

Permanent trawl fishery closures in the Mediterranean Sea: An effective management strategy?



Fabio Pranovi*, Marco Anelli Monti, Alberto Caccin, Daniele Brigolin, Matteo Zucchetta

Environmental Sciences, Informatics and Statistics Department – CEMAS, Ca' Foscari University of Venice, via Torino 155, 30170 Venice, Italy

ARTICLE INFO

Article history:

Received 21 April 2015
Received in revised form
6 July 2015
Accepted 6 July 2015

Keywords:

Trawl fishery
Spatial closure
LPUE
Fishing effort
Fishery management
Adriatic Sea

ABSTRACT

Since June 2010 the Italian government prohibited the trawling activity within three nautical miles from the coast or within the 50 m isobath. This decision was expected to have a great impact on trawl fishing activities, but at the moment no real assessment of the effects on catches and possible ecological implications has been undertaken. In order to fill this gap, an assessment on the North Western Adriatic Sea coast has been performed. Landings per Unit of Effort (kilograms per boat per day) for each trawling fleet segment have been analysed, by comparing on a monthly basis the before (2007–2009) and after ban (2011–2013) period. The comparison was carried out considering total landings and the six main species targeted inside the three miles area (sand smelt, cuttlefish, red mullet, sole, turbot, and mantis shrimp). Within a general reduction of total landings, a differential effect based on the analysed *métiers* was detected, with small trawlers being more negatively affected than the large and *rapido* ones, which showed, for some species, positive impacts. From an ecological point of view, though, no positive overall effects were detected, probably due to the fact that the adopted measure is not sufficient to reduce the overexploitation. In any case, all this is affecting the structure of the small-scale fishery in the area, since small trawlers are changing *métier*, moving towards the artisanal fishery, with deep impacts on the very coastal area that the trawling ban was designated to protect, compromising all possible benefits.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

Expanding human activities in coastal areas increasingly require management approaches capable to cope with multiple-use conflicts [8]. In order to be implemented, these approaches require integrated planning tools, such as strategic assessment, coastal-zone management, and marine spatial planning for regulating, managing, and protecting the marine environment [4,9]. Within this context, an accurate assessment of the spatial distribution of human activities and associated pressures is crucial for the successful implementation of marine spatial planning [10]. Since fishing activities are recognised as one of the most important drivers affecting marine ecosystems [35], when defining marine management plans it is important to take into account the spatial extent and patchiness of such activities [17,30]. This plays an important role also concerning the use of fishery-closed areas as a management tool. Scientific debate about the real utility of this approach is still open, with main focus on consequences induced

by the displacement of activities from closed areas to alternative locations [15,29]. This clearly contrasts with one of the key management objectives established by the European Common Fishery Policy (CFP), which consists in the reduction of fishing effort in the European Seas, also through the adoption of permanent and temporal closures [19].

At present, in Italy, fishing effort limitation (as licences, days at sea, temporal closures), technical measures (as mesh size, gear limitation), and output controls (as legal size, but not quotas) represent the principal instruments implemented to manage the fishing activities. Permanent closures, such as no taking zone, is not a common management tool. For this reason, the Council Regulation (EC) nr. 1967/2006 implementation along the Italian coasts, was expected to have a great impact. The regulation, indeed, put into force in 2010, prohibits trawling activities within three nautical miles from the coast or within the 50 m isobath where this is closer to the shoreline. This measure was expected to deeply affect fishing activities in the Adriatic Sea, the Northern part of which can be considered as a large trawlable area. This area was subjected for decades to a derogation from the ban (defined by the Italian legislation since 1968, art. 111 DPR nr 1639/1968), in

* Corresponding author.

E-mail address: fpranovi@unive.it (F. Pranovi).

relation to the exploitation of sand smelt (*Atherina boyeri*) during the Winter season (from November to February), and cuttlefish (*Sepia officinalis*) during Spring (from April to mid June). According to this, in 2010, 336 of the 712 trawl fishing licenced vessels operated in derogation to the ban [20,6]. Within the context of the Adriatic trawl fishery fleet, three segments can be recognised, in relation to the vessel length and used gear: small and large otter trawlers, and *rapido* trawlers (the *rapido* is sort of beam trawl, rigged with 10 cm long iron teeth, see [25]). Till a few decades ago, the division among these segments was clear, with small trawlers fishing all the year in the in-shore area, large trawlers exploring off-shore areas and *rapido* trawlers exploiting scallops banks in the off-shore sandy areas and flatfish along the coast, depending on the season. However, as a consequence of the depletion of resources and collapse of some stocks, (like scallops) this division progressively disappeared, with target species and fishing grounds significantly overlapping.

At the moment, no real assessment of the effects on catches and possible ecological implications has been undertaken. This paper aims to fill this gap, focusing on (i) the effects assessment on Landings per Unit of Effort ($\text{kg boat}^{-1} \text{day}^{-1}$) for the different fleet segments; (ii) a preliminary analysis of potential ecological implications, by applying trophodynamic indicators. Results were discussed in the light of modifications acting on the fleet structure, and the possible consequences on the global fishing activities in the North Western Adriatic coastal area.

2. Materials and methods

2.1. Study area

Being the widest continental shelf in the Mediterranean Sea, the Northern portion of the Adriatic Sea (NAS) (Fig. 1) is characterised by relatively high productivity, which configures a unique habitat [23] in the context of the generally oligotrophic conditions of the basin. NAS is shallow (max 35 m), semi-enclosed, and characterised by the presence of incoherent sediments, and its high productivity is mainly associated to high nutrient loads coming from the river discharge [11]. These features render it a flat trawlable platform, concentrating more than 15% of the Italian fishing activities, and making it the most exploited Italian basin [1]. The main fishing activity is the exploitation of demersal fish and shellfish. The fleet is composed by polyvalent small-scale boats, otter trawls, *rapido* trawls, hydraulic dredges and mid-water trawls [31]. The port of Chioggia, located in the Southern part of the Venice lagoon (Fig. 1), hosts the most important fishing fleet in the basin, comprising 90% of the fishing vessels in the region, with all the different *métiers* well represented. Therefore, landings from this fleet can be considered as largely representative of the study area.

2.2. Fleet and landing data

By using the European fleet register (<http://ec.europa.eu/fish>

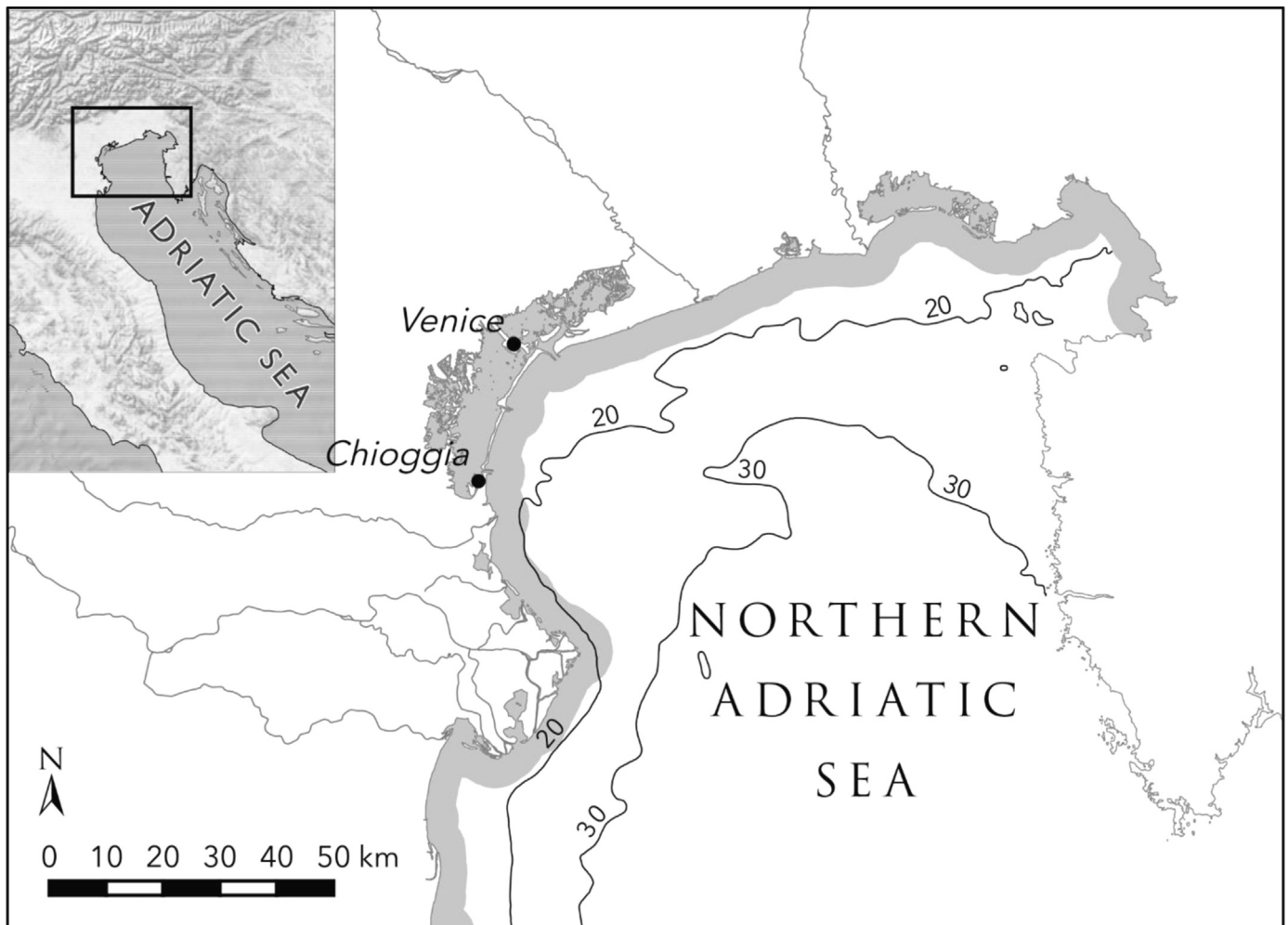


Fig. 1. The Northern Adriatic basin, showing the location of the port of Chioggia; the three miles area subjected to the trawl fishery ban is marked in grey; the 20 and 30 m isobaths are also reported.

Download English Version:

<https://daneshyari.com/en/article/7490116>

Download Persian Version:

<https://daneshyari.com/article/7490116>

[Daneshyari.com](https://daneshyari.com)