

Considering these environmental and socio-economic factors, **MedReAct thus recommends that the Gulf of Lion FRA be closed to bottom fishing and that a surrounding buffer area with reduced fishing effort be created.** Moreover, surveillance of the FRA should be reinforced, notably by means of remote electronic monitoring.

Lastly, new FRAs of significant dimensions should be created in such a way as to create a recovery network across the Western Mediterranean Sea, where such spatial measures are crucially needed.

1. Agreement for the Establishment of the General Fisheries Commission for the Mediterranean (Article 8 iv). www.fao.org/3/a-ax825e.pdf
2. Report of the eleventh session of the Scientific Advisory Committee Marrakech, Morocco, 1-5 December 2008: "The proposed FRA is a haven for spawners and juveniles and this area serves as an important refuge for commercially exploited species which guaranteed the sustainability of the fisheries concerned".
3. GFCM Scientific Advisory Committee on Fisheries (SAC), 5 April 2019, Third meeting of the Sub-regional Committee for the Western Mediterranean (SRC-WM), p 22.
4. Coll M, Vilas D, Corrales X, Piroddi C, Steenbeek J (2019) Report on the quantitative food web models calibrated with time series of data. Sustainable Fisheries in EU Mediterranean waters through network of MPAs - Safenet MARE/2014/41 Deliverable 4.3:76.
5. Coll M., personal communication, July 2019.
6. N. Vrgoč; C. Piccinetti; I. Isajlović; C. Manfredi; D. Medvešek, 2019. Preliminary data on the bottom trawl surveys in Jabuka Pit. Subregional Committee for the Adriatic Sea (GFCM, Split, Croatia)
7. Sources: France et Espagne 2008: GFCM list of fishing vessels (Gulf of Lions - Fisheries Restricted Area - 2008) www.fao.org/3/a-ax915e.pdf; France 2018: Ministère de l'agriculture; Direction des Pêches Maritimes et de l'Aquaculture; Espagne 2018: Fishing fleet in the GFCM FRAs; www.fao.org/gfcm/data/fleet/fras

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THE GULF OF LION FISH RECOVERY AREA

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The Gulf of Lion covers 15 000 km² north of a virtual line running from the border between France and Spain to Toulon. A variety of sea bed types can be found there: sandy/muddy lagoons, seagrass meadows, submarine canyons, constituting several different ecosystems of which some are Essential Fish Habitats (EFH) or Vulnerable Marine Ecosystems (VME).

More specifically, the Gulf of Lion features a complex network of canyons on its continental shelf, and its eastern slope is an important refuge for spawners of several commercial species (hake, nephrops, monkfish, etc.). For this reason, the Gulf of Lion has always been an important fishing area for French and Spanish fishermen.

One of the key functions of the General Fisheries Commission for the Mediterranean (GFCM) is the establishment of Fish Recovery Areas (FRA), to contribute to the recovery of fish populations and protection of VMEs¹. Since 2006 eight FRA have been implemented in the Mediterranean Sea in order to limit or prohibit fishing activities in key areas. Generally, a FRA is an area in which bottom-trawling is prohibited. It can include a core area in which bottom trawls and other bottom fishing gears are banned, and a buffer area subject to special rules (fishing authorization, gears or effort restrictions, temporary closures).

In 2009, the GFCM established a FRA in the Gulf of Lion to limit fishing effort on spawners of commercial species such as European hake (*Merluccius merluccius*). This area covers 2 000 km² and is located 50 km southwest of Marseille and 120 km from the fishing ports of Catalonia in Spain.

However, against the advice of its own scientific body (SAC) that cautioned that juveniles and spawners could not be protected without a permanent closure for all types of bottom gears,² the GFCM decided that bottom trawling could continue, provided that fishing effort would not exceed the 2008 level (in number of days at sea).

The presence of spawners in this area is vital for the sustainability of stocks and fisheries. Overfishing has serious consequences for the ecosystem, the viability of fisheries, and the livelihoods of the coastal communities that depend on

them. For centuries, the depth of the area and the rugged seafloor were natural obstacles to bottom trawling. However, the recent technological evolution of engines and fishing gears has increased fishing pressure, jeopardizing what should be a refuge for commercial species.

Not surprisingly, the weak restrictions that have been in place for ten years in the Gulf of Lion FRA have not had any positive effect on the populations of spawners and juveniles. In 2018, hake showed the highest rate of overfishing among all Mediterranean stocks: 15 times above what could be considered as sustainable³, and interim results of the Safenet project⁴ do not indicate any recovery of the fish resources in the area.

The lack of results is mostly due to the continuation of bottom fishing. To improve this situation additional restrictive measures must be put in place. A recent study⁵ indicates that closing the FRA to bottom gears (as the SAC first recommended in 2009) and limiting fishing effort in surrounding areas would bring significant results in terms of recovery of declining stocks, such as hake, and protection of VMEs, in particular deep-sea corals.

Stricter measures than those implemented in the Gulf of Lion FRA can bring about significant results. In a similar situation of overfishing and depleted stocks, a FRA was established in 2017 in the Jabuka/Pomo Pit in the central Adriatic. Eighteen months after implementation, encouraging increases in biomass can be seen: hake biomass has multiplied two and a half times and that of nephrops has doubled⁶. The difference between these two FRA lies primarily in the level of restrictions enforced in each area.

Of a similar size to the Gulf of Lion FRA (2 500km²), the Jabuka/Pomo Pit FRA includes 1 500 km² closed to bottom fishing and a reduction by half of fishing effort in the remaining 1 000 km². The measures that apply in the Gulf of Lion FRA, on the other hand, do not include any provision for closures; instead, they are limited to capping the fishing effort at the 2008 level. The counter-example of the Jabuka/Pomo Pit FRA

demonstrates clearly that limitations of fishing effort, if not coupled with a closure, are insufficient to ensure adequate protection for spawners and juveniles of heavily depleted stocks, such as hake.

Since the creation of the FRA, the number of fishing vessels operating in the area has dropped by 75% and the total fishing effort has dropped by 84%. The French and Spanish fleets now spend 14 days per year in the area (roughly 5% of their total annual activity). The French fishing effort has strongly declined and the Spanish presence has almost vanished. Fishing in the Gulf of Lion FRA is therefore not a matter of survival for these fleets. On the other hand, the FRA can play a key role in the recovery of the Gulf of Lion resources, such as hake, and the protection of vulnerable marine ecosystems like deep-sea corals.

An approach similar to that adopted for the Jabuka/Pomo FRA, with a core area closed to bottom fishing and a buffer area in which fishing effort is reduced, is therefore needed, especially since the impact on the 17 fishing vessels that still operate in the Gulf of Lion FRA would be very limited.

Fishing effort in the Gulf of Lion FRA (2008-2017) ⁷				
	Indicator	2008	2018	Variation 2008/2018
France	Number of vessels	36	11	-70%
	Effort (days at sea)	594	130	-79%
	% of total effort in the area	40%	54%	
Spain	Number of vessels	31	6	-81%
	Effort (days at sea)	891	112	-88%
	% of total effort in the area	60%	46%	
France + Spain	Total number of vessels	67	17	-75%
	Total effort in the area (days at sea)	1485	242	-84%

The Gulf of Lion FRA: location and bathymetry

