

Fishing in a congested sea: What do marine protected areas imply for the future of the Maltese artisanal fleet?



Alicia Said ^{a,*}, Douglas MacMillan ^a, Michael Schembri ^b, Joseph Tzanopoulos ^a

^a Durrell Institute for Conservation and Ecology, School of Anthropology and Conservation, University of Kent, UK

^b Department of Geography, University College London, UK

ARTICLE INFO

Article history:

Received 1 November 2016

Received in revised form

17 April 2017

Accepted 13 August 2017

Available online 1 September 2017

Keywords:

Mediterranean

Conflict

Livelihoods

Marine spatial planning

Grounded visualization approach

Governance

ABSTRACT

Inshore artisanal fishing in Malta is under intense spatial competition as the coastal zone is fragmented by multiple uses and designations including maritime transport, infrastructure, industrial fisheries, aquaculture, tourism and recreation. This research, adopting a grounded visualization methodology, explains how the artisanal fishing sector has undergone and been affected by 'spatial squeezing'. Our results show that artisanal fishermen have been forced to give up fishing grounds or co-exist with other uses to the point where the ability to fish is becoming increasingly challenging. These difficulties might escalate with the advent of the marine protected areas (MPAs) which encompass nearly half of the inshore fishing zones. Since there does not seem to be effective MPA consultation mechanisms that elicit the real social, cultural and economic value of artisanal fishing grounds, fishermen feel threatened, alienated and disempowered. This study urges for a more holistic approach to spatial marine planning and accentuates the need of realizing the dependency of the artisanal sector on the inshore zones in the implementation of conservation measures, such that the prolonged existence of the coastal fishing communities is not jeopardized.

© 2017 Elsevier Ltd. All rights reserved.

1. Introduction and background

Coastal fisheries, which are predominantly characterised by local fishers engaging in traditional fishing methods, are long considered to be an integral part of the social and economic fabric of coastal communities worldwide (Álvarez, Seingier, Bocco, Espejel, & Noriega, 2015). Artisanal and small-scale fishing activity varies across different countries (Guyader et al., 2013), but typically involves short fishing trips close to the home fishing port and hence is confined to the coastal zones (Maynou, Recasens, & Lombarte, 2011). Since these zones are increasingly host to other users (Stojanovic & Ballinger, 2009), fishing communities are experiencing competition for fisheries resources or sea-space, and thus are finding it difficult to maintain their practices within increasingly congested waters (Salmi, 2015).

Some conflicting users, including industrial fisheries (DuBois & Zografos, 2012), recreational fishing (Cooke & Cowx, 2006) and snorkelling/diving (Fabinyi, 2008) pose competition for both the fisheries resources and the sea-space, whilst other users are only

after the sea-space as a geographical area within which they could develop their activity/industry such as aquaculture (Mishra & Griffin, 2010), energy production (Yates, Schoeman, & Klein, 2015), shipping (Davis et al., 2016), oil exploration (Ounanian, Delaney, Raakjær, & Ramirez-Monsalve, 2012) and conservation (Richmond & Kotowicz, 2014). Although inherently different, the types of competition posed by various users produce the same results: artisanal fishers get squeezed by processes of 'ocean grabbing' (Song, 2015) or 'blue grabbing' (Benjaminsen & Bryceson, 2012). These processes involve the acquisition and privatisation of sea-space by powerful social groupings who are empowered to designate spatial boundaries through formal procedures of marine policy and governance (Levine, Richmond, & Lopez-Carr, 2015; Pinkerton & Davis, 2015). These social groupings, because of their power, become what Henri Lefebvre (1991) in his theory on the social production of space, refers to as the 'producers' of space, while those under the rule become the 'users' who passively experience and receive whatever is imposed on them and the territories to which they belong. In this manner, the producers are empowered to 'privatise' parts of the seabed to accommodate specific forms of marine uses that fulfil the needs of particular socio-economic trajectories (Clausen & Clark, 2005; Sohn, Christopoulos, & Koskinen, 2013), and in their production of this

* Corresponding author.

E-mail addresses: as946@kent.ac.uk, alicia.said@mun.ca (A. Said).

socio-spatial arrangement, they simultaneously create political and geographical marginalization of other users (Jones, 2009; Levine et al., 2015; Silver, 2014).

In other words, through this process, according to Lefebvre, the producer 'permits fresh actions to occur, while suggesting others and prohibiting yet others' either because such uses are unknown by the producer or are considered as incompatible to the new trajectories (Lefebvre, 1991:73). This producer/user dichotomy is also applicable in the context of marine protection since MPA proponents who hold conservation 'knowledge/power' are authorised to draw protected area boundaries in spaces utilized by indigenous groups, and, in the process, may create equity and access implications for traditional users (Richmond & Kotowicz, 2014). In these situations, if users such as coastal fishers lack the socio-political agency to influence decision-making of marine spatial policies (Pomeroy, Hall-Arber, & Conway, 2015), they are likely to become displaced and spatially squeezed out from their indigenous fishing territories (Jentoft, 2017).

In our study we look at the situation in Malta: an island state in which artisanal fishers have faced a major form of policy and market squeezing due to the introduction of quotas for the offshore bluefin tuna fishery and have thus become more dependent on the inshore coastal fisheries (Said, Tzanopoulos, & MacMillan, 2016). The inshore coastal area especially, within the 3 nautical mile zone (henceforth 3NMZ), is considered as a good fishing ground for artisanal practices including trammel and gill nets, long-lines, pots and traps, and other hook-and-line methods (Stelzenmüller et al., 2008). This zone is also home to a range of other marine uses including industrial trawl fishing, aquaculture, shipping and bunkering, energy, recreational snorkelling and diving (Deidun, Borg, & Micallef, 2011).

Various studies have looked into the local coastal conflicts (Conrad & Cassar, 2007) between the different uses such as aquaculture and tourism (Boissevain, 2006), aquaculture and the environment (Kotzebue, 2012) and multiple-use marine conflicts (Deidun et al., 2011), however, to date, there have been no studies that delve into the issues arising from the existence of an artisanal small-scale fishery within the 3NMZ. For example, Deidun et al. (2011), do not fully identify the spatial restrictions facing the artisanal sector, which, we would argue deserves recognition as a primary stakeholder within the promulgation of new planning policies. Furthermore, the small-scale fishing sector was a 'missing layer' in a recent national report that focused on Malta's spatial plans for sustainability and the environment (ed. Formosa, 2014), and in the national government plans for integrated coastal zone management (MEPA, 2011) and marine spatial planning (MEPA, 2007).

Unlike most of the 'new arrivals' such as shipping, bunkering, diving, aquaculture, swimming and marine conservation which are all legally designated on the national map, the small-scale fishing activity within the inshore zone is not spatially recognized through national and/or supranational legislative frameworks. Although the EU Mediterranean Regulation (EC1967/2006) provides for the recognition of these activities by stating that 'part of the coastal zone should be reserved for selective fishing gears used by small-scale fishermen', the Maltese government is not obliged to designate specific boundaries for the small-scale fisheries.¹ Consequently, the national fisheries law (Cap 425.01) provides only for the spatio-temporal restrictions of artisanal fishing within bays and creeks, and it does not specify the boundaries in which artisanal

fishing occurs, thus fishers remain unprotected against the proliferation of uses and risks emanating from new forms of seabed uses.

This reality is critically important with regard to the upcoming implementation of MPAs. MPAs in Malta are a relatively recent phenomenon that emanate from the EU Habitats Directive which sets an obligation for EU member states to establish marine Special Areas of Conservation (SACs) (EEC43/92). These SACs are considered as necessary to protect priority natural habitat types, such as seagrass meadows (e.g. *Posidonia oceanica* beds) and protected species including bivalves (e.g. *Pinna nobilis* and *Lithophaga lithophaga*) (Trochet & Schmeller, 2013). Although the SACs are not in place to conserve commercial fisheries resources,² the protection of the habitats and species must be addressed in conjunction with the social and economic activities in place, including fishing, to avoid the 'deterioration of natural habitats and the habitats of species as well as disturbance of the species' in line with the Habitats Directive (EEC43/92 [6]).

Even though the obligations emanate from the EU, the selection of the candidate sites for SACs falls mainly within national jurisdiction, thus member states are to ensure that the necessary marine protection follows the obligations of the Directive. The choice of the site brings forward a number of issues that have incited implementation problems in a number of EU countries (Beunen, Van Assche, & Duineveld, 2013; Ferranti, Beunen, & Speranza, 2010; Fleming & England, 2000; Paloniemi et al., 2015). Despite being in line with the ecological obligations of the Habitats Directive, the selection of the areas is highly political, especially in small-island states, like Malta, where spatial aspects of marine use management is a delicate and contentious issue (Schembri, 1999).

Malta has designated a total of 5 MPAs which encompass around 200 km² of the inshore coastal zone. Since 2005, two management plans have been drafted for the Rdum Majjiesa and Dwejra MPAs, and currently a national consultation exercise, which discusses the conservation objectives and fishing measures of the 5 designated MPAs, is underway. In this regard, this study seeks to elucidate the potential implications that the designated MPAs, as new spatial boundaries together with pre-existing 'old' and 'new' maritime uses, may have on the local artisanal fishers. It seeks to highlight important socio-economic challenges and social conflicts that have developed amongst the fishers as a result of shrinking fishing grounds, and raise awareness on the need of catering for these socio-spatial realities within the designated MPAs. Thus, by providing an illustrative and quantitative analysis of the fishing sector's activity within the 3NMZ using an innovative grounded visualization methodology, our research is both ground-breaking and necessary. Specifically we investigate how artisanal fishing interacts with the current marine-use patterns within the 3 NMZ, and elicit the potential predicaments that may arise with MPA designations by addressing the following questions:

1. What are the current spatial challenges that fishermen face in their traditional fishing grounds?
2. What are the likely fishing-related implications of the designated MPAs within the coastal zone?

2. Methodology

This research endeavour, which commenced in 2008

¹ In line with the United Nations Convention on the Law of the Sea (1982), the national government holds jurisdiction of spatial planning within the inshore waters up to 6 nautical miles.

² The protection of fisheries resources within Malta's coastal zone (extending to 25 nautical miles) is implemented in line with the EU Mediterranean Regulation EC 1967/2006 (26) which controls the fishing effort on the fisheries stocks through restrictions on fleet capacity and vessel measures.

(unpublished results³) and resumed between 2011 and 2015 is based on an innovative methodological framework known as 'grounded visualization'. This incorporates a fusion of spatial and ethnographic data (Knigge & Cope, 2006) collected through an array of methods (Sullivan, Conway, Pomeroy, Hall-Arber, & Wright, 2015) including (i) quantitative geospatial distribution of fishing activity, (ii) spatial digitization of the boundaries of all marine uses (except artisanal fishing) from already-existing published polygon data (iii) qualitative interviewing and participatory mapping with fishers (iv) interviews with policy-makers; (v) attendance to government-organized seminars on MPAs and (vi) document reviews of policy and national records.

The spatial data collection of artisanal fishing activity was collected from a sample of 100 small-scale⁴ vessels, which represent around 10.7% of the commercial fleet operating within the 3NMZ. The activity of these vessels is auto-tracked by either a General Packet Radio Service (GPRS) or a Vessel Monitoring System (VMS), which provide the vessel speed, its geospatial position in decimal degrees, and the date and time of transmission (Campbell, Stehfest, Votier, & Hall-Spencer, 2014). These datasets, which were provided as raw data by the Department of Fisheries and Aquaculture, were filtered to establish the actual geospatial points and dates within which fishing took place. Since the artisanal fishing is predominantly of a passive nature, the co-ordinates that were selected included those which were stationary (at sea not in the port) or cruising at a maximum of 1–2 knots since, according to fishers (pers. comm.), this is the maximum speed in which the various artisanal fishing activities can be conducted. These filtered geospatial positions (points) were then imported into ArcGIS to map their location within the 150 m-bathymetric contour, and overlaid with the various areas (polygons) representing the different maritime uses (shipping, aquaculture) within the 3NMZ. Successively, the fishing points that were identified as within the above-mentioned different polygons were quantified to generate the data represented in Table 1. GIS also allowed for the quantification of the percentage of area covered by the various marine uses (polygons) within the 150 m-bathymetric contour.

The fishing activity collected through the GPRS and VMS points was triangulated through participatory mapping during the in-depth interviews (n = 43) held with fishers. These interviews, which elicited significant qualitative socio-economic information about the sector were held through a participant observation approach on fishing boats, at the fishing port, and during informal social gatherings, since the participants' natural settings are known to improve their willingness to engage in the research process (Bernard Russell, 2002). The level of trust between the researcher – as a local – and the informants was also an important factor that determined the accessibility to information on sensitive issues, such as topics of concern that are not easily gauged through other forms of methods. A total of ten semi-structured interviews were also conducted with the scuba-diving industry during 2011–2012, and occasional conversations with scuba-diving enthusiasts took place at prime dive sites.

Furthermore, an in-depth interview and a series of email correspondences were held with the Environmental Resource Authority (ERA) which is the national body responsible for the implementation of MPAs. The main author also participated in three of the government-organized stakeholder meetings and analysed the dynamics of such fora. Finally, to evaluate the ongoing official narratives of MPAs, we reviewed government documents including conservation legislations, proposed management plans,

stakeholder meeting minutes, outreach and dissemination activity documents, and news reports that are published from time to time. Ultimately, the various qualitative and quantitative data collected were iteratively transcribed and coded using the constructivist grounded theory methodology (Charmaz, 2006) to elicit, visualize and interpret the major themes appearing throughout the narrative.

3. Results: incremental squeezing and spatial challenges in the traditional fishing grounds

The artisanal small-scale fishing fleet, comprising 935⁵ vessels below 12 metres in length overall (LOA) licensed to operate in multi-gear fishing activities within the inshore fishing zone, has been subjected to considerable change within its traditional fishing grounds. These grounds, which extend to circa the 150-m bathymetric contour, and are important for demersal and small-pelagic fisheries, encompass around 50% of the 3NMZ and cover a total area of 445 km². This same marine area has become highly developed over recent years, accommodating various marine uses. At present, these new arrivals collectively occupy 76% of waters within the 150-m bathymetric contour (Fig. 1) to which fishers have had to adapt as a result of ongoing spatial competition and conflict within their traditional grounds, which, on occasion, overlap with high risk zones.

Although fishermen have not always been 'physically' segregated from these waters, the various types of 'fish-resource' and 'sea-space' competition are making it increasingly difficult for fishers to retain their activity in full. The challenging situations fishermen face is summarised in Table 1, and vary between 'Hindered/Restricted Access' due to the exclusivity right of sea-space granted to other marine uses; reduction in fish productivity due to the 'Seabed/Ecosystem Degradation' created by the marine use in the area in which it operates; and, 'Unintended Fishing Gear Damage' which has been registered to occur when fishing activities overlap with high risk zones.

For instance, in the area designated for shipping routes which occupies 1/3 of the 150-m contour, and which between 2014 and 2015 hosted 55% of the fishing activity (Fig. 2a), a number of fishers stated that they have lost their gear when the geospatial position of the artisanal fishing gear intersected with shipping activity. Bunkering, which involves the anchoring of ships within 5% of the 150-m contour, allegedly affects the productivity of fishing grounds and unintentionally damages the fishing gear due to the continuous scouring of heavy chains and anchors. Some fishermen claimed that they have lost fishing nets and traps⁶ as a result of shipping activities both within ports' entrances and shipping routes as well as within bunkering areas.

Further registered impacts noticed by fishers include the alleged marine pollution created by the various industries such as the Freeport, the operations of the power station, and the installation of sewage outflow and spoil dump systems, since these have, according to fishers, affected the productivity of fish stocks, according to fishers. A fisherman's wife argued that... *"the power station killed the sea [ecosystems] due to the heating of the water [thermal pollution], and the infrastructure work and dredging in the development of the Freeport [which creates sedimentation processes and suspended matter in the water column] also negatively affected the fish stocks in this area [Marsaxlokk Fishing Village]"*. (Fig. 2b).

⁵ These vessels are owned by around 900 fishers (Data provided by the Department of Fisheries and Aquaculture in 2014–2015).

⁶ The main author has witnessed crushed octopus traps during a fishing trip in April 2015.

³ Main author's B.A (Hons) thesis.

⁴ Less than 12 metres.

Table 1

This table presents a quantitative illustration of the area occupied by the different marine uses within the <150 metre bathymetric contour, and the percentage of fishing activity that has been registered within these zones between 2014 and 2015. The total number of fishing positions registered by the GPRS and VMS was taken as the 100% of the fishing activity within the 150 m bathymetric contour. To quantify the %age of fishing activity in the different maritime uses (polygons), we calculated the proportion of fishing points that were within the polygons (The total percentage adds up to more than 100% due to the fact that a number of areas of marine uses overlap e.g. bunkering and MPAs). This table, through the shaded boxes, further presents a typology of competition and/or impact created by the different uses within the 3NM as reported by the fishermen during the interviews or as witnessed by the main author during fishing trips.

Spatial Challenges Encountered by Artisanal Fishing (2014-2015)									
Marine Uses		Spatial Overlap within the 150m contour (Fishing Grounds)		Type of Reported Competition			Type of Reported Impact		
		%age of Area covered by the Marine Uses	%age of Fishing Activity in area	Fish Resources	Sea-Space/Seabed		Unintended Fishing Gear Damage	Seabed/ Ecosystem Impact	Hindered/ Restricted access
		Permanent seabed closure	Forced Co- existence						
Recreation/ Tourism	Diving	0.49	0.9						
	Leisure fishing	n/a	n/a						
	Swimming Zones	0.21	0						
	No Stopping Area	0.26	0						
Maritime Transport	Shipping Traffic	32	55						
	Bunkering	5	10						
Infrastructure	Energy	n/a	n/a						
	Sewage Outflow	0.11	0.6						
	Spoil Dump	0.09	0						
Large-scale Fishing Industries	Aquaculture	0.54	5		*Partial access				
	Trawling	2.5	0.5						
Conservation	MPAs	42	44	No Impact to date since MPAs are not fully implemented					

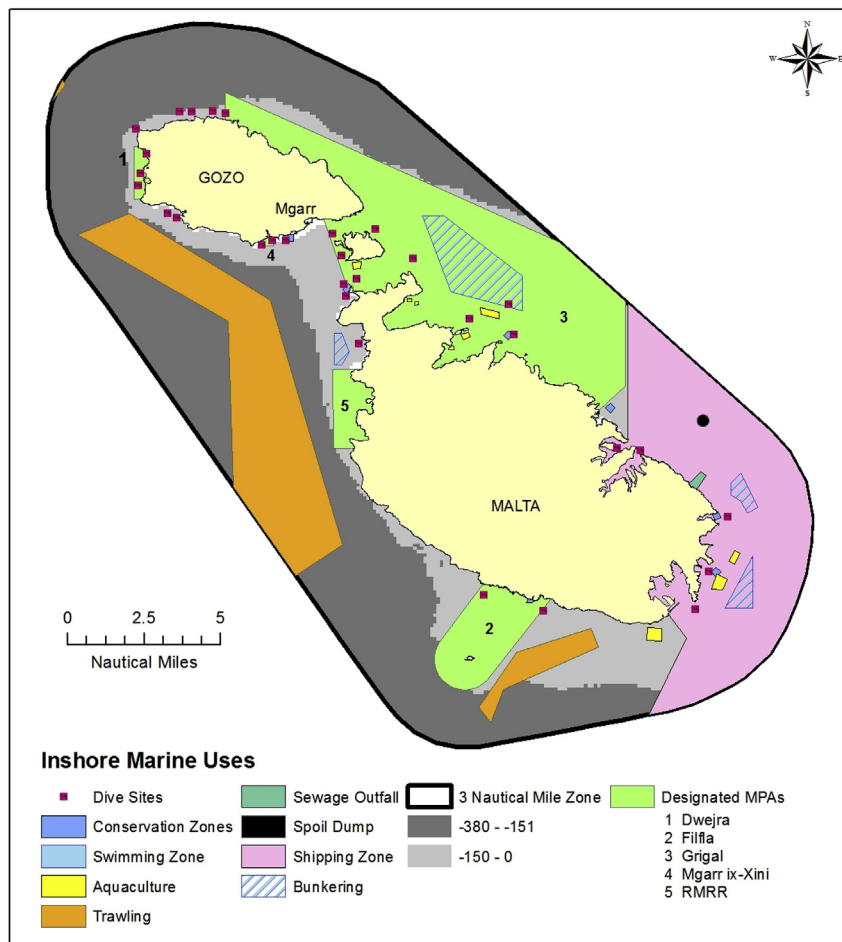
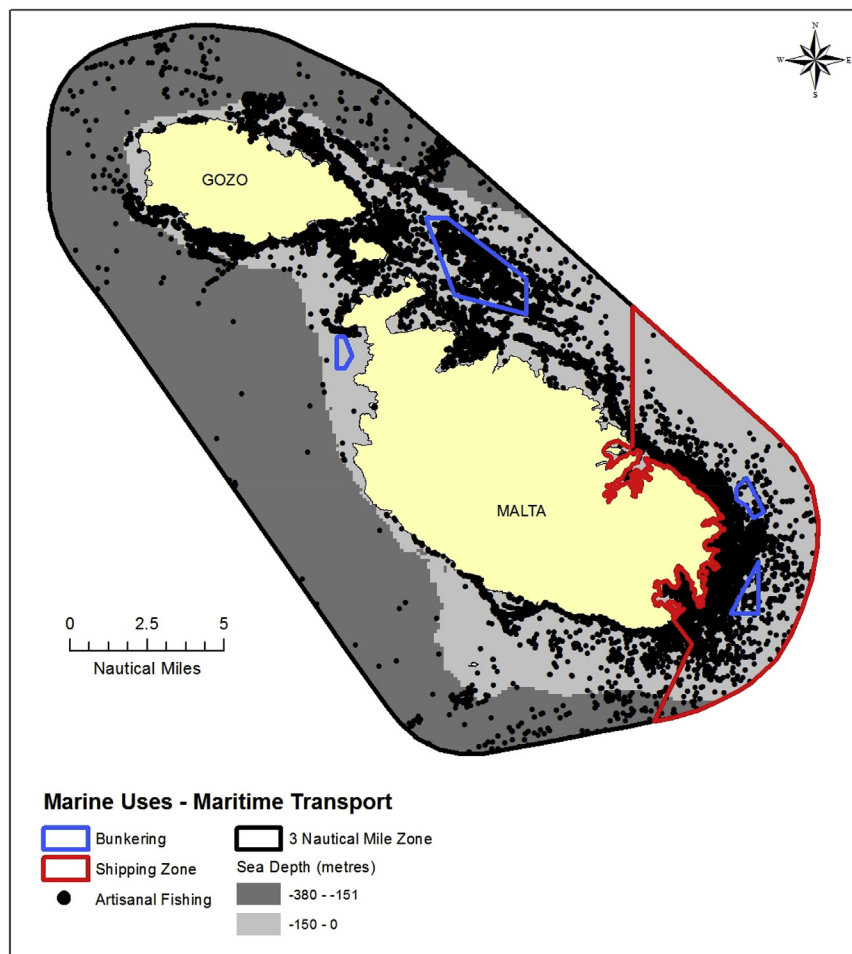
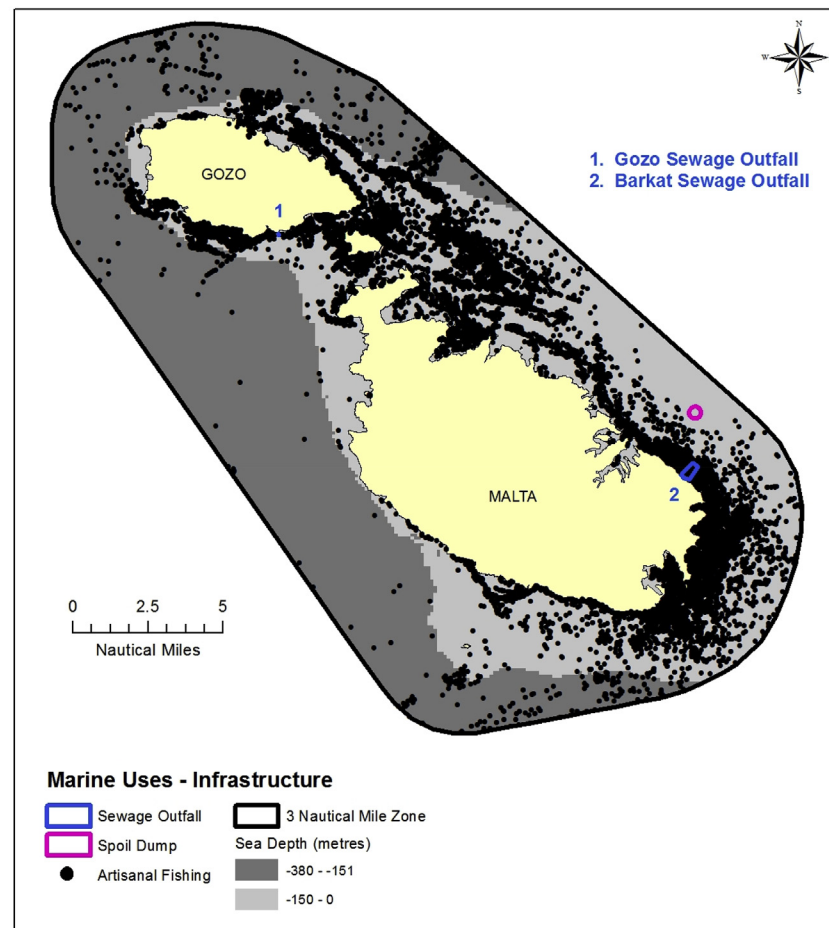


Fig. 1. This map shows a representation of the different types of uses which pose spatial competition to the artisanal fishing sector. The competition within this 3NMZ occurs mainly in the shallow areas (0–150 m).



(a)



(b)

Fig. 2. **a:** Spatial competition between maritime transport and artisanal fishing activity 2014–2015. **b:** Spatial competition between infrastructure operations and artisanal fishing activity 2014–2015. **c:** Spatial competition between large-scale fishing industries, namely trawling and aquaculture, and artisanal fishing activity 2014–2015. **d** Spatial competition between marine-based recreation and artisanal fishing activity 2014–2015.

Fishers face further challenges from the outcompeting nature of the trawling sector (Fig. 2c) since the latter involves the practice of large-scale industrial fishing for the same demersal species both within and outside the legal trawling zones as reported in a local newspaper in 2014 (see. Debono, 2014). This illegal encroachment affects the artisanal sector as, according to fishers, it intensifies the fishing effort on the same species and the trawling operations negatively affect the benthic ecosystems, as well as pose risks to the artisanal fishing gear.

Another ‘squeezing’ effect that the fishermen have been facing in the past years results from the scuba-diving industry which has been sprawling throughout the coastal areas (Fig. 2d). This niche, which has been voted as one of the top 3 dive destinations in the world and caters for an average of 60,000 tourists per year (Adi Associates Environmental Consultants, 2011), has established a network of over 40 sites across the island, and simultaneously has been lobbying against fishing in these zones. For example, it has pushed for the establishment of ‘Conservation Areas around Wrecks’ known as No Stopping Zones⁷ which restrict most forms of artisanal fishing within some of the most popular diving sites. Despite being established as ‘conservation areas’, the regulation does not detail any baseline of what is to be conserved within such areas; one can easily argue that this was in fact an indirect way of preferring diving over fishing. Fishers have expressed their dismay towards the establishment of such zones since this inflicts on their ability to work, especially on bad weather days, as clearly explained by a fisherman: *“A couple of months ago I was stopped by the enforcement agency. The officer told me that I cannot deploy my fishing nets there because that area is for divers. I don't know how they expect me to earn my living. They are doing everywhere for divers. A fisherman cannot work out at sea during the bad weather, so we need to find these sheltered areas for fishing”*. Faced by no alternative, some still risk fishing in these zones at night, and several fishers have had their fishing gear confiscated and fined up to €2000 for ‘trespassing’ within these areas (pers. comm. with fisher).

It can be assumed that such illegalities are survival strategies that the fishermen have adopted in a situation of shrinking fishing grounds, especially when considering that the fish resources within these waters are also contested by the recreational/leisure fishing segment. The recreational niche, which incorporates vessel, harpoon and shore-based fishing activities has increased drastically in the past 10 years and is considered as a major livelihood threat to the artisanal counterpart. A commercial-artisanal fisher explained that *“there are a lot of recreational fishermen and since they are equipped they are catching a lot of fish.”*

Faced by dwindling fish resources and congested sea grounds, the artisanal fishers are caught in a pattern of conflicts with the recreational segment as well as the artisanal counterpart (Fig. 3). These include (i) intimidation amongst fishers who encounter each other within the same fishing zones, as narrated by a fisher: *“Some 5 years ago, I was deploying the nets and there was another [artisanal commercial] fisherman in the same spot. Out of jealousy the fisher started driving his vessel into mine to threaten me. If I didn't move, the speed and size of his boat would have killed me”*; (ii) problems deploying gear due to lack of space since *“sometimes, the good fishing grounds are covered with trammel nets, and we (fishermen using demersal long-lines) find no space to deploy our long-lines.”* (Artisanal fisher); (iii) disputes between small vs large artisanal vessels' owners, since the latter, as explained by a fisher, *“come with a truck-full of trammel nets. They have bigger boats than us and we cannot compete with them. It's normal to get in conflict with these people”*; and, (iv) acts of vandalism between fishers from different

ports as exemplified in an artisanal fisher's account: *“Once there was seabream spillage from the fish farms in St. Paul's Bay and I went to fish in the area because you catch a lot of fish when these spillages happen. The first time was OK but the second time I went [the other fishermen] stole my 8 trammel nets – these cost around €800 altogether. When they realized that I am not a fisherman from 'their' area, they found a way of keeping me away.”*

In this fierce competition for fish resources, fishers perceive one another as threats to their livelihoods, and they are increasingly secretive about their activities in order to keep their competitors away from bountiful fishing grounds. For instance, it is unlikely for a fisher to be asked, or answer truthfully, about how large his catch was, or where the haul occurred: these are matters that are locally referred to as ‘*top secret*’ by the fishermen themselves. Such information is hidden because fishers fear that others might become motivated to mount a trip to the same spot, thereby reducing their ability to catch more during their next fishing trip. Despite such tricks in concealing important information, others however still manage to ‘spy on’ their competitors' activities either at sea whilst hauling the catch or during the unloading phase at the fishing port or the fish market. Fishers claimed that it is not unusual for them to find fishers, whom they would have met at the fish market the day before, fishing exactly within the same spot as them the next day. Feeling dismayed by what they perceive as ‘invasion’ into their fishing grounds, fishers sometimes get into rights' fights over the territory, and these fights may also escalate into manifested violent assaults or latent revenge such as stealing of fish/gear or vandalism to one's fishing gear.

These realities, which shape the everyday experiences of artisanal fishers, are the outcome of multiple incremental cause-effect changes that have gone unnoticed throughout the development of marine planning. In view of the current challenges faced by fishers, it is highly expected that such scenarios of user-conflicts and fishers' livelihood deprivation are likely to escalate if further pockets of fishing grounds are closed off for conservation purposes under the ambit of SAC designation and associated regulations. Encompassing 42% of traditional fishing grounds, and hosting around 44% of the artisanal fishing activity between 2014 and 2015 (Fig. 4), the designated network of the five SACs under NATURA 2000 brings forth a major uncertainty about the future of artisanal fishing in the inshore fishing grounds.

4. Discussion: MPAs - an encroachment too far?

Although the national administration has not officially declared any restrictive measures on artisanal fishing as part of the conservation objectives of MPAs, the current state of affairs indicates that MPAs might be another encroachment onto the fishing grounds. This can be gathered from the dynamics of ongoing negotiations and the concomitant official narratives that have unfolded since the inception of SACs designations in the Maltese waters. The areas, which have been chosen by the government (following scientific studies) as SACs - on the premise that the habitats therein (predominantly *Posidonia oceanica* meadows) are ‘geographically representative of good conservation status’ (MEPA, 2010) - are the same areas that have been serving as significant fishing ‘hotspots’ for decades. It can be assumed that their good conservation status indirectly implicates that the long-existing artisanal fishing activity has been conducted in harmony with what are now earmarked as priority habitats and species since the fishing activity has not degraded the pristine value of these resources within the designated SACs. This reality, however, does not feature within the official MPA documentation, since in various instances commercial fishing has been pictured, by default rather than by evidence, as a threat that needs to be subdued, or preferably removed to ensure

⁷ Malta Maritime Authority, Notice to Mariners No. 5 of 2008.

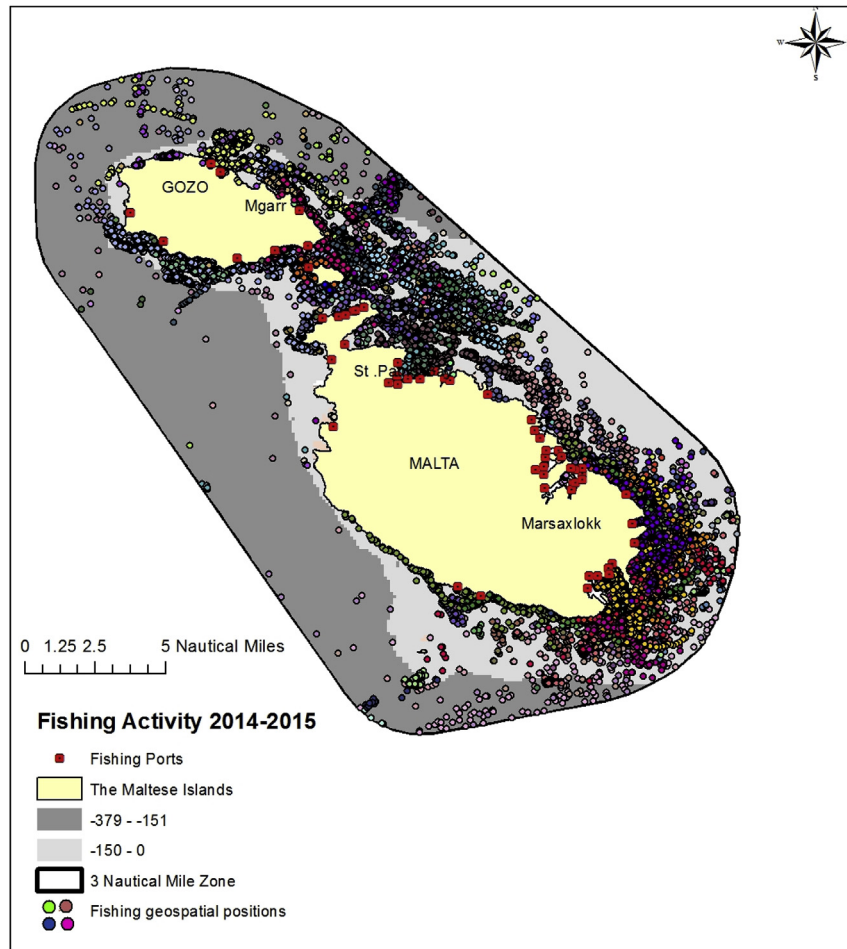


Fig. 3. This map represents the artisanal fishing activity between August 2014 and August 2015. The different represent different fishing vessels which are contesting the same fishing grounds and are thus caught in space wars.

that the seagrass meadows and other species are protected in line with the Habitats Directive.

For example, the draft management plan for the RMRR MPA (MEPA, 2005b) states that ‘the direct effects of harvesting natural resources, using destructive methods, leave a direct impact on species populations and also often lead to habitat destruction.’ (MEPA, 2005b, p. 27), and repetitively indicates that fishing should be highly restricted within the MPA. The same narrative of restricting commercial fishing to protect marine habitats is reproduced within the action plan of the Dwejra MPA (MEPA, 2005a) – an MPA that hosts three dive sites. In contrast to the commercial fishing activity, the same documents state that diving will be allowed to continue (MEPA, 2005a) as it is considered to be of ‘a relatively low impact on the status of the environment’ (MEPA, 2005b, p. 26), and is thus assumed to be compatible with marine protection. It is worthy of notice, however, that the various discourses that construct fishing as a ‘threat’ and diving as congruent to protection, are not based on evidence as ‘the impacts due to human activities within the area are poorly documented’ (Mifsud, Stevens, & Baldacchino, 2003) and the studies conducted to date have not systematically assessed the influences of fishing or diving. The evidence-gathering has been restricted to the mapping (MedPan2008, LIFE Bahar 2016), quantification (e.g. *Pinna nobilis* 2011), and promotion (Panacea2013) of the ecological aspects of designated MPAs, rather than the interaction between human-use and the ecological integrity of the marine areas.

In other words, without any supporting evidence that the degradation caused by fishing is causing irreconcilable damage to important marine habitats and protected species, the mainstream narrative has consistently reiterated the need of restricting/controlling fishing from MPAs. In these discourses, socio-economic factors, such as the fishermen’s need to fish, are somewhat trivialized and made to appear as inconsistent to the ideals of protection. This ideological thrust is facilitated by the legal provisions of the Habitats Directive that are in place to permit the compensation of human activities that perpetuate ‘the deterioration of natural habitats and the habitats of species as well as disturbance of the species [...] to ensure that the overall coherence of Natura 2000 is protected.’ (EEC43/92 [Art. 5]). Thus, it can be assumed that the avenue of compensation is perhaps seen as the escape route for policymakers, with the supposition that a compensation package will be an adequate substitute for displacing fishers from their traditional fishing grounds. Indeed, plans within the LIFE Bahar project (2016) are underway to identify the potential diversification of tasks and alternative livelihoods that could ease the socio-economic impact of stakeholder groups, including fishers, who will be impacted by the designated sites⁸.

Although government authorities seem to be depicting the

⁸ <http://lifebahar.org.mt/a8-identification-of-diversification-of-tasks-for-stakeholders-being-impacted-by-the-designated-sites-dfa/>.

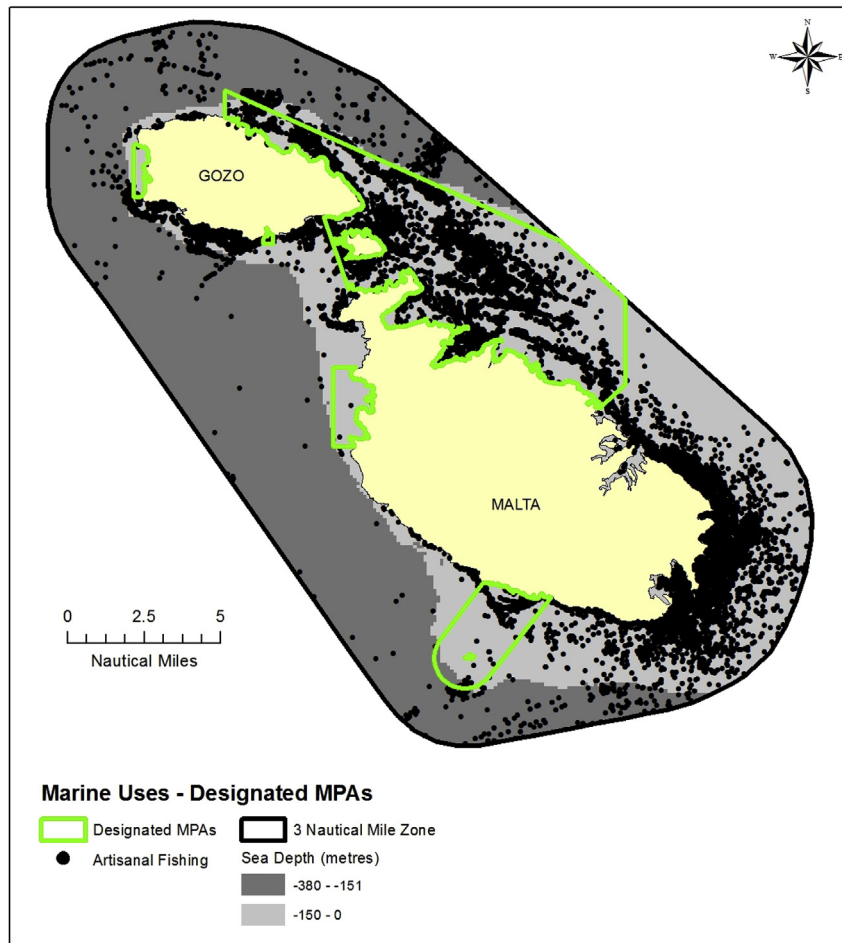


Fig. 4. The network of MPAs encompass 42% of the traditional fishing grounds and host around 445% of the artisanal fishing activity between 2014 and 2015.

concept of ‘alternative livelihoods’ as an ‘automatic solution’ to the issue, they fail to recognise that (i) many fishers do not hold sufficient skills to switch their jobs: *“I do not speak English so tourism is not good for me because I will not be able to communicate.”* (Artisanal fisherman), and that (ii) fishing means more than a mere income: *“I love my job and I go crazy if I don’t go fishing. I tried to work on land but I realized it is not for me – I need the sea and I need to fish!”* (Artisanal fisherman). In sum, fishing is a way of life that cannot be simplistically fulfilled through other forms of employment, thus, if fishing is ultimately restricted or highly controlled in MPAs, dire consequences for the artisanal sector become inevitable. Most probably displaced fishers will seek to fish in nearby zones and intensify both the fishing effort and the already-existing social conflict with other users.

It can be hypothesized that non-compliance within MPAs becomes inevitable if fishers find no alternative fishing grounds, especially when considering that commuting to offshore waters has been perceived by fishers themselves as an unviable option since it is relatively unsheltered for small-scale boats, and involves significantly higher costs. Moreover, shallow ‘fishable’ zones outside the 3NMZ are predominantly fished by industrial trawlers, and are occupied by further bunkering activity. In other words, fishers also face being squeezed out from these outer zones, and they may therefore be forced out from fishing altogether. These insights and perspectives do not seem to feature within the general narrative of the MPAs mainly because (i) this is somewhat secluded within a narrow-vision of the ecological paradigm that ignores the wider

picture of the fishing sector, and because (ii) artisanal fishers have not been effectively involved in the various negotiations pertaining to the MPA designation, and are thus unable to influence the forthcoming regulations.

For example, a recent⁹ open debate that was scheduled to gauge the fishers’ views on MPAs, was shifted to a closed-door meeting with only the representatives of fishermen’s co-operatives, whose interests differ largely from those of the artisanal fishers. The latter assert that these local organizations, whose main role is to safeguard the interests of the fishermen they represent, are not generally proactive to address the needs of the inshore sector. They feel that the spokespersons/representatives, whom they portray as being motivated by personal gain rather than by the communal good of the fishing sector, invest more energy in protesting for the rights of large-scale fishing operators such as coastal trawling (e.g. TOM, 2012) and the offshore tuna fishery than for the livelihoods of the inshore artisanal counterpart; consequently, the artisanal fishing sector remains relatively unrecognized and unprotected.

Although previous attempts to hold wider stakeholder consultations have been organized, such as the ministerial meeting with RMRR MPA fishers in 2005 and the stakeholder workshops held in 2014, these were rather unsuccessful. While being present for both events, the main author noted that the attendance rate of fishers is generally low, either because they are not aware of such meetings,

⁹ This happened in March 2017.

or fishers are out at sea during the time of the meeting. It also transpired that those who have attended felt disengaged from the consultation process due to the scientific jargon deployed by the speakers which, according to fishers, restricted the possibility of a productive dialogue between the two parties. More recently, the launching of an online public consultation¹⁰ has also restrained the involvement of fishers who are not computer or English-literate. These various participatory governance stories seem to contrast with ERA's position since it asserted that stakeholder consultations shall be inclusive to address the different needs of fishers (Interview with ERA). With this backdrop, the artisanal fishers, who are both detached and disempowered within the decision-making arenas, will remain unable to have their voice heard and determine their future within the context of MPAs.

The disempowerment of artisanal fishers has also been reinforced by a series of parallel public narratives organized by the recreational fishing industry, the environmentalists and the diving industry. These three entities have been using their influence in marine governance to push towards the banning of artisanal netting during a number of MPA stakeholder meetings, and through various forms of media. For example, the diving industry, which is supported by environmentalist groups, has used the television, newspapers and online fora to associate the conservation of the marine heritage with the need to prohibit the use of artisanal trammel and gillnets. Their pro-conservation ideology is often used as a 'smoke screen' to promote scuba diving and snorkelling interests at the expense of fishing (TOM, 2007a, 2010, 2014, pp. 1–10) and at times their 'conservation' agenda has sought the public humiliation of the fishers, casting them as 'culprits' or 'unscrupulous' individuals engaging in 'scourging' inshore fishing activities (TOM, 2007b, 2011).

Fishermen feel criminalized and powerless to stop this dominant discourse and negative propaganda. Moreover, they fear that the MPAs are likely to empower the scuba-diving interests over their own. As one fisherman expressed, "*there is a lot of pressure from the diving industry to have the MPAs; the sea is not [of the scuba-divers] and they cannot claim it as such ... they can use it but they cannot close it off for diving*", because ultimately, "*the fishermen will be pushed out from everywhere*", as remarked by another fisherman. Effectively, if no real action is taken to defend the artisanal sector, the MPAs might well become the next environmentally-based policy tool – along with others such as the bluefin tuna fisheries conservation policy – that will marginalize and decimate the artisanal fishing fleet.

5. Conclusions and recommendations

This study, which applies a grounded-visualization methodology to explicate the socio-spatial realities of marine-resource use, illustrates how inshore artisanal fishing in Malta has become squeezed by new uses which have colonized the marine zone. It is argued that the primary reason why such squeezing occurred is because the spatial boundaries of the artisanal fishing, as opposed to other marine users, are not recognized through a legal framework, thus the artisanal sector has remained somewhat invisible and not properly acknowledged in the promulgation of marine spatial policies. The upcoming MPAs which encompass a significant area of the fishing grounds seem to be a new encroachment into core fishing territory since there is currently little or no attempt to effectively uptake the fishermen's knowledge and accommodate their interests through the MPA negotiation processes.

Problems of geographical and political marginalization of fishers in MPA planning are inevitable when the process of decision-making is dictated by the natural science disciplines (Hattam, Mangi, Gall, & Rodwell, 2013) because these tend to disregard the dynamics of local communities such as the incremental spatial squeezing within traditional fishing grounds (Cinner et al., 2014; Pomeroy, Parks, Mrakovcich, & LaMonica, 2016) and already-existing livelihood hardships that the fishers might have been experiencing due to decreased fishing opportunities (Dimech, Darmanin, Philip Smith, Kaiser, & Schembri, 2009; Said et al., 2016). In this regard, it is argued that social, economic and cultural considerations which determine the future of fishing communities, must be central in the policy build-up surrounding protected areas (Agardy, di Sciara, & Christie, 2011; Blount & Pitchon, 2007; Speed Rossiter, Curti, Moreno, & López-Carr, 2015; Stoll-Kleemann, 2001). As a group of pioneer users of the marine landscape, the small-scale fishing sector deserves to be duly recognized to ensure that the prolonged existence of these communities is not jeopardized.

In the advent of the MPA conservation measures, it is recommended that greater efforts are undertaken to improve and foster the participation of fishermen in the decision-making process, particularly those belonging to the small scale fishing segments (Chuenpagdee et al., 2013) and that fishers pool in their efforts to self-organize and strengthen their common voice. By developing an association, artisanal fishers will be better-equipped to advocate about their interests, such as indicating the feasibility of incorporating the artisanal fishing activities, which are low-impact in nature, in the objectives of the MPAs. A strong argument exists in regard to MPAs which indicates that they should, in practice, be used to protect and defend, rather than catalyse the potential demise of the inshore fishing sectors since their low-impact activity is compatible with the protection of marine ecosystems (Jones, 2009). Following the actual implementation of MPAs, fishers could be involved in the monitoring of the protected habitats through their ongoing fishing trips, and become 'advocates' (Perez de Oliveira, 2013), rather than 'aliens' (Ferse, Máñez Costa, Máñez, Adhuri, & Glaser, 2010) of the MPAs upon which their livelihood depends. Ultimately, the network of MPAs could become a community-based initiative through which fishers, as owners and stewards of these areas, would seek to promote the common objectives of marine protection (Kusumawati & Huang, 2015), rather than defy what they perceive as suffocation to their livelihoods (Chen & Lopez-Carr, 2014).

Acknowledgments

Our heartfelt appreciation goes to all the residents in the Maltese fishing villages who generously gave us their time throughout the fieldwork. Also, we would like to acknowledge comments from Brian Campbell on previous drafts of this paper. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Adi Associates Environmental Consultants. (2011). *Diving master plan for Malta. Master plan to support a sustainable diving industry for Malta*.
- Agardy, T., di Sciara, G. N., & Christie, P. (2011). Mind the gap: Addressing the shortcomings of marine protected areas through large scale marine spatial planning. *Marine Policy*, 35(2), 226–232. <http://dx.doi.org/10.1016/j.marpol.2010.10.006>.
- Álvarez, P., Seingier, G., Bocco, G., Espejel, I., & Noriega, J. (2015). Regional landscape change in fishing communities of the Mexican north Pacific. *Landscape Research*, (May), 1–20. <http://dx.doi.org/10.1080/01426397.2015.1031095>.
- Benjaminsen, T., & Bryceson, I. (2012). Conservation, green/blue grabbing and accumulation by dispossession in Tanzania. *Journal of Peasant Studies*, 39(2),

¹⁰ http://era.org.mt/en/Documents/PublicConsultation_ManagementMaltaMarineN2K.PDF.

- 335–355.
- Bernard Russell, H. (2002). *Research methods in Anthropology: Qualitative and quantitative methods* (4th ed.). United States of America: AltaMira Press. [http://dx.doi.org/10.1016/S0886-1633\(96\)90044-66](http://dx.doi.org/10.1016/S0886-1633(96)90044-66).
- Beunen, R., Van Assche, K., & Duineveld, M. (2013). Performing failure in conservation policy: The implementation of European Union directives in The Netherlands. *Land Use Policy*, 31, 280–288. <http://dx.doi.org/10.1016/j.landusepol.2012.07.009>.
- Blount, B., & Pitchon, A. (2007). An anthropological research protocol for marine protected areas: Creating a niche in a multidisciplinary hierarchy. *Human Organization*, 66(2), 103–111.
- Boissevain, J. (2006). Hotels, tuna pens, and civil Society: Contesting the foreshore in Malta. In J. Boissevain, & T. Selwyn (Eds.), *Contesting the Foreshore: Tourism, society, politics on the coast* (pp. 233–260). Amsterdam University Press. <http://dx.doi.org/10.1016/j.annals.2006.05.001>.
- Campbell, M. S., Stehfest, K. M., Votier, S. C., & Hall-Spencer, J. M. (2014). Mapping fisheries for marine spatial planning: Gear-specific vessel monitoring system (VMS), marine conservation and offshore renewable energy. *Marine Policy*, 45, 293–300. <http://dx.doi.org/10.1016/j.marpol.2013.09.015>.
- Charmaz, K. (2006). *Constructing grounded theory, a practical guide through qualitative analysis*. Book. Sage Publications.
- Chen, C., & Lopez-Carr, D. (2014). The importance of place: Unraveling the vulnerability of fisherman livelihoods to the impact of marine protected areas. *Applied Geography*, 1–10. <http://dx.doi.org/10.1016/j.apgeog.2014.10.015>.
- Chuenpagdee, R., Pascual-ferna, J. J., Szeliandzky, E., Alegret, J. L., Fraga, J., & Jentoft, S. (2013). Marine protected areas: Re-thinking their inception. *Marine Policy*, 39, 234–240.
- Cinner, J. E., Daw, T., Huchery, C., Thoya, P., Wamukota, A., Cedras, M., et al. (2014). Winners and losers in marine Conservation: Fishers' displacement and livelihood benefits from marine reserves. *Society & Natural Resources*, 27(November 2015), 994–1005. <http://dx.doi.org/10.1080/08941920.2014.918229>.
- Clausen, R., & Clark, B. (2005). The metabolic rift and marine Ecology: An analysis of the ocean crisis within capitalist production. *Organization & Environment*, 18(4), 422–444. <http://dx.doi.org/10.1177/1086026605281187>.
- Conrad, E., & Cassar, L. F. (2007). *Coasts & Conflicts: Towards harmonisation and integration in the mediterranean*. International Environment Institute, University of Malta. University of Malta.
- Cooke, S. J., & Cowx, I. G. (2006). Contrasting recreational and commercial fishing: Searching for common issues to promote unified conservation of fisheries resources and aquatic environments. *Biological Conservation*, 128(1), 93–108. <http://dx.doi.org/10.1016/j.biocon.2005.09.019>.
- Davis, A. R., Broad, A., Gullett, W., Reveley, J., Steele, C., & Schofield, C. (2016). Anchors away? The impacts of anchor scour by ocean-going vessels and potential response options. *Marine Policy*, 73, 1–7. <http://dx.doi.org/10.1016/j.marpol.2016.07.021>.
- Debono, J. (2014, February 12). *New Control Centre discovers widespread illegal trawling 21 cases of illegal fishing and trawling reported last year inside the fisheries management zone*. Maltatoday. Retrieved from <http://www.maltatoday.com.mt/news/national/35594/new-control-centre-discovers-widespread-illegal-trawling-20140212#.VZpWePnRutW>.
- Deidun, A., Borg, S., & Micallef, A. (2011). Making the case for marine spatial planning in the Maltese islands. *Ocean Development & International Law*, 42(1–2), 136–154. <http://dx.doi.org/10.1080/00908320.2011.542108>.
- Dimech, M., Darmanin, M., Philip Smith, I., Kaiser, M. J., & Schembri, P. J. (2009). Fishers' perception of a 35-year old exclusive fisheries management zone. *Biological Conservation*, 142(11), 2691–2702. <http://dx.doi.org/10.1016/j.biocon.2009.06.019>.
- DuBois, C., & Zografos, C. (2012). Conflicts at sea between artisanal and industrial fishers: Inter-sectoral interactions and dispute resolution in Senegal. *Marine Policy*, 36(6), 1211–1220. <http://dx.doi.org/10.1016/j.marpol.2012.03.007>.
- EEC43/92. (1992). *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora*.
- Fabinyi, M. (2008). Dive tourism, fishing and marine protected areas in the Calamianes Islands, Philippines. *Marine Policy*, 32(6), 898–904. <http://dx.doi.org/10.1016/j.marpol.2008.01.004>.
- Ferranti, F., Beunen, R., & Speranza, M. (2010). Natura 2000 in Italy and The Netherlands. *Journal of Environmental Policy and Planning*, 12(3), 293–314.
- Ferre, S. C. A., Máñez Costa, M., Máñez, K. S., Adhuri, D. S., & Glaser, M. (2010). Allies, not aliens: Increasing the role of local communities in marine protected area implementation. *Environmental Conservation*, 37(1), 23–34. <http://dx.doi.org/10.1017/S0376892910000172>.
- Fleming, B., & England, N. (2000). *Conflict resolution in the humber estuary Natura 2000 protected area*.
- Formosa, S. (2014). Future Preparedness: Thematic and spatial issues for the environment and sustainability. In S. Formosa (Ed.), *Department of criminology. University of Malta in conjunction with MEPA*.
- Guyader, O., Berthou, P., Koutsikopoulos, C., Alban, F., Demanèche, S., Gaspar, M. B., et al. (2013). Small scale fisheries in Europe: A comparative analysis based on a selection of case studies. *Fisheries Research*, 140, 1–13. <http://dx.doi.org/10.1016/j.fishres.2012.11.008>.
- Hattam, C. E., Mangi, S. C., Gall, S. C., & Rodwell, L. D. (2013). Social impacts of a temperate fisheries closure: Understanding stakeholders' views. *Marine Policy*, 1–10. <http://dx.doi.org/10.1016/j.marpol.2013.09.005>.
- Jentoft, S. (2017). Small-scale fisheries within maritime spatial planning: Knowledge integration and power. *Journal of Environmental Policy & Planning*, 7200(March), 1–13. <http://dx.doi.org/10.1080/1523908X.2017.1304210>.
- Jones, P. J. S. (2009). Equity, justice and power issues raised by no-take marine protected area proposals. *Marine Policy*, 33(5), 759–765. <http://dx.doi.org/10.1016/j.marpol.2009.02.009>.
- Knigge, L., & Cope, M. (2006). Grounded visualization: Integrating the analysis of qualitative and quantitative data through grounded theory and visualization. *Environment and Planning A*, 38(11), 2021–2037. <http://dx.doi.org/10.1068/a37327>.
- Kotzebeue, J. R. (2012). *Spatial misfits in multilevel governance impacts on the small island state of Malta*. University of Twente.
- Kusumawati, I., & Huang, H. W. (2015). Key factors for successful management of marine protected areas: A comparison of stakeholders' perception of two MPAs in Weh island, Sabang, Aceh, Indonesia. *Marine Policy*, 51, 465–475. <http://dx.doi.org/10.1016/j.marpol.2014.09.029>.
- Lefebvre, H. (1991). *The Social Production of Space* (1st ed.). Wiley-Blackwell.
- Levine, A. S., Richmond, L., & Lopez-Carr, D. (2015). Marine resource management: Culture, livelihoods, and governance. *Applied Geography*, 59, 56–59. <http://dx.doi.org/10.1016/j.apgeog.2015.01.016>.
- Maynou, F., Recasens, L., & Lombarte, A. (2011). Fishing tactics dynamics of a Mediterranean small-scale coastal fishery. *Aquatic Living Resources*, 24(2), 149–159. <http://dx.doi.org/10.1051/alr/2011131>.
- MEPA. (2005a). *Qawra/dwejra heritage Park: Approved plan*.
- MEPA. (2005b). *Rdum Majjiesa to Ras ir-Raheb marine protected area - a management framework for the marine environment*.
- MEPA. (2007). *An overview of the state of marine spatial planning in the Mediterranean countries*.
- MEPA. (2010). *Four new marine protected areas*. Retrieved March 12, 2014, from <https://www.mepa.org.mt/outlook5-article2>.
- MEPA. (2011). *Report on the implementation of the recommendation of the European parliament and of the council concerning the implementation of integrated coastal zone management in*.
- Mifsud, C., Stevens, D., & Baldacchino, A. (2003). *Strategic action plan for the conservation of Maltese coastal and marine biodiversity, 2002-2003*.
- Mishra, S. R., & Griffin, A. L. (2010). Encroachment: A threat to resource sustainability in Chilika lake, India. *Applied Geography*, 30(3), 448–459. <http://dx.doi.org/10.1016/j.apgeog.2009.12.001>.
- Ounanian, K., Delaney, A., Raakjær, J., & Ramirez-Monsalve, P. (2012). On unequal footing: Stakeholder perspectives on the marine strategy framework directive as a mechanism of the ecosystem-based approach to marine management. *Marine Policy*, 36(3), 658–666. <http://dx.doi.org/10.1016/j.marpol.2011.10.008>.
- Paloniemi, R., Apostolopoulou, E., Cent, J., Bormpoudakis, D., Scott, A., Grodzinska-Jurczak, M., et al. (2015). *Public participation and environmental justice in biodiversity governance in Finland, Greece, Poland and the UK*. Environmental Policy and Governance. <http://dx.doi.org/10.1002/et.1672>. n/a-n/a.
- Perez de Oliveira, L. (2013). Fishers as advocates of marine protected areas: A case study from Galicia (NW Spain). *Marine Policy*, 41, 95–102. <http://dx.doi.org/10.1016/j.marpol.2012.12.024>.
- Pinkerton, E., & Davis, R. (2015). Neoliberalism and the politics of enclosure in North American small-scale fisheries. *Marine Policy*, 1–10. <http://dx.doi.org/10.1016/j.marpol.2015.03.025>.
- Pomeroy, C., Hall-Arber, M., & Conway, F. (2015). Power and perspective: Fisheries and the ocean commons beset by demands of development. *Marine Policy*, 61, 339–346. <http://dx.doi.org/10.1016/j.marpol.2014.11.016>.
- Pomeroy, R., Parks, J., Mrakovcich, K. L., & LaMonica, C. (2016). Drivers and impacts of fisheries scarcity, competition, and conflict on maritime security. *Marine Policy*, 67, 94–104. <http://dx.doi.org/10.1016/j.marpol.2016.01.005>.
- Richmond, L., & Kotowicz, D. (2014). Equity and access in marine protected areas: The history and future of “traditional indigenous fishing” in the Marianas Trench Marine National Monument. *Applied Geography*, 1–8. <http://dx.doi.org/10.1016/j.apgeog.2014.11.007>.
- Said, A., Tzanopoulos, J., & MacMillan, D. (2016). Bluefin tuna fishery policy in Malta: The plight of artisanal fishermen caught in the capitalist net. *Marine Policy*, 73, 27–34. <http://dx.doi.org/10.1016/j.marpol.2016.07.025>.
- Salmi, P. (2015). Constraints and opportunities for small-scale fishing livelihoods in a post-productivist coastal setting. *Sociologia Ruralis*, 55(3), 258–274. <http://dx.doi.org/10.1111/soru.12095>.
- Schembri, P. J. (1999). Marine protected areas in the Maltese islands: Status and problems. In F. Briand (Ed.), *Scientific design and monitoring of Mediterranean marine protected areas. (CIEM Workshop Series No. 8)* (pp. 45–47). CIEM.
- Silver, J. J. (2014). From fishing to farming: Shellfish aquaculture expansion and the complexities of ocean space on Canada's west coast. *Applied Geography*, 54, 110–117. <http://dx.doi.org/10.1016/j.apgeog.2014.07.013>.
- Sohn, C., Christopoulos, D., & Koskinen, J. (2013). Geography is more than distance! the effects of borders and territoriality over policy networks. In *Applications of social network analysis*.
- Song, A. M. (2015). Human dignity: A fundamental guiding value for a human rights approach to fisheries? *Marine Policy*, 61, 164–170. <http://dx.doi.org/10.1016/j.marpol.2015.08.013>.
- Speed Rossiter, J., Curti, G. H., Moreno, C. M., & López-Carr, D. (2015). Marine-space assemblages: Towards a different praxis of fisheries policy and management. *Applied Geography*, 59, 142–149. <http://dx.doi.org/10.1016/j.apgeog.2014.12.015>.
- Stelzenmüller, V., Maynou, F., Bernard, G., Cadiou, G., Camilleri, M., Crechriou, R., et al. (2008). Spatial assessment of fishing effort around European marine reserves: Implications for successful fisheries management. *Marine Pollution Bulletin*, 56(12), 2018–2026. Retrieved from <http://www.sciencedirect.com/>

- science/article/pii/S0025326X0800413X.
- Stojanovic, T. A., & Ballinger, R. C. (2009). Integrated coastal management: A comparative analysis of four UK initiatives. *Applied Geography*, 29(1), 49–62. <http://dx.doi.org/10.1016/j.apgeog.2008.07.005>.
- Stoll-Kleemann, S. (2001). Barriers to nature conservation in Germany: A model explaining opposition to protected areas. *Journal of Environmental Psychology*, 21(4), 369–385. <http://dx.doi.org/10.1006/jevp.2001.0228>.
- Sullivan, C. M., Conway, F. D. L., Pomeroy, C., Hall-Arber, M., & Wright, D. J. (2015). Combining geographic information systems and ethnography to better understand and plan ocean space use. *Applied Geography*, 59, 70–77. <http://dx.doi.org/10.1016/j.apgeog.2014.11.027>.
- TOM. (2007a). *Divers face risks at artificial reefs as authorities fail to act*. Times of Malta. Retrieved from <http://www.timesofmalta.com/articles/view/20070428/local/divers-face-risks-at-artificial-reefs-as-authorities-fail-to-act.18939>.
- TOM. (2007b). *Fishing near wrecks must stop, says minister*. Times of Malta. Retrieved from <http://www.timesofmalta.com/articles/view/20070508/local/fishing-near-wrecks-must-stop-says-minister.18541>.
- TOM. (2011, May 1). *Trammel nets still reign supreme*. Timesofmalta.com. Retrieved from <http://www.timesofmalta.com/articles/view/20110501/environment/Trammel-nets-still-reign-supreme.362995>.
- TOM. (2010, August 15). *Divers call for better enforcement, protection measures at dive sites* (pp. 1–2).
- TOM. (2012, December 12). *Drag net fishermen gather in Grand Harbour, plan protest*. Timesofmalta.com.
- TOM. (2014, April 6). *Dwejra fishing nets spark calls for better protection* (pp. 1–10). Retrieved from <http://www.timesofmalta.com/articles/view/20120406/local/Dwejra-fishing-nets-spark-calls-for-better-protection.414186>.
- Trochet, A., & Schmeller, D. S. (2013). Effectiveness of the Natura 2000 network to cover threatened species. *Nature Conservation*, 4, 35–53. <http://dx.doi.org/10.3897/natureconservation.4.3626>.
- Yates, K. L., Schoeman, D. S., & Klein, C. J. (2015). Ocean zoning for conservation, fisheries and marine renewable energy: Assessing trade-offs and co-location opportunities. *Journal of Environmental Management*, 1–9. <http://dx.doi.org/10.1016/j.jenvman.2015.01.045>.