013; dos Santos, 2018; da Silva et al., 2016). Following release of the NZCPS 2010, the New Zealand body of research continued to grow as implications of the new statutory measures were assessed (e.g., Orchard 2011; Peryman 2011a; Peryman and Skellern 2011; Rennie et al., 2014; Skellern et al., 2013). Furthermore, implementation of the statutory protection requirements at the regional level required additional technical studies to identify and assess the surf breaks involved. This process has continued over several years due to the different timing cycles of regional policy and plan reviews (e.g., Atkin et al. 2015; Atkin and Mead 2017; Coombes and Scarfe 2010; Northland Regional Council 2017a, 2017b; Orchard 2017, Peryman 2011b, 2011c).

On the global stage, developments in the surf tourism field also fit within our definition of research on legal protection mechanisms where they include attention to the potential regulation of surf resources to protect them from adverse effects. These cases include the investigation of tourism issues that might require intervention (e.g., Buckley 2017; Ponting & O'Brien & 2015), as well as the consequences of deregulating common pool resource arrangements for marine space that had previous included surf breaks (Mach and Ponting 2017; Ponting and O'Brien 2014). The protection of surf breaks from surf tourism impacts

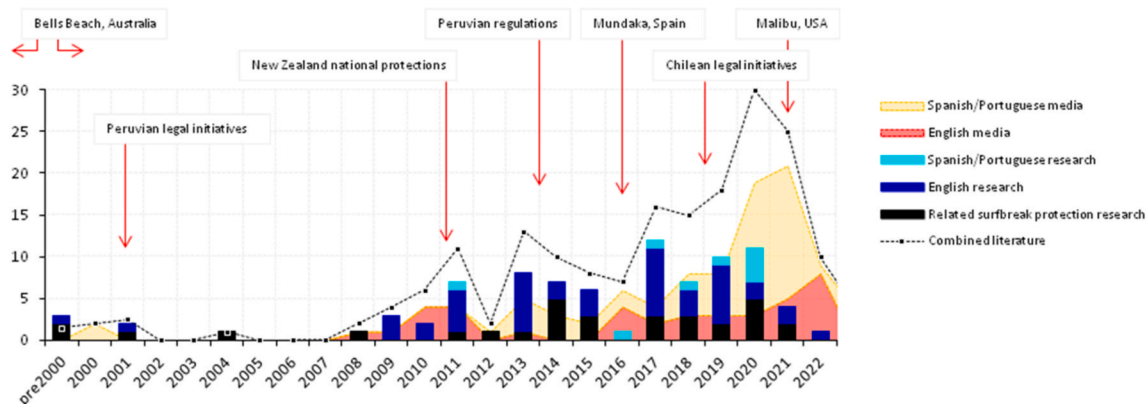


Fig. 1. Timeline of global developments as reflected in results from a systematic review of literature on the legal protection of surf breaks. Academic literature (columns) includes Spanish or Portuguese (light blue) and English articles (purple) on legal protection identified from Scopus and Google Scholar searches, and an additional search for the wider topic of ‘surfbreak protection’ (black). Popular media includes articles and websites identified in Google Search results that are additional to the academic articles but may make reference to them.

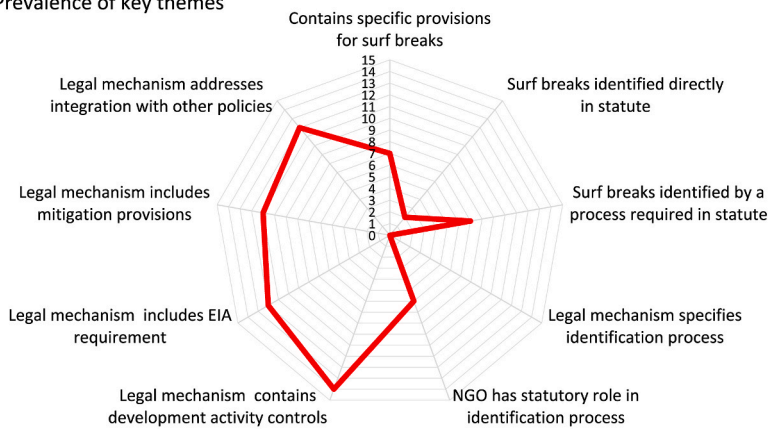
exemplifies an important dimension of surf break protection involving the negative effects of recreational use patterns such as aggressive behaviour (Fitzgerald and Clarke 2001; Mixon 2014; Nazer 2004; Waitt 2008; Young 2000), overcrowding (Buckley 2002a, 2002b; Knaap and Vanneste 2021; Towner 2016), and adverse environment impacts associated with recreational use (Martin & Assenov 2014). Non-regulatory approaches to tourism issues, e.g., in Papua New Guinea (O'Brien and Ponting 2013), and the wider 'sustainable surfing' discourse (Borne and Ponting 2019; Butt 2011), may also intersect with, or augment the need for legal protection in various ways.

In recent years there has also been growth in the diversity of research that fits within the scope of this review. Alongside the investigation of an increasingly wider range of options for applying legal protection (e.g., Arroyo et al., 2019; Barros et al., 2021a, 2021b; Monteferri et al., 2019; Reiblich and Reineman 2018; Rode 2022), newer topics include the contribution of surf break protection to wider conservation goals (Reineman et al., 2021; Scheske et al., 2019). Notable research gaps include a lack of studies on the effectiveness of surf break protections

that might include comparative analyses of existing arrangements now that there is a diversity of protection measures in place (Arroyo et al., 2020; Orchard 2017a). Limitations to note include the likelihood that early work (particularly in non-English texts) may not have been discovered through the online search engines used in this review despite the inclusion of a combination of English and Spanish search terms. Notably, the earliest surfbreak-specific legislation was enacted in Peru in 2000 and does not appear to have been accompanied by research literature from around the same time. Alternatively, this may partly explain the lack of application of that law until new regulations were enacted in 2013; which appears to have then led to an increase in research activities on the development and implementation of these provisions (e.g., Monteferri et al., 2019). These limitations aside, the review results obtained here provide a relatively cohesive picture of the body of research effort and highlight periods of heightened activity (Fig. 1). It also provides for a comprehensive identification of the associated legal mechanisms, a primary objective of the review.

Lastly, the trends in popular media discovered in Google Search

(a) Prevalence of key themes



**Fig. 2.** Distinguishing features of contemporary legal mechanisms for the protection of surf breaks. (a) Prevalence of key themes across 15 legal mechanisms from six countries. (b) Select comparisons showing key differences in the process and locus of responsibility for identifying surf breaks to which legal protections apply. Note that for this comparison we have separated the NZCPS Policy 16 provisions (which apply only to the 'Surf Breaks of National Significance') and grouped the remaining NZCPS policies with the Taranaki RPS. Note also that the Chilean Rompientes Law (Proyecto de Ley de Protección de Rompientes Chile) has yet to be enacted but was recently approved in principle, and follows a format similar to the Peruvian Rompientes Law. NZCPS = New Zealand Coastal Policy Statement, RPS = Regional Policy Statement, EIA = Environmental Impact Assessment.

(b) Select comparisons

	Protection mechanism specifically designed for surf breaks	Existing legislation applied to protect surf breaks	Surf breaks identified directly in statute	Surf breaks identified by a process required in statute	NGO has statutory role in identification process	Legal mechanism establishes new property right
NZCPS 2010 Policy 16 (New Zealand)	■		■	■		
NZCPS 2010 Policy 13, 14, 15 / Taranaki RPS 2020 (New Zealand)	■		■	■		
Waikato Navigation Safety Bylaw (New Zealand)		■	■	■		
Rompientes Law No. 27280 (Peru)	■		■	■	■	■
Regulations to Rompientes Law No. 27280 (Peru)	■		■	■	■	■
Rompientes Law – current Bill (Chile)	■		■	■	■	■
Decree 10 / Law No. 19300 General Bases of the Environment (Chile)		■	■	■		
Law No. 20930 / Real Right of Environmental Conservation (Chile)		■	■	■		■
Crown Land Act 1989 / Crown Land Management Act 2016 (Australia - New South Wales)		■	■	■		■
National Parks and Wildlife Act 1974 (Australia - New South Wales)		■	■	■		■
Crown Land Act 1958 and Crown Land (Reserves) Act 1978 (Australia - Victoria)		■	■	■		■
National Heritage Protection Act (USA)		■	■	■		
Hawai'i Revised Statutes §205A (USA)	■		■	■		
Basque Government Ley 5/1989		■	■	■		
Basque Government and Decree 139/2016 (Spain)		■	■	■		

results are also of interest (Fig. 1). They correspond well with the above description of trends in the research literature and show a peak in the English language media activity around 2010–2011 coinciding with the New Zealand developments, and another in the Spanish languages around 2013 coinciding with enactment of the Peruvian regulations. Since then there has been a steady background level of English media attention to the topic that includes news items on the Latin American developments as well as developments in other countries and media items featuring notable studies. At the same time there has been a notable increase in media attention in the Spanish languages, particularly since 2019. This increase is associated with the establishment and promotion of well-organised surf break protection campaigns in Peru and Chile that are successfully mobilizing public interest and securing crowd funding in support of surf break protection using existing legal mechanisms, and in the case of Chile, a new legislation proposal. For further reading see <http://rompientes.org/>, <https://hazlaportuola.pe/>, and <https://leyderompientes.cl/>.

### 3.2. Legal protection review

The literature review identified legal instruments from six countries that are either specific to surf breaks or have been applied to achieve the protection of surf breaks (Fig. 2). For this study, we included an analysis of the recent Chilean developments around a Rompientes Law that is the subject of a current bill (Arica Surf Association 2018). In New Zealand, we restricted attention to the primary higher-level instrument being the NZCPS 2010, and not assess the content of regional policy and plans which must give effect to, and be generally consistent with it. Differences between regions have been the subject of previous assessments and primarily relate to the methodology for characterising surf breaks for consideration, and the extent of the protections afforded (Orchard 2017a; Orchard et al., 2019). For the Australian examples, we reviewed and summarized the provisions of management plans created under the New South Wales Crown Lands Act 1989 and subsequent reforms which have not been the subject of previous assessments, and similarly in Victoria where a progression of legislative developments have been applied to the Bells Beach Surfing Recreation Reserve over several decades, creating the longest-standing example of a legally protected surf break. Over 500 surf breaks now have some form of legal protection specific to their needs. See Supplementary Material for a summary of each legal protection mechanism identified in this review.

### 3.3. Characteristics of legal protection

Content analysis of the underlying statutes identified 63 distinguishing features of the legal protection mechanisms that have been applied to date. A feature common to all examples was the establishment of some form of protected area to which the protections apply, which is consistent with the focus of the review being constrained to natural features that are identified as 'surf breaks'. Within this spatial basis, however, there is considerable diversity in the areas that have been identified for protection. They range from the NZCPS definition of surf break, which is arguably, the most comprehensive in its spatial consideration, to the protection of land adjacent to a surf break (which nonetheless serves important protection functions for values of the surf break). There is also a clear distinction between protection mechanisms that are specifically designed for surf breaks, versus the successful application of other (non-specific) legislation to achieve surf break protection goals.

Several themes we identified represent contrasts between different policy options or approaches for identifying and assessing surf breaks. For example, one of the most pronounced differences is whether the protection mechanism directly identifies the location(s) to be protected, or instead establishes devolved responsibilities for their identification through a subsequent assessment process. Related aspects include whether the mechanism contains details of the identification process or

criteria, or specifies the organisations involved (thus having responsibilities under the relevant law), and these may include non-governmental organisations in some cases (e.g. Peru and Australia). Various combinations of these aspects result in a wide diversity of approaches for the legal protection of surf breaks (Fig. 2).

### 3.4. Outcomes versus procedural requirements

In this analysis we identified a distinction between outcomes-based requirements and process-based requirements, with the latter establishing the need for certain tasks without specifying the outcome to be achieved from them. Following this distinction, we identified 35 outcomes-based and 28 process-based components of the global approach to legal protection. The outcome-based requirements are typically supported by process-based requirements but with considerably varying degrees of specificity, integration and detail.

#### 3.4.1. Outcomes-based requirements

Four primary outcomes-based themes were identified; 1) resource protection policies, 2) resource enhancement policies, 3) balanced conservation and use, and 4) establishment of a new property right, and their representation varies considerably between the legal instruments. In this treatment we have considered the new property rights as a type of outcome (rather than procedural requirement), despite that they do not necessarily require surf break protection *per se*. However, in the examples identified here (Law No. 20930 in Chile, and Rompientes laws) the type of right established enables conservation outcomes and is used explicitly for that purpose.

Within the resource protection policies, subthemes include the protection of natural environments or ecosystems that in some cases reference specific ecosystem types. Additionally, specific attributes of ecosystems are a relatively common theme that is targeted for protection with examples including resources of cultural, historical, recreational or scenic value and other aspects such as natural character and water quality. Similarly, some of the policies specifically protect natural features such as surf breaks or beaches. Lastly, another set of resource protection policies is concerned with maintain existing values, and in some cases these are specified, with examples including recreational opportunities, public access, and resilience. Similar policies may also be framed around the outcome of minimising adverse effects and related issues such as climate risk. Within each of the legal protection mechanisms there are usually a mix of resource protection requirements, but the level of detail varies considerably. Although there are far fewer resource enhancement policies, three subthemes were identified: enhancement of recreational opportunities, natural character, and public access). In comparison, balanced conservation & use policies appear in all of the legal protection mechanisms. Three main subthemes may be identified around the topics of allocation of space, provision of public facilities, and provision of public access consistent with conservation objectives. Further themes related to the allocation of space include restricting the location of coastal development to suitable areas, and promoting the efficient use of space.

#### 3.4.2. Process-based requirements

Within the 28 process-based themes there were eight major subthemes; 1) establishment of planning functions, 2) protected area mechanisms, 3) controls on use & development, 4) required assessment processes, 5) cross-boundary management approaches, 6) policies for integration with other statutes, 7) provisions for public participation, and 8) the development of non-statutory outreach or guidance materials. Interactions between these topics are evident in some cases, such as where cross-boundary management processes are supported by policies that promote integration with other statutes, particularly those involving other geographical realms that may intersect with surf break management in various ways. Within these eight major subthemes additional detail is also present. This analysis resulted in the

identification of an additional 20 process-based themes that in most case can be related directly to one of the eight major subthemes. For example, under the ‘required assessment processes’ subtheme, contributing components found across the collective set of legal protection examples include requirements for baseline assessments and inventories, impact assessments, hazard risk assessments, and climate risk assessments. Bringing together all of these requirements can be identified as the most comprehensive approach – for which there are no current examples. Conversely, there are opportunities to learn from, and combine the best aspects of the collective developments to date in future iterations of resource management policy cycles or specific legislative initiatives for the protection of surf breaks.

### 3.5. Legal protection typology

The distinguishing features identified through thematic analysis may be grouped according to commonalities and differences to derive a conceptual model or typology that can help to illuminate relationships between them. Although it should be noted that other relationships and contributing factors could be identified, Fig. 3 shows one such example that highlights the distinction between outcomes and process-based requirements and an additional a set of ‘opportunistic approaches’ in

which existing legislative mechanisms that were not specifically created for surf break protection (but have the ability to do so) have been applied for these purposes. Current examples of this include the protection of Malibu in California, and the innovative use of a private property rights instrument to protect Punta de Lobos in Chile (Fig. 3).

The 2nd tier of the typology represents important subthemes that contribute to these three primary themes in the legal protection landscape. Within these, further contributing topics can be identified that may improve the efficacy of protection mechanisms by identifying additional considerations to clarify the scope and implementation of higher level instruments. This is most clearly seen in the development of coastal policy in New Zealand where the surf break management provisions include specific attention in national policies and the requirement for more detailed provisions to be made in the context of regional planning. Although most of the 3rd, 4th and 5th tier topics can be directly related to a corresponding higher level theme, Fig. 3 highlights a theme (recognition of traditional values) that was less-easily aligned with a single higher-level theme, and has the potential to contribute to several. Likewise, we considered that the ‘recognition of surf breaks within other protected area types’ could contribute to both opportunistic and legally-required protected area initiatives (Fig. 3). These examples are just some of the many interactions to be aware of,

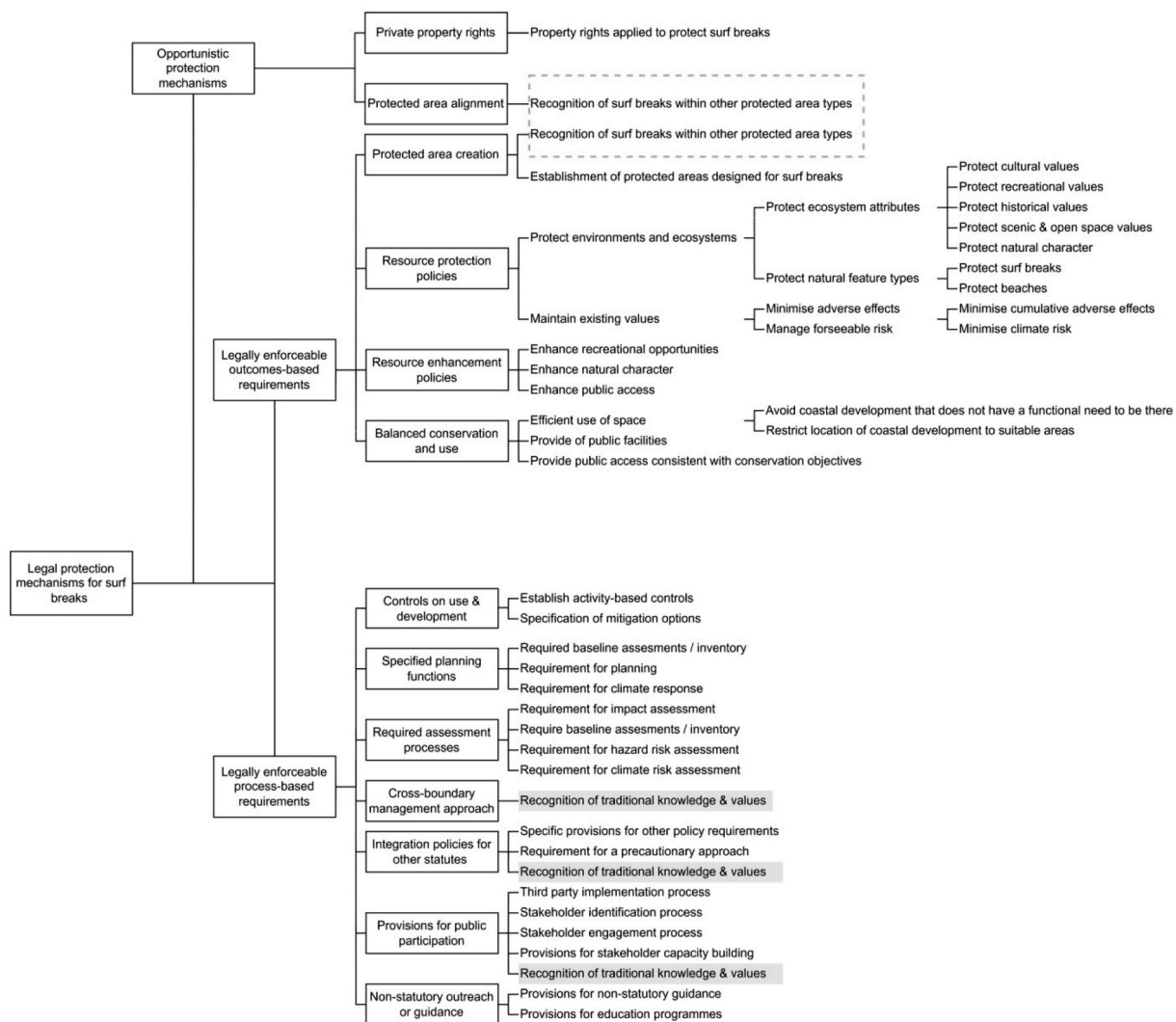


Fig. 3. A typology of legal protection mechanisms that highlights a distinction between outcomes-based and process-based requirements for the management of surf breaks. Process-based requirements generally help to achieve outcomes-based requirements and may also be required by the latter. Most sub-classes in this typology fall within the scope of a higher level class. A notable exception (the recognition of tradition knowledge and values) is shaded in darker grey. Note also the overlap between required and opportunistic protected area approaches that can be applied to surf breaks.



particularly at the subtheme level. Others include the subtheme ‘climate responses’ which interacts with ‘assessment processes’, and the ‘specification of mitigation options’ which contributes to the higher-level theme of ‘controls on use and development’ but may also interact with the subtheme ‘requirement for climate response’.

Attention to such interactions is demonstrated in the Hawai‘ian approach which includes policies that contribute to the theme of resource enhancement such as ‘developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing’ (Hawai‘i Revised Statutes 2009–2021). It also includes requirements for the replacement of coastal resources having significant recreational value (specifically including ‘surfing sites’ and ‘sand beaches’), when such resources will be unavoidably damaged by development. These replacement activities directly contribute to the ‘resource protection policies’ theme in outcomes-based requirements and ‘controls of use and development’ in process-based requirements. They also appear to be inclusive of human developments that result in damage to natural resources under climate change, thereby contributing to ‘climate responses’. The combination of resource enhancement and resource replacement policies provides an alternative to *in situ* protection where a resource cannot be realistically protected at its current site.

In the future, further developments may lead to additional themes being explored within the legal protection landscape. An excellent example can be seen in the recent application of the National Historical Protection Act at Malibu. This contributes to the higher-level theme of ‘protecting natural resources’ and further recognises that these resources can include sites of historical value to the development of nature-based activities (United States Code 2016). This is the pre-eminent example of legal protection that addresses the potential for ‘historical resources’ to be associated with surf culture and the use of surf breaks, and can be identified as a discrete sub-theme in the legal protection landscape (Fig. 3).

#### 4. Discussion

This review provides a global summary of the legal protection mechanisms that have been enacted to date, and is an important step towards evaluating what they have to offer for the management of surf breaks as important natural resources. Advantages of the content and thematic analyses used in this assessment include the ability to simplify the detail inherent in each protection mechanism, thereby facilitating comparisons. Across the set of global examples, our results show considerable variance in many key aspects. Although the lack of a standard approach is partly due to the different statutory contexts involved, innovative aspects were found in nearly all of the approaches. Our typology of legal protection mechanisms provides a useful way of summarising the current developments in terms of differences and commonalities to consider the merits of different approaches (Fig. 3). It highlights a major dichotomy between process and outcome-based protection mechanisms with direct management implications that are likely to be of interest to a range of stakeholder groups. In essence, the findings suggest a broad need for process-based mechanisms to be more specifically tied to outcomes requirements, and for outcome-based protections to be better specified and monitored. The first of these could become a point of focus for non-governmental stakeholders involved in consultation and input into coastal planning. Indeed, this could generate greater certainty for all stakeholders including agencies with statutory resource management roles. Findings from this review also provide a useful start for stakeholders interested in developing comprehensive outcomes-based policies that can address different aspects of surf break management and associated threats.

##### 4.1. Procedures for establishing legal protection

There is considerable variation in the procedural basis for

establishing legal protection across the global examples. Process-based requirements generally help to achieve outcomes-based requirements but do not constitute or necessarily lead to protections. Instead, they typically play supportive roles in pathways that may result in the development of tangible protections by contributing to enabling conditions (e.g., requirements for new planning process that must include surf breaks in the scope of their deliberations). Outcomes-based requirements represent the most direct form of legal protection since they generate explicit objectives that regulate stakeholder activities in the resource use, development and management spheres. Aside from weaknesses that may arise from deficiencies in the assessment or compliance functions of relevant authorities, they represent a ‘known quantity’ with regards to protection expectations. With this in mind, the scope of the protections they convey is a key topic of interest (see Section 4.3). As illustrated in the typology, there are over 20 policy topics that have received specific attention within the collective set of legal protection mechanisms (Fig. 3).

Examples of opportunistic approaches to legal protection are identified as falling outside of our outcomes versus process-based distinction since they do not feature legally-required instruments to address surf breaks. Nonetheless, the outcomes achieved can create protections specific to surf breaks and are therefore included in this review. Establishing new property rights is an interesting example since such rights, in general, may not necessarily invoke a protection outcome. However, Chilean Law No. 20930 enables private property owners to establish protective measures that survive in perpetuity irrespective of the future ownership of that land and result in legal protections similar to the concept of conservation easements provided under other legal regimes, like US law (McLaughlin 2007).

In the Chilean example, new property rights were established specifically to facilitate the legal protection of a surf break. Indeed, the land in question was purchased with this outcome in mind (see <https://www.puntadelobos.org/>). This innovative use of property right instruments for conservation purposes deserves further exploration in other jurisdictions where similar concepts may be applied. Opportunities to explore synergies with existing protected area mechanisms presents a somewhat analogous pathway for establishing new protections for surf breaks. As discussed further below, there is a spectrum of protected area approaches that range from the creation of new protected areas specifically designed for surf breaks, to the realignment of the objectives and function of other protected areas to better recognise surf breaks.

##### 4.2. Identification of locations

Process and outcomes-based distinctions also extend to the methods by which surf breaks are identified for protection. The global experience shows that there are essentially three pathways for identifying locations for protection (Table 2). However, the only examples of protected surf breaks being directly identified within the statutory instrument are found in New Zealand, and given the international developments since its inception, must be regarded as a globally-rare approach (Fig. 4a). All other examples to date involve protection mechanisms that establish frameworks for protection under which qualifying surf breaks are subsequently identified, or involve one or more surf breaks identified for protection within a non-statutory process for which seek legal protection is sought subsequently (Fig. 4b). Examples of the latter include Australia’s National Surfing Reserves (NSR) programme and its global equivalent, the World Surfing Reserves (Short and Farmer 2012). There are also instances where surf breaks fall within the boundaries of existing protected areas that were established for other purposes (Scheske et al., 2019). However, where the legal protection mechanisms involved do not specifically make reference or arrangements for surf breaks protection these circumstances were outside of the scope of our review. For similar reasons we did not specifically assess the protection of San Onofre State Beach in California where the protection mandate responded to the potential impacts of highway infrastructure

**Table 2**  
Pathways for identifying surf breaks for inclusion in legal protections.

Pathway	Examples of legal protection	Location
Under a framework for legal protection that specifies the locations to be protected directly within the statutory instrument	Waikato Regional Council Navigation Safety Bylaw 2003–2020	New Zealand, Waikato Region
	Regional Policy Statement for Taranaki 2010 <sup>a</sup>	New Zealand, Taranaki Region
	NZCPS 2010 Policy 16/Schedule 1	New Zealand, nationwide (Surf Breaks of National Significance)
Under a framework for legal protection that does not initially specify the locations to be protected but typically establishes the qualifying criteria and/or processes to be used	NZCPS 2010 Policies 13 and 15	New Zealand, nationwide
	Peruvian Rompientes Law (and regulations)	Peru, nationwide
	Chilean Rompientes Law	Chile, nationwide
	National Historic Preservation Act 2016	USA, Malibu
	Hawai'i Revised Statutes 205A <sup>b</sup>	USA, Hawai'i
	Decree 10, Law No. 19300	Chile, Stone of the Wind and Topocalma Nature Sanctuary
	Law No. 19300, Decree 10 (General Bases of the Environment)	Chile, Punta Lobos
Through an external process initiated and led by NGOs that is initially unrelated to legal protection mechanisms but for which legal protection opportunities are subsequently sought	Basque Government Ley May 1989 and Decree 139/2016	Spain, Mundaka
	Crown Land (Reserves) Act 1978	Australia, Bells Beach
	Crown Land Act 1989 and Crown Lands Management Act 2016	Australia, National Surfing Reserves programme, New South Wales
	National Parks and Wildlife Act 1974	Australia, National Surfing Reserves programme, Killalea
	Law No. 20930. Real Right of Environmental Conservation	Chile, Punta del Lobos World Surfing Reserve

<sup>a</sup> Similarly in other Regional Policy Statements or Regional Plans prepared under the NZCPS (not shown for brevity).

<sup>b</sup> No specific examples of surf breaks having been protected under these provisions we identified in this review, but the legal mechanism specifically provides for surf breaks.

developments on the State Park (see <https://www.calparks.org/press/key-legislation-signed-permanently-protect-san-onofre-state-beach>).

These comparisons suggest that the process of identifying surf breaks for legal protection is a multi-faceted endeavour, for which a preferred approach has yet to emerge. Moreover, there are considerable differences in the institutional arrangements that have been applied to

address these needs. For example, the Australian and Peruvian approaches involve bottom-up evidence gathering activities where non-governmental third parties have a key role in nominating surf breaks for protection (Congress of the Republic of Peru 2000; Farmer and Short 2007). In Australia these activities began within the context of a non-statutory initiative to create surfing reserves, some of which have subsequently gained government legislative backing (Orchard 2017a), and similar approaches are being explored in the context of new legal protection initiatives in Spain (Rodríguez 2020; Trueba and Rodrigo 2021). In contrast, the role of a non-governmental third party was built into the Peruvian Rompientes Law from the beginning (Monteferrri 2013).

These examples require non-governmental parties to develop the assessment rationale and provide capacity for its implementation. There are, however, marked differences in the extent of these responsibilities involves that relate to the scope and intent of the qualifying criteria as set down in the relevant statutory or non-statutory commitments (as the case may be). At one end of the spectrum, Australia's NSR programme places a high emphasis on widespread public engagement to inform the documentation of a range of community perspectives on the merits of protecting a given surf break. These activities are indeed prerequisites for the nomination of surf breaks for consideration, and demand a considerable minimum level of investment from proponents (Farmer and Short 2007). The NSR programme's requirements for community buy-in create a robust approach for identifying important locations, but conversely, might also present barriers for upscaling of the procedural aspects to achieve widespread protection (e.g., through the establishment of Regional Surfing Reserves). In comparison, Peru's Rompientes Law requires a much-reduced set of documentation requirements at the nomination stage, and these are streamlined towards mostly physical environment descriptors (Congress of the Republic of Peru 2013). This kind of law facilitates a relatively fast implementation process that can be readily upscaled. However, the nature of the assessment criteria against which nominations are approved (or otherwise) does not appear to have been publicly documented. The result is a relatively permissive approach with the potential to protect a large number of surf breaks. However, the process could attract opposition in situations where competing values are present, which are common in coastal planning (Olsen et al., 2014). These challenges are currently being addressed through NGO initiatives to raise public awareness around the need for surf break protection and merits of the Rompientes Law (see <https://www.hazlaportuola.pe/es>).

In the Australia and New Zealand examples, community engagement and awareness-raising aspects have been supported by transparent and proactive communication of the values and qualifying criteria upon which the argument for surf break protection hinges. It is likely, therefore, that the same principles could assist with implementation of the Rompientes Law as the focus turns to proposals for the protection of lesser-known surf breaks. New Zealand's NZCPS approach provides perhaps the best example of a progression of focus from protecting a core set of nationally significant surf breaks to lesser-known but nonetheless



**Fig. 4.** Surf breaks identified for protection by different means. (a) Raglan in New Zealand is one of 17 surf breaks of 'national significance' identified directly in statute during a government-led policy review. (b) Angourie in Australia is one of the 'national surfing reserves' identified through a non-governmental process that considers nominations from the community.

important surf breaks throughout the regions. This process has driven the evolution of qualifying criteria that have benefitted from a succession of implementation examples associated with statutory planning cycles in different geographies and communities. The most recent developments have incorporated highly participatory methodologies for gathering baseline information to inform significance assessments using multi-criteria assessment frameworks that encompass multiple values (Orchard et al., 2019). This approach is helping to justify the inclusion of a diverse range of surf break types in protection initiatives by addressing the relationship between surf resources and established policy objectives.

#### 4.3. *Comprehensiveness of legal protection*

Alongside the identification of surf breaks for protection, another set of distinguishing features relates to the comprehensiveness of protection arrangements. In Australia and New Zealand, for example, identification of additional surf breaks has become a key point of focus in considerations for protecting surf breaks other than those already recognised as national surfing reserves or surf breaks of national significance. This new battleground complements the task of protecting a 'national' set of renowned surf breaks and recognises that numerous locally-important breaks provide benefits to local communities (Orchard 2017a, 2017b). However, perspectives on the importance of surf breaks also vary across the community. This variance is influenced by the degree of familiarity and appreciation of the particular qualities of surf breaks (Lazarow 2007), and intersects with institutional arrangements (Ware 2017) and contemporary political will.

A lack of commitment to protecting surf breaks may promulgate the perception of their degradation being 'unavoidable' in certain contexts, such as where the community is faced with tough choices for climate change adaptation. These aspects were recently debated on the Gold Coast in Australia where mainstream media articles reported push-back against previous commitments to establish legal protection (ABC Gold Coast 2020). At the same time the Gold Coast provides one of the world's best examples of a nature-based solution to coastal protection that uses sand nourishment to reduce coastal erosion and simultaneously support the maintenance (and arguably, improvement) of beaches and wave quality aspects of the natural environment (City of Gold Coast 2016). In this case, deliberations on the needs and potential extent of legal protection occurred in the context of community consultation on a discussion paper that addressed options for establishing Queensland's World Surfing Reserves (Queensland Government 2020). Despite the results of those consultations identifying a considerable level of support for establishing greater protections (Queensland Government 2021) it is also important to recognise and help resolve the factors that contribute to opposition. Disputes like these exemplify the complexities of adapting to climate change and simultaneously dealing with an increasing coastal population while also protecting the environment. If successful, precedents from this Queensland example may also help to advance the apparent inertia surrounding legal protection elsewhere in the NSR programme despite its impressive achievements as a non-statutory initiative. For example, there is currently very little evidence (such as the content of relevant Plans of Management) to suggest that the Crown Reserves mechanism is being effectively applied to protect surf breaks as was signaled in earlier documentation (New South Wales Government 2008).

#### 4.4. *Limits of acceptable change in relation to surf resources*

In this section we highlight a topic that contributes to the comprehensiveness of protection and related decision-making and involves the opportunity to specify degrees of acceptable change within the design of protection mechanisms. These opportunities are relevant to all of the initiatives that trigger requirements for impact assessments with regards to development proposals, and include all of the national-scale legal

protection mechanisms developed to date. The NZCPS provides a clear example in which the minimum acceptable level of adverse impacts is effectively set to zero for surf breaks of 'national significance' through the use of strong policy terms (e.g., 'avoid') that convey a well-defined meaning. For locations where the required level of protection is not as stringent (e.g., in Policy 15 in relation to surf breaks as natural features), a more permissive threshold is set through the use of policy terms such 'avoid significant adverse effects'.

Conversely, this approach can be seen as a spectrum that enables varying degrees of degradation to occur in the course of decision-making, and as such exemplifies an application of the Limits of Acceptable Change principles (Stankey et al., 1985). At the time of writing there are no examples of these aspects having been the subject of a management effectiveness evaluation in which the consequences of these arrangements might be linked with actual outcomes. However the differential level of protection for various categories of surf breaks has attracted opposition from surf break protection interests (e.g., in submissions made by the Surfbreak Protection Society, see [www.surfbreak.org.nz](http://www.surfbreak.org.nz)). The extent to which these aspects could be incorporated or reflected in surf break protection arrangements under other jurisdictions is identified as a topic for consideration.

#### 4.5. *Addressing the sustainability of surf break use*

In much of the history of surf break protection, grass-roots community movements and NGOs have been the dominant force behind positive change towards the recognition of surf breaks as natural resources (Nelsen et al., 2013). Within this social context the direct users of surf breaks (hereafter referred to collectively as 'surfers') have been responsible for many of the key initiatives, and this is perhaps unsurprising given the strong connections to place that are typical of surfers (Anderson 2014; Reineman and Ardoin 2018) and other marine recreationalists (Brownlee et al., 2015). However, a further dimension concerns resource users who may engage in activities that are counterproductive, leading to the need to consider the sustainability of surfing and surf culture (Borne and Ponting 2019; Buckley 2002a, 2002b; Martin & Assenov 2014; Towner and Milne 2017). Important dimensions include the need to protect the ecological state and functioning of surf breaks as natural ecosystems, and the potentially negative effects of some user groups on others. Despite these tensions, only one of the legal protection mechanisms devotes specific attention to the potentially negative effects of one form of wave riding activity on another. Conceivably, these aspects might also be addressed through non-statutory measures, but nonetheless this example is insightful – at least as a consideration for the development of protection mechanisms that are specific to surf breaks. It is provided by the Waikato Navigation Safety Bylaw that defines various recreational activities, makes a distinction between powered and self-powered activities, and then sets explicit policy objectives to address them (Waikato Regional Council 2020).

Although this was the only legally-enforceable mechanism we found that specifically identifies and provides for the potentially negative effects of one recreational activity on another, we note that there may be other examples in grey literature (e.g., local council provisions) that weren't discovered in this review. In addition, an innovative related development has been established in Papua New Guinea with a focus on reducing overcrowding to improve the quality of surfing experiences, and promoting the sustainability of surf tourism by ensuring that visitation results in benefits for local communities. These arrangements have been promulgated through the creation of Surf Management Plans administered by the Surfing Association of Papua New Guinea in collaboration with tourism operators and local communities (O'Brien and Ponting 2013).

#### 4.6. Contributions of site-specific opportunities

If national-scale surf break legislation developments encounter pushback or other limitations in the scope of their protection, there may be important roles for site-specific protection mechanisms that can identify unique aspects and place-based opportunities. Examples of this kind of reformulation include the successes at Mundaka and Malibu where pre-existing legislation was interpreted and applied to establish new protections. In the case of Mundaka, the inclusion of the surf break within an existing Biosphere Reserve illustrates an opportunity to align a surf break protection need with biodiversity conservation initiatives in the context of a protected area. Globally, there is much potential to explore such synergies (Reineman et al., 2021; Scheske et al., 2019), although it should be recognised that surf breaks may require additional protections not necessarily included in existing protected area designations to be effective in addressing their specific values and associated drivers of degradation (Arroyo et al., 2019; Atkin et al., 2019; Orchard et al., 2019; Peryman and Orchard 2013). Therefore, a potential (as as-yet unexplored) strategic direction could involve opportunities to adapt existing biodiversity conservation arrangements to better accommodate the needs of the surf breaks. Such opportunities may include, for example, legislative reform processes or management plan review cycles. At Malibu, historic aspects of the surf breaks were identified as legally significant enough for its protection (Blum and Orbach 2021). Despite this approach being unlikely to protect all aspects of the surf resource, or being applicable to an appreciable number of surf breaks, it does illustrate an opportunistic strategy to work within the scope of existing legislation to secure a degree of protection that may not otherwise be provided for.

#### 4.7. Enduring roles for legal protection approaches

From a theoretical perspective, legal protection mechanisms typically evolve in a backward looking fashion, evolving to address issues only after great environmental damage has occurred, which drives political will to respond (Cassotta 2021). Previously overlooked issues, such as avoidable degradation, may come into clearer focus with the benefit of hindsight, improved information, or both. Pressures associated with rising sea-levels and continued population growth (Cazenave and Cozannet 2014), suggest a continuing need and enduring role for the legal protection of vulnerable coastal resources such as surf breaks. As a management tool, a legal basis can help to resolve pressures and demands by setting out resource use expectations or providing a platform for their full consideration (Romanin Jacur et al., 2015). Statutory law has the advantage of putting the public on notice regarding how society has chosen to protect natural resources and other public spaces from development and ecological harm. Judge-made case law, as in a common law legal system, maintains potentially more flexibility for that legal system to treat future cases or controversies differently, based on distinguishable respective facts in those subsequent cases. Each of these legal avenues contribute to the contemporary management context but can also inform future cycles of policy development or legislative reform for the management of surf breaks (Skellern et al., 2013).

#### 5. Conclusions

Legal protection is a powerful and necessary tool to protect surf resources. This global review has shown that there are marked differences in the approaches that have emerged to date, and these differences involve key aspects including the rationale and procedure for inclusion, extent of protection afforded, and extent to which non-governmental organisations are involved either directly or indirectly in crucial support and implementation roles. Differences between the approaches are also opportunities for cross-pollination and the building of an associated body of knowledge. The advantageous components identified here may be adopted and combined in future legislative reform or applications

with a view to applying the learning available from current examples in future developments to come. Surf break protection will be generally assisted by the monitoring and evaluation of outcomes which, in turn, will facilitate objective comparisons between the legal protection mechanisms that have been established to date. Through a process of continued innovation and learning from a variety of geographies and management contexts there is great potential for further progress towards comprehensive and legally enforceable approaches for protecting the world's surf breaks.

#### Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### Data availability

Data will be made available on request.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ocecoaman.2023.106573>.

#### References

- Gold Coast Council warns of legislation 'sneaking in' to protect Gold Coast World Surfing Reserve, 2020. <https://www.abc.net.au/news/2020-10-29/sneak-in-legislation-to-protect-world-surfing-reserve/12821494>.
- Aguilar Espinoza, W.A., Ochoa Quispe, D.M., Villanueva Salas, E.E., 2018. Dream waves Perú: Laguna de olas artificiales para la práctica del surf. Unpublished Masters thesis. Universidad Peruana de Ciencias Aplicadas (UPC), Lima, Perú.
- Anderson, J., 2014. Surfing between the local and the global: identifying spatial divisions in surfing practice. *Trans. Inst. Br. Geogr.* 39 (2), 237–249. <https://doi.org/10.1111/tran.12018>.
- Arica Surf Association, 2018. Proyecto de Ley de Protección de Rompientes Chile. In: Bill Presented by Senator José Miguel Durana. Retrieved from. <https://leyderompientes.cl/>.
- Arroyo, M., Levine, A., Espejel, I., 2019. A transdisciplinary framework proposal for surf break conservation and management: bahía de Todos Santos World Surfing Reserve. *Ocean Coast Manag.* 168, 197–211. <https://doi.org/10.1016/j.ocecoaman.2018.10.022>.
- Arroyo, M., Levine, A., Brenner, L., Seingier, G., Leyva, C., Espejel, I., 2020. Indicators to measure pressure, state, impact and responses of surf breaks: the case of Bahía de Todos Santos World Surfing Reserve. *Ocean Coast Manag.* 194, 105252 <https://doi.org/10.1016/j.ocecoaman.2020.105252>.
- Atkin, E., Mead, S., 2017. Surf Breaks of Regional Significance in the Waikato Region. Report prepared for Waikato Regional Council, p. 64pp.
- Atkin, E., Bryan, K., Hume, T., Mead, S.T., Waiti, J., 2019. *Management guidelines for surfing resources*. Raglan, Aotearoa New Zealand. Aotearoa New Zealand Association for Surfing Research, p. 118pp.
- Atkin, E.A., Greer, D., 2019. A comparison of methods for defining a surf break's swell corridor. *J. Coast Res.* 87, 70–77. <https://doi.org/10.2112/SI87-007.1>.
- Ball, S., 2015. The green room: a surfing-conscious approach to coastal and marine management. *UCLA J. Environ. Law Policy* 33 (2), 366.
- Barros, M., Buttazzoni, J., Rodríguez, F., Rodrigo, F., 2021a. Marco Institucional y Competencias Borde Costero en Chile. In: Report Prepared for Fundación Rompientes, p. 46.
- Barros, M., Buttazzoni, J., Rodríguez, F., Rodrigo, F., 2021b. Informe de Observaciones al Proyecto de Ley de Protección de Rompientes. In: Report Prepared for Fundación Rompientes, p. 34.
- Baxter, K., 2018. The approaches to classifying surf breaks in New Zealand. Unpublished Masters thesis, Lincoln University, p. 46pp.
- Blum, M.L., 2015. Protecting surf breaks and surfing areas in California. In: Unpublished Masters Thesis. Duke University, Durham, North Carolina. Retrieved from. <https://hdl.handle.net/10161/9592>.
- Blum, M.L., Orbach, M.K., 2021. First steps at first point: protecting California surf breaks and the Malibu historic district. *Coast. Manag.* 49 (2), 201–214. <https://doi.org/10.1080/08920753.2021.1875392>.
- Borne, G., Ponting, J., 2019. In: Borne, G., Ponting, J. (Eds.), *Sustainable Surfing*. Routledge.
- Boyatzis, R.E., 1998. *Transforming qualitative information: Thematic analysis and code development*. Case Western Reserve University, USA: SAGE, p. 204pp.
- Brownlee, M.T.J., Hallo, J.C., Jodice, L.W., Moore, D.D., Powell, R.B., Wright, B.A., 2015. Place attachment and marine recreationists' attitudes toward offshore wind energy development. *J. Leisure Res.* 47 (2), 263–284.

- Buckley, R., 2002a. Surf tourism and sustainable development in indo-pacific islands. I. The industry and the islands. *J. Sustain. Tourism* 10 (5), 405–424. <https://doi.org/10.1080/09669580208667176>.
- Buckley, R., 2002b. Surf tourism and sustainable development in indo-pacific islands. II. Recreational capacity management and case study. *J. Sustain. Tourism* 10 (5), 425–442. <https://doi.org/10.1080/09669580208667177>.
- Buckley, R.C., Guitart, D., Shakeela, A., 2017. Contested surf tourism resources in the Maldives. *Ann. Tourism Res.* 64, 185–199. <https://doi.org/10.1016/j.annals.2017.03.005>.
- Butt, T., 2010. The WAR Report. Waves Are Resources. Report prepared for Surfers Against Sewage, Cornwall, UK, p. 47pp.
- Butt, T., 2011. Sustainable Guide to Surfing. Surfers Against Sewerage, U.K., p. 74pp.
- Cabrera, G., Abessa, D., 2020. A rapid protocol for the preliminary selection of sites with potential to be surfing reserves through self-diagnosis. *Revista Costas* 2 (2), 149–168. <https://doi.org/10.26359/costas.1402>.
- Cassotta, S., 2021. The development of Environmental Law within a changing environmental governance context: towards a new paradigm shift in the anthropocene era. *Yearbook of International Environmental Law* 30 (1), 54–67. <https://doi.org/10.1093/yiel/yvaa071>.
- Cazenave, A., Cozannet, G.L., 2014. Sea level rise and its coastal impacts. *Earth's Future* 2 (2), 15–34. <https://doi.org/10.1002/2013EF000188>.
- City of Gold Coast, 2016. *Gold Coast Surf Management Plan*. Gold Coast: City of Gold Coast. 53pp.
- Congress of the Republic of Peru, 2000. *Ley de Preservación de las Rompientes apropiadas para la Práctica Deportiva*. Ley No. 27280. Congress of the Republic of Peru. Retrieved from: <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC129914/>.
- Congress of the Republic of Peru, 2013. *Reglamento de la Ley No. 27280, Ley de Preservación de las Rompientes apropiadas para la Práctica Deportiva*. Decreto Supremo No. 015-2013-DE. Congress of the Republic of Peru. Retrieved from: <https://www.fao.org/faolex/results/details/en/c/LEX-FAOC129915/>.
- Coombes, K., Scarfe, B., 2010. Draft Auckland Regional Policy Statement Background Report – Surf Breaks. Report prepared for Auckland Regional Council. March 2010. 37pp.
- da Silva, S.T., Santos, M.D.d., Dutra, C., 2016. Reservas de surfe e a proteção da sociobiodiversidade. *NOMOS - Revista do Programa de Pós-Graduação em Direito da Universidade Federal do Ceará, Fortaleza* 36 (2), 345–367.
- Eberlein, J., 2011. The scarcity and vulnerability of surfing resources. An analysis of the value of surfing from a social economic perspective in Matosinhos, Portugal. Unpublished Masters thesis, University of Akureyri, Ísafjörður, Iceland, p. 121pp.
- Edwards, A., Stephenson, W., 2013. Assessing the potential for surf break co-management: evidence from New Zealand. *Coast. Manag.* 41 (6), 537–560. <https://doi.org/10.1080/08920753.2013.842681>.
- Edwards, A.M., 2013. Surf break co-management: Options for the protection and enhancement of surf Breaks in New Zealand. Unpublished Masters Thesis, University of Otago. Retrieved from: <http://hdl.handle.net/10523/3735>.
- Farmer, B., Short, A.D., 2007. Australian National Surfing Reserves – rationale and process for recognizing iconic surfing locations. *J. Coastal Res.*, SI 50, 99–103.
- Fitzgerald, B.F., Clarke, G., 2001. Law of the Surf Forum Number 1, 5. *Southern Cross University Law Review*, pp. 228–261.
- González, D.S., Carillo, J.M.M., 2020. Es necesario regular la práctica de surf durante el verano? Would it be necessary to regulate beaches with surfing zones during summer? *BARATARIA. Revista Castellano-Manchega de Ciencias Sociales* 28, 93–111.
- Hawai'i Revised Statutes, 2009-2021. §205A-2 - coastal zone management program; objectives and policies. Hawai'i State Legislature: Hawai'i Revised Statutes.
- Hume, T.M., Mulcahy, N., Mead, S.T., 2019. An overview of changing usage and management issues in New Zealand's surf zone environment. *J. Coast Res.* 1–12.
- Knaap, C., Vanneste, D., 2021. Issues of conflict management in a context of increasing surf tourism. *J. Tourism Hospit. Manag.* 9 (2), 65–82. <https://doi.org/10.17265/2328-2169/2021.02.001>.
- Lazarow, N., 2007. Value of coastal recreational resources: a case study approach to examine the value of recreational surfing to specific locales. *J. Coast Res.* SI50, 12–20.
- Lazarow, N., Miller, M.L., Blackwell, B., 2009. The value of recreational surfing to society. *Tourism Mar. Environ.* 5 (2), 145–158. <https://doi.org/10.3727/154427308787716749>.
- Llantada, I.R., Serafini, T.Z., 2021. Use of socioenvironmental criteria to assess the certification potential of a surfing reserve in southern Brazil. *Revista Costas* 2, 333–356. <https://doi.org/10.26359/costas.e1621>.
- Londoño, C., 2020. The Legal Regime of Natural Sports Facilities within the Maritime-Terrestrial Public Domain: Special Attention to Surfing. Unpublished Masters thesis, University of Cantabria, 12200. Retrieved from: <http://hdl.handle.net/10902/18212>.
- Mach, J., Ponting, J., 2017. A nested socio-ecological systems approach to understanding the implications of changing surf-reef governance regimes in Fiji. In: Turner, D., Carnicelli, S. (Eds.), *Lifestyle Sports and Public Policy*. Routledge, London, p. 20.
- Machado, V., Carrasco, P., Contreiras, J.P., Duarte, A.P., Gouveia, D., 2018. Governing locally for sustainability: public and private organizations' perspective in surf tourism at Aljezur, Costa Vicentina, Portugal. *Tour. Plan. Develop.* 15 (6), 692–704. <https://doi.org/10.1080/21568316.2017.1415958>.
- Martin, S.A., Assenov, I., 2014. Developing a Surf Resource Sustainability Index as a global model for surf beach conservation and tourism research. *Asia Pac. J. Tourism Res.* 19 (7), 760–792. <https://doi.org/10.1080/10941665.2013.806942>.
- McLaughlin, N.A., 2007. Conservation easements: perpetuity and beyond. *Ecol. Law Q.* 3 (42), 673–712.
- Mead, S., 2001. Incorporating high-quality surfing breaks into multi-purpose reefs. In: PhD Thesis. University of Waikato, Hamilton, New Zealand, p. 213pp.
- Mead, S.T., Atkin, E.A., 2019. Managing issues at Aotearoa New Zealand's surf breaks. *J. Coast Res.* 87 (SI), 13–22. <https://doi.org/10.2112/si87-002.1>.
- Mixon, F.G.J., 2014. Bad vibrations: new evidence on commons quality and localism at California's surf breaks. *Int. Rev. Econ.: Rivista Internazionale di Scienze* 61 (4), 379–397. <https://doi.org/10.1007/s12232-014-0205-9>.
- Monteferrri, B., 2013. *A summary to understand the Regulation of the Rompientes Law and its implications*. Conservamos por Natureza. Available at: <https://www.facebook.com/conservamospornatureza/>.
- Monteferrri, B., Scheske, C., Muller, M.R., 2019. The legal protection of surf breaks: an option for conservation and development. In: Muller, M.R., Oyanedel, R., Monteferrri, B. (Eds.), *Marine and Fisheries Policies in Latin America: A Comparison of Selected Countries*. Routledge, p. 14.
- Nazer, D., 2004. The tragicomedy of the surfers' commons. *Deakin Law Rev.* 9 (2), 655–713. <https://doi.org/10.21153/dlr2004vol9no2art259>.
- Nelsen, C., Cummins, A., Tagholm, H., 2013. Paradise lost: threatened waves and the need for global surf protection. *J. Coast Res.* 65 (1), 904–908.
- New South Wales Government, 2008. National Surfing Reserves. NSW Department of Lands. Retrieved from: <https://www.yumpu.com/en/document/view/32326450/national-surfing-reserves-land-nsw-government>.
- Ng, K., Thomas, T., Phillips, M.R., Calado, H., Borges, P., Veloso-Gomes, F., 2015. Multifunctional artificial reefs for small islands: an evaluation of amenity and opportunity for São Miguel Island, the Azores. *Prog. Phys. Geogr.* 39 (2), 220–257. <https://doi.org/10.1177/0309133314567581>.
- Northland Regional Council, 2017a. Methodology – Identifying Regionally Significant Surf Breaks in Northland. Northland Regional Council, p. 14pp.
- Northland Regional Council, 2017b. Application of Methodology. Identifying Regionally Significant Surf Breaks in Northland. Northland Regional Council, p. 12pp.
- O'Brien, D., Ponting, J., 2013. Sustainable surf tourism: a community centered approach in Papua New Guinea. *J. Sport Manag.* 27 (2), 158–172.
- Olsen, E., Fluharty, D., Hoel, A.H., Hostens, K., Maes, F., Pecceu, E., 2014. Integration at the round table: Marine spatial planning in multi-stakeholder settings. *PLoS One* 9 (10), e109964. <https://doi.org/10.1371/journal.pone.0109964>.
- Oram, W., Valverde, C., 1994. Legal protection of surf breaks: putting the brakes on destruction of surf. *Stanford Environ. Law J.* 13 (2), 401–448.
- Orchard, S., 2011. Implications of the New Zealand Coastal Policy Statement 2010 for New Zealand Communities. Report prepared for Environment and Conservation Organisations of New Zealand, Wellington, p. 46pp.
- Orchard, S., 2017a. Lessons for the design of surf resource protection – the Australasian experience. *Ocean Coast Manag.* 148, 104–112. <https://doi.org/10.1016/j.ocecoaman.2017.07.019>.
- Orchard, S., 2017b. Regional Significance Criteria for the Assessment of Surf Breaks. Report Prepared for Taranaki Regional Council. 27pp.
- Orchard, S., Atkin, E.A., Mead, S.T., 2019. Development of the regional significance concept for surf break management in Aotearoa New Zealand. *J. Coast Res.* 87 (sp1), 23. <https://doi.org/10.2112/SI87-003.1>.
- Orchard, S., 2020. Legal protection of New Zealand's surf breaks: top-down and bottom-up aspects of a natural resource challenge. *Australas. J. Environ. Manag.* 27 (1), 6–21. <https://doi.org/10.1080/14486563.2020.1719439>.
- Peryman, B., 2011a. Surf Break Identification and Protection in the Gisborne District. Report prepared for Gisborne District Council. June 2011. 63pp.
- Peryman, B., 2011b. Bay of Plenty Surf Break Study. Report prepared for Bay of Plenty Regional Council, p. 105pp. April 2011.
- Peryman, B., 2011c. Identification of surf breaks of national significance. *Lincoln Plan. Rev.* 3 (1), 15–20.
- Peryman, B., Skellern, M., 2011. Planning tools for surf breaks. *Coastal News* 46, 1–3.
- Peryman, B., Orchard, S., 2013. Understanding the values associated with New Zealand surf breaks and implications for management. *Lincoln Plan. Rev.* 4 (2), 8–18.
- Ponting, J., O'Brien, D., 2014. Liberalizing Nirvana: an analysis of the consequences of common pool resource deregulation for the sustainability of Fiji's surf tourism industry. *J. Sustain. Tourism* 22 (3), 384–402. <https://doi.org/10.1080/09669582.2013.819879>.
- Ponting, J., O'Brien, D., 2015. Regulating "Nirvana": sustainable surf tourism in a climate of increasing regulation. *Sport Manag. Rev.* 18 (1), 99.
- Protections for World Surfing Reserves in Queensland: Discussion Paper. Sport and Recreation, Department of Housing and Public Works, 2020, p. 23. Available from: [https://www.dtis.qld.gov.au/\\_data/assets/pdf\\_file/0011/1538750/surfing-discussion-paper.pdf](https://www.dtis.qld.gov.au/_data/assets/pdf_file/0011/1538750/surfing-discussion-paper.pdf).
- Queensland Government, 2021. Protections for world surfing reserves in Queensland: community consultation snapshot of results. Available from: [https://www.dtis.qld.gov.au/\\_data/assets/pdf\\_file/0011/1552826/world-surfing-snapshot.pdf](https://www.dtis.qld.gov.au/_data/assets/pdf_file/0011/1552826/world-surfing-snapshot.pdf).
- Reiblich, J., 2013. Greening the Tube: paddling toward comprehensive surf break protection. *Enviro: Environ. Law Pol. J.* 37, 45–71.
- Reiblich, J., Reineman, D., 2018. Rhino chasers and rifles: surfing under the public trust doctrine. *J. Land Use Environ. Law* 34 (1), 35–91.
- Reineman, D.R., Ardoin, N.M., 2018. Sustainable tourism and the management of nearshore coastal places: place attachment and disruption to surf-spots. *J. Sustain. Tourism* 26 (2), 325–340. <https://doi.org/10.1080/09669582.2017.1352590>.
- Reineman, D.R., Koenig, K., Strong-Cvetich, N., Kittinger, J.N., 2021. Conservation opportunities arise from the co-occurrence of surfing and Key Biodiversity Areas. *Front. Mar. Sci.* 8 <https://doi.org/10.3389/fmars.2021.663460>.
- Rennie, H., 2018. The seduction of fast track recovery legislation - the Mangamaunu surf break saga. *Plann. Q.* 211, 21–27.
- Rennie, H.G., Orchard, S., Peryman, B., 2014. Applying an effects-based approach to the sustainable management of surf breaks. *Plann. Q.* 193, 11–13.

- Rode, M., 2022. The institutional foundations of surf break governance in Atlantic Europe. *Publ. Choice* 190 (1), 175–204. <https://doi.org/10.1007/s11127-021-00929-3>.
- Rodríguez, A.M., 2020. Organization and legal protection of maritime natural spaces: special reference to sports uses in surf zones. Unpublished Masters thesis, University of La Laguna, San Cristóbal de La Laguna, Spain. 53pp. <http://riull.uil.es/xmlui/handle/915/21584>.
- Romanin Jacur, F., Bonfanti, A., Seatzu, F., 2015. Natural resources grabbing: An international law perspective. Brill | Nijhoff.
- Salamone, K.E., 2017. Surfing towards marine conservation? An examination of World Surfing Reserves as marine conservation practice. Unpublished Masters thesis, San Diego State University. Retrieved from. <https://www.proquest.com/openview/d23e da6a1a3ff89442ba457033121f2c/1?pq-origsite=gscholar&cbl=18750>.
- Santos, M.D.d., 2018. *Reservas de surfe: uma análise jurídica da governança do espaço marinho-costeiro*. Reservas de surfe: uma análise jurídica da governança do espaço marinho-costeiro. 2018, p. 179 f. Tese (Direito Político e Econômico) - Universidade Presbiteriana Mackenzie, São Paulo. Available at. <https://dspace.mackenzie.br/handle/10899/23134>.
- Santos, M.D.d., 2020. Uso recreativo na estratégia de gestão do sistema costeiro-marinho: o exemplo da proteção dos surf breaks. In: Frota (Ed.), Oliveira, Carina Costa de; Barros-Platiau, Ana Flávia; Galindo, George Rodrigo Bandeira; Tele da Silva, Solange; Montalverne, Tarin Cristino, Meio ambiente marinho, sustentabilidade e direito, 2. Lumen Juris, Rio de Janeiro, pp. p47–p75, 1. <https://sites.google.com/ccom.unb.br/ndsr-germ/publications/direito-do-mar-e-sustentabilidade-law-of-the-sea-and-sustainability>, 2020.
- Scarfe, B.E., Healy, T.R., Rennie, H.G., Mead, S.T., 2009. Sustainable management of surfing breaks: case studies and recommendations. *J. Coast Res.* 25 (3), 684–703. <https://doi.org/10.2112/08-0999.1>.
- Scheske, C., Arroyo Rodríguez, M., Buttazzoni, J.E., Strong-Cvetich, N., Gelcich, S., Monteferrri, B., Ruiz, M., 2019. Surfing and marine conservation: exploring surf-break protection as IUCN protected area categories and other effective area-based conservation measures. *Aquat. Conserv.* 29 (S2), 195–211. <https://doi.org/10.1002/aqc.3054>.
- Sherow, B., 2011. Surf break protection: Planning implications of the NZCPS and the need for a collaborative approach. Unpublished Masters thesis, University of Illinois. Retrieved from. <http://hdl.handle.net/2142/55815>.
- Short, A.D., Farmer, B., 2012. Surfing Reserves – recognition for the world’s surfing breaks. *Reef J.* 2 (1–14).
- Skellern, M., Rennie, H.G., Davis, M., 2009. Working towards the protection of surf breaks. *Plann. Q.* 2009, 12–15. March.
- Skellern, M., Peryman, B., Orchard, S., Rennie, H., 2013. Planning approaches for the management of surf breaks in New Zealand. In: Report Prepared for Auckland Council, Bay of Plenty Regional Council and Surfbreak Protection Society, p. 98pp. December 2013.
- Stankey, G.H., Cole, D.N., Lucas, R.C., Petersen, M.E., Frissell, S.S., 1985. The Limits of Acceptable Change (LAC) system for wilderness planning. Gen. Tech. Rep. INT-176. U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station, Ogden, UT, p. 37pp.
- Surfbeats, 2020. Piedra Del Viento de Topocalma is the new nature sanctuary in O’Higgins. <https://surfbeatsradio.com/piedra-del-viento-de-topocalma-es-el-nuevo-santuario-de-la-naturaleza-en-ohiggins/>.
- Guidance on Environmental Impact Assessment of offshore renewable energy development on surfing resources and recreation, 2009. Surfers Against Sewerage, Cornwall, UK, p. 63pp.
- Towner, N., 2016. How to manage the perfect wave: surfing tourism management in the Mentawai Islands, Indonesia. *Ocean Coast Manag.* 119, 217–226. <https://doi.org/10.1016/j.ocecoaman.2015.10.016>.
- Towner, N., Milne, S., 2017. Sustainable surfing tourism development in the Mentawai Islands, Indonesia: local stakeholder perspectives. *Tour. Plan. Develop.* 14 (4), 503–524. <https://doi.org/10.1080/21568316.2017.1287122>.
- Trueba, J.J.G., Rodrigo, A.L., 2021. La ordenación y gestión de las instalaciones deportivas naturales en el medio acuático. Especial referencia al surfing. Available from. [https://www.academia.edu/49455869/LA\\_ORDENACION\\_Y\\_GESTION\\_DE\\_LAS\\_INSTALACIONES\\_DEPORTIVAS\\_NATURALES\\_EN\\_EL\\_MEDIO\\_ACUATICO\\_ESPECIAL\\_REFERENCIA\\_AL\\_SURFING](https://www.academia.edu/49455869/LA_ORDENACION_Y_GESTION_DE_LAS_INSTALACIONES_DEPORTIVAS_NATURALES_EN_EL_MEDIO_ACUATICO_ESPECIAL_REFERENCIA_AL_SURFING).
- United States Code, 2016. National Historic Preservation Act. 54 U.S.C. § 300101 et seq.
- Waikato Regional Council, 2020. Waikato Regional Council Navigation Safety Bylaw 2013. Revised Edition 2020. Waikato Regional Council, Hamilton, NZ. 80pp.
- Waitt, G., 2008. Killing waves: surfing, space and gender. *Soc. Cult. Geogr.* 9 (1), 75–94. <https://doi.org/10.1080/14649360701789600>.
- Walker, J.R., 1974. Recreational surfing parameters. Department of Ocean Engineering, University of Hawaii, Honolulu, Hawaii, p. 311pp. LOOK Laboratory Technical Report 30.
- Ware, D., 2017. Sustainable resolution of conflicts over coastal values: a case study of the Gold Coast Surf Management Plan. *Australian J. Maritime Ocean Affairs* 9 (2), 68–80. <https://doi.org/10.1080/18366503.2017.1278501>.
- Ware, D., Lazarow, N., Hales, R., 2017. Surfing voices in coastal management: Gold coast surf management plan – a case study. In: Borne, G., Ponting, J. (Eds.), *Sustainable Surfing*. Routledge, p. 18.
- Young, N., 2000. *Surf Rage*. Angourie. Nymboida Press, N.S.W.