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The Controversy over Marine Protected Areas

Science meets Policy

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Executive Summary

This book is a contribution to a controversy which has pre-occupied marine governance across the world during the past 20 years, and shows little sign of resolution. This is the debate over whether marine reserves (MRs) are a better means of protecting commercial fish stocks and marine biodiversity than is conventional fisheries management (CFM), which includes quota restrictions, gear regulations, and minimum landing sizes, combined with multi-use marine protected areas (MUMPAs). The debate is between 'nature protectionists' (NPs) who argue for an extensive network of marine reserves (MRs) or no-take zones (NTZs) in which all fishing activity would be legally prohibited; and 'social conservationists' (SCs) who argue for CFM complemented by carefully selected spatial restrictions designed to protect spawning areas of target fish and biodiversity. This book has six objectives: (a) to explain the extraordinary speed with which the NP argument gathered pace to make MRs the most favoured global policy initiative in current marine management policy (Chap. 2); (b) to confirm the ascendancy of the MR model in the academic literature (Chap. 3); (c) to discuss whether scientific advocacy for MRs has exceeded the limits of scientific objectivity by introducing a pro-MR bias into the peer-review process (Chap. 4); (d) to examine the scientific credentials of the case for MRs (Chap. 5); (e) to test whether NP or SC discourses have prevailed in the recent designation of marine conservation zones (MCZs) in the UK (Chap. 6); and (f) to discuss the wider implications of the debate between NR and SC, including whether they can be reconciled in practice if not in principle (Chap. 7).

Contents

List of Abbreviations

ABNJ	areas beyond national jurisdiction
AC	advocacy coalition
AMSA	Australian Marine Sciences Association
BACI	before-after-control-impact
BDACI	before-during-after-control-impact
BIOT	British Indian Ocean Territory
BMR	Barbados Marine Reserve
CBD	Convention on Biological Diversity
CCAMLR	Convention for the Conservation of Antarctic Marine Living Resources
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CFC	chlorofluorocarbon
CFM	conventional fisheries management
CFMA	conventional fisheries management approach
CFP	Common Fisheries Policy
CPUE	catch-per-unit-effort
Defra	Department for Environment, Food and Rural Affairs
EBA	ecosystem-based approach
EBFM	ecosystem-based fisheries management
EBM	ecosystem-based management
ECHR	European Court of Human Rights
EDM	early day motion
EEZ	exclusive economic zone
EMS	European marine site
ENG	ecological network guidance
ENGO	environmental non-governmental organisation
EpC	epistemic community
EUNIS	European nature information system
FAO	Food and Agriculture Organization of the United Nations
GBRMPA	Great Barrier Reef Marine Protected Area
GCS	global citation score
GOC	Global Ocean Commission
HPMCZ	highly protected marine conservation zone

HSMPA	high seas marine protected area
ICCAT	International Commission for the Conservation of Atlantic Tunas
IFCA	Inshore Fisheries and Conservation Authority
IMO	International Maritime Organization
ISCZ	Irish sea conservation zone
ISI	Institute for Scientific Information
IUCN	International Union for Conservation of Nature
IUU	illegal, unreported, and unregulated fishing
IWC	International Whaling Commission
JNCC	Joint Nature Conservation Committee
LCS	local citation score
LSMR	large-scale marine reserve
Marinet	Marine Network of Friends of the Earth Local Groups
MARXAN	marine spatially explicit annealing
MCAA	Marine and Coastal Access Act
MCBI	Marine Conservation Biology Institute
MCZ	marine conservation zone
MCS	Marine Conservation Society
MEOW	marine ecoregions of the world
MMO	Marine Management Organisation
MNR	marine nature reserve
MPA	marine protected area
MPAC	Marine Protected Area Coalition
MR	marine reserve
MRAG	Marine Resources Assessment Group
MSFD	Marine Strategy Framework Directive
MSP	marine spatial planning
MSY	maximum sustainable yield
MUMPA	multi-use marine protected area
NAMMCO	North Atlantic Marine Mammal Commission
NAMPAN	North America Marine Protected Area Network
Natura	EU-wide network of nature protection areas established under the Habitats Directive
NCEAS	National Center for Ecological Analysis and Synthesis
NE	Natural England
NEAFC	North East Atlantic Fisheries Commission
NFFO	National Federation of Fishermen's Organisations
NGO	non-governmental organisation
NOAA	National Oceanographic and Atmospheric Administration
NTMR	no-take marine reserves
NP	nature protectionist/protectionism
NTA	no-take area
NTMPA	no-take MPA
NTZ	no-take zone
NWIFCA	North Western Inshore Fisheries Conservation Authority

OSPAR	Oslo Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
PA	protected area
PISCO	Partnership for Interdisciplinary Studies of Coastal Oceans
PMSU	Prime Minister's Strategy Unit
PP	precautionary principle
RAMSAR	Ramsar Convention on Wetlands of International Importance
RCEP	Royal Commission on Environmental Pollution
REF	Research Excellence Framework
RFMO	Regional Fisheries Management Organisation
RSPB	Royal Society for the Protection of Birds
SAC	special areas of conservation
SAP	Science Advisory Panel
SC	social conservationist/conservationism
SPA	special protection area
SNCA	Statutory Nature Conservation Agency
SSSI	site of special scientific interest
SST	sea surface temperature
TAN	transnational advocacy network
TBMPA	transboundary marine protected area
TEK	traditional ecological knowledge
UNCLOS	United Nations Convention on the Law of the Sea
UNEP	United Nations Environment Programme
WDCS	Whale and Dolphin Conservation Society
WoS	Web of Science
WSSD	World Summit on Sustainable Development
WWF	World Wide Fund for Nature

List of Figures

List of Tables

Chapter 1
Introduction

The most important controversy in fisheries management in recent years has been the debate over marine protected areas (MPAs). The epicentre of this controversy is the issue of whether large networks of no-take MPAs (NTMPAs), more usually known as marine reserves (MRs), are necessary to protect fish stocks. On the one hand, advocates of MRs argue that without MRs the worldwide decline in fish stocks will continue to the point of threatening more stocks with extinction. On the other hand, critics of MRs argue that conventional fisheries management (CFM) which includes restrictions on quota, fishing gear, effort controls, and selective spatial restrictions, if properly enforced, is perfectly adequate to protect fish stocks. There is another element in this controversy—which concerns marine biodiversity. Advocates of MRs argue that the only way to protect non-target marine species and their habitats (biodiversity) is to establish large networks of MRs; whereas critics of MRs argue that biodiversity can be adequately protected by CFM together with some selected MRs.

Miller et al. (2011, p. 948, 952) have depicted this conflict as between "nature protectionists" (NPs) and "social conservationists" (SCs):

> In one corner, are what might be called "nature protectionists", or conservation scientists and scholarly allies in fields such as environmental philosophy who defend protected areas (PAs) and conservation policies that strictly limit human presence and who advance biodiversity protection as the primary goal of international conservation efforts…In the other, are "social conservationists" who advocate various forms of sustainable use and privilege conservation-oriented development and welfare-oriented goals such as poverty alleviation and social justice…NPs generally conceive of humans as a threat to strict biodiversity conservation…while SCs believe that humans…can be allies in the conservation effort if incorporated effectively in park planning and management

Although the Miller et al. (2011) analysis was conducted in relation to terrestrial protected areas (the parks versus people debate), we will use their terminology to exemplify the MR controversy as a debate between NPs and SCs. Jones (2002) characterised this division as top-down versus bottom-up; science-based versus science-guided; principled versus pragmatic, and emphasised the ethical divide between NPs and SCs: "NTMPA proponents being more influenced by preservationist

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and ecocentric perspectives, and CFMA proponents being more influenced by the utilitarian resource conservation perspective" (Jones 2007, p. 38) (see also Hilborn 2007c; Agardy et al. 2003).

The controversy between NPs and SCs has, therefore, two dimensions: an empirical dimension and a normative dimension. The empirical dimension is a factual dispute over whether extensive networks of MRs are necessary to protect fish stocks and biodiversity. Here both NPs and SCs agree on the objective (to protect fish stocks and biodiversity), but they disagree about the means to achieve that objective: NPs hold that extensive MR networks are necessary, whereas SCs hold that they are not necessary. This empirical dispute is potentially resolvable if sufficient data become available, or if a compromise can be reached between NPs and SCs to agree on some MRs. The normative dimension is an ethical dispute over whether marine resources should be preserved or utilised. Here NPs and SCs do not agree on the objective (whether to preserve or use marine resources), and so this normative dispute may never be resolved, unless one side persuades the other to change its value system. In this book, we will see how the controversy between NPs and SCs shifts confusingly between its empirical dimension and its normative dimension, making it difficult to predict whether a resolution between them will ever emerge.

1.1 The NP Argument

1.1.1 Empirical Dimension

The foundation of the nature protectionist argument is a pessimistic assessment of the state of the world's fish stocks. A growing body of evidence has documented the declining abundance and diversity of marine resources (Worm et al. 2009) and the negative effects of fishing on marine ecosystems (Agardy 2000). Many marine species have become extinct (Jackson et al. 2001) or are in the process of becoming extinct (Roberts and Hawkins 1999), and there have been significant declines in large predatory fish (Pauly et al. 2002; Myers and Worm 2003). According to the latest Food and Agriculture Organisation (FAO) (2012) report, as of 2009, globally 29.9% of fish stocks are overexploited[1], 57.4% are fully exploited, and 12.7% are not fully exploited. Many scientists argue that we are facing a fisheries crisis (Roberts 1997), with massive implications for long-term food security (Pauly et al. 2002; Smith et al. 2010; Godfray et al. 2010). Moreover, overfishing has destroyed habitats (Dayton et al. 1995) and altered marine ecosystems either directly (Watling and Norse 1998) or indirectly (Pinnegar et al. 2000; Baum and Worm 2009). Koldewey et al. (2010, p. 1910) claimed that "Fisheries are the largest anthropogenic threat to pelagic ecosystems, therefore preventing fishing will potentially have the greatest beneficial effect for the ecosystem".

[1] According to some, this is likely to be an underestimate. Pauly and Froese (2012) suggested that 37% of fish stocks yield less than 10% of their historic maximum catches.