# A two way process – Social capacity as a driver and outcome of equitable marine spatial planning

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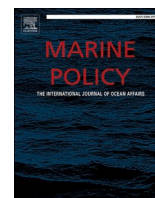
# A two way process – Social capacity as a driver and outcome of equitable marine spatial planning

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ABSTRACT

Although stakeholder engagement is one of the founding principles of marine spatial planning (MSP), meaningful representation of people and their connections to marine resources within marine governance is still lacking. A broad understanding of how concepts surrounding social capital and capacity is translated into MSP practice is missing. With this article, we describe detailed case studies in the United Kingdom, Brazil and South Africa to build a better understanding of the ways in which MSP and other ocean governance initiatives operationalise the concepts of social capital and capacity. Drawing on insights from the cases, we call for a rethinking of capacitation as a two-way process. In particular, trust-building, social learning and efforts to build social capacity should be elaborated without imposing a hierarchy between people 'who know' and people 'who don't'. Innovative approaches to relationship building, knowledge development, and collaboration highlighted in the case studies highlight ways to build social capacity both among stakeholders and planners, as is necessary for more equitable and sustainable MSP development and implementation.

## 1. Introduction

### 1.1. MSP and social sustainability

Marine spatial planning (MSP) is an approach to ocean and coastal governance that includes public processes to achieve multiple objectives through the temporal and spatial organisation of a diverse range of activities in marine areas. These objectives include the conservation of biodiversity; the sustainable use of resources and space that supports the ongoing health and resilience of marine ecosystems; and the equitable sharing of benefits arising from the utilisation of marine natural resources [1–6]. Katona et al. [7] summarise MSP as "ecosystem-based management at sea" [6], a comprehensive practice whereby people and

the environment are both managed as a social-ecological system. A foundational question for MSP is therefore how to ensure that the many connections between people and the sea are integrated into, enhanced, and equitably managed by the process [8].

Social sustainability is one of the three pillars essential to sustainable development through MSP [9–11], and is defined by Saunders et al. [12] as.

*"the recognitional, representational and distributive justice, which when broken down covers unarticulated concerns relating to culture, identity, gender, status, rights, lifestyles, wellbeing, ways of knowing, timely and effective participation, and the equitable distribution of access, risks, benefits, and capacities".*

In MSP documentation e.g. [13], social sustainability is predominantly addressed through stakeholder engagement (where stakeholders refer to any individual, group, organisation or even environments that are or will be affected, involved or interested in MSP [14,15]. However, traditional forms of stakeholder consultation within MSP are criticised for perpetuating historic inequities and power dynamics leading to ongoing exclusion of marginalised groups [16]. We argue that social capital at all levels is required to ensure equitable and robust MSP.

### 1.2. Defining social capital

The demands of promoting and leveraging social capital go beyond the effective participation widely noted as essential for MSP [9]. Social capital is considered as the outcome of relationships between actors and the development of networks that increase capacity for the exchange of knowledge and trust building [17,18]. Social capital can promote 'meaningful' stakeholder participation, providing the 'means' of sustainable MSP processes [9,19] alongside social learning [20], social cohesion [11] and "*opportunities for authentic dialogue*" [9]. As highlighted elsewhere e.g. [21,22] strategies that are tailored to build and leverage the various forms of social capital are important for socially sustainable MSP.

MSP is commonly led by governments seeking to engage a diverse array of stakeholders and entails negotiation across a vertical hierarchy of power that shapes public participation and the influence of various actors [23]. It is thus crucial to understand "*the ways in which ideologies, beliefs and norms shape the very nature of decision-making*" to investigate if power relationships are maintained in MSP [24]. Interpersonal trust is particularly important for building social capacity; relationships between individuals can support an acceptance of vulnerability which enables an 'openness' to sharing and receiving knowledge [25]. Accordingly, trust-building, learning and effective communication have been found to be important for addressing power hierarchies in MSP that can lead to the exclusion and marginalisation of stakeholder groups in favour of powerful interests [16,26]. As highlighted by Bakker et al. [21] in their analysis of how fishing communities mobilise social capital within MSP in Scotland, social capital allows a "*community to strategically position itself in 'arenas' of interest, to develop its assets-base and to strengthen its power position*". Each arena of interest or social network possesses its own set of rules, ideas and practices [21,27] and it is negotiation within and outside of these groups that influences social capital and the ability to influence governance. These processes of negotiation and learning are integral to the meaningful participation necessary for MSP to support the development of social capital, that in turn can influence the nature of engagement and the ability for stakeholder groups to be heard [17,25,28–31].

### 1.3. Knowledge gaps

The integration of social dimensions of sustainability into MSP is a key deficiency of current practice [32]. Identified reasons for this failure include inadequate consideration of power hierarchies that affect both recognition and representation of marginalised groups [16,33,34], the privileging of sectoral science and technical input [4,9], and the poor characterisation (and integration) of the distribution of costs and benefits of marine resources and space [11,12,35,36]. In a review of academic analyses engaging with the social dimensions of MSP, Gilek et al., [37] demonstrate that issues of participation and engagement, equity and social justice, and socio-cultural values and preferences take precedence over those of social capital which are very rarely considered.

Academics and practitioners alike still have much to learn about how social capital is operationalised in MSP practice. As the need for "*active (and influential) inclusion of actors*" [11] is increasingly recognised in academic literature, Grimmel et al., [32] and others, call for a focus on the practical (and local) application of approaches to address this 'social gap'. While the academic gaze has considered social capital and social capacity building, enquiry has largely been confined to developing an understanding of the conditions needed for its development (e.g. [10]) and that of institutional integration [38,39] and fall short of considering the practical application of the concept.

MSP documentation provides interesting insight into how social capital is translated into practice. While the majority of plans include goals, objectives, principles or other guiding statements related to stakeholder participation, fewer directly refer to opportunities to foster learning, the imperative of building trust among stakeholders and between stakeholders and planners, or the importance of social capital to support MSP [11]. Furthermore, few plans provide detail on the evaluation of social capital or social capacity. Marine spatial plans that do engage with these concepts do so in a variety of ways. The Marine Spatial Plan for Washington's Pacific Coast (USA) mentions learning exchange workshops as part of their strategy to provide information about MSP throughout the planning process [40]. The recently adopted American Samoa Ocean Plan documents planners' strategy to identify "*trusted and familiar intermediaries to get reluctant stakeholders to participate*" [41]. The United Kingdom (UK) East Inshore and Offshore Plans include reference to a potential initiative focused on "*investment in rural amenities and services to build social capital*" as a way to implement the stated policy of providing health and social well-being benefits [42]. Goal 4 of the New York Ocean Action Plan 2017–2027 reads "*Empower the public to actively participate in decision-making and ocean stewardship*" [43]. To achieve this goal, the MSP outlines multiple actions, including a plan to develop a state-wide campaign to increase ocean literacy, perhaps indicating aims to build stakeholder capacity for meaningful participation. In Australia, MSP approaches such as the New South Wales Marine Estate have attempted to explicitly include social values in defining decision making principles [44]. The New South Wales Marine Estate focused on the requirement for management to focus on risk-based assessment of threats, assessment of the social, cultural, and economic benefits and a focus on community engagement, values, well-being and outcome for current and future generations [45,46]. While challenges remain, such as the integration of Indigenous rights, the principles and processes used to underpin early management advice and recommendations of the marine estate have become recognised as the initiatives and actions necessary to deliver improved, evidence-based management [44,46]. These examples indicate that social capital is recognised by some actors developing marine spatial plans, but also highlight the absence of explicit consideration of how the networks of relationships that form social capital [47] can be practically supported and operationalised.

With this paper, we expand on the existing literature that considers the importance of social capital and social capacity for MSP by analysing how the concept is translated into practice. We provide detailed descriptions of three case studies that demonstrate ways in which MSP and governance initiatives have operationalised the concepts of social capital and capacity. The case studies represent various scales of marine resource use across very different contexts and illustrate how intentions for social capacity building are set at a policy level and how those intentions play out. Through the case studies, we explore the range of activities that can engender social capacity in MSP and highlight what is needed to ensure that social capital contributes to wider aims of social sustainability. We then identify ways in which existing and future governance strategies for marine areas can employ these concepts in support of the effective and fair public participation that is an essential feature of equitable ocean management and sustainable MSP.

## 2. Methodological approach

We examine three examples of marine planning: Plymouth National Marine Park, the UK's first National Marine Park where Plymouth city council through this status seeks to harmonise competing aims for the area; the Pirajubaé Marine Extractive Reserve (PMER) in Brazil which has led to conflict between users; and, the development of a marine

research Community of Practice-led MSP process seeking to influence future spatial planning development in Algoa Bay, South Africa. These case studies have been selected with respect to their diversity in the example presented, both in terms of spatial scale, geography and governance strategy. Given the multi-objective nature of each case, we consider them all to be forms of MSP, and therefore useful to our endeavour of understanding the ways in which social capital influences and is influenced by MSP. The development of each case study was led by a local author and is based on literature review of both grey and academic material.

These case studies have been analysed through the lens of social capital applying the typology developed by Putnam [48] and amended by Rydin and Holman [47]. This typology comprises three forms-bonding, bridging, and linking that classify the groups between which relationships are made. Bonding capital considers the connections within a community or stakeholder group and concentrates on common values and norms. Bridging capital considers connections between groups, focusing on the creation of networks, and linking capital refers to vertical connections between networks at different hierarchical levels such as government and local communities or user groups [25,47,49, 50]. Bonding, bridging and linking are identified as important for relationships within, between and beyond networks (or communities) and can serve to build social capital to allow stakeholders to come together in a shared social capacity to effect change [21,49–51]. Bracing capital, a fourth form of social capital introduced by Rydin and Holman [47], "*strengthens links across and between scales and sectors but only operates within a limited set of actors*". This form may be particularly relevant in the context of MSP as it promotes common values and norms among those linked together, potentially leading to a more strategic vision for a planning effort. A positive manifestation of bracing capital recognises the diversity of norms, values and practices of the different groups of people while enabling a compromise to be found through fair negotiation between these groups. Bracing capital that only promotes the views of powerful groups of people can be regarded as a dark side of social capital. Fig. 1.

Social capital is thought to be established via shared experiences and repeated interactions [28] and the power it lends may not always be in support of a policy intervention. Bonding capital within a group has been shown to have the potential to create resistance to change and promote isolation and marginalisation of minorities within the group; this is referred to by Beall [52] as 'anti-social' capital [47,53]. Whilst this resistance may in some cases be necessary, for example where MSP adversely impacts a group's rights or access to a resource. However, it can also prevent the development of barriers to increasing influence through developing bridging and linking capitals. The potential for negative consequences arising from social capacity building highlights how strategies to promote its development for equitable marine governance require careful design to ensure that it opens the potential for inclusion and participation.

The MSP literature and direct guidance for the design, development and implementation of MSP would benefit from consideration of social capital and capacity building for effective participation and for successful and fair planning processes [37]. To understand how the aims of capacity building for the purpose of participation in MSP are being operationalised we consider the five dimensions of social capital as presented by Rydin and Holman [47] – the definition of boundaries, the role of place and territory, the scale at which social capital is operating, the nature of the linkages and, the types of actors involved. Understanding the boundaries of the group in question allows an understanding of the practical dynamics of social capital (e.g., whether it is bonding or bridging in nature). Boundaries to networking are often, but not always [54], closely related to a sense of place or a specific physical location and therefore relate to spatial scales. Considering these aspects together can provide further insight into the different forms of social capital found within MSP. An examination of the linkages and the actors involved gives a sense of the hierarchies at play and can shed light on network structure (e.g., whether networks are horizontal or vertical), ultimately helping to explain why aims of social sustainability are not always realised.
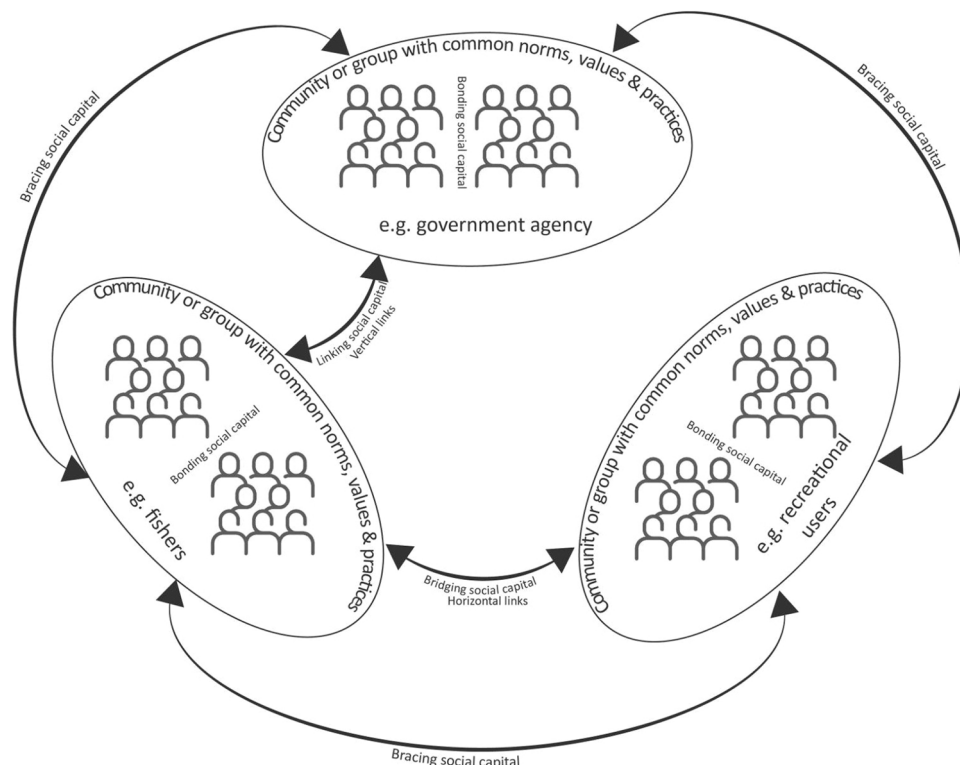


**Fig. 1.** Types of social capital (created using icons from flaticon.com) based on the typology developed by Rydin and Holman [47].

## 3. Case study one: policy as a driver for social capacity - Plymouth Sound National Marine Park, United Kingdom

In 2019, Plymouth Sound, UK was designated as the UK's first National Marine Park. The designation aims to capitalise on the success of the UK's terrestrial National Parks, that have been shown to be highly valued by users and generate significant social, economic and environmental benefits to local areas [55]. The vision for Plymouth Sound National Marine Park (PSNMP) is one that "*encourage[s] greater prosperity and enhanced engagement with our marine environment*" and "*thriving businesses, connected communities and inspired visitors*" [56]. Other objectives describe how the designation seeks to "*simplify*" the complex and overlapping governance of Plymouth Sound, which hosts several MPAs, to make it more accessible for people to understand, enjoy and consequently protect [57,58]. The National Marine Park designation at the current nascent stage is not accompanied by additional legislation, but aims to build and integrate existing governance (including other MPA designations) and institutions (e.g. local user partnerships and forums) to make it "*work harder*" without further "*exclud[ing people] by regulation*" [58].

Of relevance to this enquiry into social capital and MSP, the intention for the PSNMP is that it is designed locally to benefit coastal communities through economic growth and well-being supported by engagement strategies to build social capacity [56,59]. This aim is of relevance to Plymouth as the city holds some areas of the highest levels of deprivation in the UK [60] including communities that live on the city's waterfront. By placing the quality of the natural environment at the forefront of decision making, Plymouth City Council's intention is that the investment attracted by a National Marine Park designation, both in terms of showcasing Plymouth at a national level as a "*destination product*" [61] and also a thriving centre for marine culture, industry, research and innovation will, in turn, support ambitions for social development.

### 3.1. Boundary definition, role of place and scale

The boundary of the PSMNP, as presented in Plymouth City Council's 2019 PSMNP 'Engagement document', builds on existing environmental designations in the area, including the Plymouth MPA which describes an area that includes sites protected under different pieces of UK (and previously EU) legislation [58]. Listed 'conservation features' within the MPA include habitats such as mudflats, sandbanks, biogenic reefs, rocky reefs, saltmarsh, and various species of fish, bird and bivalve among others. The area includes the estuaries that flow into Plymouth Sound and extends 12 nautical miles (nm) offshore. The designations that comprise the MPAs are the result of a process of identification of areas of ecological importance and a consultative process leading to the agreement of legally mandated management measures. The Tamar Estuaries Consultative Forum (TECF) was established in 1991 and is a partnership of the organisations and local authorities that have a statutory responsibility towards the management of the MPA. This includes local councils, Inshore Fisheries and Conservation Authorities (IFCAs), landowners (e.g. Duchy of Cornwall), industry representatives (e.g. Associated British Ports) and other national statutory agencies (e.g. The Marine Management Organisation). TECF, through its management plan and collaborative approach, seeks to manage the MPA whilst recognising the historical importance of the area for a range of reasons including those that are for the military, recreation and commercial purposes. The rich maritime cultural and natural marine history of Plymouth as represented by the varied interests of TECF is recognised by the PSMNP.

The administrative boundary of PSMNP leans heavily on both natural and cultural values of the area, in terms of the natural habitats and species that are known to occur and are recognised through conservation designations, and the cultural values of Plymouth as an 'ocean facing' city that is historically significant for international trade, emigration, conflict, exploration and marine science [62]. In considering both the natural features of the area and the connections between people and these natural features the spatial extent of PSMNP is larger than the MPA and encompasses the entire coast of Plymouth city. Facing out to sea, the PSMNP includes the seascape visible from the city, where the lighthouse on The Eddystone Reef approximately 12 nm from shore can be seen on a clear day, projecting out into the ocean from the Sound's mouth [58]. The landward boundary of the PNMSP is proposed as being "*fuzzy*" to avoid prescription of what should and should not be included as a marine feature and to move away from the traditional separation between terrestrial and marine governance [58]. The process by which PSNMP moves from concept to practice and then towards the desired social and economic impact both within and beyond the administrative borders of the park, is intended to serve as a blueprint to influence other areas/regions with maritime identities to designate national marine parks.

### 3.2. Nature of linkages and types of actors involved

PNMSP is set as a 'local' initiative "*developed collaboratively, declared locally, and delivered through a spirit of opportunity*" [56]. The documentation available describing PNMSP textually accords with academic visions for city-focussed Marine National Parks as inclusive, participatory, and a community-centred network of partnerships to achieve a city's civic ambition [63]. PSNMP aims to protect and enhance the locally held values linked to the marine environment and to actively engage the local community to understand the designation and to create norms of sustainability that lead to socio-economic benefit [58]. The need for cooperation with those that "*live, work and enjoy Plymouth Sound*" to realise these aims is set as central to the development of PSNMP [58]: "*The scale of what we want to achieve is vast … we will be talking to everyone and anyone, shaping and testing ideas before the five year delivery plan gets into full swing*" [64]. However, there is currently limited transparency surrounding the activity and governance of the PSNMP online. Information relating to the board of directors, meeting minutes, partners and signatories of the declaration of intent is not currently publicly available online. Available documentation suggests that long-standing bonding and bridging capital between established and influential local groups has been important thus far (e.g. the involvement of the TECF), perhaps with the PSNMP conferring bracing capital that strengthens these existing networks in pursuit of a common goal for the city.

A stated aim of the PSNMP is to raise the profile of Plymouth, as an ocean city with a high-quality marine environment, to both attract inward investment and tourism (bringing economic and social benefits). Vertical linkages between local and national government have been important for these aims to demonstrate the city's value, and PSNMP as an example of good practice. An example of linking capacity is the national Ministerial endorsement of PSNMP as provided by the then UK Environment Secretary who was present at its launch in 2018 [65]. Further evidence of linking capital is the co-design of the PSNMP with the UK's Marine Management Organisation (MMO) [59]. The designation of PSNMP is at the centre of Plymouth City Council's endorsement of the Ocean Recovery Declaration. This 'Motion for the Ocean' seeks to commit local governments to "*supporting a more ecologically healthy sea and to rethink how [the] Ocean is considered in planning and decision-making at local level*" [66,67]. Plymouth city council was the first to endorse this motion and a further thirteen councils across the UK have followed suit indicating the potential of such a commitment to generate linking and bridging social capacity.

Critical to PSNMP's aims of a co-produced and governed "*Park in the Sea*" [64] are strategies that promote linking social capital downwards from those driving the designation out into the city's community. Central to these strategies are a commitment to the development of ocean literacy and marine citizenship as outcomes [67], both through education on the ocean and the equitable provision of access to the ocean [68]. PSNMP's strategy includes a series of events that seek to provide marine experiences that generate connection with the ocean, and school

programmes and apprenticeships that foster marine citizenship [69,70]. The school and apprenticeship programmes could develop 'pipelines' of capacity through future participation in social and economic activity and likely associated bonding, bridging and linking social capital. Further, a £ 9.5 m award from the National Lottery Fund Horizons Award to support the development of a series of physical and thematic hubs across the PSNMP to create "*gateways*" to PSNMP with improved facilities and enhanced community access points could also brace the linking capital between community and PSNMP administration [64].

While the focus of PSNMP's engagement programme has shifted from one of education to connection [71], the initial visions for the designation as a 'narrative' [57] perhaps point to the need for ongoing efforts to generate the social capital necessary for true coproduction of Park governance. Reaching marginalised groups, whose voices are often absent from exercises in formal consultation and often do not participate in organised events can be difficult [72]. Accordingly, PSNMP may need to develop strategies focussed on the development of both bonding and bridging capitals within the community and with particular attention to marginalised communities at this crucial point in PSNMP's development to support meaningful coproduction and to ensure against the potential exclusion of marginalised groups.

## 4. Case study two: social capacity as key factor for artisanal fisheries development - Pirajubaé Marine Extractive Reserve, Brazil

Pirajubaé Marine Extractive Reserve (PMER) is a federal sustainable-use MPA, established in 1992, and managed by Chico Mendes Institute for Biodiversity Conservation (ICMBio in Portuguese). The PMER is located in Florianópolis Bay, and aims to protect the livelihood of the traditional fishing community and its natural resources [73]. The designation of PMER was undertaken without comprehensive consultation with the local socio-cultural organisation and with limited engagement of all users, including extractive producers, such as clam and other artisanal fishers [74,75]. The designation restricts the right to access the space and resources of PMER to members that comprise registered fishers. Since its designation there has been increasing conflict among the resource users of the PMER, and between the PMER administration (i.e. ICMBio personnel who are responsible for the management of the MPA) and other government institutions. Conflict has arisen in response to controversial large infrastructure projects such as the installation of the Southern Expressway (currently one of the main avenues in the municipality) which has generated significant impact and restricted access to the PMER's marine space [76]. Another conflicting factor has been the limited recognition of PMER's relevance to the maintenance of fishers' way of life and a distinct lack of trust in the administration of PMER by the fishers [75]. This has challenged the success of PMER in achieving its stated aims.

In response to conflict in the area, efforts to establish initiatives that improve participation and thus, the effectiveness of PMER management have emerged. These have tended to focus on empowering PMER members and include the improvement of techniques for capturing and marketing fish products, and better communication with communities' representatives and the local government [77]. Communication and trust-building have been improved through the creation of a participative deliberative council in 2010 to jointly establish PMER's management strategies. This council comprises representatives from a set of government and non-government organisations, and PMER members (fishers), in which PMER members have the majority of seats, based on National Protected Area System legislation [78]. More recently and in addition to this council, community-based tourism has been employed in the PMER as a strategy to improve the livelihoods of PMER's fishing community, which has also led to both benefits and conflict between PMER members [79].

### 4.1. Boundary definition, role of place and scale

The PMER encompasses a key area of a productive estuarine system, such as mangroves, wetlands, sandbanks and adjacent marine areas covering a total area of 1721 hectares (ha). The boundary of PMER was based on the ecosystems relevant to fishing activities, such as mangrove and sand bank habitat. This boundary aims to protect the core fishing areas used by those fishing in PMER, and thus preserve their status as a 'fishing community' [73]. The community has, over the past century, established a diversified fishing activity, involving different species of fish, shrimp, and cockles, each using different fishing techniques and gear. These practices have led to a strong sense of place and identity between fishers, developed an understanding of their fishing territory and common fishing practices, with the aim of maintaining natural resources [78]. At the same time, the diversity of fishing practices has led to competition and conflict among fishers, such as conflicts between shrimp and cockle collectors whose practices are incompatible and compete for space and resources. This competition has not just impacted the productivity of fish stocks in the area, but challenged the establishment of a common agenda and management [75,78].

Management of PMER has historically focussed on the provision of subsidies to control fishing within PMER. However, more recently, increasing pressures from adjacent urban growth has demanded more attention from PMER. These pressures include increased pollution from domestic effluents, limited water management, and infrastructure projects. Addressing these impacts has expanded the scale of actions and interactions of PMER members who are now required to increase wider awareness of the social-ecological importance of PMER to the region and the expanding city of Florianópolis. This has led to the participation of PMER members and administrative staff in public consultation processes, partnerships with representatives from surrounding communities and educational and research institutions. This demand to respond to external pressures has promoted new channels of communication and learning for PMER members and has broadened the sense of place of both PMER members and the broader local community. This awareness raising activity beyond the boundaries of PMER has led to a wider recognition of the history and traditions of PMER and its fishing community while developing a greater impetus for its effective protection.

### 4.2. Nature of linkages and types of actors involved

Since the late 1980s, when participatory environmental management was established in Brazil by the country's new constitution, one of the greatest challenges has been to develop the capacity needed for natural resource users and government managers [78,80]. In this case study, different initiatives have been applied to increase participation and inclusion in the governance of PMER. These initiatives have focussed on the strengthening of a 'sense of place' of the fishers, the social fabric of the community and developing a wider appreciation of the values and importance of PMER with other stakeholders, such as research and support institutions. These initiatives have promoted social capital, aimed at enhancing the fishers' knowledge and communication and thus their voice in PMER's decision making.

Bonding social capital between fishers was initially developed through the definition of fishing territory and common practices (i.e. bonding capital developed between fishers targeting the same resource). To begin with this led to friction between groups, and conflict with the PMER administration. However, efforts such as the participatory deliberative council, have led to an increase in bonding and bridging capital, with more horizontal dialogue and the construction of a common understanding and aims for PMER's management [78]. While the establishment of this council has experienced limitations such as low participation and a continuous change of leaders, it has led to the inclusion of a higher number of public organisations involved in PMER's management offering increased influence and opportunities for learning and collaboration through associated bridging capital [78]. The

deliberative council has enabled community members, PMER members and staff to play an important role in the development and implementation of management and planning procedures [79]. With regular bimonthly meetings this council works through the debate of the participants, forming working groups to develop the themes and demands generated in the meetings. The increase in social capacity resulting from repeated interactions and dialogue between the stakeholders triggers an improvement of linking social capital through better appreciation by governmental stakeholders of local needs, as well as an understanding by PMER members and community representatives of the legal and institutional obligations of governmental agencies.

In addition to this, partnerships between PMER and educational and research institutions aimed to foster participation and improved integration of fishers and to alleviate conflict between practices perceived to be incompatible. The development of bridging capital has transformed interactions between stakeholders. While some organisations remain outside of the deliberative council, linking capital remains important with government organisations thanks to the institutional knowledge afforded by the members of the deliberative council.

Community-based tourism is a developing activity of PMER and aims to contribute to the livelihoods of PMER's fishing community. It has generated several benefits such as important income and gives local stakeholders a leading role in the development of their activities. However, access to the benefits of the growing community-based tourism industry is not equal among fishers and to date only a relatively small number of fishers participate, with further expansion hampered by limitations on infrastructure to support higher numbers of tourists. This has led to conflicts highlighting the lack of collaboration and cohesion among PMER members [79]. In response to this situation, strategies have been developed by PMER's administration to strengthen place-based bonding capital and bridging capital of fishers, centred on raising awareness of the social fabric created by small-scale fishers and their historical, current and future role in community-building. The development of the industry has required the definition of common goals, network expansion through social learning processes. Social learning has led to the organisation and empowerment of artisanal fishers and an improved participation in decision-making processes.

The targeted efforts to increase all types of social capital to address conflict have largely been successful in improving participation and representation in governance and the appreciation of the social-ecological importance of PMER. These advances in governance (participatory management and self-organisation) have led to an improvement against the aims of PMER to protect traditional livelihoods reliant on healthy functioning fish habitats. These improvements relate to consensus over access and regulation of resources and the delimitation of areas of ecological importance (e.g. mangrove edges) [78]. The PMER case demonstrates a significant advancement in public participation - from a centralised and fragmented decision-making process, in which resource dependents and vulnerable stakeholders had limited or no power, to the current approach, based on dialogue and agreement among various stakeholder groups [75]. Social capital has improved mainly through bridging between different groups of fishermen and linking with government organisations. This approach contributes to better inclusion of socio-cultural objectives (through the participation of other members of the community/society in PMER meetings), a greater appraisal of fishers and their traditional way of life, and brings to light potential social benefits of conservation initiatives with a positive effect of better integration of PMER's management issues with the surrounding urban territory [77].

## 5. Case study three: knowledge co-production as a key driver for social capacity in MSP development: The Algoa Bay Project, South Africa

The South African government began its MSP initiative in 2014 and gazetted the Marine Spatial Planning Act in 2018 [81]. In April 2021 the Act was signed into operation, providing mandatory requirements for the establishment of marine area plans [82]. The Act aims to provide a national framework for MSP which will:

> "*develop and implement a shared MSP system to manage a changing environment that can be accessed by all sectors and users of the ocean; promote sustainable economic opportunities which contribute to the development of the South African ocean economy through coordinated and integrated planning; conserve the ocean for present and future generations; and facilitate responsible use of the ocean*".

While the national MSP legislation was being developed, and in anticipation of the need for ecosystem-based approaches to the development of the marine area plans, a marine research Community of Practice (CoP) was established in Algoa Bay in the Eastern Cape Province in 2017 [83,84]. The CoP initiated the Algoa Bay Project (ABP) [85]; a pilot study aimed at developing a stakeholder-driven, ecosystem-based MSP process that can later be applied in the national marine area plan development. Phase I of the project commenced in 2017 and focused on the biophysical and legal aspects of MSP. Phase II commenced in 2021 and focused on socio-economic and cultural factors that will impact and be impacted by MSP in the Bay.

The South African MSP Act argues for the need to "*ensure that all relevant stakeholders are adequately consulted*". However, the MSP process to date has been considerably "*top-down*", with limited and inadequate stakeholder engagement outside of Government. In response, Reed and Lombard [86] published a recommended approach to provide a platform for civil society to engage with Government, but the approach has not been implemented. Furthermore, despite the importance of Indigenous and local knowledge, as well as socio-cultural dimensions related to people's interactions with the ocean and coast see [77] and [98], these aspects are often overlooked or neglected in marine governance processes, leaving several affected stakeholder groups excluded from marine decision-making processes [see 78]. With its rich biodiversity, pluriversal demographics and ocean interactions, the case of Algoa Bay is particularly interesting for an enquiry into social capital in marine spatial planning.

### 5.1. Boundary definition, role of place and scale

Algoa Bay stretches from Cannon Rocks in the east to Sardinia Bay in the west and is known for its rich marine biodiversity [84], and the wealth of longstanding data of the Bay is the reason why it was chosen as an ideal case study for MSP. The Bay is home to two prominent estuaries, the Sundays River estuary and the Swartkops River estuary, as well as several different bird species that live on the islands of Bird Island and St Croix. The western area of the Bay is largely surrounded by the city of Gqeberha (formerly Port Elizabeth), with a population of more than 1 million people [112]. The eastern reach of the Bay comprises one of the largest sand dune systems in the southern hemisphere [89], the Alexandria dune fields, and most of this area and surrounding waters and coastline are protected by the Addo Elephant National Park Marine Protected Area. Due to its mild climate, the Bay is host to an active outdoor recreational culture, with local residents participating in ocean-based activities such as large sporting events (e.g. Ironman), surfing, paddling, scuba diving, snorkelling, swimming, fishing, boating and sea-based tours. Subsidiary industries from accommodation (hotels, resorts, B&Bs), catering, laundry services, restaurants to fishing tackle shops, boat building and entertainment also depend on the tourism sector [90]. The Bay also hosts two ports, the Port of Port Elizabeth (PE) as well as the deep-water Port of Ngqura (Coega). The Port of Port Elizabeth serves local industries with primary products including deciduous and citrus fruit, and wool, manganese ore railed from the Northern Cape region, petroleum products imported from other ports across the country as well as the prominent automotive industry which is a primary economic driver for the area [90]. The newer Port of Ngqura, established in 2012, is a world class deep-water transhipment hub

offering port services for containers on transit to global markets, including trade in manganese ore, as well as within the Sub-Saharan Africa region [91]. Both ports are linked to rail and road networks which connect to the rest of South Africa [92]. Due to its productive ecosystems, large coastal population, scenic sea and landscapes and ports, Algoa Bay is both an important commercial and recreational hub.

*5.2. Nature of linkages and types of actors involved*

The Algoa Bay Project, self-defined as a 'public process' reflecting that of MSP, has aimed to engage with various stakeholder groups from several sectors alongside residents, including fishing (small-scale, subsistence and commercial), tourism, conservation, business/consultants, oil and gas, mariculture, transport and infrastructure, governance (local, provincial and national government) and research institutions. Several methodological approaches were used to engage with rights holders and stakeholders. These included the development of a systematic conservation plan (SCP) through participatory stakeholder mapping and engagement [93]; participatory modelling using systems dynamics modelling [94]; arts-based participatory research and participatory community mapping approaches to explore alternative knowledge systems to integrate in the MSP [87,88]; facilitated stakeholder meetings, and engagements with decision-makers at local, provincial and national level to capacitate high-level stakeholders (as it was found that decision-makers need to be capacitated to adequately respond to local-level stakeholders). All approaches intrinsically included aspects of social learning, such as processes of uncovering how people value, know and understand the ocean and coast. These approaches served as points of connection and provided opportunities for knowledge sharing.

Participatory mapping, where stakeholders mark information on gridded maps, is a popular approach in area-based management and has many benefits including the incorporation and legitimation of a diverse range of knowledges, strengthening people's connections to space and place, enabling stakeholders to make links and patterns on a broader scale, enabling coordination and knowledge exchange and sharing across sectors and disciplines [95]. The SCP report acknowledged that, in the context of the ABP, 'the expert mapping process contributed to the CoP by helping people understand the planning process, enabling them to contribute, and by aligning biodiversity objectives with the requirements of other sustainable uses and users of the Bay' [96]. Participatory community mapping workshops created bonding capital within community groups as they discussed issues regarding lack of access to the coastline and estuaries or as they shared fond memories and stories of fun and exciting times on a river or at the beach [88]. The project also identified that considerable bonding capital already existed in certain groups such as between local small-scale fishing cooperatives, where a struggle for official government recognition and fishing rights formed a strong sense of group cohesion. The maps produced from the participatory community mapping exercises of culturally significant areas also generated linking capital. For example, the South African Heritage Resource Agency (SAHRA) was very enthusiastic about cultural mapping being carried out in specific areas of the Bay as they could refer to this work and recommend that other government departments engage with these coastal and estuarine communities that had been overlooked in previous stakeholder engagement processes regarding new developments that would impact them (e.g. river bank stabilisation activities).

Arts-based participatory research and participatory community mapping approaches with local community representatives support knowledge co-production in the Bay and are being used to identify and integrate Indigenous and local knowledge into the pilot MSP. From initial work with local and Indigenous communities in Algoa Bay as co-researchers, the research has found that current ocean management approaches do not adequately include their interests, values or knowledge [88]. The challenge that lies ahead is therefore to improve the social capacity of local and high-level management, researchers and

different stakeholder groups to engage more meaningfully through social learning processes and to co-produce knowledge for MSP that can better represent different knowledge systems, groups and networks [87]. The arts-based participatory research approach generated bonding capital within certain groups as they shared their cultural connections with each other as well as stories of joy and pain connected to how they experience the ocean [87,88]. During a photography exhibition that presented and conveyed stakeholder stories and connections to the ocean and coast, opportunities for future linking and bonding capital were identified. Conservation authorities, coastal managers and a representative from the national MSP working group expressed they had benefited from the knowledge exchange (facilitated by the exhibition and multi-stakeholder workshop), realising the importance of socio-cultural connections to the ocean and coast that they would better recognise in their work moving forward [97].

The Algoa Bay Collaborative Dynamic Modelling (ABCoDyM) component of the project adopted a systems dynamics approach and worked directly with sector-based stakeholders to achieve a deeper understanding of the interconnections between different sectors in the Bay and provided a decision support tool that dynamically simulates the overall uses of the Bay. Bridging capital was enhanced by these participatory modelling approaches through the co-production of knowledge with Bay users to better understand the social-ecological system.

Bridging capital was also generated through a multi-stakeholder workshop that brought together various coastal and marine users (e.g. traditional and Indigenous leaders, local coastal authorities and NGOs) to collaboratively identify pathways to integrate Indigenous and local knowledge into MSP in the Bay and more broadly in South Africa [98]. This workshop focussed on linking different stakeholder groups and networks by facilitating them to work on a common problem together.

Although the ABP has achieved local buy-in from some ocean stakeholders in Algoa Bay, researchers have identified that there are some stakeholders that can be easily overlooked, especially those not represented by larger, more formally organised, sectors such as small-scale fishers or Indigenous knowledge holders [88]. During the course of 2022, the ABP team has therefore organised several stakeholder workshops in different areas of the Bay with the aim of reaching a broader spread of actors and interested parties, but greater efforts are needed from national government, provincial authorities and local municipalities to keep engaging and capacitating themselves as well as grass-roots stakeholders and marginalised communities. The research process has also identified existing strong bonding capital between conservation groups (e.g. WESSA, SANCCOB, Bayworld, Zwartkops Conservancy), which could be utilised by government officials and initiatives in the future.

Specifically scrutinising the concept of social capital in Algoa Bay, the ABP has identified knowledge co-production and collaboration with key stakeholders as a central priority to build social capacity. Social capacity in this context means being able to equitably participate in stakeholder processes which means not only having the time and resources (time off work or transport to get to meeting venues) to attend participatory processes like meetings and workshops about MSP but also having a adequate understanding of what MSP is, how it will impact upon them as individuals and their broader community and having the agency and power to critique and question MSP developments.

## 6. Discussion and conclusion

*6.1. Use of social capital*

The case studies presented above reflect existing literature in their lack of specific consideration of social capital and its role in MSP. However, the foundational importance of social capital is highlighted in the case studies presented by the acknowledgement of the need to meaningfully include affected groups and individuals for effective MSP. The ways that social capital is (indirectly) considered varies widely

among cases. Case Study 1 - PSNMP - articulates the concept of social capital (defined in that case as Ocean Literacy and Marine Citizenship) as an outcome or goal of the spatial designation [67]. Case Study Two – PMER – includes focussed efforts to build trust and collaboration that were developed in response to, and as a means to overcome, conflict between users. Case Study Three - the ABP – explores an (academic) group seeking to develop an accurate representation of the social-ecological system through participatory processes. Experience in the ABP highlights the challenges of operationalising meaningful consultation, where barriers to inclusion range from the physical (e.g. transport) to knowledge (institutional and ocean literacy) and agency and power and therefore provides insight into the importance of reflexivity in governance for equitable MSP.

### 6.2. Role of space

The case studies illustrate MSP examples that are by their nature 'place-based' and seek to encourage 'locally grounded' participation [47,99]. However, the criteria determining who was targeted or involved in these efforts varies among the cases. For example, the boundary of PMER was defined by traditional fishing activity in the area. In that case, MSP aimed to protect habitats important to focal fish stocks, but planners found that protection of the area expanded the perception of who is affected or affects the area to include individuals and groups outside of PMER's administrative boundary. The ABP and PSNMP similarly rely on geophysical estuary and coastal formations that are ecologically rich and important historically, culturally, recreationally, and economically. Both locations are host to major international ports that support their respective national economies. Both are also supported by protected areas, with those adjacent to ABP being terrestrial and PSNMP overlapping with an existing suite of MPAs. The boundary of the PSNMP adheres to formal marine governance on its ocean-facing edge, with 12 nm signalling the outer edge of territorial waters but landwards has adopted a fuzzy boundary to support a shift towards integration between terrestrial and marine management [58]. The boundaries of the MSP in these case studies are mainly based on physical or ecological attributes, or linked to existing regulatory boundaries (e.g., the 12 nm boundary for territorial waters). PMER was the only example that based boundary formation on a social dimension, fishing activity, of the social-ecological system. None of the case studies considered characteristics of human populations as a way to determine boundaries. Despite this, our case studies illustrate the diverse relationships between social capital and place and space [54]. Communities can share an activity, or a geographic space, or a connection to the ocean but these features do not make them "*a community*" per se sharing common practices, norms and values. Defining what or who constitutes a community or those affected or influenced by MSP is not a simple endeavour.

### 6.3. Types of social capacity

Bonding capital of influential groups with established power and agency was important for driving MSP in the PSNMP, which leaned heavily on the existing management forum for the area (the TECF), and in ABP, where academics from the area led the initiative. In the case of PMER, the federal designation focussed on a perceived need to protect a marine area and the livelihoods of those dependent on it. This perception, and the associated response to it, was poorly informed and a lack of inclusion of those affected by restrictions in use of the area led to conflict. Here, bonding capital within small community groups (delimited by their mode of fishing) acted to reinforce this conflict with the proposed protection of PMER and pushed against consensus or collective thinking with other users of the PMER. This experience, whereby conflict spurs the development of bonding capital that entrenches positions and prevents shifts in governance has been outlined in literature as "*anti-social*" capital [47,53]. However, the implementation of a deliberative

council and community-based tourism has transformed bonding capital within fishing communities towards new sets of shared norms and values that have facilitated governance that supports the aims of PMER.

In considering how the governance of PMER has responded to the initial conflict created by its ill- (or un-) informed designation, we can see that strategies that prioritise the development of bridging capital between communities affected by the PMER designation have been important. These strategies have included the creation of a participatory deliberative council to codesign the management of PMER and the development of community-based tourism to improve the livelihoods of PMER's fishing community. These initiatives have included the voices of those most affected by the PMER designation and have supported the development of new communities of practice with (new) shared values and norms that centre around the protection of PMER. In the case of the ABP, bridging capital was more formally developed through MSP strategies to 'map' the social-ecological system. Methods included participatory modelling approaches [94] and multi-stakeholder workshops [87,88,93], where network expansion through discussion was a key aim to elicit a robust picture of the connections acting within the area. Here it remains unclear as to whether this bridging capital will support inclusion as MSP outside of the ABP develops.

Linking enables communities to connect to stakeholders with power and authority creating "*opportunities for communities to gain access to resources and to get a stronger position and voice in governance processes*" [21,100]. It is recognised as essential for resilient governance [101] and hampered by anti-social capital [47]. Bonding capital is recognized as a prerequisite of bridging and linking capital [21] meaning that the self-organisation of a community is crucial to building networks and influence. This is demonstrated in PMER where increased organisation of artisanal fishers facilitated their participation in governance processes. Vertically upward linking capital was observed in all case studies as an avenue for influence (PSNMP), promotion of best practice (ABP) and enhanced recognition of intangible connections and values of the marine environment and associated traditions (PMER). The processes by which linking capital was developed in the cases of PSNMP and ABP are not explicitly described, however, these opportunities likely arose as a result of existing institutional knowledge held by those involved in both initiatives. This would have built upon existing bonding and bridging capital [21,101] that exists within the groups leading these initiatives and in the case of PSNMP braced by a common goal. Linking capital in the case of PMER arose as a result of growing bonding and bridging capital and through the partnerships needed to respond to pressures on PMER outside of its boundary. Again, it is likely that these partnerships have afforded institutional knowledge on how to achieve the necessary linking capital to meet their needs.

With most MSP being government-led, vertically downward linking capital is important to achieve social sustainability. Capacitation at all levels is a crucial prerequisite to increase the potential for linking capital and that of local community members is often promoted by educational and research activities as illustrated in PSNMP and ABP. Capacitation itself can be considered as downward linking. The AGP case study highlights that efforts to create downwardly linking capital require specific attention, careful consideration, and planning. While the academic-led AGP has been able to respond to these needs and has been successful in developing a rich understanding of the social-ecological system, its findings highlight the deficiencies in MSP consultation exercises commonly undertaken by government (local and national) [88]. This supports arguments that the generation of social capital is contingent on active and engaged leadership that is supportive of trust and relationship building between community members [102]. Their findings also show that the common emphasis on capacitating 'communities' and grass-roots level stakeholders is insufficient when high-level government systems lack the financial, human and social capacity, political will, and effective leadership to carry out equitable, fair and meaningful engagement processes with rights holders [103–106]. Despite a growing awareness of the need for a two-way learning to support the

development of social capital and equitable MSP, none of our case studies indicated activities or plans to focus capacity building at a leadership level.

Several strategies to develop community level social capital that enables future vertical linking and influence are described in the case studies. PSNMP seeks to increase the emotional connection of the local community to the ocean through ocean literacy and marine citizenship programmes. While these strategies are not specifically designed to build social capacity, shared experiences (such as education and event programmes) may support the development of common values and norms that support the growth of bonding (or bridging) capital at a community level. The example of PMER suggests that strategies targeted at the development of bonding and bridging capital within the community are effective at integrating actors and co-producing governance. The lessons garnered from the ABP and PMER indicate that specific and targeted activities are more likely to empower communities and lead to more equitable participation than diffuse methods such as providing opportunities for access. This understanding offers an opportunity for MSP, and nascent local initiatives such as PSNMP, which could build on their strongly rooted position in the community to offer programmes focussed on community coalescence and capacity building for the purpose of co-governance of local marine resources.

Through these three examples, the importance of the three types of social capital to build a collective framework for MSP has been highlighted. Within each type of social capital new sets of norms, values and practices shared among all stakeholders are developed to reach a common understanding. This is enabled by a two-way capacitation process. Trust-building and efforts to build social capacity should be elaborated without imposing a hierarchy between people 'who know' and people 'who don't'. Grassroot networks and local coastal communities can and should be capacitated, but this should be balanced with efforts to build the relevant skills and knowledge of implementing bodies and decision-makers to listen, engage meaningfully with stakeholders, and to act [104,107,108]. Two-way capacitation is well illustrated by our case studies. The PMER Deliberative Council promoted a better appreciation by governmental stakeholders of local needs, and a clearer understanding by PMER members and community representatives of the legal and institutional obligations of governmental agencies. In the ABP, two-way capacitation required innovative approaches. In that case, the Coastal Justice Network worked to support and empower SSFs to advocate for themselves, and researchers worked with local coastal managers and decision-makers to understand their constraints and identify possible levers for the integration of local knowledge in the management process. Similarly, learning should be understood as a social process that takes place through collective practice, rather than individually and in separate compartments [109]. This approach to learning is termed social learning or change-oriented learning and often refers to the bringing together of multiple values and interests to creatively work on stubborn practices that lead to unsustainability [110, 111]. Two-way capacitation and social learning processes will take substantial time and effort and are intended to proceed throughout all stages of MSP, rather than as one-off projects with clearly defined end dates. Although efforts to build social capacity and encourage social learning should begin in pre-planning phases of MSP, they should also continue through planning, implementation, evaluation, and adaptation to position stakeholders and managers most effectively to meaningfully collaborate and act. The case studies presented in this article demonstrate various approaches to learning and the building of social capital and social capacity throughout the management process. They provide real-world examples of ways that managers can operationalize these theoretical concepts for more effective and equitable marine governance.

This exploration of three case studies that employ different approaches to MSP in varying international contexts indicates that attention to social capital, as both a means and outcome of MSP, is essential for social sustainability. The cases show that an understanding of who

should be included in MSP, whilst informed by the geographical boundaries of an area, depends on existing networks, institutions and intangible connections to the natural resources of the area. Indeed, the relationship of social capital to place and scale is found to be quite diverse. Understanding the differences in practice, values and norms of the range of users is foundational for effective and socially sustainable governance. Directed and specific efforts to generate social capital can respond to this understanding and enable the development of new sets of practices, norms and values centred around a commitment to sustainability. The case studies suggest that in the absence of targeted efforts to engender social capital it is unlikely that effective and meaningful representation of communities will be achieved by MSP. Those activities that seem to be the most efficient for this purpose are rooted in aims to improve social learning and knowledge exchange such that a two-way capacitation process at all levels (particularly high-level government) is allowed. Crucial to this will be the support of reflexive MSP practice that can respond to evolving dynamics supported by developing social capacity at all levels and to ensure the relevance of shared norms, values and practices.

## CRediT authorship contribution statement

**Jacob C:** Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **DuPrey Diederichsen S.:** Conceptualization, Writing – original draft; Writing – review & editing. **Fullbrook L.:** Conceptualization, Writing – original draft; Writing – review & editing. **Lombard A. T.:** Supervision, Writing – review & editing. **Rees S.:** Writing – original draft; Writing – review & editing. **Rivers N.:** Writing – original draft; Writing – review & editing. **Snow, B.:** Supervision; Writing – review & editing. **Strand, M.:** Writing – original draft; Writing – review & editing. **Zuercher R.:** Conceptualization, Writing – original draft; Writing – review & editing. **Niner, H. J.:** Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing.

## Data availability

No data was used for the research described in the article.

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