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Marine protected areas in Algeria: Future marine protected area of "Taza" (SW Mediterranean), continuing challenges and new opportunities facing an integrated coastal management

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1. Introduction

Marine protected areas (MPAs) are crucial tools for marine biodiversity conservation and sustainable utilization of marine resources through fisheries management (Agardy et al., 2011; Alós and Arlinghaus, 2013; Edgar, 2011; García-Charton et al., 2008; Rioja-Nieto and Sheppard, 2008; Batista et al., 2011; Gaines et al., 2010). They have been proposed as an efficient way to protect biodiversity, critical habitats and the species on which sustainable tourism is focused, to help restore overexploited stocks and degraded areas, to resolve user conflicts and to tackle other conservation and social issues (Kelleher, 1999). In 1996, the World Bank published guidelines for effective Integrated Coastal Zone Management (ICZM) to support countries with setting up ICZM legislation and putting programs in place (Post and Lundin, 1996). Promotion of ICZM, which considers both MPAs and other coastal resources, guarantees the protection of coastal areas (Cho, 2005; Murray and Ferguson, 1998).

Many human activities affect coastal areas, and it is very important for those planning MPAs to work with these sectors from the beginning (Kelleher, 1999). MPAs are typically established to enhance the effectiveness and optimize the value of the area in terms of coastal and ocean management (OSB, 2001), and are more effective when designed as complements to other management tools (Agardy et al., 2012; CEA, 2012; Sumaila, 2002). Fogarty and Murawski (2004) highlight the notable role of integration of MPAs and other management tools as the key to stock recovery in the Georges Bank (North Atlantic) fishery. The Great Barrier Reef Marine Park in Australia, approved in 1975, may be unique in providing a balance between the conservation and sustainable development of a large area of recognized conservational value (Brodie, 2001). Depending on the specific circumstances and design of an MPA, artisanal and recreational fishers, the tourism sector, biodiversity conservation interests and others will not gain the same benefits or bear the same costs. However, well-designed MPAs that are planned through a participatory process and use the best available information can offer important benefits to specific user-groups and local communities, in addition to longer-term benefits to governments and the common good (FAO, 2011).

MPAs have demonstrated their capability to supply a variety of benefits in the Mediterranean basin (García-Charton et al., 2008), with their establishment and management being driven by a variety of international, regional, and national obligations and initiatives (Abdulla et al., 2008). The Mediterranean Sea constitutes only 0.82% of the surface area and 0.32% of the volume of the world's oceans (Defant, 1961). However, it harbors 4–18% of all known marine species (~17,000) and has a high level of endemism (Bianchi and Morri, 2000; Coll et al., 2010; Lejeusne et al., 2010). After the creation of the Regional Seas Programme by the United Nations Environment Programme (UNEP) in 1974, the Mediterranean region pioneered adoption of an Action Plan (MAP) in 1975. Followed by the adoption of the Convention for the Protection of the Mediterranean Sea against Pollution (Barcelona Convention, adopted in 1976) which entered into force in 1978 and was later amended in 1995 (Vallega, 1995). The Barcelona Convention is now a dynamic framework that enables the 22 participating nations to address

Abbreviations: MedPAN, Mediterranean Protected Areas Network; MSP, MedPAN South Project; SEA-Med, Sustainable Economic Activities in the Mediterranean.

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emerging challenges and adapt to changes in international law on protection of the marine environment (UNEP-MAP-Barcelona Convention, 2011). Over the years, these nations have adopted seven protocols addressing specific aspects of Mediterranean environmental conservation and that complete the MAP legal framework. In addition, all Mediterranean countries have ratified the Convention on Biological Diversity (CBD), which compels them to reduce biodiversity loss (Abdulla et al., 2008).

Algeria first showed its commitment to the protection of the environment through its participation in the United Nations Conference on the Human Environment, held in Stockholm (Sweden) in 1972, which brought international awareness to global environmental problems. Since then, Algeria has ratified several conventions, treaties and protocols relating to protection of the sea, natural biological resources, the atmosphere, the fight against desertification and hazardous waste control, amongst others. The main international agreements and national legislation with a bearing on marine and coastal management that Algeria is party to are highlighted in Table 1. In 1997, Algeria benefited from project ALG/97/G31, backed and financed through a collaboration between the Global Environment Facility (GEF) and the United Nations Conference on Environment and Development (UNCED-Earth Summit), which supported the preparation of a National Strategy and Action Plan for sustainable use of biological diversity in the country. In accordance with the CBD, Algeria subsequently developed a National Strategic Action Plan for the Conservation of Biological Diversity (SAP-BIO Algeria) in 2002, aimed at protecting species and habitats, improving knowledge about marine and coastal biodiversity, reducing negative impacts on biological diversity and promoting sector-based policies that promote biodiversity (fisheries, tourism, agriculture, etc.).

The Algerian coastal zone represents less than 2% of the total area of the country, but is home to 36% of the population (ONS, 2008). With a coastline stretching up to 1622 km, in the past two decades Algeria's legislation on coastal policy has been characterized by remarkable changes to adapt to the regional and international legal instruments to which the country is signatory (Table 1). These changes were initiated by the promulgation of the Law on Land Use (2001), together with Coastal Law No. 02-02 (2002), and followed by enactment of Costal Area Management Programs in 2003 and creation of the CNL (National Commission for the Littoral) in 2004 to coordinate management of Marine Nature Reserves in Algeria. Currently, the country is entering a phase of implementation of these international policies, integrating sustainable development criteria into the management of coastal and marine areas (Mangos and Claudot, 2013). In 2005, several sites (Banc des Kabyles, Habibas Islands, Rachgoun Island and Cap de Garde) were listed as potential MPAs in Algeria (UNEP, 2005), but only two have since been designated as a Specially Protected Area of Mediterranean Importance (SPAMI), i.e. Banc des Kabyles and Habibas Islands. A specific law on MPAs was enacted in 2010, which provides the main legal basis for creation of new MPAs and management of marine resources, and also reaffirmed the CNL as the leading agency for management of MPAs in Algeria. However, more recently, Law No. 11-02 (2011) on protected areas (PAs) within a sustainable development context, states that the management of a PA is the responsibility of an institution established by the authority initiating the procedure to create the PA. According to Law No. 11-02, Algeria has seven categories of PAs; National Park, Natural Park, Strict Nature Reserve, Natural Reserve, Habitat/Species Management Reserve, Natural Site and Biological Corridor. Wetlands are classified into one of these categories. Thus, overall, aspects of marine protection in Algeria have long fallen under various legislation for a range of sectors and the concept of MPAs is still new. The increasing importance of MPAs as a tool for developing management approaches that enable multiple-use on a sustainable basis for areas subjected to high anthropogenic pressure, the failures of sectorial management and the need to initiate local sustainable development were the principles that lead and support this study.

1.1. Study area

Located in the northeast of Algeria, Taza National Park (3807 ha) was established in 1984 to protect the natural environment of the area by controlling hunting, wood cutting and road clearing. The area is a mixture of marine and terrestrial ecosystems including agricultural land, forests, rocky coasts, sandy beaches, grottos and springs. It is located about 30 km west of the province of Jijel and extends along 9 km of coast, with the three municipalities of El Aouana, Selma Benziada and Ziama Mansouriah having jurisdiction over its lands (Fig. 1). Taza National Park is home to wildlife such as yellow-legged gulls (*Larus michahellis*), Barbary macaque (*Macaca sylvanus*), the endangered loggerhead turtle (*Caretta caretta*) and various dolphin species. In 2009, with support from the regional MSP initiative, Taza National Park began a process to include its adjacent marine area covering 9603 ha. This area is divided into three zones with different levels of protection: a no-take zone (1299 ha), a peripheral zone (6293 ha) and a buffer zone (2011 ha) (Fig. 1). The planned MPA (latitude 38° 34′ 8″N and 38° 23′ 43″N; longitude 9° 14′ 05″W and 8° 53′ 46″W) extends about 23 km along rocky coasts and sandy beaches, incorporating coastline of the municipalities of Jijel, El Aouana and Ziama Mansouriah (Fig. 1).

2. Marine protected areas in the Mediterranean Sea

Though numerous definitions exist for MPAs, leading to inconsistent use of terminology (Agardy, 2000; Agardy et al., 2003), an MPA may be described as "An area designated to protect marine ecosystems, processes, habitats and species, including the essentials of marine biodiversity and which can contribute to the restoration and replenishment of resources for social, economic and cultural enrichment" (WWF, 2005). MPAs can differ in how

Table 1
Major international agreements to which Algeria is a signatory/party (as of September 2015).

International agreement	Year	National legislation implementing the agreement
Convention on wetlands (Ramsar Convention)	1971	Decree No. 82–439 of 11 December 1982
Convention for the protection of the Mediterranean sea against pollution (the Barcelona Convention)	1976	Decree No. 80-14 of 29 January 1980
Convention on biological diversity (CBD)	1992	Decree No. 95–163 of 14 June 1995
United nations framework convention on climate change (UNFCCC)	1992	Decree No. 93–99 of 21 April 1993
Convention for the protection of the marine environment and the coastal region of the mediterranean (Amendment of the Barcelona Convention)	1995	Decree No. 04–141 of 25 June 2004
Protocol concerning specially protected areas and biological diversity in the Mediterranean	1995	Decree No. 06–405 of 22 November 2006
Protocol concerning cooperation in preventing pollution from ships and, in cases of emergency, combating pollution of the Mediterranean sea	2002	Decree No. 05–71 of 13 February 2005
The protocol on integrated coastal zone management in the Mediterranean	2008	(signed but not yet ratified)