Chapter 12
Marine Protected Areas in the Canary Islands – Improving Their Governability

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Abstract MPAs are complex institutional arrangements that should be analyzed from a governance perspective taking into account the serious challenges posed about their capacity to cope with the problems of implementation or effectiveness. In this paper we emphasize the huge and diverse advantages of MPAs initiated by local communities. This trend is increasing lately with the involvement and demands of traditional users, such as artisanal fishers, requesting the implementation of marine reserves. Frequently, they want to ensure the sustainability of fishing activities and avoid the pitfalls of rising numbers of other users. In Spain, many of the latest proposals for Marine Reserves (MRs) were designed for this purpose by local fishers' organizations in partnership with biologists and social scientists, and some of these initiatives learned precisely from the inception process of La Restinga MPA, the case we are analyzing in detail here.

Keywords Marine protected areas • Marine reserves • Artisanal fisheries • Scuba diving • *Cofradías* • Governability • Step zero

Introduction[1]

Marine protected areas (MPAs) are institutional arrangements that are being promoted worldwide as solutions to the marine resource crisis and, to a certain extent, as a consequence of applying the ecosystem perspective to the preservation of sea

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resources. However, MPAs are complex systems that should be analyzed from a governance perspective that takes into account the serious questions posed about their capacity to cope with the problems of implementation or effectiveness (Jentoft et al. 2007). MPAs include a system-to-be-governed that basically consists of the ecosystem and its resources on the one hand, and human populations and stakeholders groups that depend on these areas, usually capable of building institutions and political organizations, on the other. We can also analyze an MPA by examining its governing system, which, in terms of its social nature, is formed by institutions and mechanisms of control, and nested into larger institutional and political settings (Thorpe et al. 2011). Both systems interact dynamically, and both the systems and their interactions should be given equal consideration in MPA research. Moreover, the research must take into account elements such as their diversity, complexity, dynamics and scale (Jentoft et al. 2007). Any of these systems may introduce limitations into the governability of MPAs, and consequently their implementation has proven more difficult than expected. In most cases, an MPA cannot be declared and implemented in a short period of time. Its establishment can take considerable time and energy; all too often more than 5 or even 10 years (Jentoft et al. 2011). Additionally, MPA establishment must always overcome governability challenges, such as those exemplified by the case of the Marine Reserve of La Restinga-Mar de las Calmas in El Hierro (Canary Islands, Spain), the focus of this chapter.

Marine conservation has a long history around the world and takes many different forms. The conservation practices in Oceania described by Johannes (1978, 1982, 2002), for example, included protected areas where fishing was considered taboo for various reasons. For centuries, these practices, together with closed seasons and many other examples of customary-based marine resource management, preceded some of the most sophisticated modern management measures, including the existing variety of MPAs. Such measures had been developed without input from the modern sciences or support from states or international donors. Instead, these were mainly conceived by taking into account traditional knowledge. Unfortunately, many were compromised by contact with western management models that attempted to impose new styles of relationships on human societies and resources (Johannes 1978). In recent decades, however, the rediscovery of these deeply rooted measures in Oceania has encouraged the allocation of territorial rights to local populations in many of these states. This has, in turn, resulted in the recovery of traditional models of fisheries management and the promotion of 'organic' MPAs, in addition to other measures focused on preserving fishing resources (Johannes 2002).

Examples of territorial use rights in fishing are present in many continents and coasts. Most of these include controls over outsiders usage by fishing communities. As suggested by Charles, examples of territorial use rights and customary usage are widespread around the world, and are identifiable in both modern and traditional fisheries. They generally have considerable potential to provide a relatively stable, socially-supported fishery management system (Charles 2002). In Spain, the location of our case study, the fishing sector is organized into *cofradías*, long-standing institutions that have survived since medieval times in some areas of the country.

The range and type of possible co-management systems may vary substantially in Spain and around the world, but many *cofradías* can, in practice, be regarded as horizontal co-management models (Symes et al. 2003). The *cofradías* (or "guilds") of fishers are local, non-profit corporations with public rights and exclusive territories (Alegret 1996). They represent the interests of the whole fishing sector by acting "as consultative and cooperative bodies for the administration, undertaking economic, administrative and commercial management tasks", and with the ability to "cooperate in matters of regulating access to the resources and informing over infractions occurring in their territory" (Pascual Fernández 1999, 71). In nineteenth-century Spain, and probably throughout Europe, these local arrangements were eroded systematically by the State, as they constituted a hindrance to the capitalist development of fisheries in the context of rising liberalism. For decades, these processes were driven by large state subsidies to industrial fisheries and, to a certain extent, by confidence in the inexhaustible condition of the oceans. Another important factor was the belief in the capacity of science to manage and predict the future states of marine species, as exemplified by the many models of single species recruitment used extensively in traditional fisheries management. All these elements had one thing in common: the disregard for local institutions, traditions and knowledge. As a consequence, local, community-based institutional arrangements were marginalized by the State. Instead, the top-down management of natural and marine resources, supported by the scientific models of fisheries biology, acquired an increasingly important role. Accordingly, the increased capacity of industrial fleets in Europe and in other areas of the world has driven a number of stocks to extinction, as well as deeply modifying coastal and marine ecosystems to the point where some predictions anticipate a jellyfish future for the world's oceans (Pauly et al. 1998; Pauly and Watson 2003). MPAs are one of the leading measures devised to prevent this scenario.

The literature contains a number of different definitions of MPAs. Perhaps the most cited is the one proposed by the 4th World Wilderness Congress in 1987. It refers to the MPA as, "*an area of intertidal or subtidal terrain, together with its overlying water and associated flora, fauna, historical and cultural features, which has been reserved by law or other effective means to protect part or all of the enclosed environment*" (Kelleher and Kenchington 1992, 44). In the United States of America, MPAs are legislated with some emphasis on the relevance of cultural issues and are defined as, "*any area of the marine environment that has been reserved by Federal, State, territorial, tribal, or local laws or regulations to provide lasting protection for part or all of the natural and cultural resources therein*".[2] Following the recommendation of the Committee on the Evaluation, Design and Monitoring of Marine Reserves and Protected Areas in the United States (National Research Council), protected areas can be classified into four categories with increasing levels of protection: Marine Protected Area, Marine Reserve, Fishery Reserve and

[2] Presidential Documents, Executive Order 13158 of May 26, 2000. Retrieved January 27, 2012 from http://ceq.hss.doe.gov/nepa/regs/eos/eo13158.html

Ecological Reserve (2001). The six categories of protected areas proposed by the International Union for Conservation of Nature (IUCN) are also widely cited (IUCN Commission on National Parks and Protected Areas 1994). All these definitions have some common general traits. To a certain extent, an MPA may be regarded as a territorial measure, characterized by the exclusion of some uses and/or users of specific resources in delimited areas. The key factor is the exclusionary capacity of these areas or resources, which needs to be enforced in some way so as to avoid being labeled a "paper park" with scarce practical relevance. In 2008, protected areas covered approximately 0.65% of the world's oceans and about 1.6% of the total marine area within Exclusive Economic Zones (EEZ) (Wood et al. 2008). Notwithstanding the progress made in the previous decades, these figures fall far short of the targets set by international organizations, such as the Convention on Biological Diversity (CBD), which suggests the protection of 10% of all eco-regions in the world (including marine and coastal areas) before 2010 (CBD-UNEP 2006). At the end of 2010, the data suggested that only 1.17% of the world's oceans was protected, and probably for this reason the countries that signed the CBD extended the deadline until 2020 (Cressey 2011).

On the whole, MPAs comprise a territorial model that has been propelled, to a certain degree, by resource crisis and conservation paradigms. MPA goals can be multiple and diverse, and need to be researched empirically (Jentoft et al. 2011). In the 1970s, the primary driver for MPA creation was related to conservation (Noël and Weigel 2007; Thorpe et al. 2011). All too frequently, this led to the marginalization of traditional users linked to those areas. The human side of the ecosystem was often considered irrelevant despite the considerable evidence suggesting that humans play an important role in many contemporary ecosystems (Vitousek et al. 1997; Stepp et al. 2003). As of the 1980s, the perception of MPAs began to change towards multiple use and sustainability. The implementation of MPAs, or protected areas in general, means that certain capacities for control of the space are assigned to the State or to a variety of institutional arrangements. Specific stakeholders may play a leading role in such arrangements. In some cases, there may be conservation-related non-governmental organizations (NGOs), while in others fishers' organizations may take the lead, since traditional extractive uses of artisanal fisheries may feasibly be considered central elements of MPA goals. Analyzing the creation processes of any MPA from step zero may help to understand how different stakeholders, but also local communities, negotiate their own future or the future of resources considered essential for their social reproduction and continuity (Chuenpagdee and Jentoft 2007).

MPAs have an impact on local community resource governance mechanisms, transforming the conventional fisheries management systems (Thorpe et al. 2011). It is not unusual to find conflicts arising between traditional users of marine resources and conservationists in relation to MPAs, especially during creation processes. Perspectives on marine environment conservation about what should be achieved with these MPAs and how are likely to vary between conservationists, scientists, governments and fishers. In some cases, MPAs may be conceived solely

to preserve the ecosystem, excluding the human side and traditional extractive activities. In other cases, the proposal may be to substitute artisanal fishing activities with non-consumptive uses, such as scuba diving, or to inhibit any human activity in the area. It is, however, also possible to identify examples of MPAs designed and implemented in support of artisanal fisheries and to ensure their sustainable development (Kalikoski and Vasconcellos 2008; Pascual Fernández and De la Cruz Modino 2008, 2011). MPAs may reinforce or create new territorial use rights. For that reason, we argue that MPAs may improve local fishing management conditions when they are locally-driven and when the sea and natural resource protection policies generate some kind of community-based response rather than a simple, imposed tool. The examples of the Eastport MPA in Canada (Charles and Wilson 2009) and the Actam Chuleb Marine Reserve in Mexico (Chuenpagdee et al. 2002) illustrate the huge and diverse advantages of MPAs initiated by local communities in comparison to others that are introduced and imposed externally. This trend has been increasing of late, with the involvement and demands of traditional users, such as artisanal fishers, requesting the implementation of marine reserves. Frequently, they want to ensure the sustainability of fishing activities and avoid the pitfalls of rising numbers of other users, such as recreational fishers and intensive trawlers, taking control of the area and jeopardizing the viability of traditional activities. In Spain, many of the latest proposals for Marine Reserves (MRs) have been designed for this purpose by local fishers' organizations in partnership with biologists and social scientists. Some of these initiatives have learned precisely from the inception process of La Restinga MPA.

What is remarkable about the case study of La Restinga (Canary Islands, Spain) is that MPAs may represent a way of retaining control of resources in the hands of local fishers and their institutions by excluding any new entrant considered a threat to the health of the ecosystem or to the fishers' livelihood (Pascual-Fernandez and De la Cruz Modino 2011). This chapter begins by reflecting on the historical and legal context of MPAs in Spain, and the specific conditions that favor the involvement of fishers' organizations in their governance. It is followed by a general description of the Canary Islands and the analysis of the fishing community of La Restinga, in the south of El Hierro, where the MR was established in 1996. Taking into account the diversity, complexity, dynamics and scale framework provided by the governability theory, we provide a detailed description of some of the historical, economic and general traits of this area, as well as the specific situation and challenges faced by the local community at the moment of MR inception (Jentoft 2007; Jentoft et al. 2007). We develop a summarized analysis of the creation process and comment on how this MR has increased governability in the area in the discussion and conclusion. We demonstrate how the MR has enabled the community to clearly influence the control of local resources and economic activities, contributing to local empowerment and the slow and controlled pace of local development that favors local people. In this sense, it has increased the capacity of the community to cope with their most urgent concerns, thereby increasing governability (Jentoft 2007).

Spanish Marine Protected Areas

Biogeographically speaking, Spain is an extremely diverse coastal country. It is comprised of most of the Iberian Peninsula, some archipelagos and other islands and islets. Here, MPAs have taken on many different forms, including No-take zones, Maritime & Terrestrial National Parks, Marine Reserves, and Fishing Reserves. One of the first Spanish protected areas was created around the archipelago of the Chafarinas Islands, off the Mediterranean coast of Africa. The archipelago was declared an "Area for National Defence" in 1920, and then converted into a "National hunting refuge" from 1979 to 1982. In 1982, the area was declared a "No-take zone". In Spain, MPAs can be regarded as multiple-use areas for purposes other than ecological conservation. Spanish MPAs have already been analyzed in the literature, and their goals and images are as diverse and dynamic as the socio-ecological context in which they are implemented (Jentoft et al. 2011). Consequently, denominations or forms may change or overlap within the same area. The Medes Islands (Catalonia, Spain) are an interesting example, because the MPA has undergone several transformations. It originated as a "No-take zone" in 1983, was made a "Protected Area" in the 1990s, after which the protected area was extended and declared a marine and terrestrial "Natural Park" in 2010. Another emblematic and early Spanish MPA is Doñana (Andalusia), which encompasses various terrestrial and aquatic habitats and ecosystems. The area has been declared a Natural Park, National park, Biosphere Reserve, World Heritage Site and Special Area for the Protection of Wild Birds (Pain et al. 1998, 46). It is also reserved for several human, recreational and non-recreational (including apiculture, shellfishing, pilgrimage route, raising livestock, etc.) uses and receives thousands of visitors per year.[3]

Article 148 of the 1978 Spanish Constitution specifies that regional governments have the capacity to legislate and manage maritime areas (Suárez de Vivero and Frieyro de Lara 1994); hence, fisheries responsibilities are shared in Spain. Both national and regional governments legislate on the protection of the marine environment under their jurisdiction, creating a need for coordination that has not always been successful. In addition, after Spain's inclusion in the European Union (EU) in 1986, several protectionist policies were implemented as a result of the European environmental agenda and the maritime and coastal directories. Several aspects affect the implementation and rising numbers of Spanish MPAs: different designations, diverse goals, and legal frameworks not always connected with any fishing interest or issues. MPA responsibilities can also be shared by the different administrations (national or regional). This may be a result of location, for example, within or

[3] In 1987 J.M. Granados Corona presented an extensive study in his doctoral thesis about the historical transformations of the Ecosystem of Doñana National Park; available at http://fondos-digitales.us.es/tesis/tesis/1555/transformaciones-historicas-de-los-ecosistemas-del-parque-nacional-de-donana/#description

outside the waters where the regional governments have competences.[4] In some cases, the characteristics of the ecological systems involved must be considered for specific conservation goals, such as the Special Protection Areas (SPAs) for birds or the Special Areas of Conservation (SACs), arising from the EU Habitats and Birds Directives. There is no clear distribution of responsibilities between national and regional governments; recently, the management of Spanish National Parks has been transferred from the State to the regional governments even though the main responsibility remains with the State (Law 5/2007 of 3 April, of the National Parks Network, Official State Gazette, number 81, of Wednesday 4 April 2007, 14639–49). In short, Spanish MPAs are the result of negotiations in different decision-making environments and contexts. For the general purposes of this chapter, we will refer to one type of MPA in particular, "Marine Reserve with fishing interest", whereby the "main goal is the sustainability of artisanal fisheries" (Revenga 2003, 101) and which allows some types of small scale fishing activities.

The legalization of the Marine Reserves (MRs) in Spain appeared for the first time in a "Ministerial Order of Maritime Restocking", published as a fishing restoration tool in 1982 (Order 11, of May 1982, Official State Gazette, number 125, 13824–5). The State would be required to consult with the National Federation of *Cofradías* and the Spanish Institute of Oceanography prior to the establishment of the MRs. The first MR created under this Ministerial Order was the Marine Reserve of Tabarca[5] in Alicante, off the Spanish Mediterranean Coast in 1986. The fishing identity of the Spanish MRs was written into Spanish Marine Fisheries Law 3/2001, which explicitly stated that "those areas[,] because of their particular characteristics[,] deemed appropriate for the regeneration of fish stocks", would be declared marine reserves (Law 3/2001, Official State Gazette, *BOE* number 75, Wednesday 28 of March 2001, 11516). Finally, the Marine Protected Area definition was drawn into Spanish Law 42/2007 on Natural Heritage and Biodiversity, of 13 December (Official State Gazette, *BOE*, number 299, Friday 14 December 2007, 51275–327). This was a legal definition proposed by the Ministry of the Environment. The Marine Reserve definition, on the other hand, was proposed by the Ministry of Agriculture and Fisheries, and had a clearer emphasis on the sustainability of fishing activities as one of the goals.

[4] This is due to Spanish decentralization process that provides regional governments with some competences over internal waters. As Suárez de Vivero et al. affirms: "This division of competences also affects territorial distribution: the Central Administration have exclusive competences over the Territorial Seas (TS) and the Exclusive Economic Zone (EEZ) – where most national fishing areas are located – whereas the regional governments restrict their action to Internal Waters (IW)" (1997, 199)

[5] Two years earlier the Spanish Government had published a "Royal Decree for Fisheries Management" (R.D. 681/1980, 28 May) whose main objective was to restock marine areas and resources of commercial and ecological interest. Under this decree the first no-take zones were established in Spain: the Chafarinas Islands (Melilla, 1982) and Medes Islands (Catalonia, 1983). Listing the first Spanish Marine Reserves can give rise to some confusion between the first no-take zones and the MRs created according to the 1982 Order.

At present, there are three MPAs with the label "Marine Reserves with Fishing Interest" and one area designated as "Fishing reserve". All were created under the full responsibility of regional governments. However, national and regional governments have recognized the "fishing interests" of a number of MRs created by the State or under a regime of shared responsibility. The selection of protected areas specified in Table 12.1 comprises all those that are explicitly linked with artisanal fisheries, either in their label or in public discourse.

The label "Marine Reserves with Fishing Interest" is not included in the aforementioned national legal definition, but this is a special condition assumed by the State in the public discourse. The fish-restocking goal is expressed in the national legal definitions that prompted the establishment of MRs in Spain. It is therefore highly likely that the fisheries administration, as being responsible for promoting the initial MRs, was aiming for the involvement of the artisanal fishing sector in its creation and functioning. Marine conservation in Spain has strong ties with fisheries administration for a long time, and not with environmental administration—until recently.

La Restinga and the Sea of Calms Case Study

The village of La Restinga is located on the southwest coast of the island of El Hierro in the archipelago of the Canaries. This is the main fishing community on the island, and the location of the island's only *cofradía*.

The Canary Islands are a region of Spain, located around 100 km west of the Saharan Coast of Northwest Africa and 1,500 km south of the Spanish mainland. There are seven islands and four islets, covering a total surface area of 7,446.95 km^2. Tenerife is the largest island (2,034.38 km^2) and El Hierro is the smallest (268.71 km^2) (Fig. 12.1).[6] The economy of the Canary Islands depends significantly on tourism, especially since the 1960s, when a combination of specific policy decisions at regional and national levels during the Franco dictatorship, in conjunction with the changing nature of tourism on a wider scale, precipitated the massive build-up of tourism infrastructure along the arid coastal plains in the south of each island (Bianchi 2004). At present, tourism income represents roughly 30% of the Gross Domestic Product (GDP) of the Archipelago, while the service sector as a whole reaches 77% of the GDP.[7] More than ten million tourists visit the Canaries every year, while the permanent population only slightly exceeds two million inhabitants.[8]

[6] Source: Institute of Statistics of the Canary Islands, see http://www2.gobiernodecanarias.org/istac/estadisticas.html

[7] Source: Economic and Social Council of the Canary Islands: Annual rapport: http://www.cescanarias.org/?q=informes_anuales

[8] Data from 2009 retrieved December 12, 2000 from http://www2.gobiernodecanarias.org/istac/estadisticas.html

Table 12.1 Number and characteristics of MRs associated with fishing activities in Spain

Name	Description	Year	Area (has)	Location	Responsibilities
Isla de Tabarca	MR	1986	1,400	Mediterranean Sea	SHARED between the State and Regional Governments
Islas Columbretes	MR	1990	4,400	Mediterranean Sea	STATE
La Graciosa e islotes del Norte de Lanzarote	MR	1995	70,700	Atlantic Ocean	SHARED
Cabo de Palos-Islas Hormigas	MR	1995	1,898	Mediterranean Sea	SHARED
Cabo de Gata-Níjar	Natural Park	1987	12,200	Mediterranean Sea	STATE
	MR	1995			
Punta de La Restinga-Mar de las Calmas	MR	1996	750	Atlantic Ocean	SHARED
Isla de Alborán	Fishing protected area	1997	429	Mediterranean Sea	STATE
	MR – Fishing Reserve	1998	425,645		
Masía Blanca	MR	1999	280	Mediterranean Sea	STATE
La Palma	MR	2001	3,719,1	Atlantic Ocean	STATE
Irta	Natural-Marine Reserve	2002–2003	No data	Mediterranean Sea	Regional Government (RG)
	Marine Reserve with Fishing Interest (MRFI)				
Desembocadura del Guadalquivir	Fishing Reserve	2004	22,200	Atlantic Ocean	RG
Cala Ratjada	MR	2007	5,900	Mediterranean Sea	STATE
Os Miñarzos	MRFI	2007	2,200	Atlantic Ocean	RG
Cedeira	MRFI	2009	720	Atlantic Ocean	RG

Fig. 12.1 Map of Canary Islands and El Hierro (Credit: A.J. Rodríguez-Darias)

The distribution of this human pressure around the territory is however, not balanced: Gran Canaria has 537 inhabitants per km^2 versus El Hierro's[9] 41 per km^2, the least populated island of the archipelago with only 10,892 total inhabitants.[10] Tourist and services-related development is largely concentrated on only a few of islands. Each island government, or *Cabildo*, has a role in this process. In the case of El Hierro the island government rejected the idea of mass tourism development, keeping tourist infrastructure to a minimum. The airport, for example, only allows propeller airplanes arriving from other regional islands, and there are no plans for expanding to international flights. The *Cabildo* does not want to follow the patterns of rapid growth and the models of mass tourism development of the other islands, such as Fuerteventura, which has almost tripled in population in less than 20 years.

The story of La Restinga is marked by its recent creation. Located in a peripheral and uninhabited area surrounded by volcanic lava flows but with excellent year-round climatic and environmental conditions, the fishing families who founded the village in 1940 came from Valle Gran Rey, in La Gomera. Before their arrival, the area was largely uninhabited,[11] and was used as a place of temporary settlement by farmers from the neighboring village of El Pinar (who spent several weeks a year farming and fishing on the coast) and for fishing trips from La Gomera. In the late 1970s, the total population of La Restinga counted 124 inhabitants. Since its foundation, the main economic activities in the village have involved fisheries.

[9] Data from 2009 retrieved December 12, 2010 from http://www2.gobiernodecanarias.org/istac/estadisticas

[10] Data from 2009 retrieved December 12, 2010 from http://www2.gobiernodecanarias.org/istac/estadisticas.html

[11] Without electricity or fresh water supply, the first families who came to La Restinga lived in caves on the coast.

La Restinga was founded as a fishing village despite the fact that its peripheral location made selling fish very difficult. For a long time, the fishing community depended on factories or intermediaries who practically monopolized the catches. In 1989, the fishers rejected this traditional monopoly when intermediaries refused to buy some catches because of market issues. In 1991, with the support of the *Cabildo*, local fishers set up a Fishermen's Cooperative in the village. This initiative also reflected their desire to obtain more control over tuna fishery development (Galván Tudela 1990).

The growth of scuba diving for tourists in La Restinga has changed some of these aspects. In the absence of foreign investments in tourist infrastructures, certain fishing families have taken advantage of the presence of tourists by setting up various business initiatives (Pascual Fernández et al. 2001; Pascual 2004). Female employment has also risen as a result of increasing tourism. A case in point is a commission-based system of accommodation available for tourism, which is managed by some fishermen's wives and entails building maintenance and housekeeping, client reception and direct attention, and accommodation booking. This activity takes place through informal channels and provides an important source of income for families, enabling them to improve their standard of living (De la Cruz Modino and Pascual-Fernández 2005a; Pascual-Fernández and De la Cruz Modino 2005).

There is a strong territorial identity within the fishing community, which is based primarily on a common origin. After all, the founders of the village all came from the island of La Gomera. There is also common socio-economical background that links local inhabitants to fishing activities, with shared concerns, troubles and development strategies. The community is isolated from the rest of the island and, to a certain extent, from the rest of the Canary Islands. Considering the role of the *Cofradía* of La Restinga in local fisheries management, the local fishing identity is further fed by different experiences of self-governance or co-governance. This feeling is also bound up with the main fishing area, known as the Sea of Calms, where fishers traditionally worked and learned to fish. The name of this section of the coast near La Restinga reflects the continuously calm state of the ocean, which is evident from the shore. The towering land mass offers protection against the prevailing northeasterly winds (Pascual 2004). The absence of winds and currents allows for ongoing fishing and tourism activities in the area at most times of the year. There is considerable diversity in the tropical and subtropical characteristics of the sea, but a remarkably low density of species. In general, the marine ecosystems that surround the archipelago are characterized by biodiversity and fragility; the subtropical location results in a surface water temperature of around 21 °C for El Hierro. Along the coast of La Restinga, it is possible to find pelagic and subtropical species that are less frequent in the rest of the Canary Islands. These include the whale shark (*Rhincodon typusk*), trumpet fish or atlantic cornet fish (*Aulostomus strigosus*), and the ocean triggerfish (*Canthidermis sufflamen*), all of which are a great attraction for scuba divers. The Sea of Calms is extremely important for fishing, because it is especially rich in coastal pelagic, semi-pelagic and benthonic species, with tuna stocks such as yellowfin tuna (*Thunnus* spp.*)* and *bonito* (*Katsuwonus pelamis*) arriving on a cyclical basis. The natural conditions, however, also facilitate poaching

or spear fishing in the sea. These conditions—absence of wind, diverse but limited numbers of sea species and rising human uses—were emphasized in the proposal for the protection of the Sea of Calms from a preventive point of view.

At present, the population of La Restinga stands at around 600 inhabitants, and the community is mainly composed of close families. There are between 37–43 artisanal fishers, organized into 33 productive units, and aged between 30–40 years on average—the youngest group of fishers in the Canary Islands. There are approximately 28 families (including fishers' and fish sellers' families, and other personnel involved in commercial activities) whose economy is directly linked to the fishing sector. On the whole, fishers own their own boats and many (between 30–50%) have more than one—different fishing techniques require smaller or larger boats. The tuna fishery is tremendously important for the village and affects the rest of the fisheries present in the Sea of Calms. Depending on the fishery, tourist demand and institutional support, fishers either sell their catch themselves, through the cooperative or through other sellers. Roughly 50% of the fishers are currently involved in the cooperative and those who are not have moved to other economic sectors (construction in particular) (De la Cruz Modino 2008).

In 2007, we estimated a total of 223 tourist apartments offering accommodation for up to 829 persons (there are no hotels in La Restinga). For many, however, occupation is not year-round and mainly on summer and public holidays (De la Cruz Modino and Hernández Barbuzano 2007). Most of the apartments available for rent are owned by local people. In addition, there are four restaurants (three of them serve fresh fish) and seven bars (De la Cruz Modino 2008). Around ten scuba diving businesses cater to Spanish and European scuba-diving tourists all year-round; most are family-run businesses and there are no tour operators on the island. All of the island's scuba-diving businesses are owned by people not born in El Hierro.

The Marine Reserve of La Restinga

Proposals for Marine Reserves in the Canary Islands increased considerably in the 1980s. These were prompted by a group of marine biology researchers based at the University of La Laguna (Tenerife). One of the group leaders was born and raised in a fishing community and therefore had a deep understanding of the constraints involved in establishing protection measures for fishers. In 1987, the MR proposal was first presented to local fishers at the *Cofradía* in La Restinga. Their initial reaction was anything but positive, nevertheless the discussion remained on the table for some time and the early proposal will have an impact later on. The idea was considered interesting from the outset by some local fishers, but perhaps needed a while to mature. The intervention of a local fisher's son, who studied Marine Biology with the leader of the research group, was also important.

In 1994, the *Cofradía* of La Restinga rescue the MR proposal and discussions began again. This time, the proposal included the possibility of protecting the Sea of Calms. In the 1990s, the MR was presented as a tool to address the problems and

demands previously identified by local fishers who had banned the use of certain gear in the Sea of Calms between 1980 and 1990. Fishers were aware of the area's ecological characteristics and fragility, and reached local agreements to ban gear they considered unsustainable for the ecosystem: fishing pots, long-lines and trammels. Developing countermeasures against illegal fishing activities was also one of the arguments proposed in support of the MR. In the 1990s, then, the MR appeared as an extension of actions and decisions already initiated by the fishers.

The project in the 1990s was led by the vice-president (*Vice-Patron Mayor*[12]) of the *Cofradía.* After a discussion period, fishers agreed on the MR design and voted for it at the *Cofradía*; in 1996, the *Reserva Marina Punta de La Restinga-Mar de Las Calmas* was created. It is important to bear in mind that the MR proposal was discussed extensively (always within the *Cofradía*) for almost 2 years. Time is a highly relevant variable in the governance of social systems.

Local fishers decided and voted on a range of key aspects involved in the MR design, such as boundaries, characteristics, surveillance services, gear and users allowed, and not merely on its acceptance. Various administrations and scientists participated in the decision-making process, but fishers always played the most important role. For example, in 1995, fishers rejected the first official proposal for the MR sent to the *Cofradía*, and the national Ministry of Agriculture, Fisheries and Food had to correct it. Fishers complained about the composition of the *Commissions* designed to manage the MR locally, because they were not recognized as members. Throughout the entire process, local administrations supported fishers' decisions. Responsibility for this MR is shared between the national and regional governments, based on two norms.[13] The decree issued by the regional government clearly specifies the status of "Marine Reserve of Fishing Interest". The public discourse of the Ministry of Agriculture, Fisheries and Food recognizes this specific aim: "its main goal is the sustainability of the artisanal fisheries" (Revenga 2003, 101).

After the MR was declared in 1996, fishers continued discussing objections or doubts inside the *Cofradía*, and also participated in implementing and managing the MR. In 1999, for example, surveillance activities were introduced at the sea and on land, and several fishers were employed as inspectors. In 2001, coordination activities began with the creation of Commissions for MRFI monitoring, an activity in which fishermen actively participated. At the same time, other stakeholders of the Sea of Calms, such as scuba diving entrepreneurs, were neither invited nor considered at any point in the entire process. Despite voicing their concerns and opinions about the MR to the government, they were often ignored. The MR was considered

[12] *Patron Mayor* (president) and *Vice-Patron Mayor* (vice-president) are positions of responsibility and representation within Spanish *cofradías*; both are elected positions.

[13] Order of 24 February 1996 that establishes the *Reserva Marina Punta de La Restinga-Mar de las Calmas*. Official State Gazette, *BOE,* number 30, 3 February 1996, pp. 3765–6. Decree 30/1996 of February 16 that creates a Marine Reserve of Fishing Interest in the area of "Punta de La Restinga-Mar de las Calmas". Official Bulletin of the Canary Islands, published Monday 11 March 1996, pp. 1472–4.

a "fishermen's issue" by all administrations with decision-making power during the process, generally reflecting the thinking of the villagers and local residents (De la Cruz Modino 2003, 2008).

Inside the *Marine Reserve of Punta de La Restinga-Mar de Las Calmas,* all traditional uses by artisanal fishers from La Restinga have been maintained at varying levels of regulation. Recreational fishing by boat is forbidden throughout the MR, and angling from the shore is only allowed in some areas (see Table 12.2). Scuba diving has also been restricted. Small scale fishing boats wishing to access the MR must be registered in a census. Two years of fishing experience in the area must be demonstrated in order to access the census. Consequently, fishers from other areas of El Hierro or from other islands are severely limited and only allowed fish for tuna under special permits and conditions.

Discussion: MPAs Increasing Governability

Since the MR was created, it has often been labeled the best example of a well-functioning MPA in the Canary Islands and used as an exemplar for later initiatives in mainland Spain. The natural environment, which is subject to annual scientific evaluation, has been improved since then. After some years, researchers from the University of La Laguna have recognized that, despite its size, "La Restinga MR is the best, maybe due to fishers' participation". The fishers believe that they proved decisive in the creation of the MR and consider it "their own". In 2004, a survey revealed that fishermen considered the surveillance service and the *Cofradía* as responsible for governing the MR (De la Cruz Modino and Pascual-Fernández 2005b).

The challenges to governance faced by fishers in La Restinga before the establishment of the MR were closely related to natural conditions. The multi-specific ecosystem, on a very small continental shelf, made the area extremely sensitive to depletion, requiring a diversity of fishing strategies as means of adaptation. The ecosystem, is extremely complex and dynamic, with important relations between individuals and populations. The MR may have helped to sustain high catches of key species whilst ensuring sustainability, even in the case that the MR is relatively small and isolated.

Although many new activities and enterprises in the services sector are carried out by fishing families, including fresh fish restaurants or tourist accommodation management, fisheries have remained the main economic activity in La Restinga for decades. Local people are certainly interested in some degree of tourism development, but only in low numbers and in agreement with certain parameters that enable them to continue being the main suppliers of tourism services. In the Sea of Calms, fishers have reduced and limited scuba-diving activity in the MR and created new rules in the area affected by the MPA. Moreover, it must be said that almost all scuba-diving center owners, managers and instructors in the area were born outside the island, and that the ownership and staff of some of these centers change frequently.

Table 12.2 Characteristics of the MR *Punta de La Restinga-Mar de las Calmas*

	TOTAL MR			
Responsibility	SHARED: National & Regional Government			
Year of declaration	1995–1996			
Effective implementation	1998–1999			
Depth range	0–400 m			
Habitats	Rocky reefs, caves, sandy substrates			
Protection Objectives	Fisheries enhancement & conservation			
Management body	*Comisión de Gestión y Seguimiento* (Advisory body)/*Comisión de Control*			
General Services	Surveillance service/Visitors center			
Scientist & management activities	Signposting of diving points/Monitoring of underwater activities/Monitoring of angling from the shore			
Forbidden in all MPA	Anchoring/Recreational fishing by boat/Spear fishing/Scuba Diving with propulsion systems/extractive uses other than those described & allowed uses			
Zone classification	Total MR	Maximum restricted area	Buffer zone	Multiple uses areas
Size (ha)	750	180	90	480
Uses (General uses allowed)	Small scale fishing uses/ recreational uses	Small scale tuna fishery	Small scale fisheries/ Scuba Diving	Small scale fisheries/Scuba diving/ Angling from the shore/other recreational uses
Gears allowed	Traditional fishing gears	Hook & line and cane for tuna fishery	Hook & line gears, tuna fishery gears, harpoon	Hook & line gears, tuna fishery gears, harpoon, traps for shrimps, traps for moray (mainly), nets for bait and for shoals of *Salma salpa* that cannot be caught by hook & line

As a result, their capacity to act collectively is not comparable, and despite having joined some associations, their recognition is not particularly significant.

Analyzing the governing system in La Restinga reveals a remarkable number of new stakeholders in recent decades. These include entrepreneurs, neighborhood associations and administrations (local, insular, provincial, regional and national) involved in managing the area, users and resources. The role of the *Cofradía* and its leaders in facilitating collective action must certainly be emphasized, and fishing remains the main identity-marker of the local community. Being the only legally recognized public rights institution based in the community, the *Cofradía* has long been the channel for local demands to insular, regional or national administrations. With that said, there have been conflicts among fishers, some of considerable importance. However, the *cofradía* has generally served as a reference point or mediator during such conflicts.

In La Restinga, the MR is responsible for ensuring that fishers' decisions prevail in the Sea of Calms. In this case, fishers have successfully managed all parts of the process, including decision-making. This was exemplified in 1995 when the fishermen blocked the first official proposal for an MR and requested its revision. Bottom-up processes have produced successful results. In some cases, governing initiatives may certainly come from outside the community, but processes can still be managed or influenced from within. The MR could be interpreted as an institutional arrangement devised to prevent changes in the area, such as the growth of scuba-diving tourism, from escaping local control. As a governing tool, the MR helps confront changes, such as the extension of recreational fisheries or other dynamics and developments linked with tourism, by providing a framework within which the local community and administrations can negotiate solutions and opportunities. The MR is currently being affected by a volcanic eruption, active since July 2011, whose consequences for the ecological system-to-be-governed are becoming extremely serious for local fisheries. All fishing and scuba-diving activities have been halted in La Restinga and in the Sea of Calms, with far-reaching effects on the socio-economic system. This process is still ongoing at the end of 2011, and evaluations about the consequences for the natural and the socio-economic systems have yet to be concluded. However, the MR does still exist, the governing system is maintained, and all governing interactions are focusing on the new situation. The fishing community of La Restinga is facing new challenges that we will continue to follow in the near future (Table 12.3).

Conclusions and Recommendations

Successful co-governance in specific scenarios may be dependent on many factors. Not all scenarios can be equally governable, because real systems differ in key characteristics that, from the perspective of interactive governance, may be summarized as diversity, complexity, dynamics and scale. Furthermore, governability arrangements—in this case institutions related to the governing of MPAs—should be analyzed

Table 12.3 Governance analysis framework on La Restinga case of study

Challenges related to La Restinga & the Sea of Calms				
	System to be governed			
	Natural system	Socio-economic system	Governing System	Governing interactions
Diversity	There is considerable ecosystem diversity in a multi-specific ecosystem; diverse fishing strategies as a means of adaptation. The Sea of Calms presents a typical situation of tropical and subtropical islands, whose coastal ecosystems are noted for their diversity (although the density of species is low in numbers).	Economic activities in the area related to fisheries have prevailed since the 1940s. There are approximately 600 inhabitants in La Restinga and 28 families associated with small scale fishing activities (including families involved in fishing trade chain). Strong local close bonds. Scuba diving and tourism businesses have appeared more recently but they are important to local economy.	In recent decades, there has been a rise in the number of stakeholders and agencies involved in managing the Sea of Calms. For example, the Sea of Calms has been included in a range of programs linked with the MR creation and the designation of El Hierro as a Biosphere Reserve. Also, numerous administrations (local, insular, provincial, regional and national) are involved in managing the area, users and resources.	Conflicts between different fishers' groups in connection with collective action and commercialization prior to the inception of the MR and the creation of the cooperative. Also, one scuba-diving entrepreneur legally challenged the MR model because of not being consulted during its design. Ministry of Agriculture and Fisheries disregarded this legal challenge, as the courts did too.
Complexity	There is a complex ecosystem, caused by a small coastal platform, the location in the middle of the ocean, the existence of multiple habitats generated by rocky environments. These factors explain the existence of important relations between individuals and populations in the Sea of Calms. The MR may have added stability to the system.	There is average socio-economic complexity. Fishing activities have dominated the area, and tourism is a recent development. Activities involving the services sector and fishing have been developed by fishing families (fresh fish restaurants; tourist accommodation management).	Despite the growth of stakeholders and uses in the area, as fishing organization the *Cofradía* has a strong presence in the community, influencing many important issues concerning the Sea of Calms. Channels many local demands to other administrations. The *Cofradía* has presence in all governing bodies created or related to managing Sea of Calms and resources.	There have been some conflicts between *Cofradía*-fishers and scuba-diving centers, during set up and the process of limiting the number of annual dives in some of the most sought-after sites in external waters of the MR.

(continued)

Table 12.3 (continued)

Challenges related to La Restinga & the Sea of Calms				
	System to be governed			
	Natural system	Socio-economic system	Governing System	Governing interactions
Dynamics	There are complex and intense interactions between coastal pelagic, semi-pelagic and benthonic species in this area. Climate change influences the appearance of new species relevant for fishing and tourism. The MR may have helped sustain a high level of catches of key species, assuring sustainability at the same time.	Fishing families maintain control of some key tourist resources and activities in the area. In the context of the MR, fishers have reduced and limited scuba-diving activity. Locals are highly interested in some degree of tourism development, but with low numbers and with them maintaining control.	Fishers' decisions prevail in all management contexts. Administrations appear on scene supporting fishers' decisions. Other initiatives developed in the area, such as the declaration of the Biosphere Reserve, have not affected MR management of the area with fishers' participation.	The MR could be interpreted as an institutional arrangement devised to prevent changes in the area escaping local control. Also, the MR has reinforced some communal agreements related to banning fishing gears (long-lines, traps, trammels) made before its implementation. No decisions about the Sea of Calms and their resources are made without fishers or outside the MR.
Scale	The Sea of Calms is relatively small and isolated. Despite this, each year it is visited by oceanic pelagic species such as whale sharks, turtles or tunas during their migration, and is connected to tropical ecosystems due to climate change.	There are some factors limiting tourist growth in La Restinga and in El Hierro, due to its isolation. Nevertheless, the village has become one of the most popular destinations for scuba-diving tourism in Spain today. Fishers have also reduced and limited scuba-diving activity in the Sea of Calms, by using the MR and creating new rules in the area affected by the MR.	The Sea of Calms management model with fishers' participation has been exported as an example for other areas where new MPAs have been proposed. Also, the cooperative system implemented by fishers to commercialize their products in 1990s with island government support has been extended to other sectors (local farmers, ranchers, carriers) on the island.	The *Cofradía* has been demanding MR expansion to the rest of the island, but lack of funding and conflicts with other sectors have hindered the process.

by taking into account the 'step zero' suggested by Chuenpagdee and Jentoft (2007), which asks the following questions: who wants to establish the MPA; who constitutes the driving force; and how and to whom can the idea be communicated?

Often, agents external to the local areas where the MPA is discussed, such as national or international conservation organizations, academics and state or provincial government institutions, bring the idea forward and push it through certain agendas or mandates. But the case of La Restinga exemplifies the relevance of the capacity of civil society, the social side of the system-to-be-governed, for evaluating the possibility of building a successful MPA. All too frequently feasibility studies in this area are centered on the non-human side of the ecosystem, disregarding the relevance of governability conditions. Of course, the existence of previous institutional arrangements with legal recognition and the intervention of the *Cofradía* cannot be underestimated; besides, strong leadership reinforced their role in the process.

By examining how the MR of La Restinga was prompted, established and implemented, we can affirm that it enhance "the governing system's ability to address the most urgent concerns" (Jentoft 2007, 362). In some way, the MR acts as a territorial measure that provides institutional support for the preservation of the will of local stakeholders against new entrants or free riders who can endanger the key resources that support the local way of living. The governing system devised to cope with this arena has favored a slow pace of development, which permits locals to stay in their village to work as fishers and develop a livelihood they enjoy. The example shows how diverse, complex and dynamic local contexts are for artisanal fisheries, but also how some populations are capable of using global tendencies to assure their control of local scenarios. In this case we have described a well-organized fishers' group that exerts a clear leadership in governing local fisheries and consequently obtains government support. It is possible to observe that the general system has improved its governability if we realize that, despite a degree of social conflict, it did not disturb fishing management or the agreements made around the Sea of Calms.

An MPA is not simply a technical fix. Although many scientists may only focus on its capacity to protect ecosystems, an MPA is also a social institution that has been devised to allocate rights, preserve uses and/or exclude users (Degnbol et al. 2006; Pascual-Fernandez and De la Cruz Modino 2011). Relatively small and coastal MPAs, such as La Restinga MR, constitute a good opportunity for co-governance, where societal parties (state, local communities and institutions, stakeholders) join hands to build institutional arrangements and propose specific goals for the protected area (Kooiman and Bavinck 2005). One of these goals may be the conservation of marine resources, but other goals, such as preventing new users from taking control of an area or developing new activities like tourism, are usually also intermingled. This makes goal formation an empirical research issue that is especially relevant for MPA governability analysis.

The Spanish legal framework that provides the *cofradías* with a consultative role for fisheries administration, and which links marine reserves with small-scale fishers as traditional users in the protected areas, has made this entire process possible.

Once again, involving local communities or supporting their will when they clearly propose a conservation measure, constitute the best foundations for protected areas. Pure conservation of the natural environment is not the goal pursued by local inhabitants; other goals are always intermingled (Jentoft et al. 2011). In this process, they can, of course, use the globalization patterns that generalize protected areas in the sea for their own benefit, all the while assuring ecosystem conservation and preserving a way of life with a practical perspective on their own problems. This agenda should not be regarded as illegitimate; it constitutes an effort to secure a livelihood, reducing present or future risks. Planners need to take into account the broader, highly contextual situation that influences people's lives (Gonzalez and Jentoft 2011); lives that depend on natural environment factors, but also on many other circumstances at the same time. This broader perspective is compelling when planning a protected area and evaluating its governability.

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