PILOT ACTION

Transferable Fishing Concessions (TFC)

Transferability, modes of applicability and management model analysis for the Mediterranean area

MARCHE REGION

FINAL REPORT

Programme Cofinancé par le Fonds Européen de Développement Régional

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Abbreviations and acronyms

CFP	Common Fisheries Policy
CTQ	Community Transferable Quota
EC	European Commission
EMFF	European Maritime and Fisheries Fund
EU	European Union
FAO-GFCM	Food and Agriculture Organization of the United Nations - General Fisheries Commission for the Mediterranean
FQA	Fixed Quota Allocation
GT	Gross Tonnage
IQ	Individual non-transferable catch Quota
IQE	Icelandic Quota Exchange
ITE	Individual Transferable Effort
ITQ	Individual Transferable Quota
GSA	Geographical Sub Area
MS	Member State
MSY	Maximum Sustainable Yield
PO	Producers' Organization
RBM	Rights-Based Management
TAC	Total Allowable Catches
TFC	Transferable Fishing Concession
TURF	Territorial Use Rights in Fisheries
VTQ	Vessel Transferable Quota

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PART A – INTRODUCTORY FRAMEWORK

INTRODUCTION

An issue of paramount concern for the fisheries sector is related to **fleet overcapacity and inefficiency**, associated to a **general overfishing of stocks** which has become increasingly apparent in the last few decades (*e.g.* FAO, 1997, 2011; MRAG/WWF, 2009; ICES/ACFM, 2011). The fisheries sector gives an important contribution to food security and the global economy. However, marine resources have barely been managed until recent years, and they have often been exploited under a free access regime, which has contributed to fleet overcapacity and has resulted in "too many fishers and vessels racing after too few fish" (OECD, 1996).

Measures taken by governments to solve the problem of declining fish stocks include the control of overall catches by setting **limits to total landings and to fishing effort and access** (*e.g.* restrictions to fishing vessels and gears, area closures, fishing days constraints). In addition, in order to specifically tackle the problem of overcapacity and achieve an efficient management and use of resources, economists have suggested to create a **property rights system for the access to resources** (**fishery Rights-Based Management, RBM**). Property rights are defined as a package of entitlements defining the owner's rights, privileges and limitations for use of the resource. When rights are well defined, people who own the rights can be certain how their actions will affect their current and future welfare and therefore they will have an incentive to use resources sustainably and efficiently (Stokes, 1999). Property rights will be more or less effective for fisheries resource management as a function of four features:

- Universality: how many of the resources are privately owned, and at what extent property rights are specified.
- Exclusivity: what level of benefits and costs deriving from resource property are referred exclusively to the rights owner.
- Transferability: at what extent are property rights transferable between owners in a voluntary exchange.
- Enforceability: how effective are controls on rights, aimed at avoiding involuntary appropriation or infractions.

Within the European context, fisheries management is shared between the European Union (EU) and the Member States. EU competences relate to:

- limiting total fleet size;
- fixing catch and fishing effort levels;
- adopting technical measures such as restrictions on the use of gears and/or catches for certain fisheries in order to better protect stocks.

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National authorities are responsible for distributing and managing licences, quotas and fishing effort at national and Regional levels.

Hence, a key driver for the development of Rights-Based Management (RBM) systems has been the need for national implementation of EC regulations, such as Total Allowable Catches (TAC) and Quota allocations, capacity limitations on national fleets, and days-at-sea restrictions (Spagnolo, 2011). The **European Commission's Communication on Rights-Based Management tools in fisheries** (2007) defined RBM as "a formalised system of allocating individual fishing rights to fishermen, fishing vessels, enterprises, cooperatives or fishing communities". RBM thus covers a wide range of systems: limited licensing, limited transferable licensing, individual non-transferable effort quotas, individual transferable effort quotas, individual non-transferable catch quotas (IQ), individual transferable quotas (ITQ), vessel catch limits, vessel transferable quotas (VTQ), community transferable quotas (CTQ), and territorial use rights in fisheries (TURF) (MRAG *et al.*, 2009). Quotas are usually subject to periodic reallocation. The initial Quota is usually based on track records of a fishing unit's catches in the last few years.

Overall, RBM tools in fisheries should lead to a reduction of fleet overcapacity and thus result in a smaller fleet (in terms of number of vessels and employment) producing the same amount of fish in a more efficient way. At the EU level however, the mechanisms put in place by the Common Fisheries Policy (CFP) for the allocation of fishing rights among Member States have proved to be mostly ineffective, as shown by the depleted condition of many fish stocks, as well as by the poor economic performance of some parts of the fleet, as underlined by the EC Communication on RBM (2007).

Another critical aspect pointed out by the same EC Communication on RBM is the **transferability of fishing rights**. Transferability gives a market value to resource use and this can have positive effects on the development of the sector. The transferability of rights tends to make fishing enterprises more efficient, but it may also intensify the concentration of quotas, licences, geographical distribution and fleet composition in a few hands. To counterbalance excessive concentration, the EC Communication suggest to design RBM tools to **restrict concentrations beyond a certain threshold**, in order to preserve the geographical balance of fishing activities and to maintain the cultural, social and professional framework, in particular by **protecting small-scale coastal fishing activities**.

In order to tackle all these controversial issues, a few years ago the European Commission initiated a debate with Member States, the fishing industry and other stakeholders for the assessment and improvement of rights-based management systems in fisheries. A number of relevant topics have emerged from these discussions, including:

- the issue of "relative stability" for the allocation of fishing opportunities between Member States, aimed at ensuring "a predictable share of the stocks for each Member State";
- the need to regulate transferability, in order to avoid excessive concentration of rights;
- initial allocation and validity duration of fishing rights;
- possible adverse conditions for the small-scale fisheries sector when it coexists with industrial fishing enterprises;
- "high grading" (*i.e.* selectively keep only the higher-value fish onboard) and related discard problems;

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- the need for effective enforcement controls.

Further issues to be tackled according to the EC Communication on RBM (2007) include:

- an analysis of current national systems;
- the improvement of their efficacy, by means of sharing best practices;
- transnational elements such as seeking synergies between the Member State systems, or the introduction of the exchange of quotas between Member States.

In September 2007, the European Parliament carried out a workshop on RBM in fisheries, aimed at outlining further developments of the CFP legal framework. Systems based on **Individual Transferable Quota (ITQ)** tools were especially debated. When designing an ITQ system however, it should be considered that many EU fisheries are mixed fisheries, and this is particularly true in the Mediterranean. One solution could be to determine **ITQs as an overall share in all stocks for which a TAC has been specified.** If a limited number of target species are captured with a relatively stable catch composition, the "cod-equivalent" method could be applied. In this case an **ITQ for the total of the target species** is set, and ITQs of specific species are calculated against the total ITQ using cod-equivalent coefficients, as done in Iceland. A second method could be to determine an **ITQ only for the dominant target species**, regarding the rest of catches as by-catch. In cases where there is not a main set of target stocks, as **in the Mediterranean, a general multi-species quota could be set**.

One of the main concerns of ITQ-related systems is that they could favour **discarding practices**. In addition, ITQ systems do not generate real property rights: owning part of the quotas gives a fisherman the right to fish, but it does not give him a real control (and responsibility) on the fisheries resource (Wingard, 2000). ITQ systems do not necessarily increase fisheries sustainability; it is often difficult to determine the effects on fish stocks due to a **lack of data on stock abundance and density,** and in many cases fishing capacity (in terms of engine horsepower) is even increased as a consequence of ITQs, through the **renewal of fishing vessels** following quota acquisition. At the **social level**, it is worth pointing out that crew members do not usually gain advantages from the adoption of an ITQ system (Copes and Charles, 2004). As a general rule, if a vessel's owner sells his quota, crew members do not receive any shares, even if they have contributed to the quota definition through their catches (van Hoof *et al.*, 2002, 2005).

Another critical issue is the potential loss of access to fisheries due to the **concentration of quotas in a few hands**, with particularly negative effects on small fishing communities. In order to prevent local coastal communities form losing all their fishing rights however, **Community Transferable Quota (CTQ)** could be introduced. Community quotas could be held by municipalities, consortia, organisations, or other groups representing the fisheries community rather than individual owners. Furthermore, the risk of **prevention of access to fishery by new entries** could be solved by the set-aside of quotas to be specifically devoted to new fishermen entering the sector (European Parliament, 2007).

Conclusions and recommendations of the RBM workshop carried out by the European Parliament suggested to consider the introduction of a system based on **effort regulation**. This is particularly relevant for multispecies, multigear fisheries, such as Mediterranean ones, where RBM is more likely to be effective if it is related to the set up of **Individual Transferable Effort (ITE) systems** (Spagnolo, 2011).

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From an EU legal perspective, the most important conclusions of the European Parliament RBM workshop included:

- Member States (MS) should manage quotas at their own discretion, as long as this is done in compliance with the EU regulations. Hence, MS are already in the position to design an operational ITQ-like system for their national fisheries sector.
- According to the current EU regulations, fishing vessels are strictly associated to the country which has allocated the quota. This system could however be adapted if more effective solutions emerge.
- Most MS calculate quotas on the basis of historical track records of catches. This system is contested because it may give an advantage to those already in the fisheries, thus preventing new entries.

Stemming from these premises and further debates, in 2009 the European Commission identified in fleet overcapacity and inefficiency, associated to a general overfishing of stocks, two of the main issues threatening the EU fisheries sector, and prepared a specific Green Paper on the issue (EU COM, 2009). Advocating for an ambitious reform of the Common Fisheries Policy (CFP), the Green Paper "Reform of the Common Fisheries Policy" underlined a high criticism *vis-à-vis* of the last 10 years of implementation of the CFP. In such a context, in 2011 the European Commission proposed a set of principles and regulations for the Reform of the Common Fisheries Policy (EU COM 2011a, b). In particular, a market-based system of Transferable Fishing Concessions (TFC) was proposed in order to contribute to achieve efficiency, reduce fleet overcapacity and increase economic viability of the fisheries sector. Indeed, under this system some operators would have an incentive to increase their concessions, while others may decide to sell their shares and leave the sector.

Transferable Fishing Concessions (TFC) are defined in the proposal (EU COM, 2011b) as "revocable user entitlements to a specific part of fishing opportunities allocated to a Member State or established in management plans adopted by a Member State in accordance with Article 19 of Regulation (EC) No 1967/2006, which the holder may transfer to other eligible holders of such transferable fishing concessions".

A related concept outlined in the proposal, which forms the basis of allocation criteria, is that of **individual fishing opportunities**, defined as the "annual fishing opportunities allocated to holders of transferable fishing concessions in a Member State on the basis of the proportion of fishing opportunities pertaining to that Member State".

According to the European Commission's Proposal (2011b) and in particular to Part IV "Access to resources", a **mandatory system of transferable fishing concessions (on fishing opportunities for regulated stocks)** should be introduced no later than 31 December 2013 for (a) all fishing vessels of **12 meters length over all or more**; and (b) all fishing vessels under 12 meters length overall fishing with **towed gear**.

Under the EC Proposal, these concessions should be **transferable, but only within a Member State (vessels flying the same flag)**. Member States may further regulate TFCs to ensure a close link between them and the fishing communities (for example, by **limiting the transferability within fleet segments**) and to prevent speculation. In addition, TFCs may be pooled together for **collective management** by

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legal or natural persons or recognized producers' organisations. This could be particularly relevant for small-scale coastal fleets, although the specific characteristics of this fleet segment, the particular link with coastal communities and the vulnerability of some of these small or medium-sized enterprises justify the **facultative application of TFCs to small-scale vessels**.

The EC Proposal stated that "Member States may create a reserve and **introduce a fee for the concessions**, which under normal conditions may be recalled by the Member States only after expiration of their validity or invocation of an early warning. Member States may limit the period of validity of transferable fishing concessions to **a period of at least 15 years**, for the purpose of reallocating such concessions".

The EC Proposal only marginally tackled the issue of **allocation criteria**. It stated that each Member State shall allocate TFCs on the basis of transparent criteria, for each stock or group of stocks, aiming at ensuring a long-term stability of fish stocks and fishing activities. Individual fishing opportunities based on TFCs should be allocated on the basis of overall fishing opportunities allocated to Member States by the EC (through a **TAC and Quota** system), or established in national management plans for species for which TACs and quotas have not been determined. In this case, Member States should determine individual fishing opportunities on the basis of the **best available scientific advice**. For the allocation of transferable fishing concessions pertaining to **mixed fisheries**, which is of particular interest for the Mediterranean context, the EC Proposal stated that Member States should take into account the **likely catch composition of vessels** participating in mixed fisheries.

The original EC Proposal has been extensively discussed at all governance and stakeholder levels, and several amendments have been included in the final proposal. In January 2013, the Committee of Fisheries of the European Parliament has finally released the **Report on the proposal for a regulation of the European Parliament and of the Council on the Common Fisheries Policy** (Rapporteur Ulrike Rodust), which deletes the following points:

- A system of transferable fishing concessions for the majority of managed stocks under the Common Fisheries Policy should be implemented no later than 31 December 2013 for all vessels of 12 meters' length or over and all other vessels fishing with towed gears. Member States may exclude vessels up to 12 meters' length other than vessels using towed gear from transferable fishing concessions. Such a system should contribute to industry-induced fleet reductions and improved economic performance while at the same time creating legally secure and exclusive transferable fishing concession of a Member State's annual fishing opportunities. Since marine biological resources are a common good, transferable fishing concessions should only establish user entitlements to a Member State's part of annual fishing opportunities which may be recalled according to established rules.
- Fishing concessions should be transferable and leasable in order to decentralise management of fishing opportunities towards the fishing industry and ensuring that fishers leaving the industry will not need to rely on public financial assistance under the Common Fisheries Policy.
- Specific characteristics and socioeconomic vulnerability of some small scale fleets justify the limitation of the mandatory system of transferable fishing concessions to large vessels. The system

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of transferable fishing concessions should apply to stocks for which fishing opportunities are allocated.

The Amendment included in the Report states the following:

- Each Member State should be allowed to choose its method of allocating the fishing opportunities assigned to it, in accordance with the subsidiarity principle, without an allocation system being imposed at European level. In this way, **Member States will remain free to establish – or not to establish – a system of transferable fishing concessions**.

Why does the Commission propose Transferable Fishing Concessions (TFC)?

The CFP has failed to resolve the problem of overcapacity. We will have spent 2,73 billion € from 1994 until 2013 to scrap fishing vessels, but despite this massive spending our fishing capacity is still increasing by about 3 % every year. None of the past policies to tackle the overcapacity (Multi Annual Guidance Programmes, entry exit ratios, capping the maximum fleet size, public scrapping schemes) have worked. The Court of Auditors is questioning the use of taxpayer's money to address overcapacity. In light of this the Commission proposes to draw upon the positive experience of a number of Member States (MS) with TFC like systems, both at the ecological and the socio-economic level.

If designed correctly TFCs can be an effective tool for vessel owners to plan their fishing activity along market developments, land all catches and plan their investments. They also offer the possibility to fishermen to leave the industry in exchange for financial compensation. Experience shows that TFC like systems also increase operators responsibility and facilitate discard reduction.

What is the Commission proposing?

The Commission has proposed to introduce TFCs at the MS level while following strict principles. First marine resources are and must remain a public good. TFCs can not confer property rights over marine resources, but only user rights to exploit them for a limited time. After the time is up the TFC has to fall back to the MS, who is free to allocate it again using the same allocation criteria or different ones. Second, selling, leasing or swapping of TFCs can only happen under strict conditions as only owners of registered and active vessels with the purpose to use them on a licensed and active vessel, can buy TFCs. Third, relative stability must be respected. Fourth, MS have to withdraw TFCs in case of a serious infringement by the vessel owner and fifth, they have to reserve quotas and TFCs for new fishermen who are looking to enter the fishery.

While respecting the above five principles MS should introduce TFCs at national level for all species under TAC and quota or effort limits and for all vessels above 12 metres as well as for all vessels with towed gear. TFCs are only user rights distributed by MS to vessel owners for certain periods. They are a fixed percentage of the national quota for a specific fish stock. Where fishing effort is used, as in the Mediterranean Sea, TFCs would apply to effort allocations. Fishing opportunities not regulated under a quota or effort regime of the EU or those under a sustainable fisheries agreement with a third country would stay outside a TFC system.

How should quotas and TFCs be allocated?

The proposal foresees flexibility for MS, but the Commission would prefer the following: MS should set national or regional priorities allocating a certain % share of the national quotas to the small scale fleet. The rest of the quotas would be managed under TFCs. MS should design their national TFC system together with stakeholders as their close involvement would ensure that the national TFC system is adapted to the specificities of the relevant MS and is accepted by stakeholders. When designing the TFC system, MS and stakeholders should favour coastal communities dependant on fishing, more environmentally friendly fishing practices and the artisanal fleets. They

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should set aside up to 5% of the quotas or TFCs for new entries. MS and stakeholders should thus use this system to prioritise fishing practices that they consider more desirable, be it for social or environmental reasons.

What safeguards can MS put in place?

Experience in MS where a TFC system is used shows that risks can be avoided through design. In designing the system MS and stakeholders must therefore take care that the TFC system leaves no room for speculations or situations that are detrimental to regions dependent on fisheries and related activities. They must also strictly regulate a TFC system and ensure that public authorities in the MS are able to act at all times to ensure that TFC holders play by the rules. To this end MS should use a toolbox of measures, such as:

- excluding small scale fishing (<12m with passive gear), in order to ensure that fishing rights of this important segment will not be sold to larger vessels;
- preventing excessive concentration by avoiding that too many fishing rights end up in the hands of a few vessel owners. This must be done by setting maximum percentages of a given resource that can be held by any given vessel owner;
- reserving a part of national quotas for coastal communities that depend on small scale fleets;
- limiting the transferability to inside specific fisheries (e.g. whitefish concessions can only be traded with other whitefish concession holders, not to a pelagic concession holder).

What is expected in terms of consolidation for the EU fleet?

In a number of MS TFCs have helped to rationalize the fleet. In Denmark TFCs were introduced in 2003 for the pelagic fleet, which had since decreased by 50%. For the demersal fleet TFCs were introduced in 2007 and this fleet has shrunk by 30% since. Profits for both segments increased. Estonia introduced a TFC system in 2001 and by 2009 the fleet has decreased by around 40%. In Spain the so called Gran Sol fleet decreased by 30% between 1992 and 1997 with the use of TFCs.

Source: *http://ec.europa.eu/fisheries/reform/docs/tfc_en.pdf*

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STATE OF THE ART AT THE EUROPEAN LEVEL

In the last decades, a number of European countries (both Member States and Third Countries) have developed fisheries management systems based on transferable concessions/quotas and similar rights-based systems. Overall, such systems have proved to be positive in **improving management efficiency**, although the outcomes have been controversial at times, as outlined below for each country. It is worth noting that TFC-related systems have been mainly developed in Northern European maritime areas, where fishery is usually characterised by simpler patterns than in Southern/Mediterranean areas.

EU MEMBER STATES

NETHERLANDS

The fisheries sector has been managed through an ITQ system for almost thirty years. At the beginning a number of problems were encountered, spanning from fleet overcapacity which caused continuous pressure toward overfishing of ITQs, to an excessive trade in ITQs which made administration updates difficult, to the poor coordination between different types of controllers, administration and professional organisations (Salz, 1996).

However, these problems have been successfully solved by introducing **effort restrictions** and by implementing a **co-management scheme** (van Hoof, 2010). In particular, the introduction in 1993 of Management Groups, which are organizations of vessel owners usually in the same region charged with the responsibility to manage parts of the fishery in cooperation with the fisheries authorities, has allowed to facilitate trades amongst their members thus making the ITQ system successful (Arnason, 2002). The Dutch case shows that by managing the quota by **fishermen's groups the rights can be safeguarded for local communities** (van Hoof, 2010).

In addition, the system seems to have had beneficial results in terms of fleet rationalization and overall profits. There has been a substantial **reduction in fleet size and overeall fishing capacity**: between 1987 and 1993 the number of flatfish vessels declined by 23% and the total engine power of the flatfish fleet by 12% (Anonymous, 1994). Also, during the same period the Dutch fishing industry recorded a significant increase in profits (Davidse, 1995).

Other positive effects of the privatisation of fishing rights are that **catches were brought in line with the Total Allowable Catch (TAC)**, and fishermen were able to plan their fishing undertaking and hence **reduce the "race for fish"** (van Hoof, 2010).

The Dutch experience with ITQs thus shows that they can be an effective management tool, provided that they are applied consistently with other measures (*e.g.* licensing), and that there is clear commitment to their implementation. Nevertheless, some critical issues persist (Salz, 1996): (i) ITQs will contribute to stock conservation only if **TACs are properly set**; (ii) they will strengthen the long term **economic viability of the (usually few) firms which manage to survive**, but many firms will have to

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leave; (iii) ITQs tend to **increase fish production costs**, which have to be paid for by consumers; (iv) they do **not have a clear positive impact on the environment**.

UNITED KINGDOM

Fishing rights are conferred to UK-registered vessels by means of a **licensing system**, which is calibrated on both **type of vessel and target species**. As a general rule, quantitative restrictions on catches are imposed as licence conditions. Licences are **issued annually** by the Government Fisheries Departments, and **licence entitlements can be transferred** between vessels. The current licence structure limits not only the **total number of vessels** but also their **size and power** and the extent to which **effort can be shifted** between stocks and between fishing methods (Hatcher and Read, 2001).

Licences are subdivided into different categories according to **vessel size and engine power**, target **fish stocks** (stocks subject to TAC and quotas *vs* non-quota species), specific **fisheries segments** or **types of vessel and gear** (Hatcher and Read, 2001). Licences can only be transferred within categories.

Linked to the licensing scheme is a system for regulating the uptake of national quotas. This involves the **annual allocation of percentage quota shares to groups of vessels (Producers' Organizations)**. Until recently all these allocations were based on vessels' recent patterns of catches, or their track record of **landings during the previous three years** (the reference period for the majority of stocks), but in 1999 this was replaced by a system of **fixed quota allocations** or FQAs (Hatcher and Read, 2001). Group allocations are made by Government to **Producers' Organizations (POs)** - vessel owners' associations recognized under EC law - which are then allowed to manage those allocations as they wish, for example, by means of monthly landing limits or individual vessel or company quotas.

A significant feature of the UK quota management system is that it is essentially an informal arrangement between Government and industry. There is **no legal basis for the notional individual quota allocations** which are used to calculate group allocations, they are merely an administrative tool used by the Government Fisheries Departments. Fishermen have no legal right to receive a licence and certainly no legal title to any share of national quotas. Thus although quota units are traded as very valuable assets, their legal status appears extremely weak. The Government has **never** tried to impose **quota or licence fees**, nor to regain any of its management costs through **charges**. It has so far allowed **all the returns from sales of licences and quota to remain in private hands** (Hatcher and Pascoe, 1998). This attitude may change if the costs of management increase significantly or if quota prices increase in a more organised and efficient market environment.

Small size (<10 m) coastal fleets still represent a critical issue. This fleet segment owns only 4 % of the national fishing quotas, but it includes 77% of the entire UK fleet and 65% of the total number of employees in the fisheries sector. The introduction of the European Register of sellers and buyers in 2006 has marked the start of a more balanced licence regime.

DENMARK

Denmark has introduced a management system based on individual transferable quotas (ITQ) for the **pelagic fisheries** in 2003, and a vessel transferable quota (VTQ) management system for the **demersal**

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fisheries in 2007. Restrictions are few in the pelagic fleet, characterised by large and efficient vessels, and transferability is very flexible (Andersen *et al*., 2010).

The Danish **fleet has shown a significant decrease** as a consequence of the adoption of a TFC-related system: the pelagic fleet as shrunk by 50%, the demersal fleet by 30%, and currently both fleets are in balance with fishing opportunities. **Profits have increased** in both segments, and so have investments in quality and better working conditions. Fishermen plan their **activity according to market developments**, and the day-to-day leasing of quotas has **reduced discards**. In addition, **coastal fisheries has become more competitive** under the new regime.

SPAIN

The Spanish **North East Atlantic Fisheries Commission "300" fleet** is an important demersal fishery (representing 13% of national landings) composed of trawlers, longliners and entanglers (300 refers to the number of vessels at the time of Spain's entry to the European Community) (MRAG *et al*., 2009).

The fleet was managed by individual effort quotas during 1986-2006, and by individual catch quotas since 2007, while transferability has been a feature of the system since 1997. Fleet reduction (to less than 200 vessels) was largely achieved prior to the introduction of ITQs, with **decommissioning schemes and incentives playing a significant role in the 30% reduction** during 1992-1997. It is likely that high-grading and consequently discarding have been practised throughout the history of the fishery – if any **reduction in discarding** has occurred, it will be mainly due to **more selective technologies and surveillance** and not to ITQs (MRAG *et al*., 2009).

ESTONIA

Between 2001 and 2002, Estonia implemented an ITQ system for the management of the main **Baltic Sea species** (Ulmas, 2003). After a few years, a significant **decrease in the total fleet** was recorded (about 40% decrease in 2009).

The acquistion of fishing rights is subject to a **fee of up to 4%** of the catch value. It is interesting to note that with the introduction of an ITQ system, Estonia has obtained a **decrease in fisheries management cost** in relation to landed value (Ulmas, 2003).

EUROPEAN THIRD COUNTRIES

NORWAY

Norway has started to implement a **licence policy** to limit access to the fisheries since the 1960s. Allowing trading in quota rights has had mixed success: it has **reduced the number of fishing vessels**, **increased profitability** for the remaining vessels, and **improved the net added value** (difference between gains from sales and fishing costs) for pelagic fish stocks (Trondsen, 2007). However, Norway has also seen an **increase in fishing capacity** (when measured by engine capacity), a **concentration of fishing rights** in the hands of fewer companies/larger vessels/fewer fishing ports, an **increase in quota prices** (Trondsen, 2007).

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Overall, the **economic efficiency** has been significantly increased by the introduction of a rights-based management system **for the pelagic fleet, but not for the demersal fleet**.

ICELAND

The introduction of an ITQ system has allowed to improve both the **economic efficiency** of the fishing industry and to accomplish the s**ustainable supply of fish.** The success of the ITQ system has been significantly influenced by the **setting of TACs and biological support measures**, the implementation of an effective **surveillance of landings** (the landings of every fishing vessel are registered), the creation of a **quota market system** that uses the prices to coordinate the decisions of buyers and sellers. Indeed, in 1998, the **Icelandic Quota Exchange (IQE)** was established in order to facilitate the bidders to get more complete information (Xinshan, 2000).

The ITQ system was initially put in place to face the dramatic crisis of cod fish stocks. In 1990, quota was permanently allocated to current permit holding boat owners and made fully divisible and transferable between owners of Icelandic fishing vessels, so that shares could be leased or sold **similar to selling shares on the stock market**. Investments in the fishing fleet and total catch capacity continued to increase thereafter. Despite this management strategy however, **catches surpassed the TAC** by 12% annually between 1984 and 1996, and despite a reduction in number of fishing vessels, **fleet capacity increased** due to increased engine capacity and gross tonnage (GT). In addition, **industrialized vessels hold the majority of ITQs**. For this reason, in 1998 the government enacted a law stating that one **boat owner can hold no more than 10%** of TAC shares for cod (Hersoug, 2007).

Another critical issue of the ITQ system in Iceland is its **negative social impact on communities**. Iceland has therefore initiated a debate for the **introduction of a CTQ system**, aimed at moving from the individual to the community level in quota management. Finally in Iceland, similarly to the Netherlands and the United Kingdom, the **lack of an exhaustive legal framework** to deal with ITQs as **property and trading rights** represents a barrier to the efficiency of the fisheries management system.

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THE MEDITERRANEAN CONTEXT

The traditional approach to fisheries management differentiates between output control measures (catch limits for the entire fleet or for each vessel, fish size, etc) and input control measures (fishing effort limits, restrictions on fishing days, creation of protected areas, etc). This approach implies a hierarchical relationship between the management authority, which owns the resource on behalf of the community, and the fishermen, who are called to respect the rules. Such a **"command and control" approach** prevents the valorization of businesses in enhancing sustainability, whereas the business role could be empowered through the introduction of **rights-based management measures**, which could also increase fishermen's responsibility (Spagnolo, 2006). A different approach to fisheries management can enhance this aspect, moving from collective rights to individual rights, and thus allowing to internalize costs related to the common nature of fisheries resources. Indeed, the efficacy of conservation measures depends in the first place on the participation of stakeholders, in particular fishermen, in outlining the most appropriate management measures.

Within a Mediterranean context, some authors (Spagnolo, 2006) have identified two main management measures based on rights:

- **Territorial Use Rights in Fisheries (TURF)** allocated to specific fishing groups for the exploitation of a given area.
- **Individual Rights on resources**, which can be subdivided into Individual non-transferable catch Quota (IQ) and Individual Transferable Quota (ITQ).

Territorial Use Rights (TURF) are appropriate for the **exploitation of sedentary resources**; only in this case there is no competition between territorial rights owners and fishermen exploiting the resources out of the TURF area. Clam management is very similar to this system, where each fisheries compartment can operate and have fishing rights only in its own territory.

Individual Quotas imply the full transfer of rights to quota owners, who have the exclusive right to catch the quantity which has been allocated to them. The outline of management measures based on individual (transferable) fishing concessions/quotas allows to **determine, either directly or indirectly, the maximum amount of fish that can be caught by each rights' owner**. These measures may therefore help to control the level of stock mortality without a direct control of fishing effort. Two basic requirements must be satisfied for the measure to be effective: on the one hand, catches should be constantly monitored (**resource state assessment**), on the other hand, fishermen should be constantly monitored too (**compliance with the rules**). The Total Allowed Catches (TAC) to be distributed among individual quota owners can only be determined if the state of stocks is known.

Total Allowed Catches (TAC) are widely adopted in international management contexts, but they do not necessarily imply the subsequent distribution of individual quotas according to a rights-based management system. TACs are calculated for each target species on the basis of biological indices. Landings should be constantly monitored so that the fishing season can be terminated as soon as the TAC value is reached. Through this measure, the management authority can fix lower catch levels if the

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resource is overexploited, so that stocks can progressively recover. Once a stock has reached sustainable levels again, TAC can be raised to the initial or even higher values. The use of TACs is however no guarantee of success and of optimal management, since the two requirements mentioned above (resource assessment and compliance control) are not always completely satisfied. For instance, in the Mediterranean TACs have been used for years for Bluefin tuna (*Thunnus thynnus*) management, but the results of this measures have been highly criticized.

In addition, the use of TACs can enhance the "***race to fish***" phenomenon, since fishermen will strive to catch the largest quantity of fish in the shortest time, before the total allowed quota is reached and the fisheries activity is thus prohibited (Spagnolo, 2006). If fishing effort increases, the individual quota caught by each vessel will tend to decrease, costs will tend to increase, and a new bioeconomic balance will be reached when the average costs and revenues will coincide again. For these reasons, where TACs have been adopted (North Europa, North America, Australia), they are generally integrated with additional technical measures such as restrictions on fishing effort and catches of small-size fish, or the establishment of protected areas.

An alternative option is to **associate TACs with the introduction of individual quotas**. In this way, the **biological approach is interwined with the principles rooted in the property rights theory** (Spagnolo, 2006). Indeed, each individual quota is a portion of the total quota that can be catched each year according to the state of a stock. The "race to fish" phenomenon is thus avoided: each fisherman owns a specific stock quantity, and his quota can be caught according to the times and modes that are deemed as the most appropriate and convenient.

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PART B – GENERAL ANALYSIS

As highlighted in the introductory framework, a major concern for the fisheries sector is related to **fleet overcapacity and inefficiency** associated to a general **overfishing of stocks**. The Common Fisheries Policy (CFP) has not helped to solve these issues. For this reason, between 2009 and 2011 the European Commission produced a series of documents aimed at carrying out a significant **Reform of the CFP**. Among the new measures proposed, such documents included the mandatory introduction of a system of Transferable Fishing Concessions (TFC) at the State level, specifically aimed at reducing fleet overcapacity and increasing economic viability of the fisheries sector. **Transferable Fishing Concessions (TFC)** are a form of rights-based fisheries management that entitle the holder to a specific proportion of its Member State's annual fishing quota or allowable fishing effort. The mandatory introduction of a TFC system has however been widely opposed and it has been finally rejected by the European Parliament and Council. The reformed CFP will therefore include the possibility to **adopt a TFC system for fisheries management on a facultative basis** at each Member State's discretion. Indeed, given the diversity of fisheries in Europe, Member States should be allowed to choose the management system which is most appropriate for the specific **characteristics and requirements of the regional fisheries**, based on a set of transparent **criteria for economically viable and environmentally and socially sustainable practices**.

GOALS OF THE PILOT ACTION AND PARTNERS INVOLVED

Stemming from these premises, the present pilot action aimed at carrying out an overall investigation on Transferable Fishing Concessions (TFC), including an introductory analysis of the legal framework and state of the art at the European level (Part A of this Report), and an evaluation of the appropriateness, transferability and modes of applicability of a fisheries management model based on a TFC system in the Mediterranean area, which is characterised by multispecific, multigear and small-scale fisheries (Part B and Annexes of this Report).

The main goals of this pilot action were:

- To **increase knowledge and competences on TFC** in view of the next European Maritime and Fisheries Fund (**EMFF**), which will enter into force on 1 January 2014 until 31 December 2020.
- To **assess the appropriateness and transferability** of a fisheries management model based on a TFC system to the **Mediterranean context**, also outlining specific **modes of applicability**.

Overall, the **project partners involved** in the MAREMED project are:

FRANCE

- PACA Region: Maritime Service
- Corsica Region: Environment Office
- Conference of Peripheral Maritime Regions and Mediterranean Intercommission (CRPM and CIM)

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SPAIN

- Valencia Region: Port Institute for Studies and Cooperation FEPORTS
- Murcia Region: Department of Public Works and Land Planning

ITALY

- Liguria Region: Department of Land Planning
- Toscana Region: Maritime System; International Cooperation
- Lazio Region: Department of the Environment
- Marche Region: Directorate of Fisheries, Agriculture, Forestry and Fisheries Services
- Emilia-Romagna Region: General Directorate of the Environment, Coast and Land Defence Service

GREECE

- Crete Decentralized Administration Authority: General Direction of Spatial And Environmental Policy

CYPRUS

- Larnaca District Development Agency

All these partners were asked to collaborate in filling out the TFC questionnaire. Six out of 11 partners (France: PACA Region, Corsica Region; Spain: Valencia Region; Italy: Marche Region, Liguria Region, Toscana Region) provided opinions, data and information through the questionnaire with the support of experts internal to the public administration bodies and external to them (research institutes and universities). In addition, the Conference of Peripheral Maritime Regions and Mediterranean Intercommission (CRPM and CIM) participated in drawing up the Report.

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RESULTS AND DISCUSSION

This section presents and discusses the overall results of the questionnaire's analysis (see Annex II for full detail on each partner's response to the questionnaire), with special reference to the general parts of the three thematic sections:

- 1st Thematic Section: Options for Quota determination and allocation criteria.
- 2nd Thematic Section: Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues.
- 3rd Thematic Section: Fisheries management model based on a TFC system: Social, Economic and Regulatory issues.

OPTIONS FOR QUOTA DETERMINATION AND ALLOCATION CRITERIA

In order to evaluate the transferability and modes of applicability of a TFC management model in the Mediterranean area, it is vital to outline the most suitable options for Quota determination and criteria for TFC allocation.

As a basis for the development of an appropriate set of rules, a coherent **system for Quota determination** (based for example on parameters such as species quantity, fleet/vessel characteristics, length of fishing period) and related **allocation criteria** shall thus be developed, making sure that the advantages and disadvantages associated to each option are clearly defined.

There are various possible options for Quota determination, and different options may also be combined in order to make them more effective. When choosing among available options, it is important to identify the option that better allows to stay **within the biological catch limits** of the target species, keeping in mind that such limits are different among species.

Some examples of possible options for Quota determination in the TFC framework are:

TFC – Quota as a quantity that can be caught by a fishing vessel identified as a portion of the national catch Quota for a TAC species, for example tons of mullets.

TFC – Quota as a portion of the total fishing time allocated to the catch of one or more species, for example fishing days for mullets or fishing days for all species caught together.

TFC – Quota as a portion of the total fishing capacity of the whole fleet calculated as fishing power by fishing time, for examples fishing days by vessel horsepower in kW.

TFC – Quota as a portion of the national catch Quota for each fishing system and fishing area, both for single species and for groups of species, for example tons of mullets caught by towed gear in FAO-GFCM GSA 17.

The following table presents a general overview of the various **options for Quota determination and related allocation criteria for the Mediterranean** that were identified by MAREMED project partners according to their Regional situation, together with a list of advantages and disadvantages related to each option (see Annex II for specific options indicated by each project partner in the questionnaire).

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OPTION 1: <u>Quota in terms of resource quantity</u> that can be caught by a fishing vessel *(quota is calculated as a portion of the total allowed catches)*	
ADVANTAGES	***DISADVANTAGES***
Biological, Ecological, Environmental aspects	
1. More control on the resource to be monitored /protected. 2. It could keep catches within safe biological limits. 3. It can be applied to single species fisheries and it has given good results with sedentary species. The maximum daily allowable catch per vessel has already been put in place for clams. 4. Quotas would make more sense if they are applied to catches rather than to landings, in order to avoid an increase in discards which is very difficult to control. 5. Smaller vessels could sell their quotas to bigger ones and cease their activity. This could decrease fishing pressure on resources. 6. For strictly single-species fisheries (*e.g.* «rossetto», cuttlefish and octopus caught with traps, swordfish, bluefin tuna) it may be appropriate to set Quotas.	1. Necessity of very accurate studies on the resource quantity and status: introduction of a degree of uncertainty. 2. For most species, especially demersal ones, there are no exhaustive resource assessments for quota determination, together with an overall lack of biological and ecological data (e.g. with regard to Corsica, the red spiny lobster *Palinurus elephas* is a very important species but understanding stock-recruitment relationship is still very difficult). 3. There are no exhaustive data which allow to assign quotas to the different GSA areas for each species. 4. Quotas assigned to each species could differ among areas, even if vessel characteristics are the same, due to differences in the ecological features of each area and in the species biology (e.g. distribution throughout the life cycle). 5. Several species of commercial interest are part of multispecific communities, and it is not possible to catch them as single species. 6. Discards tend to increase without biological benefits. 7. Due to the short life cycle of many Mediterranean species, quotas can include adults as well as juveniles according to the chosen fishing period. 8. Small fishing vessels may sell their TFCs to bigger vessels which concentrate their catches in restricted areas. This would

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	determine an increase of the fishing effort in specific areas.
Economic aspects	
1. Quotas put a limit on quantities that can be sold, and in certain periods quotas can cause an increase in market prices (if the same product is not brought to the market from other fishing areas, its economic value increases). 2. For some fishing systems, such as anchovies caught by light fishing and purse seine, fixing quotas could give a higher value to catches and more stable prices throughout the year. 3. Smaller vessels could decide to sell part of their quotas to bigger vessels, thus obtaining an economic gain. 4. Quotas may give a higher value to licences and thus to fishing vessels. This may be relevant if the new EMFF does not provide financial support for vessel scrapping and/or sets limits to supports for renewal. Quotas could therefore be an advantage for fishermen, in that they give an added value to their vessels and could allow to gain higher monetary reward to fishermen who cease their activity. 5. A TFC system based on catch quotas could give economic benefits if it is related to product quality policies aimed at increasing the price of fisheries products.	1. Quotas are usually reached in a short time, and this could cause long inactivity periods or the use of quotas allocated to other species, with a high probability of catching also species for which the quota has already been reached (in this case it is most likely that species for which the quota has been reached are discarded). 2. The quota will be reached trying to catch fish of the size/age class at higher market value. This means younger individuals for many Mediterranean commercial species (octopus, cuttlefish, squids, mullets, etc). In other cases, such as anchovies, bigger size fish have a higher commercial value. In these cases the risk is that fishermen selectively keep on board bigger-size individuals and discard the residual catches (this is both an economic and a biological consideration). 3. The controls carried out to verify catch quantities on fishing vessels have high costs and are often not effective, as demonstrated in Northern Europe. These costs would have to be beard by fishermen. 4. In the case of transnational resources, quotas should be shared between neighbouring countries and respected also in neighbouring areas, but this is difficult to apply and control. 5. There is the risk to concentrate quotas in a few hands, if small size vessels sell their quotas to big vessels that can more easily bear with market fluctuations. 6. Quotas for different species could be traded between vessels, for instance one could exchange a few "higher value" Norwegian

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	prawn quotas and get a lot of mullet or anchovy quotas. 7. The distribution of national quotas among fishermen could lead to anomalies related to the different distribution of fish resources in the different areas. This could lead to the uneven distribution of quotas among fishing vessels with similar characteristics but operating in areas with different resource availability. 8. Fishermen that do not obtain quotas or have lower quota values are penalized from the economic point of view. 9. The operational and maintenance costs of fishing vessels are high. Allocating TFCs on the basis of catch quotas may lead to a further decrease in the profitability of fisheries, especially if quotas are assigned to species with low market value. 10. If the quota system caused a decrease of the total amount of fish that is caught, this could determine an increase in the price of fish, which might remain unsold. This would further decrease the fishermen's gains, which are already low.
Social aspects	
1. Fixing quotas could favour the aggregation of fishermen in consortia or producers' associations in order to improve market relationships. 2. Fixing quotas could develop better collaboration between fishermen and could improve the position of Regional institutions (e.g. prud'homies in Corsica) – especially considering that at present, professional fishermen tend to be increasingly individualistic. 3. Fixing quotas could decrease the total	1. Each fishing area hosts populations characterised by specific territorial and seasonal features. Quotas can modify fishing areas according to the distribution and movements of species for which a quota has been assigned, thus modifying the typical fishing areas of the different fisheries segments. 2. As soon as a quota is reached, fishing must be suspended, and this means longer periods of inactivity and no direct incomes for fishermen. 3. Fixing quotas could reduce the time spent out

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amount of time spent out at sea, thus improving the quality of life and enhancing the possibility to develop secondary activities.	at sea, and this could lead fishing vessel's owners to cut the number of crew members. 4. Smaller vessels could sell their quotas to bigger ones and cease their activity. This would cause a loss of working places.
ALLOCATION CRITERIA	
A quota is determined for each GSA and for each species, adopting a precautionary approach. The quota fixed for each species is subdivided among authorized fishing systems, and then it is allocated to the fishing vessels which are registered in each category. Specific allocation criteria can vary. Same quotas for all fishing vessels in a category and in a GSA, or quotas proportional to horsepower/size/tonnage of vessel, or quotas proportional to a fishing vessel's catches based on landings in the last few years. In addition, some fishing such as sole or cuttlefish fishing, is carried out in coastal areas, whereas other, such as Norway prawn or hake fishing is carried out in open sea (areas more difficult and more expensive to reach), and this must also be taken into account when allocating quotas.	
OPTION 2: <u>Quota as a portion of the total fishing time</u> independent of the species ***(only the total time for which a vessel is allowed to fish is considered, with no restrictions on chosen areas or caught species)***	
ADVANTAGES	***DISADVANTAGES***
Biological, Ecological, Environmental aspects	
1. Environmental pressure will not increase since the overall time spent fishing will be kept constant or will decrease as a consequence of quota setting. 2. If the fixed quota is lower than the current total fishing time, the fishing effort would decrease with positive impacts on the status of stocks. 3. It reduces discards and accessory catches. 4. If fishing times could be related to the life cycles of the species of main interest, this would allow to better safeguard those species.	1. Fishing time cannot be calibrated on each and every species' dynamics, and even associating it to the species of main interest may be very difficult. 2. The MSY goal for each species will not be reached, since fishermen will use their fishing time to catch whatever species, taking into account only the economic gain. 3. Fishing time cannot be associated to a biological community because fishermen will catch species wherever it is more profitable. 4. Fishing effort would be concentrated in periods which are more economically convenient or environmentally favourable, with the risk of stock overexploitation during

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	such periods.
Economic aspects	
1. Since the total fishing time is limited, the best meteorological conditions can be chosen throughout the year. 2. Smaller vessels could decide to sell their time-quotas to bigger vessels. 3. A decrease in costs due for instance to lower fuel consumption, since fishing trips can be better planned and optimized. 4. Quotas may give a higher value to licences and thus to fishing vessels. This may be relevant if the new EMFF does not provide financial support for vessel scrapping and/or sets limits to supports for renewal. Quotas could therefore be an advantage for fishermen, in that they give an added value to their vessels and could allow to gain higher monetary reward to fishermen who cease their activity. 5. A TFC system based on time quotas could give economic benefits if it is related to product quality policies aimed at increasing the price of fisheries products.	1. Fishing time is lower, and thus catches and economic revenues will probably be lower too. 2. The total fishing time cannot be flexibly varied according to market requirements. 3. In the last portion of the year, many vessels will have already finished their fishing time. 4. If fishing effort is concentrated in certain periods, this may cause the landing of high fish quantities all in the same period, thus causing a decrease in prices. 5. Fishermen would have lower market power.
Social aspects	
1. The time to be spent out at sea can be better planned throughout the year, and this will improve the quality of life. 2. Traditional fishing habits, expertise and cultural heritage can be maintained.	1. Difficulties in calibrating fishing time allocation for vessels of different size and using different fishing systems. 2. Daily fishing times can be very different, ranging from 10 to 24 hours, fixing a maximum number of fishing days can make "working days" longer in terms of hours spent out at sea. 3. Controls must be very intense in order to avoid infringements. This could be particularly difficult in some Regions, such as Corsica, where there is a high number of small and

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	independent ports (direct selling, no general common fish markets) spread along a 1000-km coastline.
ALLOCATION CRITERIA	
Based on the existing fleet and on number of fishing vessels in each category, a total number of fishing days is assigned for each fishing system. This total number of fishing days is allocated among vessels in that category, so that a specific number of fishing days will be assigned to each vessel. The number of fishing days will tend to decrease throughout the years, causing an income reduction and an abandonment of the profession by several fishermen.	
OPTION 3: <u>Quota as a portion of the total fishing capacity</u>, considering the overall fishing time and the overall horsepower/size of fishing vessels ***(the quota is assigned to each vessel as a function of its horsepower/size and the maximum fishing time, and therefore it will vary according to a fishing vessel's characteristics)***	
ADVANTAGES	***DISADVANTAGES***
Biological, Ecological, Environmental aspects	
1. Each fishing vessel operates with quota restrictions which are mainly related to its horsepower/size, and it can catch a certain amount of fish (of whatever species) during a specific fishing time. 2. Small vessels could sell their quotas and the fleet could be restructured, causing a reduction in fishing effort and a lower pressure on fish stocks.	1. Catches are usually composed by a mixture of higher and lower value species; with a fixed quota, lower-value catches are discarded and the pressure on higher-value ones will increase. 2. There is no connection between quotas of allowed catches and levels of resource exploitation for each species, and thus the benefits on the status of specific stocks cannot be evaluated. 3. With two limits, total catches allowed and fishing time, it is not possible to calibrate quotas on the available resources (fluctuations in abundance). 4. The decrease in fishing effort is not targeted on specific species, and thus it is not possible to control pressure levels on specific species (especially those that should be more safeguarded). 5. If a specific reduction in fishing time or

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	allowed catches is not put in place, there will be no benefits in terms of levels of resource exploitation, and thus in expected future catches (this has also socio-economic implications).
Economic aspects	
1. Bigger vessels will get more quotas. 2. Smaller vessels could sell their quotas to bigger ones thus obtaining a direct monetary reward.	1. Only the declared (registered) horsepower can be considered for quota allocation, but the real horsepower of fishing vessels is often higher than the registered one. 2. The controls should be doubled, on quantities of catches and on fishing times. 3. The quota allocated to same-horsepower fishing vessels will not have the same value for each one of them, since the real value depends on the species composition of catches, which varies according to fishing areas (for instance it is different in coastal and deep sea areas). 4. In some cases, for instance in Corsica, quantity and economic value of catches are not necessarily proportional to fishing vessel size.
Social aspects	
1. Fishing habits will not vary much, apart from a stricter control on catch quantities and fishing times. 2. If the days to go fishing can be freely chosen by fishermen throughout the year, only respecting the maximum fishing time allowed, some restrictions are avoided (Saturdays and Sundays can become fishing days, etc). 3. Job contracts can be fairer because the maximum fishing time is clearly stated.	1. Risk to increase fishing capacity in order to obtain more quotas. 2. When the quota limit is reached, fishermen will have no direct incomes. 3. An income reduction can be expected for both vessel owners and crew. 4. Smaller vessels (lower horsepower) would get very small quotas and thus would not obtain sufficient economic gains from their fishing activity anymore.
ALLOCATION CRITERIA	
The total fishing capacity for each GSA is determined and then subdivided among fishing systems.	

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Within each fishing system, the parameter on which to calculate the fishing capacity is determined (length, horsepower, tonnage, etc) and the quota for each fishing vessel is allocated in a proportional way (tons of catches allowed according to a vessel's characteristics). Such a quota will indicate the maximum quantity of fish that can be caught in a maximum number of days (freely chosen by fishermen throughout the year). This quota would assign a specific "value" to each fishing vessel. For instance, bigger vessels that can operate even with very bad weather conditions could get a higher time-quota. In the long run smaller vessels could be "forced" to sell their quotas since economic gains are too low, thus reducing fleet consistency.

The options highlighted above can be considered as "pure options", but **several other options could be considered by combining a number of different factors, for instance setting a catch quota for a group of species rather than a single species, and taking into account combinations of catch quotas and other parameters such as fishing areas, fishing systems, fishing times**.

A good example is the **combination of a catch quota** (tons of red mullets) **caught by a specific fishing system** (bottom trawling) **in a specific fishing area** (GSA 17). Such a «mixed-criteria» option would have all the advantages of the «pure option» n.1 (catch quota), and in general it would allow to better manage a specific fisheries segment from both the resource and the socio-economic point of view. In addition, **linking catch quotas to specific fishing areas and systems would allow to better implement the interventions included in local management plans**. The adoption of measures developed at the local scale would allow to finely-tune the socio-economic interventions aimed at compensating income losses due to fishing effort restrictions. One of the main disadvantages of this mixed criteria is the risk to freeze the system. Fishing vessels would in fact be forced to operate only in specific areas (*e.g.* only in GSA 17) and this may lead to a loss of income and a loss of some important species (*e.g.* swordfish).

In the case of **catch quotas set for groups of species**, if we want a direct connection with a species' level of exploitation (fishing pressure on each species), we will have to determine the combined quota as the weighted sum of quantities that can be caught for each species, but this could be very difficult to be determined. If an overall catch quota is set with no limits assigned to each single species, the risk is to have a more intense fishing pressure on higher-value species, so that these will tend to be overexploited, and the lower-value species will tend to be discarded.

In all cases and whatever the option chosen, control and surveillance activities will have to be stricter, both on landings and out at sea, with higher costs and obligations. Ideally, a TFC system based on quantities would be more meaningful if applied to catches rather than to landings, but this would imply the implementation of complex control systems on board fishing vessels.

It must also be considered that for most Mediterreanean species and areas (GSA) there are no exhaustive data on the overall state of exploitation of resources, and quotas could only be assigned adopting a precautionary approach (which is very restrictive).

Finally, if small-scale fishing is kept out of the TFC system, a thorough control on the overall catches cannot be carried out, especially in a context such as the Mediterranean one, where small-scale fisheries has a very significant incidence on the overall catches.

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In the Mediterranean, a TFC system based on quotas of caught fish, with all the limitations discussed above, could be appropriate only if applied to single-species fisheries, such as clam or anchovy fishing. In general terms and despite the fact that disadvantages seem always to be higher than advantages as discussed above, **the most appropriate TFC system for the Mediterranean may be the one based on a portion of the total fishing capacity, and thus on the allocation of a time-quota calculated according to a fishing vessel's characteristics (*e.g.* length, horsepower, tonnage).** However the results of this choice would be highly unpredictable, since specific tests and experiments have not been carried out yet.

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FISHERIES MANAGEMENT MODEL BASED ON A TFC SYSTEM: BIOLOGICAL, ECOLOGICAL AND ENVIRONMENTAL ISSUES

Overall, the questionnaire analysis highlights that throughout the Mediterranean (MAREMED project partner Regions that filled out the questionnaire are located in France, Italy and Spain) fisheries is multispecific, and **a wide variety of species of commercial interest are commonly caught**. Although annual catches per species are usually summarized at the national and Regional level by statistics and charts, often in collaboration with research institutes in charge of data collection, **Regions do not have a specific archive or database managed by the Regional administration to keep track of catch data in full detail**, including for instance catches of each and every species per fishing district and per fishing vessel. The only exceptions are, to a certain extent, Toscana and Corsica Regions. In Toscana Region, the Regional Environmental Protection Agency has kept a daily record of "rossetto" catches for many years, and all landings of the Viareggio marinery have also been recorded each month for the last 20 years, but it is not clear if such data are also subdivided by fishing vessel, which would be important in order to determine catch histories and thus quotas to be allocated. In Corsica Region a specific database has been created only for spiny lobster catches since 2004.

Even if in certain European areas (*e.g.* Scotland, Iceland) Individual Transferable Quotas are mainly assigned on the basis of fishing vessels' catch histories (species and quantities caught in recent years by each vessel), **none of the partners think that a system based on catch histories would be appropriate and feasible for the Mediterranean**. The main reason is a general lack of sound individual historical data, as seen above, together with the fact that catches declared by fishermen are not always accurate and reliable. When it comes to **new entries**, quotas should be assigned taking into account the amounts that are allocated to vessels with similar characteristics.

The **Maximum Sustainable Yield (MSY) concept does not seem appropriate and exhaustive** for the development of a sustainable fisheries management model in the Mediterranean. All partners see the MSY concept as too theoretical, and not applicable to resources which are highly interrelated and variable over time. The current determination of stock status is based on scientific assessments which **do not take into account all factors that have an influence on resource fluctuations** (climate change impacts, maritime pollution, natural predation, recruitment variation, etc). The MSY definition is relatively easier for single stocks as it is the case for Northern Sea fisheries, but it is very difficult in case of mixed species catches, as it is the case for Mediterranean fisheries. Indeed, **in the Mediterranean the MSY should be determined for groups of species (mixed-species MSY) according to fishing systems, seasons and areas**, also considering that MSY for mixed species should have a margin of flexibility. Moreover, there are **not enough biological and life history data** to determine the MSY for most Mediterranean species. PACA and Corsica Regions highlight that it is difficult to develop a method to calculate the MSY for multispecies fisheries. There have been many objections to the EC proposal of

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calibrating multispecies MSY on the most threatened species, since this would cause an unnecessary ban on species with stocks in good status. Calculations could be based on the mortality rate for each target species, but this type of data may not be available. Also, Marche Region points out that in the Adriatic sea the state of populations is determined by recruitment rather than by fishing mortality, since most species have a short life cycle. In Corsica, it seems that the state of spiny lobster population does also fluctuate according to recruitment, a complex process governed by a 5-month pelagic larval phase. More in general, it would be good to develop specific management tools at the Regional level, and to enhance a dialogue with non-European countries in order to set specific MSY goals within multiannual management plans calibrated on each target species and for each Region in the framework of more general MSY guidelines. This is difficult to achieve however, due to the lack of sufficient scientific data and to the difficult dialogue with non-EU third countries. Valencia Region adds that the MSY concept is very restrictive and it does only take into account environmental aspects, whereas social and economic issues should also be added to the equation.

Project partners identify **direct resource assessment methods** as the most suitable alternative to MSY. Liguria Region stresses the importance to constantly monitor the state of resources at the local level, identifying specific indicators that can be used to assess resource state and trends and thus modulate fishing effort. Marche Region suggests the adoption of direct methods such as **echo-surveys with standardised equipment kept onboard**. Abundance or density indexes and trends could then be determined, and consequently mortality rates could be calculated. If the resource showed a decrease, the quota would be proportionally decreased, if the resource showed a recovery trend, the quota could be raised again. PACA Region points out that echo-surveys are however not suitable for their Regional fleet, which is characterised by small vessels (< 12 m) with limited financial resources. The acquisition of sonars to carry out echo-surveys is not cofinanced by the EU anymore, since this was seen as a measure to potentially increase the fishing fleet, although it is in fact a way to reduce the fishing effort through the constant monitoring of stock status. However, stock abundance assessment through echo-survey monitoring campaigns is currently carried out by scientific institutes in the framework of EU projects on "Data Collection" (*e.g.* MEDIAS project).

Overall, **discard seems not to be a common practice in Mediterranean Regions** which participated in the project, with the exception of Toscana and Valencia Regions. In Valencia, the "Fishery Towns Association (AECIPE)" has started a project on discard in July 2012; the project was especially needed because of the high amounts of dead fish that reached the beaches, with an impact on tourism and bathing water quality. In the other Regions, **discard is commonly associated only to bottom trawling**, where non-commercial species or species below legal size are typically thrown back in the sea. Pelagic trawling may also favour discard as a consequence of multispecific catches associated to economic considerations: for instance, sardines are sometimes discarded due to their low commercial value. In general, project partners think that **a TFC system could increase the practice of discards**. If a non-sellable species is caught with the target species, the "best" choice for a fisherman will be to discard it, unless forced by law to land it. The only effective solution would be to apply TFC to catches rather than

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to landings, but this would imply much stricter control and surveillance activities on board fishing vessels, something which is in general not feasible at the moment in the Mediterranean. PACA Region adds that the proposal of setting up a supply chain to transform discards into fish flour is not approved by Regional fishermen (additional costs, difficulty of access for small-scale fishermen, economic interests by big enterprises, etc). This supply chain approach would not be feasible in Corsica either, due to the large fleet dispersion along a 1000 km coastline.

In general terms, none of the partners would apply a TFC system to the Regional fisheries sector. Marche Region points out that **a quota system is in general not suitable for the management of Mediterranean resources, especially considering fishery characteristics (multispecific, multigear, small-scale) and the high seasonal and spatial variability**. Having said this however, a management model similar to a quota-based TFC system is applied with good results to clams and in some cases to anchovy fishing in Marche Region. PACA and Corsica Regions highlight that it would be anomalous to develop a TFC system in the Mediterranean, where there are no quotas except for bluefin tuna (for swordfish the possibility is under study). Small-scale fishermen are already facing difficulties in the access to these quotas: in France, 90% of bluefin tuna national quota is hold by just a few big vessels, and the small-scale fisheries segment has access to just 10% of the authorised catches. Corsica Region adds out that no fishing vessels in their fleet would be eligible for a TFC system.

According to MAREMED project partners, if a TFC system were to be developed in the Mediterranean, this should be **limited only to certain types of fisheries resources, to some fishing areas and to specific fleet segments and fisheries gears and systems**. For instance, Marche Region would only apply it to single-species fisheries such as clam fisheries, with direct management of TFCs by Fishermen Consortia or Producers' Organizations, which have the responsibility to determine quotas within the overall limits (TAC and contingencies) defined by Member States. On the top of that, it would adopt a TFC system only in coastal areas for specific species (*e.g.* within one mile from the shoreline for clams) and for specific gears, such as hydraulic dredges with self-management, which are indeed used for clam fishing. **TFC could be tested also for anchovy (pelagic trawling or purse seining), provided that the test will be carried out on all Adriatic fleets, in order to assess if this approach could really improve the overall fisheries sector and state of resources.** At the moment, the main problem for anchovy fishing is not the state of resources but the market value of fish; in many cases the high quantities of anchovies that reach the market cause a strong decrease in prices. Toscana Region would also apply TFCs only to specific fishing areas and fishing systems, but it would not set restrictions on fisheries resources. With regard to fleet segments and in particular to small-scale fisheries (exempted from TFC), Valencia Region highlights that for Spanish fishermen it is quite difficult to accept that a 12.5-m-long boat is classified as "industrial", whereas a 11.5-m-long boat is classified as "artisanal/small-scale", even if they have the same number of crew members, they use the same fishing gears and systems, they fish in the same areas and sell their catches in the same ports. Corsica Region would only apply it to overexploited species caught by pelagic long lines, which is the only fishing system currently interested by quotas.

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Finally, project partners have different opinions with regard to **whether or not TFCs should be finely tuned on Regional market trends, thus possibly modifying the value attributed to fishing rights**. PACA and Corsica Regions argue that a fisheries management system should not be based on market fluctuations, also considering that the most common way of selling fish is by direct selling at the docks and not in fish markets. Valencia and Toscana Regions may be in favour of this Regional approach, although the problem of modulating the value of fishing rights according to local market fluctuations is very complex and it would require exhaustive and detailed socio-economic analyses at both the Regional and the national scale. Marche Region points out that the market is ample and fishermen can access different market segments simultaneously, making this type of modulation even more complex.

FISHERIES MANAGEMENT MODEL BASED ON A TFC SYSTEM: SOCIAL, ECONOMIC AND REGULATORY ISSUES

MAREMED project partners were asked whether they have already developed a Rights Based Management (RBM) system for fisheries that can be compared to a concession system. In all Italian Regions partner of the project (Marche, Liguria, Toscana, Lazio, Emilia-Romagna), **fisheries rights are regulated through a system of licences** released by the State. A licence authorizes a fishing vessel to catch fish with a specific fishing gear and system. Licences usually last 8 years and can be renewed. They can be related to the concept of "concession", but they are not transferable (licences can only be sold with a fishing vessel or a portion of it) and they are not associated to a quota. Similarly, in PACA and Corsica Regions fishing rights are regulated through licences, which are associated to a specific fishing vessel and gear, and "transferable" only when the fishing vessel is sold, and through **special fishing permits** (Permis de Pêche Spéciaux-PPS), which are allocated on an annual basis and associated to specific species. For example, bluefin tuna, eels, clams can only be caught after having acquired a PPS.

At the moment, **fisheries rights are in general not assigned according to territorial, biological or economic criteria, although there are exceptions in the case of species under special management regimes**. In Marche Region, licences were assigned to the existing vessels on a specific date, which was agreed upon by the authority in charge. In order to subsequently enter the fleet, a licence should be purchased. Licences cannot be "created" and they are assigned on the basis of a fishing vessel's size/horsepower. Hence, in order to operate with a big (or high horsepower) fishing vessel, several small vessels must be dismantled.
In Liguria Region, a specificity is related to "rossetto" fishing. Catches for this species are regulated through a Management Plan, and fisheries rights are assigned on the basis of territorial, biological and socio-economic criteria; the number of fishing vessels which are allowed to operate, the maximum quota that can be caught and the total fishing days are all strictly defined. PACA and Corsica Regions show similarities with the Italian system: licences are only assigned and regulated according to the

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overall available kW (horsepower): for each fishing vessel which is dismissed, a corresponding amount of kW is made available for new entries.

While in PACA and Corsica Regions a licence can only be transferred when a fishing vessel is sold, in Marche Region **the "transferability" of licences is done with a sell/purchase process on either the whole fishing vessel or on portions of it (carats)**. The owner society could trade some of its "quotas" (vessel carats), thus keeping its name on the licence but sharing property on one or more vessels. Similarly, a legal entity may own carats of one or more vessels without having its name on the licence. Liguria Region argues that if fishing concessions were associated to specific marine areas, transferability would allow to increase or reduce the "sea portion" where a fisherman exerts exclusive rights.

Both Marche and PACA Regions stress that **fishing concessions are very similar to licences**. But the latter **do not penalize fishermen by setting restrictions on catch quotas or on fishing days. Bringing such factors into the equation would decrease the licence value**. The overall fishing effort is regulated by reducing the number of licences through vessel scrapping without allowing new entries. Liguria Region points out that according to the Regional context, **a genuine "fishing concession" could only make sense if related to a spatial concept**, that is to the exclusive rights to catch resources located in a specific maritime area.

None of the partners think that a TFC system would be appropriate for their Regional context and, more in general, for the Mediterranean. PACA Region enumerates once more some of the reasons why: it would introduce stricter limits in terms of catches (through quotas) and in terms of fishing time, it would make it more difficult for new entries to enter the fisheries sector, it would cause the disappearance of a number of fishermen from the sector without real benefits in terms of production (their concessions would simply be acquired by bigger enterprises). Corsica Region states that TFCs would be misunderstood and not well accepted by fishermen, and it points out that, to be effective, this management policy would require monitoring and control operations that at present are impossible to be implemented in Corsica. In addition, Corsican fleet is mainly composed of little vessels that are economically and socially vulnerable (95% of the fleet is composed of small-scale artisanal vessels), one of the risks of TFCs would be that small-scale fisheries should disappear in favor of larger, economically stronger companies. Marche and Liguria Regions argue that fishermen should instead be **directly involved in fisheries management at the local level**, and made more responsible through the participation in the development and implementation of management plans. In Marche Region, management plans always set the rule that fishermen receive **specific fishing permits (to be added to the licence) only if they agree upon respecting the management measures included in the plan**.

All project partners agree in making **TFC systems facultative and discretionary for Member States**. Marche and Liguria Regions recognize that there might be specific ecological or social contexts where TFCs can provide some benefits, even if current experiences show that concessions are a way to expel significant percentages of fishermen from the market with no benefits for the production, which is

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constantly decreasing. PACA Region highlights that it is important that this choice is made on the basis of clear and sound decisions shared by all actors and stakeholders involved, and not on the basis of mere market pressures. Also, the process of selling and acquiring TFCs should not be merely regulated by the operators' individual interests, especially considering the weaker position of small and medium enterprises, the pressures that could be made on the fisheries market, and the difficulties created by the general economic crisis. The problems related to speculations, to the excessive concentration of TFCs in a few hands (stronger economic groups/bigger enterprises), to the safeguard of small-scale coastal fisheries have not been exhaustively tackled and solved yet.

The initial CFP reform proposal indicated that TFCs should be allocated for a period of 15 years. However, all partners agree that **there is not an optimal duration for TFCs**. If the limits in duration and validity are associated to **mortage duration for new vessels, the maximum duration will be 15 years. But this is not long enough for making long term investments in a fishing activity**. If a fisherman invests his capital in a fishing vessel, he does not think that he will lose it after 15 years. Indeed, the average age of the Mediterranean fleet is much higher. It is likely that after 15 years a TFC will have to be renewed, and this means that there will be no room for new entries, unless some fishermen leave the sector and sell their TFCs.

Theoretically, **the market value of a TFC is proportional to the potential profits that it will allow to obtain**. At the moment the fisheries sector is in strong crisis and there are no buyers, and only vessel scrapping allows to exit the sector without losing too much. **If quantities of fish that can be caught and fishing times were limited by assigning TFCs and thus setting quotas, the economic situation would become even more critical**. Concessions would also lose their transferability power, since there would be no significant potential gains in acquiring a TFC.

With regard to setting specific restrictions to TFC transferability, almost none of the partners would set territorial restrictions, since this would further decrease the possibility to develop the fisheries activity, further decreasing also the TFC value. The only exception is Corsica Region, which would limit the transferability at the Regional level, in order to avoid the risk that big industrial vessels which are not part of the Corsican fleet acquire concessions to exploit the Corsican sea, thus put at risk the local small-scale artisanal fishery sector. Considering fishing vessel characteristics and fishing gears and systems, all partners think that **TFC should not be transferred from fixed (gillnetting) to trawling gears**. This measure would protect in particular artisanal small-scale coastal fisheries. Similarly, all partners believe that some **restrictions in transferability should be set on fish categories**. For example, TFCs for demersal fish should not be transferred to pelagic fishing, and TFCs for small-size pelagic should not be transferred to big pelagic fishing. This is important in order to **avoid transferring fishing pressure from one resource to another**, and thus maintain a good control on the status of each stock and a good balance between the different fish resources. More in general, transferability should be regulated by the **releasing authority, so that catches can be orientated on the resources that are environmentally and economically more sustainable**.

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Overall, **TFCs are not seen as an appropriate tool to increase competitiveness in the fisheries sector**. Marche Region comments that TFCs neither improve the socio-economic situation of the fisheries sector nor increase production. On the contrary, TFCs bring restrictions that are often set without a thorough knowledge of the local requirements, with a tendency to standardize too much and oversimplify a highly complex issue. In terms of competition, the only likely effect is that many small enterprises cease the activity by selling their TFC to bigger and more competitive enterprises. Within an Adriatic context, a TFC system could bring benefits only to anchovy fishing, if the same approach is applied to the whole GSA 17. But this should be verified with pilot tests in the field as a first step. PACA and Corsica Regions add that a TFC system is based too strongly on market and economic considerations and does not take into account social factors. In several EU countries, this has helped to rationalize the fleet. But this type of economic speculations would be detrimental for the Mediterranean Regions, which are characterised by artisanal small-scale fisheries.

TFCs would also **increase job entry barriers for new generations**. In order to enter the profession, TFCs or licences must be purchased, and this has a cost which is proportional to the potential incomes. Building or buying a fishing vessel in order to get a TFC is very expensive, usually too expensive compared to potential incomes, considering the current crisis of the sector. In addition a concentration of TFCs could cause an exit of small fishing vessels, thus making new entries to the profession even more difficult.

It is often argued that one of the criticalities of TFCs is the **risk of concentration in the hands of a few vessel owners**. Overall, partners agree with this position, and both PACA and Corsica Regions underline that the risk for bigger fishing enterprises to absorbe smaller ones is high, and the subsequent TFC concentration in just a few hands would also further prevent new entries to access the profession. Marche Region argues however that it is difficult to foresee TFC markets and prices. In certain cases the monopoly can be obtained through a concentration of licences rather than the organisation of fishermen in Consortia or Producers' Organisations. The best way to **avoid excessive concentration would be to exclude small-scale fisheries, as well as species which do not have a quota** (only bluefin tuna has a quota in the Mediterranean). PACA Region adds that an overall **stronger financial support to new entries** would be more useful than reserving a proportion of TFCs to new entries.

Project partners do not agree when asked if they prefer a system based on quotas managed and transferred on a strictly individual basis (ITQ model), or a system based on wider quotas co-managed at the community level (CTQ model). Marche Region suggests that **an ITQ model might be more appropriate and reliable**, since a CTQ model might bring into the equation aspects that are too theoretical and unpredictable. Liguria Region supports this position, adding that a **co-management of resources at the community level is not positively seen by the Regional fisheries community itself**, perhaps due to the intrinsic behavioural traits of fishermen. On the other hand, PACA and Corsica Regions would be more in favour of a quota co-management at the community level. They recognize

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however that small-scale fishermen do not favour a global co-management system. They are more interested in the development of an ITQ system. But **a common management of TFCs at the Producers' Organization (PO) level could help to better plan production and to exchange quotas in real time**. A CTQ management by PO or "prud'homie" could be interesting both for fleet and resource management. In Mediterranean France, "prud'homies de pêche" have already legislative power, although they are not independent jurisdictional bodies according to article 234 of the Treaty on the Functioning of the European Union.

All partners believe that **the adoption of a TFC system would lead to a fleet reduction**. Introducing new **restrictions (quota and/or fishing days), the potential income for each enterprise is reduced**. Some of the fishermen will therefore have to exit the sector because staying in is not remunerative anymore.

According to the MAREMED partners, **throughout the Mediterranean fishermen and category associations are mainly worried about a potential TFC introduction**. One of the reasons is related to what has happened with the introduction of quotas for tuna: this type of fisheries has almost disappeared as a consequence. In Marche and Liguria Regions however, fishermen that catch small-size pelagic fish may support the introduction of quotas for anchovies. Fishermen and Producers Organizations, CNPMEM, CRPMEM PACA, CCR Méditerranée and the Regional Council are all against the application of a TFC system in Region PACA, since TFCs are not appropriate for fisheries systems which are not based on quotas. Moreover, if TFCs were put in place at the French national level, only about ten fishing vessels (> 12 m) would be involved in Region PACA. Overall, **actors and stakeholders in the fisheries sector have however not a clear vision of how a TFC system could actually work**, since this issue is managed with a top-down approach, including the setting of quotas and fishing times. Marche and Liguria Regions point out that the only exception is perhaps the anchovy fisheries sector, where fishermen show a direct interest in developing management schemes based on quotas.

In Italy, **a legal framework** that can be somehow related to the concept of transferable concessions **has been developed at the national level for fishing licences**, with Law n. 41/82 and subsequent regulations. Similarly, in France there is a national legal framework for licences and special fishing permits (Permis de Pêche Spéciaux-PPS). Spain has also developed a legal framework for fishing licences.

Considering more in general EU fisheries regulations, Valencia and Marche Regions have not **claimed for derogations from the fishing restrictions set by EU rules**, even if they set stringent restrictions (*e.g.* minimum size for clams, anchovies, sardines, hakes, etc). In Liguria Region the only derogations have been claimed for the traditional "rossetto" fishing (minimum net size, distance from the coast). In France, EU fishery regulations are usually translated into national rules without derogations. Where these are made, they are related to stricter regulations (*e.g.* trawling distance from the coast is set to 1500 m by EU regulations, but it is set at 3000 m by the French rules; in Corsica, the opening of the spiny lobster fishing season is restricted to 7 months – March to September, whereas there is no closed season in the rest of France).

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CONCLUSIONS

Fisheries management systems based on transferable concessions/quotas and similar rights-based systems have been developed during the last decades in a number of European countries (especially in Northern Europe). However, at present there is not a clear view on the effects caused by the application of this management systems, and controversial results have been achieved in many cases. According to the results of this pilot action, the Transferable Fishing Concession (TFC) concept may fit well with fisheries regimes characterised by industrial, monospecific and single-gear fishing, but **the transferability potential of a TFC-based system to the Mediterranean context appears to be extremely low due to the characteristics of the Mediterranean fisheries**, which is mainly characterised by artisanal small-scale fishing vessels, where each vessel usually catches a wide variety of species using several different fishing gears and systems, with high spatial and seasonal variability. Therefore, the results of this pilot action have shown that **a fisheries management model based on a TFC system is in general not appropriate and recommended for the Mediterranean context**.

With regard to the analysis of **biological, ecological and environmental issues** related to the applicability potential of a TFC system in the Mediterranean, MAREMED project partners highlighted that their Regional fleets are mainly artisanal, with small-scale fishing vessels commonly catching a wide variety of species with different fishing gears. None of the partners think that a quota allocation system based on **catch histories** would be appropriate and feasible for the Mediterranean. The main reason is a general lack of sound individual historical data, since none of the Regions have a specific archive or database managed by the Regional administration to keep track of catch data per fishing vessel, and catches declared by fishermen are not always accurate and reliable. In fact, only national statistics are available, where catches are subdivided by Region, species and fishing gear, but these statistics are based on a restricted sample of fishing vessels and cannot be referred to individual catches.

A concept strictly related to catch quotas as a portion of Total Allowable Catches is that of **Maximum Sustainable Yield (MSY)**, which does however not seem exhaustive in its current shape for the development of a sustainable fisheries management model in the Mediterranean. The current MSY concept seems not applicable to resources which are highly interrelated and variable over time. In the Mediterranean, the MSY should be determined for groups of species (mixed-species MSY) according to fishing systems, seasons and areas, also considering that MSY for mixed species should have a margin of flexibility. Moreover, there are not enough biological and life history data to determine the MSY for most Mediterranean species. Direct resource assessment methods, such as echo-surveys with standardised equipment kept onboard fishing vessels, could be a feasible alternative to MSY in order to determine catch quotas, provided that local data are integrated over space and time to obtain a reliable picture of stock status and trends.

At the moment and according to the questionnaire's responses, **discard** seems not to be a common practice in Mediterranean Regions, except for bottom trawling, and to a certain extent for pelagic trawling. But project partners think that a TFC system could increase the practice of discards. A possible

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solution would be to carry out stricter control and surveillance activities on board fishing vessels, and this would also allow to collect more reliable total catch data, but this is in general not feasible in the Mediterranean yet.

In general terms, none of the project partners would apply a TFC system to the Regional fisheries sector. If a TFC system were to be developed in the Mediterranean, this should be limited only to certain types of fisheries resources, to some fishing areas and to specific fleet segments and fisheries gears and systems. For instance, Marche Region would only consider it for specific single-species and single-gear fisheries such as clam fisheries, with direct management by Fishermen Consortia or Producers' Organizations, which have the responsibility to determine quotas within the overall limits defined by Member States. Clam fisheries is based on the exploitation of sedentary resources (clam, mutable nassa, etc) and it is regulated by TURF management. A TFC system based on catch or time restrictions may be feasible also for small pelagic fisheries, such as anchovy and sardine fishing. However, this system could only be applied after having assessed the status of small-scale pelagic fish stocks for the entire Adriatic sea, and this would imply a thorough data collection from all countries which share this basin. Moreover, the potential negative effects of this system on discard levels should also be taken into account. The application of this system would require stricter surveillance and control activities by fishermen associations and control bodies, but this is not always feasible.

Another critical issue is that **the Mediterranean sea is characterised by the presence of several geographic areas where stocks are shared among different countries**, such as the Adriatic Sea (probably the largest and the best-defined area of shared stocks in the Mediterranean). This aspect further complicates the feasibility of applying quotas on certain resources (pelagic and demersal), which are targeted by Italian, Croatian and Slovenian fisheries. In fact, several demersal species (hake, Norway lobster, sole, etc) are caught by all these countries, and a few species (red mullet, pandora, sole, common cuttlefish, tub gurnard, etc) complete their lifecycle by moving from the East coast to the West; thus, quotas should be applied taking into account all these aspects.

With regard to the analysis of social, economic and regulatory issues related to the applicability potential of a TFC system in the Mediterranean, Italian, French and Spanish partners have pointed out that in their Regions fisheries rights are currently regulated through a **system of licences** released by the State according to specific regulatory frameworks. Fisheries rights are in general not assigned according to territorial, biological or economic criteria, although there are exceptions in the case of species under special management regimes. The TFC concept could be compared to the licence system, although licences do not "penalize" fishermen by setting restrictions on catch quota or fishing time. Theoretically, the market value of a TFC is proportional to the potential profits that it will allow to obtain. At the moment the fisheries sector is in strong crisis, and project partners argue that if quantities of fish that can be caught or fishing days were limited by assigning TFCs and thus setting quotas, the economic situation would become even more critical. Concessions would also lose their transferability power, since there would be no significant potential gains in acquiring a TFC.
Just as seen for the biological and ecological aspects, also when it comes to socio-economic issues none of the partners think that a TFC system would be appropriate for the Mediterranean: this would introduce **stricter limits in terms of catch quotas and fishing time**, it would cause the **disappearance of**

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a number of fishermen from the sector without real benefits in terms of fish stocks or production (their concessions would be simply acquired by bigger enterprises), and it would **increase job barriers** for new generations.

Overall, **TFCs are not seen as an appropriate tool to increase competitiveness** in the fisheries sector. TFCs bring restrictions that are often set without a thorough knowledge of the local requirements, with a tendency to standardize too much and oversimplify a highly complex issue. A TFC system is strongly based on market and economic considerations. In some EU countries, this has helped to rationalize the fleet. But this type of economic speculations would be detrimental for the Mediterranean Regions, which are characterised by artisanal small-scale fisheries. In terms of competition, the only likely effect is that many small enterprises cease the activity by selling their TFCs to bigger and more competitive enterprises. This would also increase the risk of TFC concentration in the hands of a few fishing vessel owners. **The best way to avoid excessive concentration would be to exclude small-scale fisheries, as well as species which do not have a quota (only bluefin tuna has a quota in the Mediterranean). But this means once again that TFCs are not appropriate for the Mediterranean peculiarities and specificities**.

More in general, all project partners agree in making **TFC systems facultative and discretionary for Member States**. There might be specific ecological or social contexts where TFCs can provide some benefits, but the choice to adopt a TFC system should be made on the basis of clear and sound decisions shared by all actors and stakeholders involved, and not on the basis of mere economic and market pressures. With regard to setting specific **restrictions to TFC transferability**, none of the partners would set territorial restrictions. Considering fishing vessel characteristics and fishing gears and systems, all partners think that TFCs should not be transferred from fixed (gillnetting) to trawling gears. Similarly, all partners believe that some restrictions in transferability should be set on fish categories, in order to avoid transferring fishing pressure from one resource to another. Transferability should be regulated by the releasing authority, so that catches can be orientated on the resources that are environmentally and economically more sustainable.

TFC systems can be based on **quotas managed and transferred on a strictly individual basis (ITQ model), or on wider quotas co-managed at the community level (CTQ model).** Some of the project partners think that an ITQ model might be more appropriate and reliable, since a CTQ model might bring into the equation aspects that are too theoretical and unpredictable. Also, the co-management of resources at the community level is often not positively seen by Regional fisheries communities themselves, as reported by Italian and French partners. Nevertheless, some project partners believe that a common management of TFCs at the Producers' Organization level could help to better plan production and to exchange quotas in real time.

According to MAREMED project partners, throughout the Mediterranean **fishermen and category associations are mainly worried about the potential introduction of a TFC system**. Overall, actors and stakeholders in the fisheries sector have not a clear vision of how a TFC system could actually work, since this issue is managed with a top-down approach, including the setting of quotas and fishing times. There are however specific cases where fishermen show a direct interest in developing management schemes based on quotas, such as for anchovy fishing in Marche and Liguria Regions.

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With regard to the **options for Quota determination and related allocation criteria for the Mediterranean**, MAREMED project partners identified the following main options, also providing an exhaustive list of advantages and disadvantages associated to each one of them:

- Option 1: Quota in terms of resource quantity that can be caught by a fishing vessel
  (quota is calculated as a portion of the total allowed catches)
- Option 2: Quota as a portion of the total fishing time independent of the species
  (only the total time for which a vessel is allowed to fish is considered, with no restrictions on chosen areas or caught species)
- Option 3: Quota as a portion of the total fishing capacity, considering the overall fishing time and the overall horsepower/size of fishing vessels
  (the quota is assigned to each vessel as a function of its horsepower/size and the maximum fishing time, and therefore it will vary according to a fishing vessel's characteristics)

These can be regarded as "pure options", but several other options could be considered by combining a number of different factors. In all cases and whatever the option chosen, control and surveillance activities will have to be stricter, both on landings and out at sea, with higher costs and obligations. It must also be considered that for most Mediterreanean species and fishing areas there are no exhaustive data on the overall state of exploitation of resources, and quotas could only be assigned adopting a precautionary approach. Finally, if small scale fishing is kept out of the TFC system, a thorough control on the overall catches cannot be carried out. In fact, in the Mediterranean context small-scale fisheries have a very significant incidence on the overall catches.

In the Mediterranean, a TFC system based on quotas of caught fish, with all the limitations discussed above, could be appropriate only if applied to single-species fisheries, such as clam or anchovy fishing, even if in general terms the disadvantages seem always to be higher than the advantages.

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ANNEX I – PILOT TESTING

MANAGEMENT MODEL BASED ON A TFC SYSTEM IN THE MEDITERRANEAN SEA: CHALLENGES AND OPPORTUNITIES

The Mediterranean Sea is a semi-enclosed basin with a surface area of about 3 million km^2 (Black Sea incuded), which is about 0.8% of the world's total sea surface. In terms of fisheries, its two fundamental features are the large variety of species harvested and the **absence of large single-species stocks** (with some exceptions such as bluefin tuna) comparable to those inhabiting the coastal borders of open oceans and the subject of extensive fisheries (Lleonart, 2004).

Fishing activities in the Mediterranean employ several hundreds of thousands of persons and have artisanal fisheries characteristics. The fishing gears used are highly diversified and the fleets are generally composed of large numbers of boats, mostly of low tonnage, based in a multitude of ports. Three types of fleet operate: artisanal, semi-industrial and industrial. The artisanal fleet is composed of small, relatively cheap and often rather old fishing vessels, mostly owned by the fishermen themselves. Small-scale vessels usually operate at close distance from the shore, and deploy a broad diversity of fishing gears targeting several demersal species. The semi-industrial fleet is composed of vessels with intermediate characteristics between the other two classifications, but closest to the artisanal fleet. It consists mainly of trawlers, purse-seiners and some longliners. Catches are usually landed daily or every other day, and therefore vessels usually operate close to the coast, on the shelf or upper slope. The industrial fleet is composed of fishing vessels of higher size and higher engine power, mainly trawlers or targeting big pelagic fish. Industrial fishing vessels can spend several days out at sea, and they have onboard refrigerating systems for long-term product conservation (especially for shrimp fishing). They can undertake considerable movements according to the chosen fishing areas.

The Mediterranean is considered as one of the most important marine regions in the world for its peculiarities and biodiversity levels. Demersal trawling fisheries in the Mediterranean are essentially multispecific. Monospecific fisheries are very rare and are largely limited to deep shrimp fisheries on muddy slope bottoms. The high marketability of small fish in many countries encourages the targeting of the juvenile fraction of some species, often in violation of laws regarding minimum sizes.

Demersal trawling in the Mediterranean is characterised by the high number of species that are commercialised. Otter trawl fishermen tend to maximize catches in relation to fishing effort, and therefore they tend to capture whatever species that is legally marketable. Demersal fish (also called groundfish) stocks have traditionally provided the most important catches in economic terms, and several species have a very high commercial importance at the local level. Due to the importance of this fishing sector some authors believe that managing Mediterranean fisheries means managing trawl fisheries (Lleonart and Maynou, 2003).

The Mediterranean region is characterised by a very high level of anthropogenic pressure: indeed, fishing vessels from more than 20 countries share the same pool of fisheries resources (Lucchetti and

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Sala, 2010). Therefore managing Mediterranean fisheries is a complicated process, with the presence of a large number of different fishing fleets in the same (shared) areas using a diverse array of fishing gears. Mediterranean fisheries are characterized by a large number of small (80 % are <12 m) and relatively old vessels, widely distributed along the coastline, with fragmented landing sites and markets and a high degree of polyvalent techniques. Also, Mediterranean fisheries are highly diverse and show strong geographical variations, not only because of the existence of different marine environments, but also because of different socio-economic situations. Two international organizations are in charge of assessing and managing Mediterranean fisheries: the General Fisheries Commission for the Mediterranean (**GFCM**) and the International Commission for the Conservation of Atlantic Tunas (**ICCAT**). Fishing has been carried out in the Mediterranean for thousands of years, so the current patterns are the result of a long history, and not simply the outcome of a specific (relatively recent) management policy. Mediterranean fisheries management is mainly based on **effort control**. Neither TACs (except for bluefin tuna) nor other types of adaptive management are applied. A management system based on catch quotas is applied to some specific fishery segments, such as clam fisheries. Other technical measures, such as **minimum landing size** and **minimum mesh size**, are also implemented but not always enforced. Most of the rules concerning demersal fisheries management have been developed for trawling, not only because it is the fishing gear which gives the highest contribution to demersal catches, but also because it has lower selectivity than the most important artisanal gears (net and lines). **National management** generally consists of technical and economic measures, such as limiting vessels' engine power and tonnage, limiting the number of boats or licences, limiting the daily time at sea, declaring closed areas and, occasionally, implementing closed seasons and temporary protection periods. However, governments still support the fishing sector through subsidies for modernization, infrastructure and fishing equipment (often using EU funds). In general, economic measures are more effective than technical ones in managing Mediterranean fisheries. The complexity of the fisheries sector is also related to the fishermen's ability to show rapid adaptation in response to favourable or unfavourable incentives (biomass fluctuations, energy costs, market schemes, innovation, legal measures, etc).

Some fishermen organizations contribute to the regulation of local fisheries through gentlemen's agreements. In some cases and during a certain period, the associations have been able to implement a "self-regulation" system based on specific rules to be followed by the whole fishing community, a behaviour that has been even studied by social scientists. However, they still have to follow government directives, which have higher priority than their own rules. A case study is that of **clam fishery** in the Adriatic Sea, for which formal consortia have been created (in agreement with the producers) in order to regulate and manage resource exploitation and to carry out seeding experiments. Quotas have been fixed on the basis of dredge surveys, and research input will continue to form the basis of management decisions by the consortia. Community-based management is another interesting approach to Mediterranean fisheries management. It involves giving some authority to fishermen in developing a regulatory framework and in protecting both resource and local fishing activities. This approach implies a debate on global versus regional management (Lleonart, 2004).

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Whatever the complexity of a system, fisheries management always aims at achieving a balance between fish stock levels and catch levels, in order to ensure a long-term sustainability of fisheries. This means that economic gains must be obtained without compromising the state of resources for future exploitation.

Within a Mediterranean context, the management of fisheries and marine resources is a particularly complex task. Each country is characterised by strong environmental, socio-cultural and economic specificities, whereas at the European level there is a tendency to set common and standard rules for the implementation of common policies. The Mediterranean specificity has already been recognised at the European level with the implementation of **European regulations focused on Mediterranean fisheries**, even if a lot remains to be done (Cataudella and Spagnolo, 2011).

In addition, managing fisheries resources in the Mediterranean means acting on two fronts: within the EU and in the context of biological resource sharing with the non-EU Balkan countries at the East and with Northern Africa at the South. Developing and implementing fisheries management policies based on innovative models, such as those based on a strong scientific support, is therefore particularly difficult in the Mediterranean, not only because of the fish stock characteristics (*e.g.* multispecific stocks) and catch types (*e.g.* a high variety of fishing gears), but also because of the **geographical and sociopolitical complexity of the Mediterranean area.**

The Mediterranean situation is therefore very different from that of Northern European areas, where TFC systems have found an effective application. Indeed, a fisheries area can be described as an intertwined system between one or more fish stocks and the group of fishermen exploiting them. The system's complexity depends on stock complexity, fleet size, technologies, etc. **The Mediterranean system is intrinsically complex**, since this area is characterised by **fleets of diverse origin**, which use highly **differentiated and mutually competitive fisheries systems**, and which exploit fish communities characterised by the **coexistence of a high number of interdependent populations of commercial interest**.

Within the non-Mediterranean EU context, which is the reference area for European Community Regulations, the technical measures adopted for fisheries management have been associated to the introduction of Total Allowed Catches (TAC), based on biomass assessment for specific stocks. But the Mediterranean is very different from the Northern European areas. In the Mediterranean, the presence of multispecific stocks and the wide variety of fishing systems and gears used for catching single species have favoured the adoption of management systems mainly based on the **regulation of fishing effort** and on the definition of **minimum catchable sizes** for the relevant commercial species.

With regard to the Italian context, at the moment in **Italy there are three different fisheries management systems** that can be regarded as **rights-based management systems** (MRAG *et al.*, 2009). The most common system, used for the majority of stocks, is based on licences. A **licence** is a professional fishing authorization released by the Ministry of Agriculture, Food and Forestry Policies and valid for 8 years (renewable). Each licence is associated to a specific fishing gear pool that a fishing vessel is authorized to use. A licence is associated to a fishing vessel, and it is a document which formalizes specific rights for resource exploitation and legal obligations that a fisherman must respect.

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A licence owner has exclusive but conditional fishing rights, which are constrained by vessel size, horsepower, fishing gears, etc. A licence can therefore be considered as a sort of contract that force the owner to carry out fishing activities under strict observation of the rules included in the contract. On the other hand, a licence owner has fishing rights that others do not have. In other cases, and for fishing activities carried out under specific conditions such as in the framework of management plans, fishermen can carry out their activities only if they have **additional fishing authorizations and permits.** The third case refers to management systems that can be **compared to TFC systems**, such as **tuna fishing based on TACs** shared among seven Mediterranean european countries and subdivided into **individual quotas**, and **clam fishing based on territorial rights and resource co-management**.

All this considered, it is difficult to develop and apply a TFC system in the Mediterranean context, where TAC-based management systems are not common, since TACs are only appropriate for single-species fisheries. In addition, long-time data series for the fisheries sector (landings, real engine horsepower, etc) are not exhaustive for the Mediterranean area.

The implications of introducing catch and effort quotas, proposed by the European Commission, may enhance the efficiency of management authorities only within **specific management plans**. More specifically, effort quotas could be assigned to multispecific stock fisheries, whereas for monospecific stocks – like shrimp fisheries in the Sicilian Channel, or small pelagic fisheries in the Adriatic – catch quotas may be more suitable, possibly in association with effort quotas.

Member States may be the main referent authority for management plans when resources are not shared with other countries, the European Community when resources are shared by different Community fleets. With Croatia joining the EU, this could be the case in Northern and Central Adriatic sea, where Italian, Croatian and Slovenian fleets compete for the same resources. In the Sicilian Channel, where fleets from Community and non-Community countries target the same stocks, the General Fishery Commission for the Mediterranean holds the responsibility to draft management schemes on an appropriate scale and over selected stocks.

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FOCUS 1: MARCHE REGION AND THE ADRIATIC SEA

In the Adriatic sea and especially in Marche Region, artisanal fisheries is the most important fishery sector in terms of number of vessels, and it is mainly active at close distance from the coast, where the highest biodiversity occurs. Larger vessels using towed gears or purse seines, however, are responsible for a large proportion of the total catches, including very important economic species such as red mullets, shrimps, European hakes, Norway lobsters, clams and anchovies. The Adriatic basin is characterised by a very high level of anthropogenic pressure, since fishing vessels from 6 countries share the same pool of fisheries resources. At present the management of fishing stocks is mainly based on defining closed areas and seasons, minimum landing sizes, minimum mesh sizes, limiting fishing effort. However, managing Adriatic fisheries is a complicated process with the presence of a large number of different fishing fleets in the same shared fishing areas using a diverse array of fishing gears.

Adriatic fisheries is **one the most important Mediterranean fisheries,** and the Adriatic Sea is probably the largest and best-defined **area of occurrence of shared stocks** in the Mediterranean, due to the semienclosed nature of the Adriatic basin and the presence of many different countries all along its coasts. In recent years, the issue of shared fishery stocks in the Mediterranean has gained particular attention within international bodies such as the General Fisheries Commission for the Mediterranean (GFCM), its Scientific Advisory Committee (SAC) and the European Commission (EC). Two Geographical Sub Areas (GSA) have been defined in the Adriatic Sea for management purposes by FAO, GSA 17 (North and Central Adriatic) and GSA 18 (Southern Adriatic). Six countries, whose coastline development differs greatly, border the Adriatic. Evidence of the transboundary and straddling nature of some important stocks may be drawn from the geographical occurrence pattern in late spring and early summer of the European hake (*Merluccius merluccius*) and Norway lobster (*Nephrops norvegicus*), which are high-value stocks targeted by the Adriatic demersal fishery. The shared character of Adriatic fishery resources makes it necessary to take in full consideration the cooperation among states as an essential and unavoidable requirement to pursue a responsible exploitation of such resources.

The state of heavy exploitation of Adriatic fishery resources is evident, and for some stocks it has reached critical levels. It can be noted that several different factors, often interacting simultaneously, have affected Adriatic fisheries. Fishery production dynamics are based not only on **resource availability** but are also strongly driven by **market demand and prices**. Socio-economic forces have been observed to be determinant in shaping fishery exploitation patterns. Moreover, considering that six countries fish in the same basin, caution needs to be exerted when assessing trends in fisheries landing. Underestimation of landed quantities is a common problem that affects available statistics to an often unknown extent. Therefore the application of a system based on catch quotas should carefully take into account all these factors.

The Quota concept is not new to some marineries of the Adriatic Sea. For instance, in the Compartment of Ancona **small-scale pelagic trawling fishery** is regulated so that each fishing unit (composed by two paired vessels associated to one fishing net, the so-called pair pelagic trawling) can catch a maximum of

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500 boxes (approximately 4 tons) of anchovies per day. This Quota has been set by the Ancona Pair Pelagic Trawling Fishery Consortium, and it aims at better managing both the resource and the market.

Clam management is regulated through a system that can be associated to the TURF (Territorial Use Rights in Fisheries) concept, and daily catches per fishing vessel are fixed at a maximum of 600 kg (Ministerial Decree DM 22/12/2000).

A **management plan for bottom trawling** has been developed for the whole GSA17 (Northern and Central Adriatic Area), but quotas have not been determined in the plan. Even more difficult is the overall management of small-scale fisheries.

Considering the negative trends of both catches and economic revenues for most commercial species, confirmed also by IREPA statistics and by scientific data of MEDITS surveys, an effective management tool is urgently needed in order to safeguard both fish stocks and the fisheries sector, which is becoming less and less rewarding in economic and social terms.

The transferability and applicability of a management model based on a TFC system to the Adriatic Sea appears rather difficult, especially considering that fisheries is multispecific and multi-gear as in the rest of Italy and the Mediterranean Sea. With the exception of clam fishing vessels and pair pelagic trawling, the introduction of a quota concept, defined as the maximum resource quantity that can be caught for each species, is difficult to accept for fishermen and it is also very difficult to apply due to the variability of catch composition.

A further criticality is related to the fact that in the Adriatic Sea demersal and pelagic fish stocks are shared among different States (Italy, Croatia, Slovenia), and this should be taken into account when establishing TACs. In addition, TACs can only be determined on the basis of stock assessment data and models, but these are available only for a limited number of species in the Adriatic Sea.

If an experimental test on the applicability of a TFC system were carried out in the Adriatic Sea, **the initial allocation of concessions to fishermen should be done after having determined the overall maximum fishing effort that could be reached**. This means that, where fisheries management is not based on TACs and quotas, the maximum fishing capacity of fishing vessels should be regulated by associating each vessel's characteristics (size/horsepower) to the total fishing days.

In Marche Region, **Producers' Organizations (POs) can play a fundamental role in TFC management**. Indeed, POs could acquire a certain amount of TFCs and co-manage them at the community level with a management plan approach. This criteria would provide several adavantages: it would give the possibility to exhaustively plan the production, which is the main aim of POs, and meanwhile it would allow the exchange of concessions among associates in real time. Hence, once these collective rights are acquired by a PO, it would be possible to freely transfer them among associates within the limits set by the total TFC acquired by the PO.

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Fisheries management model based on a TFC system: background biological, ecological and environmental data and information for Marche Region and the Adriatic Sea

The Adriatic Sea is a semi-enclosed basin within the larger semi-enclosed sea constituted by the Mediterranean, it extends over 138000 km^2 and it may be seen as characterised by Northern, Central and Southern sub-basins with decreasing depth from the south toward the north. The Adriatic sea is characterised by the largest shelf area of the Mediterranean, which extends over the Northern and Central parts where the bottom depth is no more than about 75 and 100 m respectively. The Jabuka/Pomo Pit (273 m) and the south Adriatic Pit (1330 m) are the only areas where the water is over 200 m deep, averaging 231 m. In the Northern and Central basins the depth gradually decreases from south to north. The Southern Adriatic has a relatively narrow continental shelf and a marked, steep slope. In the Adriatic Sea all types of bottom sediments are found, muddy bottoms are mostly below a depth of 100 m, while in the Central and Northern Adriatic the shallower sea bed is characterised by relict sand. The Eastern and Western coasts are very different; the former is high, rocky and articulated with many islands, the Western coast is flat and alluvial with raised terraces in some areas. The hydrography of the region is characterised by water inflow from the Eastern Mediterranean (entering from the Otranto channel along the Eastern Adriatic coast) and fresh water runoff from Italian rivers.
The Mediterranean has been globally considered as an oligotrophic sea (Margalef, 1985; Estrada,1996; Stergiou *et al*., 1997), but the Adriatic Sea presents singular characteristics: about one-third of all Mediterranean continental waters flow into the Northern and Central Adriatic Sea. Nutrients coming from rivers make the Adriatic Sea waters extremely productive. Furthermore the moderate slope and soft sea bottom, which covers a large area moving away from the coast and which is for the most part sandy, muddy and alluvial, have made the **Adriatic particularly suitable for trawl fishery, both bottom and beam trawling for demersal species, midwater pair trawl for small pelagic fish and dredgers for clams,** in international waters and along Italian coasts. The Adriatic fisheries are extremely diverse, targeting a great number of species, and have an extensive scope of fishing gear and methods, some of them unique. Two important features of the fishing activity in the Mediterranean Sea are the multispecificity of catches and the absence of large single stocks, especially in the demersal regime, compared to those which inhabit other seas. The high number of species exploited by the demersal fishery characterizes the Adriatic fisheries (as well as Mediterranean fisheries in general) as remarkably **multi-specific**. However, despite the complexity of multispecies catches and the fact that demersal trawl catches are generally highly multi-specific, there is a well defined series of target species which in biomass or in economic terms constitute an important basis of production. In the Adriatic Sea, and in particular in Marche Region, these are dominated by roundfish (European hake *Merluccius merluccius*, red mullet *Mullus barbatus*, blue whiting *Micromesistius poutassou*, whiting *Merlangius merlangus*, Pandora *Pagellus erytrinus*, bogue *Boops boops*, picarels *Spicara* spp.), flatfish species (common sole *Solea solea*, turbot *Psetta maxima*, brill *Scophtalmus rhombus*), anglerfishes *Lophius* spp, some rays, etc), several Crustaceans (Norway lobster *Nephrops norvegicus*, mantis shrimp *Squilla mantis*, Caramote

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prawn *Melicertus kerathutrus*, deepwater rose shrimp *Parapenaeus longirostris* etc), several Cephalopods (shortfin squid *Illex coindetii*, European squid *Loligo vulgaris*, common cuttlefish *Sepia officinalis*, little squid *Alloteuthis media*, curled octopus *Eledone* spp), which are mainly targeted by big-size fishing vessels.

Many demersal resources are localized very close to the coastline and most of them are considered as fully or over-exploited. Most species breed along the coasts during springtime. In Western Central Adriatic, characterised by shallow sandy coasts and gentle muddy slopes, species of commercial interest (pandora, seabream, red mullet, tub gurnard, sole, squid and cuttlefish) are present almost the whole year round, with densities variable according to seasons and distances from the coast. During winter, the coastal cold waters with high hydrodynamism are not a favourable habitat, and therefore many species migrate offshore where they can find better environmental conditions. During this period, growing is significantly slowed down and it will start again only in springtime, when the climatic conditions become milder again. For some of the most important target species of trawling (cuttlefish, red mullet, tub gurnard, Norway lobster and hake), there is the need to protect nursery areas which are mainly located along the coast. Indeed, juveniles of many demersal species find in these areas the most suitable habitat for their growing phase, which takes places between summer and the beginning of autumn.

In oder to ensure a future for both the fisheries sector and the viability of marine resources, it is vital to safeguard some crucial life-cycle stages of commercial species, such as breeding and juvenile growth. The protection of spawning areas, which are well-defined areas where adults gather in order to breed, sometimes after long migrations, and of nursery areas where juveniles gather during their growing stage before reaching sexual maturity, is therefore of the utmost importance. Similarly, it is of the utmost importance to protect the recruiting phases, which in Marche Region are represented by the massive coast-offshore migration of many species during the period August-October. Less than twenty species represent more than two thirds of trawling fishery production for the Northern and Central Adriatic sea. Such species are subdivided into "long-day spawners", whose egg laying period is between April and August (when daylight lasts for a higher number of hours), "short-day spawners" whose egg laying period is between September and March (when daylight lasts for a lower number of hours) and "all-year-round spawners" that breed throughout the year, with seasonal peaks. The breeding season can last for more than 4 months (pandora, turb gurnard), for just a few months (between 2 and 4), for only a month, and in a few species for the whole year (hake, mussel, squid). For most stocks, the breeding period lasts from mid spring (April) to the end of the summer (August) with peaks in June and July. A high number of species breeds during summer, among fish (horse mackerel, gobies, red mullet, small-scale pelagics such as anchovy and sardine), crustaceans (Norway lobster, prawns), cephalopods (squids, horned octopus), mollusks (clams, murex). This underlines how important is seasonality for breeding of marine resources, and it highlights that the majority of species of commercial interests breed during spring and summer.

Species sharing the same areas or the same ecological habits (which are often of the same genus or family) often show sequential spawning periods and in many cases egg laying does not overlap. This has been shown for sparids in the Adriatic sea, where in particular species of the genus Diplodus (*D. sargus,*

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D. annularis, D. vulgaris, D. puntazzo) show sequential spawning with just a very limited temporal overlap.
The knowledge of life-cycle and breeding features of the different species, together with information on fishing effort exerted on them, is of paramount importance for an effective management of fisheries. Indeed, the biological and behavioural features of species of commercial interest affect the strong seasonality which characterises the different fishing activities in the Adriatic sea.

Catch and biological data reported hereby have been collected during several international trawl surveys (GRUND, MEDITS) funded by the European Commission and Italian administrations.

>> Annual overall fish catches in Marche Region (year 2010):

The annual overall Regional catches are of **29622** Tons of fish.
Data are highly affected by hydraulic dredge catches, that in 2010 represented 39% of the total catches. Indeed, according to resource abundance trends, the management of hydraulic dredge fisheries could imply long periods of fishing suspension. For this reason there have been wide fluctuations in total catches since 2004. With regard to bottom trawling, highly affected by the depauperation of demersal resources, it is possible to note a progressive decrease in landings since 2006: quantities have gone from 11666 tons in 2006 to 8693 tons in 2010.
With regard to pelagic trawling, catches have remained constant (around 6000 tons per year), this means that for this fisheries system problems are not related to species abundance but rather to commercial and economic issues.
In the case of small scale fisheries, catches have shown constant trends with values around 3000 tons per year, except in 2007 where a catch peak of about 4000 tons has been reached.

>> Annual overall fish catches for the main commercial species in Marche Region (year 2010):

Species	Quantity (T)	% of total catches
1. Anchovy	4587	15.5
2. Sardine	1233	4.2
3. Hake	1138	3.8
4. Sole	485	1.6
5. Red mullet	1109	3.7
6. Mutable nassa	1471	5.0
7. Musky octopus	481	1.6
8. Cuttlefish	733	2.5
9. European flying squid	581	2.0
10. Clam	11544	39.0
11. Caramote prawn	298	1.0
12. Mantis shrimp	1708	5.8
13. Norwegian prawn	450	1.5

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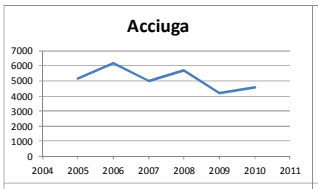
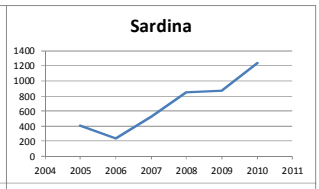
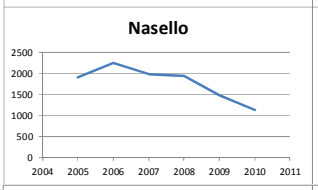
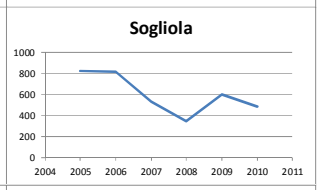
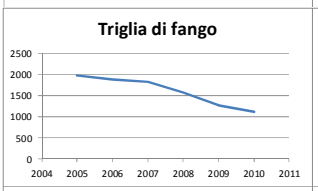
The last five-year trend shows a decrease in catches (see figures, data are in tons) for most demersal species, which are a typical target of bottom trawling. For many species, the lowest catches were recorded in 2010. Data therefore confirm the progressive depauperation of demersal resources. The only species that has shown a constant increase over the last years is the Caramote prawn, probably due to environmental-ecological factors. Anchovies have shown a decreasing trend too, but for this species criticalities are related to product commercialization rather than to the state of resources. Clams have shown wide fluctuations, mainly due to resource management by Consortia, that can impose long fishing suspension periods if the resource is becoming scarce.

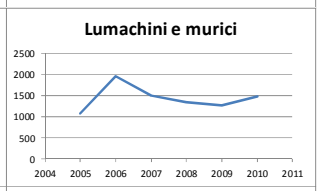


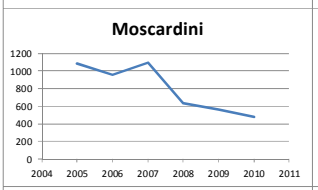


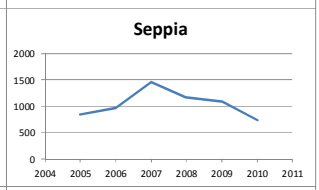


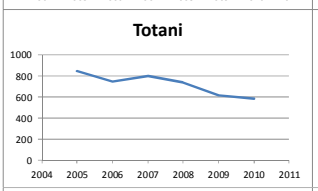


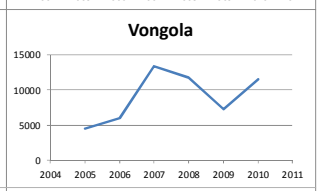


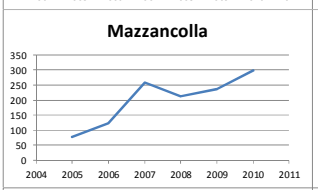


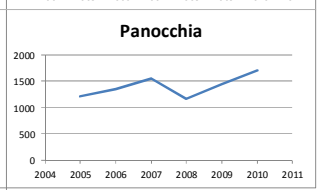


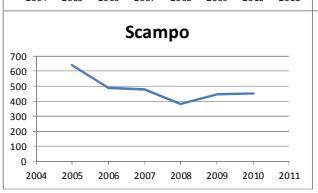












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>> Catch seasonal trends in Marche Region: overall catches per month (year 2010):

Month	Quantity (T)
January	2271
February	2110
March	2541
April	2340
May	2444
June	2682
July	2343
August	1009
September	2480
October	2817
November	3384
December	3201

The lowest catches are recorded in August. This is related to the temporary protection period for bottom and pelagic trawling, and to the interruption of hydraulic dredge fishing. The highest catches are recorded between October and December, when the summer temporary protection period shows its beneficial effects, since species born in last spring-summer have grown and reached commercial size.

>> Catch quantities and composition for each fisheries system in Marche Region (year 2010):

CATCH QUANTITIES

Fisheries system	Quantity (T)	% of total catches
1. Bottom trawling	8693	29.3
2. Pelagic trawling	6111	20.6
3. Hydraulic dredges	11544	39.0
4. Small scale fisheries	2956	10
5. Longlining	317	1.1

CATCH COMPOSITION

The last five-year trend shows a decrease in bottom trawling catches (see figures), which confirms the progressive depauperation of demersal resources. For the other fishing systems, ample fluctuations in catches have been recorded. For hydraulic dredges, this is mainly due to clam management by Consortia, that can impose long fishing suspension periods if the resource is becoming scarce. In 2009 a dramatic decrease in catches and economic revenues have been recorded, because clam fishing has been reduced to 83 days, whereas the annual average would be of more than 100 days per vessel. For pelagic trawling, fluctuations are mainly related to product commercialization, due to the difficulties in giving a good economic value to small-size pelagic fish. The fluctuations shown by small scale fisheries

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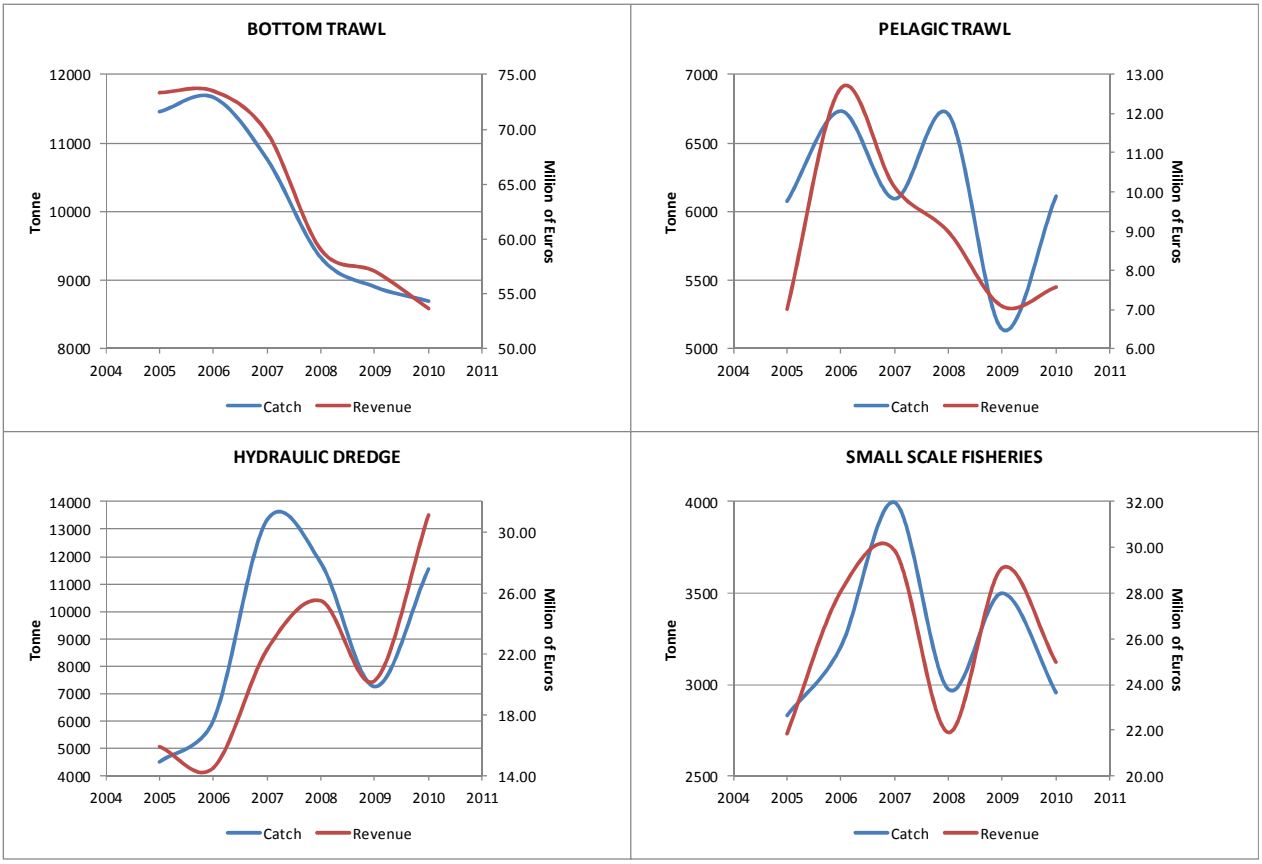
between years are a typical feature of this fisheries system, nevertheless, an overall and constant decreasing trend has been recorded throughout the years.

Economic revenues obtained over the last 5 years (see figures, incomes in millions of euro) show a deep crisis for bottom and pelagic trawling. For pelagic trawling, catches and revenues show very different trends. In particular, revenues have constantly decreased since 2006, although catches have not, and this indicates that it is difficult to give a good economic value to resources caught by pelagic trawling (mainly anchovies).



>> Data and information on population dynamics and life histories of the main commercial species in the Adriatic Sea (Northern and Central area), including studies on fishing mortality *vs* fish natural mortality:

Data are referred to the entire GSA 17, which is one of the 30 big geographic areas identified in the Mediterranean by FAO-CGPM for fisheries resource management. It includes the Northern and Central Adriatic sea (North of Gargano and Kotor), and it includes national waters (Italy, Croatia and Slovenia) as well as international waters (over 12 miles out).

The relatively low depths and sedimentary bottoms make the basin particularly suitable for bottom trawling. Demersal species fisheries in the Adriatic, as well as in the Mediterranean, is multispecific and has a high number of target species, even if the relative importance of each species differs among zones. Differences in ecological features determine a high variability in species distributions, and just a

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few species can be found throughout the area, whereas the majority of species is located in restricted areas, covering less than 20% of the total GSA 17 surface (Piccinetti et al., 2012).

Most resources are shared between the three States (Italy, Croatia and Slovenia), also due to the feeding or breeding migrations carried out by some species (i.e. hake, red mullet, sole) (Jardas et al., 2008). Some breeding areas are located in Italy (such as those for cuttlefish and tub gurnard) or along the coasts of Croatia (such as sole breeding areas). Juveniles of many species are concentrated along the Western coasts during the summer, where they grow for about 2-3 months, and can be found in the open sea in autumn and winter, where they migrate to get better environmental conditions during the cold months.

Catches are mainly composed by species with short life cycle and by fish less than 2-3 years old, and therefore variations in species abundance are in many cases related to fluctuations in annual recruitments, strictly related to hydrographic conditions, rather than to levels of fishing effort (Piccinetti e Piccinetti Manfrin, 1994; Arneri, 1996 Vrgoč et al., 2004).

In the last decades, several changes in the demersal community structure have been recorded (Jukić-Peladić et al., 2001; Vrgoč, 2000), together with an overall biomass decrease over the years, particularly evident for commercial demersal species (Vrgoč et al., 2006; Coll et al., 2009; Krstulović Šifner et al., 2009).

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>> Data and information on the state of fish stocks (and overxploitation, if any) in the Adriatic Sea (Northern and Central area):

Data are referred to the entire GSA 17.

National Strategic Plan (MIPAAF) - 2007

The 2007 National Strategic Plan (PSN) for fisheries, developed by the Italian Ministry of Agriculture, Food and Forestry Policies (MIPAAF), has outlined the following general situation for some important fisheries resources in the GSA 17.

Biomass has shown a significant increase for the musky octopus (*Eledone cirrhosa*), a non-significant increase for the hake (*Merluccius merluccius*; R= 0.81; P>0.05), a non-significant increase for the Norwegian prawn (*Nephrops norvegicus*; R= 0.83; P>0.05).

Conversely, biomass indexes for two angler species, *Lophius budegassa* (R= 0.93; P<0.05) and *Lophius piscatorius* (R= 0.78; P>0.05) have shown a decrease. All other species have shown fluctuations but with overall stable trends (*e.g. Illex coindetii, Loligo vulgaris*) (Table 1).

Hakes were caught at all depths (0-500 m), with a variation in abundances between 17-35 kg/km2 and 863-2038 n/km2. The highest abundance indexes (weight and numbers) were recorded in 2005 (35 kg/km2 and 2038 n/km2). Overall, the size range was between 2 and 76 cm; almost 90% of caught individuals had a size of less than 20 cm, which is the minimum commercial size according to EC Reg. n. 1967/2006. Sex ratio was of 0.40 with higher number of males, but most individuals were females in the bigger size classes (approx 32 cm TL or more).

Red mullets (*Mullus barbatus*) are a common species in the GSA 17, the average biomass index recorded was of 11 kg/km2 and the average density of 469 n/km2. The biomass has shown ample fluctuations, spanning from higher values in 2002 (16 kg/km2) and in 2006 (15 kg/km2) to lower values in 2004 (6.5 kg/km2).

Almost 90% of the individuals in the sample population were between 9 and 14 cm long. The trend in the average size, strongly biased by bigger-size individuals, was between 12 and 13 cm TL. Catches of individuals below the commercial size tend therefore to be frequent also for this species.

Table 1 – Biomass trends in GSA 17 during the period 2002-2006 (↔ stationary biomass; ↑ increasing biomass; ↓ decreasing biomass).

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Analisi di tendenza dal 2002 al 2006	GSA 17
Specie	Indice di biomassa (kg/km^2)
Aristaeomorpha foliacea	↔
Aristeus antennatus	↔
Eledone cirrhosa	↑S
Illex coindetii	↔
Loligo vulgaris	↔
Lophius budegassa	↓S
Lophius piscatorius	↓
Merluccius merluccius	↑
Micromesistius poutassou	↔
Mullus barbatus	↔
Mullus surmuletus	↔
Nephrops norvegicus	↑
Octopus vulgaris	↔
Pagellus erythrinus	↔
Parapenaeus longirostris	↔
Phycis blennoides	↔
Sepia officinalis	↔

General Advisory Board on Maritime Fisheries, Crisis unit - 2010

The situation highlighted above is however not confirmed by more recent data.

The report prepared by the "Laboratorio di Biologia e Pesca Fano" for the General Advisory Board on Maritime Fisheries, Crisis unit, highlights a more worrying situation for the conservation of fisheries resources in the GSA 17.

In the Northern and Central Adriatic, the state of fish resources is critical and several species have reached their minimum levels since 1993. The trend in the state of resources over the last 17 years has been assessed by means of density index (number of individuals/km^2) and abundance or biomass index (kg/km2). Annual indexes have been calculated based on 180 sample fishing in the GSA 17, in Italian but also in Croatian and Slovenian waters. Italian fishermen cannot fish over the whole area, so the report presents density and abundance indexes for international as well as for Italian national waters. The relative importance of each species is of course different in Italy, Croatia and Slovenia, and it changes also in different parts of the GSA 17 within Italian waters.

During the period from 2006 to 2010, the following situation was been recorded for the main species of commercial interest (Table 2).

Engraulis encrasicolus. Anchovies are one of the most important target species in Italy, even if they have not the highest economic value. Juveniles are mainly concentrated in Italian waters. Density and abundance indexes show a decreasing trend since 2001, but in 2010 a slight increase has been recorded.

Sardina pilchardus. The highest concentration of sardines is recorded in Croatian and Slovenian waters; even if density and biomass indexes are always low, in 2010 a slight increase has been recorded.

Sepia officinalis. Mainly distributed in Northern Adriatic, after a period of highly variable abundance, it is now showing a decreasing trend and indexes are very low. Cuttlefish have a very short life cycle and therefore recruitment levels are highly relevant.

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Squilla mantis. It has a coastal distribution and it has shown a slight increase in 2010 (after a progressive decrease which started in 2006).
Nephorps norvegicus. Highest densities in Central Adriatic. Since 2007, density and biomass indexes have shown a drastic decrease.
Merluccius merluccius. It has a wide distribution in GSA 17; it is absent or very scarce only in Northern Adriatic. In the last years, a constant concentration of juveniles has been recorded South of Pescara. The density index has started to decrease since 2005, the biomass index since 2006.
Mullus barbatus. It has a wide distribution in GSA 17; juveniles are constantly present in the coastal area between Chioggia and Gargano. Density index has shown slight fluctuations over the last years.
Eledone moschata. Mostly distributed in Northern Adriatic and Croatia. Fairly stable indexes since 2004.
Eledone cirrhosa. Mainly in Central Adriatic, absent in Northern Adriatic. Indexes have started to increase in 2010, after a decreasing trend which started in 2007.
Loligo vulgaris. It has a rather wide distribution in GSA 17; with higher density in coastal waters where juveniles are concentrated. The resource has started to decrease in 2005 and it was still showing a decreasing trend in 2010.
Illex coindetii. It has a wide distribution in GSA 17; scarce or absent only in shallow waters. Indexes show strong annual fluctuations, with values higher than average in 2010.
Lophius spp. It is distributed in the Southern part of GSA 17 and almost absent in Northern Adriatic. The resource has started to decrease in 2003 and it was still showing a decreasing trend in 2010.
Pagellus erythrinus. It is more abundant in Croatian waters, and there is a constant presence of young individuals in the coastal waters of Northern Adriatic. The population has been fairly stable since 2001.
Trisopterus minutus capelanus. . It has a wide distribution in GSA 17; a decrease in abundances has started in 2005, and the trend was still decreasing in 2010.
Merlangius merlangus. An important species for the Northern Adriatic, it replaces hakes in certain areas. From 2008 to 2010 there has been a slightly increasing trend in abundances.

Table 2 – Biomass trend in GSA 17 during the period 2006-2010 (↔ stationary biomass; ↑ increasing biomass; ↓ decreasing biomass).

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Analisi di tendenza complessiva dal 2006 al 2010	GSA 17
SPECIE	**INDICE DI BIOMASSA (kg/km²)**
Alice	↓
Sardina	↔
Seppia	↓
Pannocchia	↓
Scampo	↓ ↔
Nasello	↓
Triglia di fango	↔
Moscardino muschiato	↔
Moscardino bianco	↔ ↓
Calamaro	↓
Totano	↔ ↓
Rana pescatrice	↔
Pagello fragolino	↔
Merluzzetto giallo	↓
Merlano	↔

Management Plan for Bottom Trawling - 2010

The Management Plan for Bottom Trawling, developed by the Italian Ministry of Agriculture, Food and Forestry Policies (MIPAAF), has underlined a general overexploitation of demersal resources in the GSA 17. Over the last 20 years, exploitation levels have also been assessed for the main demersal resources (Hake, Red mullet, Norwegian prawn) in the framework of international programmes such as FAO-ADRIAMED, SAMED (EU) and others.

Hakes show general trends similar to those recorded in the other Italian waters (e.g. Tyrrhenian sea), with exploitation rates (E=F/Z) around 0.8 (Flamigni 1983; Giovanardi et al., 1986; SAMED 2002). Hakes were already considered overexploited in the Adriatic at the beginning of the Seventies (Levi & Giannetti, 1972; AlegriaHernandez et al., 1982). High exploitation rates are recorded for red mullets too (much higher than the limit reference point LRP of 0.5; Arneri and Jukić, 1986; SAMED 2002). The species has high fishing mortality rates in the first months of life, when it is concentrated along the Western Adriatic coasts. High exploitation rates are similarly recorded for Norwegian prawns, E= 0.6-

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0.7, both considering trawl survey data (SAMED 2002) and a population analysis based on market landings (Marrs et al., 2000). With regard to the sole, which is the forth more important species in GSA 17 in terms of economic revenues, the Plan has highlighted a high exploitation rate, with (E) of approx 0.6.

SAC GFCM. Sub-Committee on Stock Assessment – 2010

Data on soles (*Solea solea*) in the GSA 17 highlights an overexploitation tendency for this species. Current exploitation levels are therefore not sustainable in the long run, and this resource could be regarded as close to collapse. The results of the survey carried out in the framework of SOLEMON project indicate that a decrease in fishing mortality from 50 to 80%, especially for pelagic trawling, should be obtained for the population to recover. Results indicate that pelagic trawling fishing should be carried out at more than 11 miles from the coast in September-October, in order to reduce the pressure on juveniles. The survey has assessed a size at first sexual maturity of 25.8 cm for the sole, which is much higher than the min size (20 cm) required by EC Reg. 1967/2006.

Annual report on the state of biological resources in the Italian seas - 2011

With the exception of the important catches of small-size pelagic fish, the overall state of fish resources in the Adriatic (GSA 17) is critical and no positive trends are recorded in demersal stocks: demersal species of commercial interest have shown in 2010 and 2011 the minimum abundance indexes of the whole long-term data series (18 years).

Merluccius merluccius abundance and biomass indexes are stable and at very low levels, comparable in 2011 with values recorded in 2010, which were the lowest ever. The same situation has been recorded for *Lophius budegassa*, *Trisopterus minutus*, *Squilla mantis*, *Sepia officinalis,Eledone moschata* and *Eledone cirrhosa*.

The only demersal species of commercial interest which has shown an increase in abundance is the whiting *Merlangius merlangus*. The situation is critical but stable for *Mullus barbatus*, wheras there is a decrease for *Pagellus erythrinus*, but this could be part of the natural fluctuations in abundance recorded in previous years.

A strong decreasing trend, already recorded in previous years, is still shown for Norway prawns *Nephrops norvegicus*, and this underlines the strongly critical situation of this species.

The exploitation of demersal fish resources in the Adriatic is typically a multi-gear exploitation, since the same species are caught with different fishing gears and systems; this causes relevant cumulative, competitive and synergic effects (Piccinetti et al., 2012).

The different fisheries systems and the variability of caught species (multispecific catches) have variable economic consequences for fishermen, which make it difficult to identify common protection measures for the whole GSA 17. The combination of technical measures differentiated in time and space in the framework of local management plans, shared by professional categories, could be a possible way to invert the overall decreasing trend of fish resources and of the fisheries sector as a whole.

STECF 2011 [REVIEW OF SCIENTIFIC ADVICE FOR 2012Part 3 (STECF 11-15)]

ANCHOVY

The stock of anchovy living in the northern and central Adriatic Sea (GFCM-GSA 17) is shared between Italy, Slovenia and Croatia. The stock is moderately exploited and there are indications of a recent

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recovery of the stock size from a low level. The GFCM-SAC recommended that fishing effort should not be allowed to increase. STECF suggests that consideration be given to introducing landing restrictions as a more effective management tool for small pelagic in the Mediterranean.

SARDINE

According to GFCM-SAC 2010 assessment, the stock was moderately exploited. The GFCM-SAC recommended that fishing effort should not be allowed to increase. STECF was unable to support the conclusion from GFCM-SAC that the stock is exploited sustainably.

RED MULLET

The fishery for red mullet is one of the most important in the GSA 17. Fishing grounds correspond to the distribution of the stock particularly within 100 m depth. The allocation of fishing effort depends on the different life cycles of this species and the different concentration and distribution in GSA 17. The Italian catch of red mulled in GSA 17 is obtained mostly by demersal otter trawl, but other gears are participating at the fishery for a very minor fraction of the catch.

Given the values of F and F/Z (the latter one equal to or higher than 0.50) the stock can be considered overexploited. In order to reduce the risk of overfishing, the STECF-SGMED-08-04WG recommends fishing mortality to be reduced through effort reductions of the relevant fleets.

EUROPEAN HAKE

The hake fishery is one of the most important in GSA 17. The species is mainly fished with bottom trawl nets, but long-lines and trammel-net are also used. The stock of hake in GSA17 was considered overexploited in 2006-2008. STECF advises the relevant fisheries' effort to be reduced until fishing mortality is below or at the proposed level F0.1, in order to avoid future loss in stock productivity and landings. This should be achieved by means of a multi-annual management plan taking into account mixed-fisheries effects.

COMMON SOLE

The Italian fleets exploit this resource with rapido trawl and set nets (gill nets and trammel nets), while only trammel net is used in the countries of the eastern coast of GSA 17 in the Adriatic Sea. Sole is an accessory species for otter trawling. STECF classified the stock status as being subject to overfishing. STECF advises reducing fishing mortality towards the proposed reference point FMSY. A change in the exploitation pattern is also recommended, taking into account that the exploitation is mainly orientated towards juveniles.

In summary, data on the state of resources in GSA 17, and in particular in Marche Region, highlight a general depauperation of resources, especially with regard to demersal species. Overall, resources are overexploited and thus suffering of too high fishing pressures. The negative trend seems to be confirmed in 2011.

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Fisheries management model based on a TFC system: background social, economic and regulatory data and information for Marche Region and the Adriatic Sea

Over the past few years, Italian national fishery production has shown a steady decline, and this **negative trend** continued in 2010, when the national fleet harvested under 210,000 tonnes of seafood. One of the greatest catch losses was recorded for the Adriatic Sea. A steady decline in fishing activity characterises the Italian fleet: between 2004 and 2010 it fell by an average of 6%, dropping to 16% for midwater pair trawlers, 15% for hydraulic dredges, 12% for purse seiners and 7% for bottom trawlers.
This trend can only be partly due to an **increase in fuel price**, though this surely had an impact on the trend over the last three years. But more generally, the decline in fishing activity can be explained by a different organization of the fishing sector, where operators spontaneously adopted strategies to optimize time spent at sea, both for commercial reasons and in order to cut back on operation costs associated to fishing and landing activities.
Small-scale fishing is the most relevant sector from a social and job-related point of view, followed by trawling and purse seining. Comparing data from 2004 to 2010, the **socio-economic impact** of the decline in fishing activities is considerable; the number of employees fell last year below 30,000. Since 2004, jobs lost in maritime fisheries amount to 6,000 units. This trend is mostly due to the reduced number of fishing vessels, but also to the decline in their physical and economic productivity. The **increase in production costs**, especially in the past two years, contributed to a **decline in the economy of fishing enterprises and thus of workers**. The annual cost of labour per worker, which amounts to the gross earning of the crew, fell by 20% both on an annual and a monthly basis.
Social and economic data of Marche Region fisheries are reported below and are provided by **IREPA** (Institute for Economic Research on Fisheries and Aquaculture). The IREPA monitoring system for economic data on the Italian fishery sector is based on three main modules: fishing effort and activities, landings and prices by species, and economic data.

>> Data and information on the fleet in Marche Region (year 2010):

Overall N. fishing vessels	Average age	Average tonnage (GT)	Average engine power (kW)
880	28.4	20.6	106

The fleet of Marche Region is the third one in Italy (after Sicilia and Puglia). The average size of the fleet, in terms of tonnage and engine power, is higher than the national average, despite the high number of small scale fishing vessels. This can be related to the weight of bottom trawling in the fleet composition (more than 1/5 of the total number of vessels).

>> Fleet trend (entry/exit) in Marche Region (year 2010):

Fleet	Units	
	N. vessels	% of total

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		fleet
Entries	4	0.45%
Exits	9	1%

The number of exits have been twice the number of entries of new vessels in the fleet. There are no specific data (age, tonnage, horsepower) on entry/exit vessels.

>> Data and information on the main fisheries systems in Marche Region (including small-scale fisheries) (year 2010):

Fleet	Units		Age	Tonnage	Engine power
Fisheries system	**N. vessels**	**% of total fleet**	**Average age**	**Average tonnage (GT)**	**Average power (kW)**
1. Bottom trawling	184	20.9	27	62.9	242.7
2. Pelagic trawling	21	2.4	22	110.7	452.8
3. Hydraulic dregdes	222	25.2	24	15.4	106.4
4. Small scale fisheries	446	50.7	36	1.6	31.4

The total number of vessels has shown a drastic decrease since 2000, mainly due to the decommissioning scheme. In 2000 the fleet of Marche Region was composed of 1286 units, in 2001 of 1093, in 2002 of 1067, in 2003 of 1051, in 2004 of 1033, in 2005 of 989, in 2006 of 935, in 2007 of 906, in 2008 of 896, in 2009 of 885 units. This means that between 2000 and 2010 the fleet of Marche Region has decreased of more than 400 vessels. Decommissioning has mainly targeted bottom and pelagic trawling vessels (a decrease of about 40% in numbers) and to a lesser extent small scale fisheries (a decrease of about 34%).

Hydraulic dredge fisheries has remained constant over the last ten years, and this means that the resource management system put in place for clams, based on resource abundance, is effective.

The high number of small scale fishing vessels (half of the total fleet) highlights that coastal artisanal fisheries is relevant in Marche Region, although catches and number of people employed are lower than those recorded for other categories. Indeed, Marche Region is characterised by an industrial rather than an artisanal fleet. In 2010 bottom trawling has been the most important fisheries system both considering vessel size (63%) and horsepower (47.9%) and number of people employed as crew members (36%). Bottom trawling crews usually have an average of 4 people. Pelagic trawling has the highest number of crew members (an average of 6 people per vessel). Hydraulic dredge systems usually have 2 crew members. Small scale fisheries have 1-2 crew members.

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	N vessels	%	GT	%	kW	%	Crue number	%
Bottom trawl	184	20.9	11566	63.7	44654	47.9	727	36.0
Pelagic trawl	21	2.4	2324	12.8	9509	10.2	135	6.7
Hydraulic dredge	222	25.2	3428	18.9	23613	25.3	428	21.2
Small scale fisheries	446	50.7	705	3.9	14024	15.0	713	35.3
Total	880	100.0	18143	100.0	93251	100.0	2018	100.0

>> Fishing days in Marche Region (year 2010):

Overall annual fishing days (total number for the entire fleet): 134390

Average annual fishing days (per fishing vessel): 150.9

>> Fishing days per fisheries system (year 2010):

Fisheries system	**Overall fishing days** (total number for the whole fleet segment)	**Average fishing days** (average number per vessel in the segment)
1. Bottom trawling	26563	143.6
2. Pelagic trawling	3858	154.0
3. Hydraulic dregdes	24891	112.5
4. Small scale fisheries	77521	171.4

The average fishing days are very similar for bottom and pelagic trawling. Indeed, they have the same temporary protection periods (summer protection period and weekly technical suspension period). The slight difference between the two is due to the fact that bottom trawling (average GT 62.9) is carried out also by some small-size fishing vessels, which cannot operate in bad meteo-marine conditions. On the contrary, pelagic trawling (average GT 110.7) is only carried out by big-size vessels, which can operate independently of the meteomarine conditions.

Hydraulic dredge fisheries has the lowest number of fishing days per vessel. This is a consequence of the management system carried out by Consortia, which can impose long suspension periods according to the state of resources (clams). In addition, hydraulic dredges can only operate with good meteomarine conditions, because waves make the fishing gear highly uneffective.

Small scale fisheries has the highest average number of fishing days per vessel, since this system do not have to respect any compulsory activity suspensions (temporary protection period and weekly technical suspension period).

>> Types of fisheries in Marche Region: multispecific *vs* single-species catches (year 2010):

Type of fisheries	Target species	Fisheries system	Units	Tonnage	Engine power

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			N. vessels	% of total fleet	Average tonnage (GT)	Average power (kW)
Multispecific	Hake, Sole, Cuttlefish, Norwegian prawn, Mantis shrimp, Red mullet, Caramote prawn	Bottom trawling	184	20.9	62.8	243
Multispecific	Sole, Cuttlefish, Caramote prawn, Mantis shrimp, Breams, Mutable nassa and other muricid shells	Small scale fisheries	446	50.7	1.6	31
Single species	Anchovy, Sardine	Pelagic trawling	21	2.4	110.6	453
Single species	Clam	Hydraulic dredges	222	25.2	15.4	106

In Marche Region, hydraulic dredge is the only fishing gear which is focused on a single and specific target species, the clam.

Pelagic trawling fisheries is targeted on anchovies, but accessory species such as sardines are also caught. Over the last years however, the economic value of sardines have shown a dramatic decrease and therefore they tend not to be seen as a species of commercial interest. The most common accessory species are sprats (*Sprattus sprattus*), mackerels (*Scomber scombrus* and *Scomber japonicus*), sea needles (*Belone belone*) and mullets (genus: *Liza*, *Mugil* and *Chelon*).

Bottom trawling in the Adriatic and more in general in the Mediterranean sea, is multispecific and it is difficult to identify a single target species. It may make more sense to refer to "pools" of target species. In the Adriatic, bottom trawling target species vary according to the fishing area, depth, bottom type, season and commercial requirements. For instance, target species of high-depth bottom trawling are hakes (*Merluccius merluccius*), Norwegian prawns (*Nephrops norvegicus*) and anglers (*Lophius* spp). Target species of coastal bottom trawling are red mullets (*Mullus barbatus*), cuttlefish (*Sepia officinalis*), soles (*Solea solea*), mantis shrimps (*Squilla mantis*) and Caramote prawns (*Melicertus kerathurus*). Other cephalopods such as squids (*Loligo vulgaris*), little squids (*Alloteuthis media*), European flying squids (*Illex coindetii*) and musky octopus (*Eledone* spp) can also have a slight commercial relevance.

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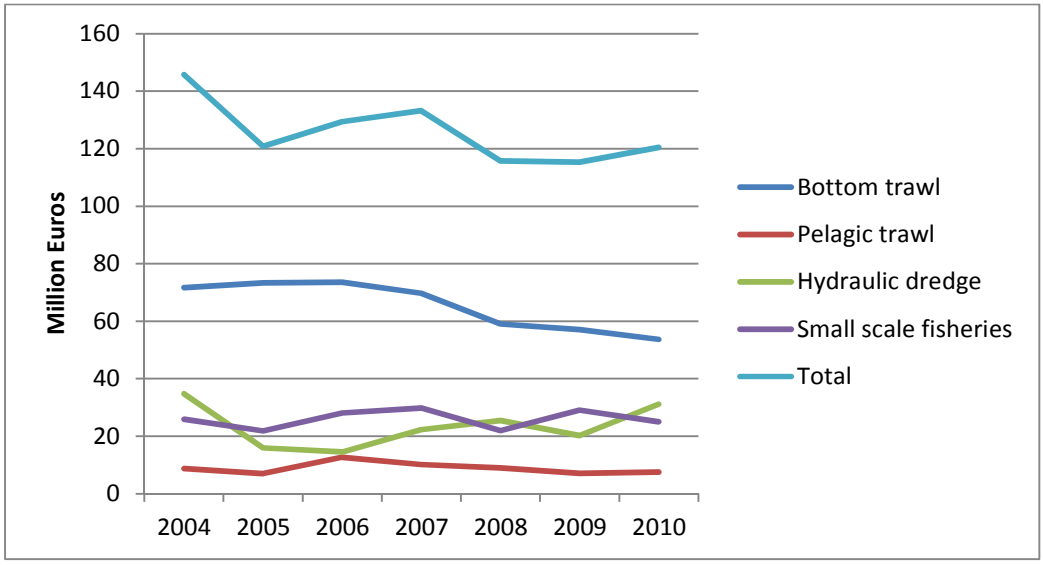
Small scale fisheries with gillnets shows a high seasonal variability in catches. Gillnetting is mainly used for soles (*S. solea*), gurnards (*Chelidonichthys lucernus*), white fish of high commercial value such as the European seabass (*Dicentrarchus labrax*), brown meagres (*Sciaena umbra*), striped seabreams (*Lithognathus mormyrus*) and Sparidae fish in general, mullets (*Liza* spp and other species), mantis shrimps (*S. mantis*), cuttlefish (*S. officinalis*) and turbots (*Psetta maxima*). Traps are mainly used for cuttlefish (*S. officinalis*) in spring-beginning of summer, and for mutable nassa (*Nassarius mutabilis*) in winter-spring. Indeed, these two activities represent the main small scale fisheries income during the period November-June.

>> Economic value of fisheries in Marche Region (year 2006):

Total revenues (mln Euro)	% of GDP	Average market price (Euro/kg)
129.33 (mln Euro) *Source: MIPAF-IREPA 2006*	0.335% (Regional *GDP: 38580.64 mln Euro –source ISTAT 2006*)	4.06

Over the last 7 years, economic revenues have shown a decreasing trend, mainly affected by bottom and pelagic trawling fisheries.



>> Economic value of fisheries for the main commercial species in Marche Region (year 2010):

Species	Market price (Euro/kg)	Total revenues (mln Euro)	% of fisheries' total revenues
1. Anchovy	1.41	6.45	5.4
2. Sardine	0.6	0.73	0.6

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3. Hake	8.2	9.44	7.8
4. Sole	20.1	9.77	8.1
5. Red mullet	4.6	5.09	4.2
6. Mutable nassa	3.5	5.16	4.3
7. Musky octopus	2.6	1.32	1.1
8. Cuttlefish	7.8	5.74	4.8
9. European flying squid	2.5	1.46	1.2
10. Clam	2.7	31.13	25.9
11. Caramote prawn	15.8	4.71	3.9
12. Mantis shrimp	5.8	9.88	8.2
13. Norwegian prawn	25.6	11.52	9.6

Over the last 7 years, revenues have shown a decreasing trend for most commercial species (see figures). The only exception is given by Caramote prawns and mantis shrimps. Clams, which represent 18-20% of the whole economic revenues in the last 7 years, have undergone the highest fluctuations among years. This can be associated to the management system put in place for this resource, since catches are calibrated on clam abundance.

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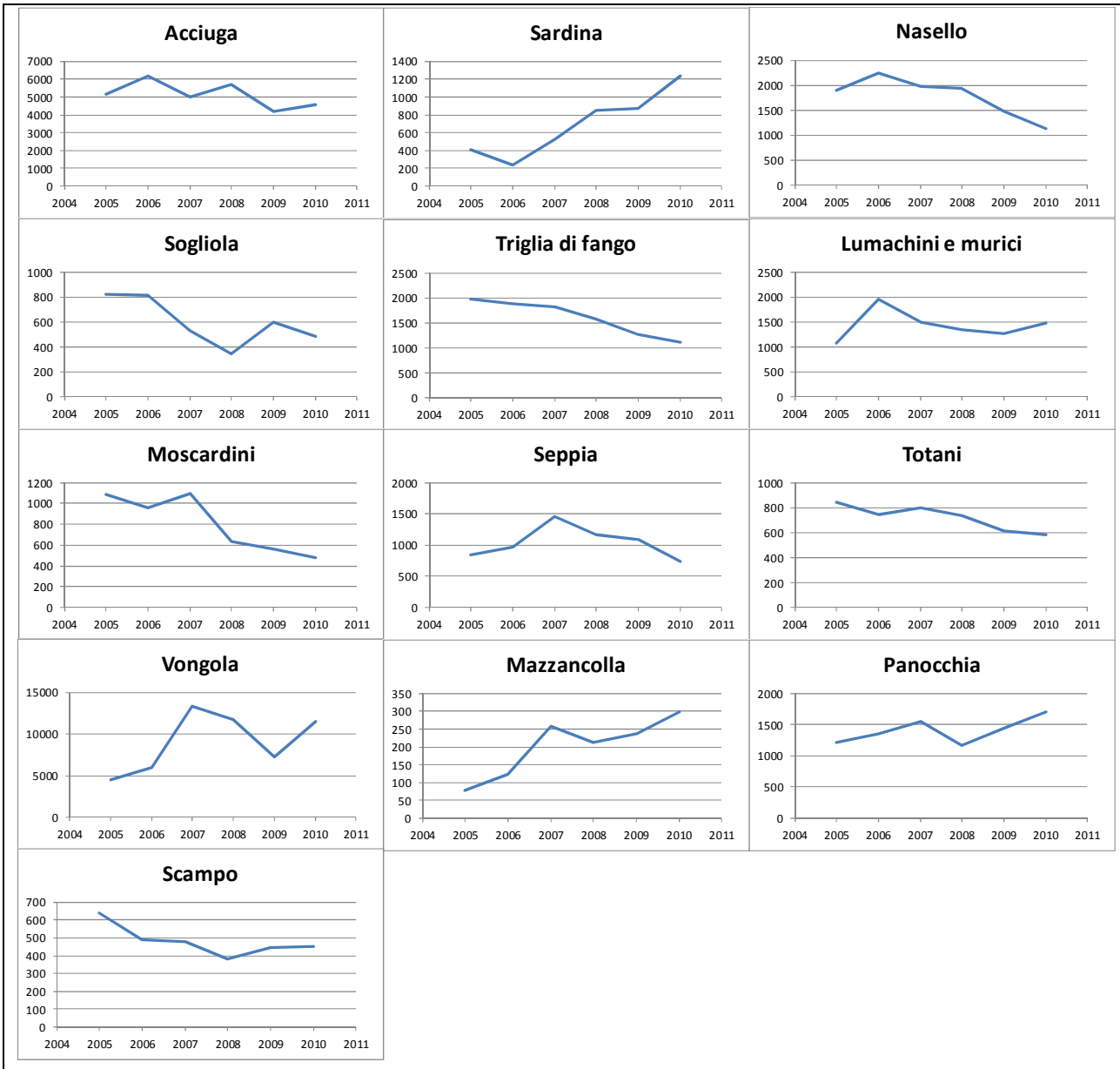

>> Economic value of fisheries for the main fisheries systems in Marche Region (year 2010):

Fisheries system	Market price (Euro/kg)	Total revenues (mln Euro)	% of fisheries' total revenues
1. Bottom trawling		53.65	44.57
2. Pelagic trawling		7.57	6.28
3. Hydraulic dredges		31.13	25.86
4. Small scale fisheries		24.98	20.75

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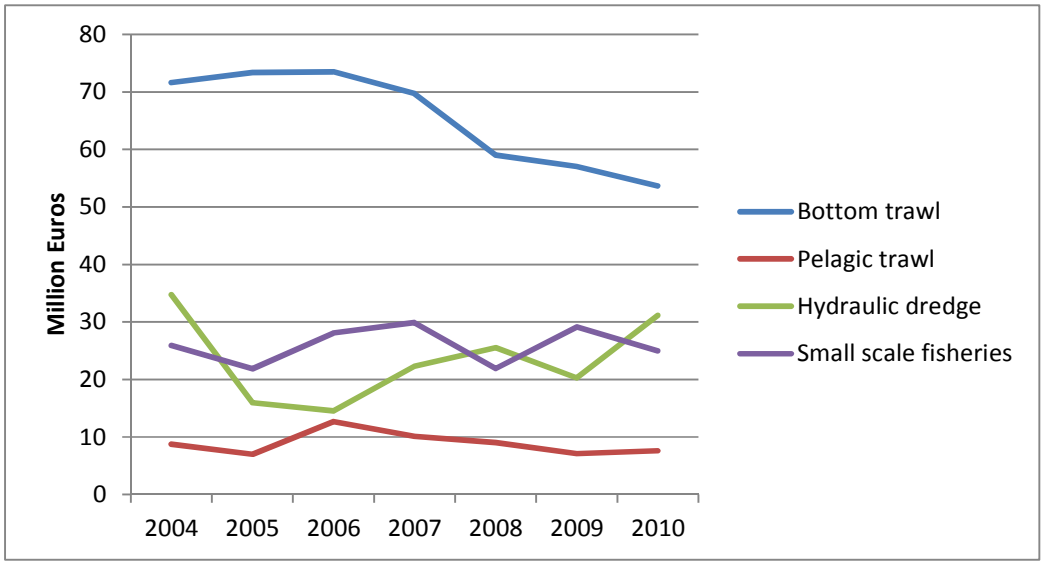
Over the last 7 years, revenues have especially decreased for bottom and pelagic trawling, highlighting the economic crisis faced by the sector.



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FOCUS 2: CORSICA REGION AND THE CORSICAN SEA

In Corsica, artisanal fishery is mainly composed of artisanal companies that practice a small-scale coastal fishing. This fishery is characterized by a large seasonality, with a maximal fishing effort during spring and summer. Indeed, weather conditions are often very windy in winter, and in summer mass tourism concentrates along coastal areas.

Corsican fleet may be separated into two major categories: bottom trawlers and small-scale fishery. The latter can also be divided into two groups according to the fishing gears that are used: netters and pelagic long liners. It is important to know that fishermen who use pelagic long lines can also use other fishery gears (*e.g.* nets, encircling nets, benthic long lines). There are other gears that are less employed or used in lagoons.

Bottom trawlers: nowadays, bottom trawling with otter trawls is exclusively practiced in eastern plains, where muddy and sandy silts dominate. Two kinds of trawls can be distinguished:

- Trawls on the continental shelf: pelagic fish (*e.g.* sardines, mackerels, horse mackerels) and benthic fish (red mullets, dogfishes, skates, monkfishes, gurnards) are caught. The trawl is kept in the water for approximately one hour.
- Bottom trawls, 250 to 600 m depth: these muddy bottoms are rich in prawns, hakes and whiting. The trawl is kept in the water for approximately 3 or 4 hours.

Pelagic long lines: for several decades, some Corsican fishermen have exploited swordfish, bluefin tuna and other pelagic fish thanks to pelagic long lines. The latter, baited by sardines or mackerels, are installed in the evening in open sea, a dozen nautical miles from the coast. Several kilometers long, they drift all night long, and are pulled back in the dawn. This fishery method is made possible by a general modernization of fleets, and most especially by increasing engine power. The fishery, which can be very profitable, is nevertheless conditioned by bait supplying imported from continent. In Corsica, some fleets are specialized in this fishery technique, whereas other use pelagic long lines unevenly, often during autumn.

Netters: the nets used are mostly trammel nets. Fishing efforts are mainly focused on the spiny lobster - exploited from March to September - even if some high-value species, such as the red mullet, red scorpion fish, john dory, or other Sparidae species are also exploited. Due to the abundance of rocky and coralligenous seabeds, which spread over 1000 km of the coast, Corsica is the first region in France for spiny lobster production. This fishery is traditional on the island, and *Palinurus elephas* is the target species on which focuses the most important part of small-scale fishery. Because of the great market value of this product in the local market and despite low landing, spiny lobster production plays an important economic role. We can say that spiny lobster resource in Corsica acts like a barometer that influences halieutic activities. In years of heavy production, an important part of fishing effort focuses on spiny lobsters and fishermen earn a

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good income. In years of scarcity, fishermen exploit fish more intensively and their incomes are rather low.

Other activities:

- Benthic long line: depending on target species, many parameters vary (*e.g*. launching of fishing gears at night / at day, hook size, bait sort, depth of fishing gear). These gears can catch fish of good market value (*e.g*. common pandora, seabream, weever, red porgy, common dentex, dusky grouper, blackspot seabream, wreckfish) and fish of lesser market value (*e.g*. wrasse, conger, Mediterranean moray). Many fishermen possess long line but this gear is scarcely used.
- Encircling net: this technique consists in encircling a light source (*i.e*. the "lampara") with an encircling net at night. Target species are small pelagic fish (*e.g.* sardine, mackerel, horse mackerel, bogue). A large quantity of fish of lesser quality is also landed.
- Sea urchin fishing: nowadays, sea urchins are picked up in apnea during the opening period (*e.g*. 15 December to 15 April). This resource helps fishermen to earn an extra income that will be important if the fishing season turns out to be bad. Sea urchins, mainly eaten in coastal restaurants, are very appreciated in southern Corsica, in particular in the sector of Ajaccio.
- Lagoon fishing: several lagoons are exploited on the Corsica eastern coast (*e.g*. Biguglia, Dianna, Urbinu). Fishing is practiced on small vessels where several gears allow fishermen to catch mostly sand smelts, eels and mullets.

In the following part, only the first three gears previously introduced will be considered:

- The bottom trawler: nowadays 9 fishing licenses are registered in Corsica, it represents approximately 5% of the fishing fleet.
- The pelagic long liner: about twenty fishermen regularly or occasionally launch pelagic long line in the island.
- The netter: In Corsica 182 fishing licenses were assigned in 2011. Netters represent the majority of the fishing fleet (approximately 95% of insular fleet).

In Corsica, only bluefin tuna fishing is managed by a quota system. Thus, pelagic long liner have to possess a special fishery permission (*i.e*. PPS) to catch this species and only these fishermen are accustomed to quota concept. Only 5 vessels have received a PPS in 2011. For all other fishermen (186 vessels, 97% of the fleet), the quota concept is quite unknown.

There are many management measures in Corsica, at several levels:

- Community level: *Règlement (CE) n° 1967/2006 du Conseil du 21 décembre 2006 concernant des mesures de gestion pour l'exploitation durable des ressources halieutiques en Méditerranée et modifiant le règlement (CEE) n° 2847/93 et abrogeant le règlement (CE) n°1626/94*
- National level: for example, professional fishing in Corsica is allowed only with fishing license possession.

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- Regional level: for example, spiny lobster fishery is closed from 1st October to 1st March of the next year.
- Prud'homal level: for example, the establishment of fishery confinement.

The TFC affect:

- all vessels above 12 meters as well as all vessels with towed gear
- quota species

In the current conditions, **no Corsican fishing vessels are eligible for TFC** because:

- only long liner which have tuna PPS would be concerned,
- none of them are more than 12 m long.

A management model based on a TFC system seems hardly practicable in Corsica because insular fishery is characterized by the use of multi-gear and multi-specific species fishery. In addition to that, fish, crustacean and cephalopod stocks are often shared among several countries of the western basin of the Mediterranean Sea. Finally, this management measure would be hardly controllable because there are more than thirty ports in the island, there are no central market centers to sell fish, and direct selling from producer to consumer is a common practice.

Corsica Region does also point out a number of **critical issues related to Quota allocation criteria**, in the highly hypothetical case of the introduction of a TFC-based management system.

OPTION 1: Quota in terms of resource quantity that can be caught by a fishing vessel

In the case of quota allocated to each fishing vessel according to potential catches, allocation criteria could be considered according to:

- Technical traits of the boat like horsepower/size/tonnage: a bigger vessel does not necessarily catch more fishes than a smaller one.
- Crew members: a crew composed by 2 fishermen does not necessarily have higher catches than a single fisherman.
- Landing in the last few years: data declared on logbook by fishermen or collected by scientists are at present not fully exhaustive.

There is probably not a single solution for the choice of allocation criteria, and the best way could be perhaps to find a solution after debate with professional organizations.

Another problem is related to target species: in Corsica, the two main fish caught by longline are bluefin tuna and swordfish. When bluefin tuna quota is closed, fishermen could work again with longline to catch swordfish, without major fishing mortality because many tuna could return alive at sea. But this is not the case with the main fishing gear used by the quasi totality of the small-scale fishery: trammelnet. This gear catches multiple species like sparidae, scorpeanidae, mullidae, various cephalopod and crustacean. Most fish die during net hauling. The instauration of quotas for a single specie therefore favour discards.

OPTION 2: Quota as a portion of the total fishing time independent of the species

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Based on the existing fleet and on number of fishing vessels in each category, a total number of fishing days is assigned for each fishing system. This total number of fishing days is allocated among vessels in that category, so that a specific number of fishing days will be assigned to each vessel. Since the Eighties, Corsican fleet has decreased slowly and regularly. In many cases, old fishermen leave the fishery sector and younger men do not recover their boats. Hence, after a departure of a fisherman, the free quota in term of number of fishing day:

- Could be redistribute to other fishermen if state of resource is acceptable,
- Could be attributed to another entry to the fishery,
- Could be give up if resource decreases.

OPTION 3: Quota as a portion of the total fishing capacity, considering the overall fishing time and the overall horsepower/size of fishing vessels

The fleet in Corsica is composed by 5 % trawlers characterized by an important horsepower and tonnage. So, 95 % of the fleet is a small-scale fishery with low technical capacity. Among small-scale vessels there are still important differences related to length/horsepower/tonnage, but this parameter is not correlated with the number of days at sea and with the landing quantities. In fact, an increase in horsepower in Corsica is mainly associated with an improvement of the security, but not with an amplification of the fishing effort. Hence, from this observation, a quota calculated as a portion of the total fishing capacity is maybe the worst criteria from a Corsican point of view.

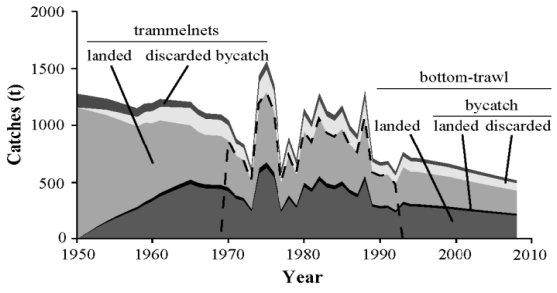
Fisheries management model based on a TFC system: background biological, ecological and environmental data and information for Corsica Region and the Corsican Sea

>> Annual overall fish catches and CPUE (Catches Per Unit Effort) in your Region*:* 500 Tons

Comments *(please indicate also year of reference and indicative trend for the last years)*:

There are two information sources at the scale of whole Corsica:

Le Manach *et al*. (2011)[1]: Estimations are mainly established on the basis of FAO data, official statistics and available insular literature (figure below).



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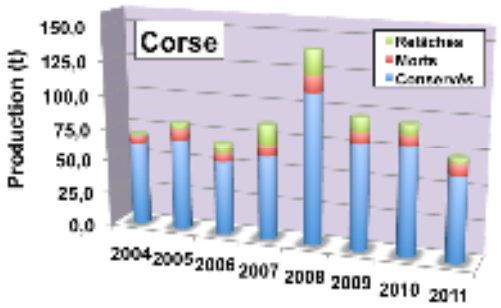
Pere (2012)[2]: Fishing effort and production data have been collected between 2004 and 2011 by a network of investigators, on the entire island. This data have been collected only during boarding with fishermen. In this study, only spiny lobster fishery was studied (figure below).



There are data collected directly by professional fishermen, and stored in logbooks. These fishery notebooks are afterwards sent to French administration (France Agrimer) who is responsible of statistical treatment. Unfortunately, these data aren't available yet.

The 500 tons mentioned above are established by Le Manach *et al*. (2011). These productions consider only demersal artisanal fisheries. Thus, long liner catches haven't been included in these estimations.

[1] Le Manach F, Dura D, Pere A, Riutort J-J, Lejeune P, Santoni M-C, Culioli J-M, Pauly D. 2011. Preliminary estimate of total marine fisheries catches in Corsica, France (1950-2008). In: Harper S, Zeller D (eds.). *Fisheries catch reconstructions: Islands, Part II. Fisheries Centre Research Reports*. Fisheries Centre, University of British Columbia. 3-14.

[2] Pere A. 2012. Déclin des populations de langouste rouge et baisse de la ressource halieutique en Corse – Causes et perspectives. Thèse de doctorat, spécialité biologie marine, mention biologie des populations et écologie. Université de Corse, France. 478 pp.

>> Annual overall fish catches for the main commercial species in your Region*:*

Species	Quantity (T)	% of total catches
1. *Diplodus* spp (Le Manach *et al*., 2011)	171	/
2. *Palinurus elephas* (Pere, 2012)	112	/
3. *Dentex dentex* (Le Manach *et al*., 2011)	112	/

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4. *Scorpaena scrofa* (Le Manach *et al*., 2011)	58	/
5. *Physis* spp (Le Manach *et al*., 2011)	37	/

Comments ***(please indicate also year of reference and indicative trend for the last years)*:**

Data below have been established in 2008, for all Corsica. We don't give percentages because there is a lack of data for some commercial species specifically targeted in Corsica, including:

- Prawns (caught by bottom trawlers),

- Tuna and swordfish (caught by long liners) and

- Red mullet (caught by netters). This lack of data creates a bias in the overall catch estimates, thus making percentages calculation unreliable.

Evolution of catches for the whole Corsica, based on boarding data, is only available for the main target species of small-scale fisheries, the spiny lobster *Palinurus elephas*. The study by Pere (2012) showed a wide variation in production between 2004 and 2011 (63 tons in 2004, 112 tons in 2008, see figure above). Considering that fishing effort on this resource has remained stable over time, this variation has been linked with a successful recruitment resulting from biologic, ecologic and oceanographic processes that are still poorly understood.

>> Catch seasonal trends in your Region: overall catches per month*:*

There are not catch data per month in Corsica. On the island, fishery is very seasonal. Halieutic activities mainly take place between March and October. During the winter months (November-February), few fishing gears are use. Only a few bottom trawlers and long liners go out at sea.

>> Catch quantities and composition for each fisheries system in your Region*:*

For netters (i.e. trammel nets) and bottom trawlers, catch data, without species distinction, are illustrated in the figure above (Le Manach *et al*., 2011). Please keep in mind that these data have been mainly estimated from available official statistics.

Pelagic longliner catches are not available in Corsica.

Finally, *Palinurus elephas* data taken on board are the only information available across the whoke island (Pere, 2012; see on figure above). Only netters catch spiny lobsters in Corsica.

>> Data and information on discard practice in your Region ***(if available, please add detailed data on discard quantities for each species, fisheries system, etc):***

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Discard data for netters and bottom trawlers are shown above, in both figures (Le Manach *et al*., 2011; Pere, 2012).

Netters choose to discard, spiny lobsters according to the physiological condition of animals (dead animals, under-sized animals released alive). Generally, netters' discard are low, and most catches are commercialized.

Discards are low for long liners. They are mainly under-sized or Commercial species that are not submitted to quotas. Long line is indeed a very selective gear, and in most cases, fishes are released alive. Furthermore, long liners are scarce in Corsica.

Bottom trawler discards can be more important than in both both of the aforementioned fisheries segments. Moreover, most caught individuals belonging to commercial species are commercialized. Overall, discards remain low because the bottom trawler fleet is only composed of 9 vessels.

>> Data and information on population dynamics and life histories of the main commercial species in your Region, including studies on fishing mortality *vs* fish natural mortality (*please provide a general summary and a reasoned list of relevant documents/publications*):

To our knowledge, there is only one study in Corsica about population dynamic including fishing mortality *vs.* fish natural mortality. This study was carried out by Jean Marin[1] in 1987, and concerns the stocks of the spiny lobster *Palinurus elephas* stock. This document describes fishing activity in Corsica, evaluate spiny lobster fishing effort and production between 1983 and 1984, estimates growth parameters and sexual maturity of crustaceans. Finally, stock evaluation and optimal exploitation conditions (cohort analysis, yield per recruit, fecundity per recruit) are done.

[1] Marin J. 1987. Exploitation, biologie et dynamique du stock de langouste rouge de Corse, *Palinurus elephas* Fabricius. Thèse d'Etat, Université d'Aix-Marseille II, Faculté des Sciences de Luminy. 328 pp.

>> Data and information on the state of fish stocks in your Region (*please provide a general summary and a reasoned list of relevant documents/publications*):

There is no consistent information about the state of fish and crustacean stocks in Corsica, except for the aforementioned study. However, studies concering particular species (e.g. common spiny lobster) or small geographic area (e.g. marine protected area) were done. Main publications are thematically listed below.

<u>Common spiny lobster:</u>

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- Marin J. 1987. Exploitation, biologie et dynamique du stock de langouste rouge de Corse, *Palinurus elephas* Fabricius. Thèse d'Etat, Université d'Aix-Marseille II, Faculté des Sciences de Luminy. 328 pp.

- Riutort J-J. 1999. Rapport final. Pêche de la langouste rouge (*Palinurus elephas*), en Corse (Production, sélectivité des engins de pêche, effet réserve des cantonnements à crustacés). CRPMEM. 117 pp.

- Pere A. 2012. Déclin des populations de langouste rouge et baisse de la ressource halieutique en Corse – Causes et perspectives. Thèse de doctorat, spécialité biologie marine, mention biologie des populations et écologie. Université de Corse, France. 478 pp.

Marine protected areas:

- Culioli J-M. 1995. La pêche professionnelle dans la Réserve Naturelle des Iles Lavezzi (Corse). Effort et production (Août 1992 - juillet 1993). Travaux scientifiques du Parc Naturel Régional et Réserves Naturelles de Corse. 106 pp.

- Le Direac'h L, Cadiou G, Boudouresque C-F. 2002. Mise en place d'un suivi de l'effort de pêche professionnelle dans la réserve de Scandola (Corse). Données 2000-2001. Contrat Parc Naturel Régional de Corse & GIS Posidonie publ., Fr. 61 pp.

- Mouillot D, Tomasini J-A, Culioli J-M, Do Chi T. 2007. Developpement durable de la pêche artisanale sur le site de la Réserve Naturelle des Bouches de Bonifacio (Corse du Sud) - Programme MEDD LITEAU 2 : gestion intégrée des zones côtières. Université de Montpellier 2. 65 pp.

Trawlers:

- Dintheer C. 1982. Premiers résultats des prospections par chalutage du talus de la côte orientale de la Corse. Conseil général des pêches pour la Méditerranée (CGPM), rapport de la première consultation technique sur l'évaluation des stocks dans la Méditerranée centrale. *FAO, Rapport Pêche*. 97-100.

- Bertrand JA, Gil de Sola L, Papaconstantinou C, Relini G, Souplet A. 1998. An internation bottom trawl survey in the Mediterranean: the MEDITS programme. Actes de colloques IFREMER 26, 76-93.

- MEDITS. 2007. Assessment of indicator trends related to exploited demersal fish populations and communities in the Mediterranean. DCR Medits Working group. Nantes (France), 15-18 March 2005 and Kavala (Greece), 2-6 April 2006. 168 pp.

>> Data and information on stock overexploitation (if any) in your Region (*please provide a general summary and a reasoned list of relevant documents/publications*):

In Corsica, there are no data that clearly shows stock overexploitation.

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Fisheries management model based on a TFC system: background social, economic and regulatory data and information for Corsica Region and the Corsican Sea

>> Data and information on the fleet in your Region:

Overall N. fishing vessels	Average age	Average tonnage (GT)	Average engine power (kW)
191	30	5,6	103,3

Comments *(please indicate also year of reference and indicative trend for the last years)*:

Corsican fleet represents 4% of French fleet (metropolitan France). Technical features are weaker than national average. The average age of vessels is seven years older than the national average. Corsican vessels have a lower average engine power (103 kW vs. 154 kilowatts) and a much lower average tonnage (5.6 GT vs. 35 GT) than the rest of the French fleet.

>> Fleet trend (entry/exit) in your Region:

Fleet	Units		Age	Tonnage	Engine power
	N. vessels	% of total fleet	Average age	Average tonnage (GT)	Average power (kW)
Entries	**4**	**2,1**	**34**	**3,1**	**64,3**
Exits	**6**	**3,1**	**33,2**	**4,6**	**87**

Comments *(please indicate also year of reference and indicative trend for the last years)*:

Vessels exiting Corsican fleet number is more important than the one of ships entering the fleet. New entries do not show technical features' improvements. On the contrary, they are slightly lower. The evolution of the number of vessels only affects small-scale fisheries, as bottom trawler number is stable between 2011 and 2012.

>> Data and information on the main fisheries systems in your Region (including small-scale fisheries):

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Fleet	Units		Age	Tonnage	Engine power
Fisheries system	**N. vessels**	**% of total fleet**	**Average age**	**Average tonnage (GT)**	**Average power (kW)**
1. Small-scale fisheries	**182**	**95,3**	**29,6**	**3,7**	**98,2**
2. Bottom trawlers	**9**	**4,7**	**36,7**	**43**	**207,9**

Comments *(please indicate also year of reference and indicative trend for the last years)*:

More than 95% of Corsican fleet is composed of small-scale fishery. They are old vessels with low engine power and low tonnage. Bottom trawlers are rare, less than 5% of Corsican fleet. They are characterized by an older age than small-scale vessels, and much larger engine power and tonnage.

>> Fishing days in your Region (2011) :

Overall annual fishing days (total number for the entire fleet): 15 200 days

Average annual fishing days (per fishing vessel): 84 days

Comments *(please indicate also year of reference and indicative trend for the last years)*:

Figures submitted for the number of fishing days only take small-scale fisheries into account. There are no data available for bottom trawlers.

Fishing activity is very seasonal, as the vessels have an important spring/summer activity and a low winter activity. This is due to the following factors:

- Market is mostly regional, and all marine products caught are sold on the island. Thus, the sale is important during summer months to meet tourist demand and decreases considerably during the winter months when consumption is only local;

- Small-scale fisheries use small vessels, with low engine power and tonnage, and make 1-day fishing trips. These vessels are not suitable to go out at sea in bad weather conditions. Since weather conditions are worse in winter, the number of possible fishing days is limited during this season.

- Spiny lobster fishing is closed from October to February. Spiny lobsters are the main target species of small-scale fisheries in Corsica, and their fishing activity is accordingly reduced during the the period where catching these animals is prohibited.

>> Fishing days per fisheries system:

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Fisheries system	Overall fishing days (total number for the whole fleet segment)	Average fishing days (average number per vessel in the segment)
1. Small-scale fisheries	**15 200**	**84**
2. Trawlers	**/**	**/**

>> Types of fisheries in your Region: multispecific *vs* single-species catches:

Type of fisheries	Target species	Fisheries system	Units		Tonnage	Engine power
			N. vessels	% of total fleet	Average tonnage (GT)	Average power (kW)
Multispecific	**Spiny lobster, Sparidae, Scorpaenidae, red mullet, john dory, etc.**	**Coastal small-scale fisheries**	**178**	**93,2**	**3,6**	**95,3**
	Tuna, swordfish	**Offshore small-scale fisheries**	**4**	**2,1**	**9,7**	**223,2**
	Lobster, whiting, hake, squid, etc.	**Bottom trawlers**	**9**	**4,7**	**43**	**207,9**
Single species	**/**	**/**	**0**	**0**	**/**	**/**

Comments *(please indicate also year of reference and indicative trend for the last years. Kindly provide detailed indications on fisheries systems associated to multispecific and single-species catches)*:

In Corsica, all fisheries are multispecific. More than 90% of vessels have a coastal fishing activity, targeting crustaceans and fishes with nets, traps and benthic long lines. Landed weights are low but market value of these species is important.

Offshore small-scale fisheries only concerns 2% of Corsican fleet. These vessels have more powerful engines to fish large pelagic species in offshore areas.

Trawlers represent 5% of the Corsican fleet. They target deep species on the continental shelf of the East Coast.

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ANNEX II – QUESTIONNAIRE STRUCTURE AND RESPONSES

QUESTIONNAIRE STRUCTURE

Data, information and opinions on the appropriateness and transferability of a fisheries management model based on a TFC system to the Mediterranean context, and on possible modes of applicability, were gathered through a comprehensive questionnaire that was submitted to all project partners. The questionnaire included a preliminary section with an introductory framework and general information, and was then subdivided into the following main sections:

- **1st Thematic Section** - ***Options for quota determination and allocation criteria.***
  A schematic table was provided, and all project partners were required to complete the table providing information on the various options for Quota determination and related allocation criteria according to their Regional situation. Partners were also asked to give a list of advantages and disadvantages associated to each option from an biological/ecological/environmental point of view and a social/economic/regulatory point of view.
- **2nd Thematic Section** - ***Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues.***
  All project partners were required to answer a series of closed and open questions (12 questions) on biological, ecological and environmental issues related to TFC, in order to gather data, information and opinions aimed at developing a fisheries management model based on a TFC system at the Mediterranean level.
- **3rd Thematic Section** - ***Fisheries management model based on a TFC system: Social, Economic and Regulatory issues.***
  All project partners were required to answer a series of closed and open questions (26 questions) on social, economic and regulatory issues related to TFC, in order to gather data, information and opinions aimed at developing a fisheries management model based on a TFC system at the Mediterranean level.

  In addition, the 2nd and 3rd Thematic Sections included a "**pilot testing**" part, which was aimed at gathering more detailed, in-depth and exhaustive data and information on fisheries-related issues that could be relevant for the introduction of a TFC system from partners participating in the pilot test (Marche Region, Corse). Information collected in the framework of the pilot testing spanned from data on fisheries target species (catches, population dynamics and stock assessment, etc), fish landing data, data related to fishing effort (fleet and fishing vessel characteristics, fishing gears and systems, fishing days, etc), economic and social parameters.

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The questionnaire was sent to all partners for the first time on 30 October 2012, and the deadline for submission was set on the following 30 November. In order to gather the completed questionnaire, a series of reminders had to be sent according to the following time schedule:

- First sending of the questionnaire: 30 October 2012. Deadline for submission: 30 November 2012
- First reminder: 20 November 2012. Deadline for submission: 30 November 2012
- Second reminder: 28 November 2012. Deadline for submission: 30 November 2012
- Third reminder: 7 December 2012. *New* deadline for submission: 15 December 2012

Six out of eleven project partners supported this pilot action by filling out the TFC questionnaire:

- **PACA Region**
- **Corsica Region**
- **Valencia Region**
- **Marche Region**
- **Liguria Region**
- **Toscana Region**

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QUESTIONNAIRE RESPONSES

The responses to the questionnaire on Transferable Fishing Concessions are presented hereby in full detail for each project partner's Region.

PACA Region (FRANCE)

2nd Thematic Section: Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues

2.1. What are the main species of commercial interest caught in your Region?

The production of Mediterranean fisheries is about 8% of national production. PACA Region is only 19.5% of French Mediterranean fishing tonnage and represents 16% of the overall French mediterranean façade's economic value. The only auction ("criée" in french language) in the Region (located in Port de Bouc) closed in early 2010, following to the reduction of inputs (low resource) and to the number of ships (trawlers in particular). Direct selling (where available) is the usual way for the fishery business; almost all sales are made through direct sale to dock in the direction of consumers, restaurateurs and some fishmongers. The top 3 species in terms of tonnage within the Region PACA are the common anchovy (30% and 62% in terms of value/sales), the common sardine (23% and 20% in terms of value/sales), and the common hake (7% and 3% in terms of value/sales). Although it is logical that different species are identified throughout the French coast, the PACA Region has targeted significant species such as the common anchovy or the common sardine. For the latter, this represents most (62%) of sales. Other notable marketable species include: bluefin tuna, swordfish, European seabass, gilthead seabream and other sparids, sole, mackerel, octopus, spiny lobster, lobster.

2.2. Do you have in your Region an archive/database with a detail of catch data for each fishing district? And for each fishing vessel (quantities in kg/ton of species of commercial interest)? *(please indicate the source of data and the competent authority for archive/database implementation and update)*

Yes ☐
No ☒
I don't know ☐

Detailed explanation:

At the moment there is no specific database managed and updated at the Regional level. The declarations of catches of professional fishermen (logbooks) are not treated by the administration for lack of human resources. France Agrimer, a public body related to agriculture and fisheries, is in charge of implementing at the national level measures included in the Common Agricultural Policy and actions aimed at the agricultural and fisheries supply chains. France Agrimer collects data but only at the Mediterranean level. The same remark is valid for IFREMER, the French Research Institute for Exploitation of the Sea, a well-known French oceanographic institution, which nurishes a database regarding fisheries but only for the Mediterranean. However, a fisheries & aquaculture socio-economic observatory is about to be created in PACA Region, in order to obtain an exhaustive data collection system on fisheries (caught species, volumes, state of the stocks, etc), which is currently lacking at the national level. The creation of this observatory has been an initiative of the Regional Fisheries Committee and the Regional Council, and will be funded by internal funds and the EU (EFF 2007-2013).

2.3. In certain areas (*e.g.* Scotland, Iceland) ITQ (Individual Transferable Quotas) are mainly assigned on the basis of fishing vessels' catch histories (species and quantities caught in recent years by each vessel – usually the last three years). Do you think this system would be appropriate and feasible for your Region?

Yes ☐

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No ☒

I don't know ☐

For what reasons?

The experience with bluefin tuna quotas in the Mediterranean has not been positive for several reasons including illegal catches and difficulties in traceability. More in general, the adoption of quotas for small-scale artisanal fisheries is not appropriate. In addition, PACA Region has no interest in developing an ITQ system even for fish under a quota regime such as the bluefin tuna. With regard to species which are not under a quota regime, scientific data on stock status are still too scattered and they would not allow to determine a quota and ITQ system. However, bluefin tuna management is currently giving good results, also due to the collaboration of fishermen. The stock is now recovering and the MSY may be reached by 2022. Fishermen are now not only strictly following regulations, but they are also involved in research programme with IFREMER and other bodies (e.g. aerial surveys to assess the status and distribution of stocks, innovations to increase selectivity of fishing gears, genetic studies).

2.4. If you think that a system based on catch histories is appropriate for your Region, how would you assign quotas to "new entries"?

New entries are only possible through the acquisition of existing fishing vessels and licences, and in certain cases of special fishing permissions (permis de pêche spéciaux, PPS). Considering the difficulties faced by the fisheries sector, new entries are in any case rather unlikely since fishermen who have just entered the profession would find it particularly difficult to make a living out of fishing.

2.5. Do you think that the concept of Maximum Sustainable Yield (MSY) is appropriate and exhaustive for the development of sustainable fisheries management models?

Yes ☐

No ☒

I don't know ☐

For what reasons?

In addition to the uncertainties in reaching the MSY goal by 2020, there is a problem in determining MSY and especially in developing a method to calculate it for multispecies fisheries. There have been many objections to the EC proposal of calibrating multispecies MSY on the most threatened species, since this would cause an unnecessary ban on species with stocks in good status. Calculations could be based on the mortality rate for each target species, but this type of data may not be available. More in general, it would be good to develop specific management tools at the Regional level, and to enhance a dialogue with non-European countries in order to fix specific MSY goals within multiannual management plans calibrated on each target species and for each Region in the framework of more general MSY guidelines. This is difficult to achieve however, due to the lack of sufficient scientific data and to the difficult dialogue with non-EU third countries. The concept of MSY is still too theoretical and it is related in very general terms to stock densities. The current determination of stock status is based on scientific assessments which do not take into account all the different factors that have an influence on resource fluctuations (climate change impacts, maritime pollution, natural predation, etc). The MSY definition is relatively easier for single stocks as it is the case for Northern Sea fisheries, but it is very difficult in case of mixed species catches, as it is the case for Mediterranean fisheries. In addition, data on the state of resources are available for only a few areas. The situation in the Mediterranean sea is very different from that of other European basins, where the research institutes monitor the stocks under TAC and quota systems in order to determine the annual catches that can be allowed for each target species. In the Mediterranean, the MSY should be determined for groups of species according to fishing systems, seasons and areas, also considering that MSY for mixed species should have a margin of flexibility.

2.6. If you think that the concept of MSY is not appropriate or exhaustive, what resource assessment models would you suggest as more suitable?

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Even if obtaining sound scientific data is important, direct field methods such as echo-surveys could be an interesting way to assess stock status. However, echo-surveys could only be applied to big fishing vessels (trawlers) in the framework of fishing expeditions aimed at catching high quantities of fish. In addition, trawlers are only focused on 2 or 3 target species, and this would decrease the appropriateness of this direct method. This type of direct methods are however not appliable to the fleet of PACA, which is characterised by small vessels (< 12 m). The acquisition of sonars to carry out echo-surveys is not cofinanced by the EU anymore, since this was seen as a measure to potentially increase the fishing fleet, although it is in fact a way to reduce the fishing effort through the constant monitoring of stock status. It would be interesting to see if the assessment of stock status could be carried out by "prud'homies de pêche" (for example according to the season) in order to link these assessment to a more sustainable fisheries management and conservation of resources at the regional/local level.

2.7. Is discard a common practice in your Region?

Yes ☐
No ☒
I don't know ☐

Detailed explanation:

PACA is characterised by artisanal multispecies fisheries, which is associated to lower discards. In general terms, discards are higher for trawling fishing, where it is easier to catch non-commercial or small-size species. For small-scale pelagic species such as sardines and anchovies the problem of discards has been tackled by using nets with bigger mesh size.

2.8. Do you think that a TFC system could enhance the practice of discards?

Yes ☒
No ☐
I don't know ☐

For what reasons, and which solutions would you suggest in order to prevent this problem?

A TFC system is in general not appropriated for PACA fisheries. Having said this however, the idea of carrying out control and surveillance activities on board fishing vessels could be a good way to prevent discards. The proposal of setting up a supply chain to transform discards into fish flour is not approved by PACA fishermen (additional costs, difficulty of access for small-scale fishermen, economic interests by big enterprises, etc).

2.9. How would you calibrate a TFC system in your Region, taking into account (i) catch limits (TAC and contingencies) and (ii) fishing effort (fishing capacity times fishing activity)?

It would be anomalous to develop a TFC system in the Mediterranean where there are no quotas except for bluefin tuna (for swordfish the possibility is under study). Small-scale fishermen are already facing difficulties in the access to these quotas: 90% of bluefin tuna national quota is hold by just a few big vessels, and small-scale fisheries segment has access to just 10% of the authorised catches. In addition, there is the competition of non-EU and non-European countries. In the Mediterranean, for example, an Exclusive Economic Zone (EEZ) of up to 200 miles will be created, and the effect of TAC will be decreased in this zone.

2.10. How would you calibrate a TFC system in your Region, taking into account the main fisheries systems? Please consider in particular issues related to (i) multispecific fisheries; (ii) different fishing gears used for a single species; (iii) prevalence of small-scale fisheries.

I would not apply a TFC system to PACA fisheries. Fish are caught through various different fishing systems, and often fishing systems are peculiar of specific zones. Small-scale fisheries represents 90% of the fleet in PACA, and bigger vessels (trawling fishing, light fishing, tuna fishing) are a minority. Fishermen have developed specific and diversified fishing techniques, which are often seasonal, to adapt to the characteristics of the area: high number of target species, reduced continental plateau, presence of the river Rhone and of lagoons where fish spend part of their life cycle.

2.11. Would you limit TFCs only to certain:

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- Types of fisheries resources?

  Yes ☒
  No ☐
  I don't know ☐

  For what reasons?

In PACA there is only one Producers Organization in Port-de-Bouc. TFC are not suitable in this case, they should be applied only to single-species fisheries.

- Fishing areas?

  Yes ☒
  No ☐
  I don't know ☐

  For what reasons?

As said above, only in areas characterised by single-species fisheries, which is not the case in PACA. PACA is characterised by artisanal coastal fisheries (less than 12 miles from the shoreline, daily fishing, high seasonality) with fishing activities and systems typical of small-scale fisheries. In general terms, fishermen are more vulnerable to market crisis but they are still putting a considerable effort in making their products a synonym for quality. Fishing vessel tonnage in PACA is lower than in the Atlantic, but also than the neighbouring region of Languedoc-Roussillon.

- Fleet segments and fisheries systems?

  Yes ☐
  No ☒
  I don't know ☐

  For what reasons?

More than 90% of PACA fleet is composed of small vessels (< 12 m) and therefore they would not be interested by TFC even if this system were put in place at the national level. A direct consequence is on the composition of the fleet with a total number of vessels of 674 units that overcome on average 25 years old. Briefly, in 1990: 929 ships representing 69 809 KW and in 2010: 674 ships representing 50 469 KW, namely a decrease of - 27.5% in the number of ships over the past 20 years. This decrease is partly due to natural work stoppages (retirement of fisherman chief) and to scrapping plans that mainly involved the segment of trawlers (about 35 ships in 1991, there remain 17 in 2010) and more recently on sensitive fisheries: tuna seiners and « thonailleurs » (= tuna fishing to driftnet). TFC will be adopted by Member States on a facultative basis, and France seems not to be interested in adopting them.

- Other specificities?

  Yes ☐
  No ☒
  I don't know ☐

  For what reasons?

As said, a TFC system is not appropriate for PACA fisheries, which is multispecific, coastal, artisanal, multigear, characterised by species that are not very widely distributed.

2.12. Do you think that TFCs should be finely tuned on regional market trends, within the TAC and national contingency limits allocated on an annual basis?

Yes ☐
No ☒

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I don't know ☐

For what reasons?

A fisheries management system should not be based on market fluctuations. In addition, the most common way of selling fish is in PACA is by direct selling at the docks.

3rd Thematic Section: Fisheries management model based on a TFC system: Social, Economic and Regulatory issues

3.1. How are fisheries rights currently regulated in your Region? Is there a Rights Based Management (RBM) system that can be compared to a quota/concession system?

In France, fishing rights are given through licences (associated to a fishing technique and a fishing vessel, and transferable together with the fishing vessel if this is sold) and through special fishing permits (Permis de Pêche Spéciaux, PPS) on an annual basis and associated to a species. For example catches of bluefin tuna, eels, clams are subjected to the acquisition of a PPS. It is worth stressing the fact that in the Mediterranean catches are not based on TAC and Quotas except for the bluefin tuna.

3.2. In your Region, fisheries rights are regulated and assigned mainly according to:

Territorial criteria ☐

Biological criteria ☒

Economic criteria ☐

Other criteria ☒

Detailed explanation:

There are similarities with Marche Region. A licence is strictly associated to a fishing vessel and it is transferred with the vessel when this is sold. New entries should ask for specific permits which are linked to the overall available kW: for each vessel which is dismissed, the corresponding amount of kW is made available for new entries, there is a national registry for this. New entries are already facing big administrative difficulties, TFC would make the system even more difficult.

3.3. How would you define the concept of "Fishing Concession", both on legal and economic terms?

See answer 3.2, there are strong similarities with Marche Region.

3.4. How would you interpret the concept of "Transferable Concession" in your Region? (for example, consider if it may be related to a system based on fisheries rights, licences, quotas or combined solutions, and how transferability could be defined)

The transferability of a licence is part of a typical purchase and sell procedure concerning a fishing vessel as a whole (including the licence). It is not possible to have partial transferability, and it is not possible to co-own a fishing vessel. Fishing vessels and related licences are bought and sold as a single entity.

3.5. What is the most effective way to adapt the concept of "Transferable Fishing Concession" to your regional context?

There is no reason to apply a TFC system in PACA Region and more in general in the Mediterranean, considering the specific characteristics and structure of fishing activities in these areas. It may be feasible to think about a system of "fishing vessel location/rental", but the applicability of such a procedure is not clear especially considering the limited duration and the fact that this measure would be very difficult to apply and manage. In any case, TFC would determine stricter limits to catches and fishing time.

3.6. Do you think that a TFC system would be appropriate at all in your regional context?

Yes ☐

No ☒

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I don't know ☐

For what reasons?

As stated in the previous answer, a TFC system is not appropriate for PACA for several reasons: it would introduce stricter limits in terms of catches (by means of quotas) and in terms of fishing time, it would make it more difficult for new entries to enter the fisheries sector, it would cause the disappearance of a number of fishermen from the sector without real benefits in terms of productions (their concessions would be simply acquired by bigger enterprises).

3.7. Do you agree in making TFC systems facultative and discretionary for Member States?

Yes ☒

No ☐

I don't know ☐

For what reasons?

It is appropriate to make TFC facultative and discretionary at the level of Member States, and it is important that this choice is made on the basis of clear, motivated, required and shared decisions by all professionals of the sector (ideally it should be the result of an exhaustive consultation and participatory process involving all actors and stakeholders concerned with this reform proposal). Also, the process of selling and acquiring TFC should not be put in place on the mere basis of operators' interests, especially considering the weaker position of small and medium enterprises, the pressures that could be made on the fisheries market, and the difficulties created by the general economic crisis. The problems related to speculations, to the excessive concentration of TFC in a few hands (stronger economic groups/bigger enterprises), to the safeguard of small-scale coastal fisheries are still not solved. All this considered, applying a TFC system to small-scale fisheries would more likely make artisanal fisheries disappear (together with the cultural and social heritage and economy of coastal communities). In any case, the adoption of a TFC system in the Mediterranean should be a choice at each Member State's level and should be independent of market pressures.

3.8. The CFP reform proposal has indicated that TFCs should be given for a period of 15 years. What would be the optimal duration of a concession according to your regional context? *(please explain also for what reasons)*

There is not an optimal duration for TFC. If the limits in duration and validity are associated to mortage duration for new vessels, the maximum duration will be 15 years. This duration is not long enough for making long term investments in a fishing activity.

3.9. What is your position on the transferability criteria/modes suggested by the CFP reform proposal?

Theoretically, the market value of a concession is proportional to its potential profits. A TFC system would introduce new restrictions in terms of potential profits and therefore transferability itself would be decreased. More in general, the fisheries sector is facing big structural difficulties. In PACA for example trawling vessels have decreased.

3.10. Do you think that there should be some restrictions on the transferability of concessions at the territorial level?

Yes ☐

No ☒

I don't know ☐

For what reasons?

Territorial restrictions on TFC transferability would further decrease the possibility to develop the activity and thus would also decrease TFC value.

3.11. Do you think that there should be some restrictions on the transferability of concessions with regard to fishing vessels/fisheries systems (for example only fishing vessels above 12 meters; all vessels with towed gears)?

Yes ☐

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No ☒
I don't know ☐

For what reasons?

Restrictions should be made on type of fishing systems, and in particular TFC should not be transferred from fixed to trawling gears. This measure would protect in particular artisanal small-scale coastal fisheries, since trawling is carried out by bigger fishing vessels which are forced to keep at a certain distance from the coast.

3.12. Do you think that there should be some restrictions on the transferability of concessions with regard to fish categories (for example demersal/pelagic fish, small size pelagic/big pelagic fish)?

Yes ☒
No ☐
I don't know ☐

For what reasons?

Transferability should be limited to specific fisheries (for instance TFC for small-scale pelagic fish should only be transferred to fishermen catching small-scale pelagics, etc). This is important in order to avoid the transfer of fishing pressure from one resource to another and thus maintain a good control on the status of each stock and a good balance between the different fish resources.

3.13. Do you think that TFCs are an appropriate tool to increase competitiveness in the fisheries sector?

Yes ☐
No ☒
I don't know ☐

For what reasons?

No, a TFC system is based too strongly on market and economic requirements and it is associated to speculations that are not suitable for the type of fisheries carried out in PACA, that is artisanal small-scale fisheries.

3.14. What are the main pros and cons of using TFCs for competitiveness, especially considering your regional context?

In many EU countries, TFC have helped to rationalize the fleet, as pointed out in the introductory section. But in areas such as PACA, characterised by small-scale, multispecies and multigear coastal fisheries, a TFC system is not appropriate. Also, the lack of information on fish stocks and the subsequent difficulty in setting MSY, as well as the differences in stock status between areas play against the setting of TFC.

3.15. Do you think that TFCs increase job entry barriers for new generations?

Yes ☒
No ☐
I don't know ☐

For what reasons?

TFC do not favour the access to fisheries to new entries. This sums up to the difficulties of obtaining credits from banks. It is therefore very difficult for a young fisherman to have enough money to acquire a fishing vessel and the fishing licence.

3.16. Do you think that there is a high risk of TFC concentration in the hands of a few vessel owners?

Yes ☒
No ☐
I don't know ☐

For what reasons?

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The risk for bigger fishing enterprises to absorbe smaller ones is high, and the subsequent concentration of TFC in just a few hands would also further prevent the accession to the profession to new entries.

3.17. How would you avoid the risk of excessive concentration? (e.g. exclusion of small-scale fisheries, % of concessions set aside for new entries, etc)

The exclusion of small-scale fisheries could be a good way to prevent too much concentration of TFC in just a few hands. An overall better financial support for new entries would be more useful than reserving a % of TFC to new entries.

3.18. Do you prefer a system based on quotas managed and transferable on an individual basis (ITQ model), or a system based on wider quotas co-managed at the community level (CTQ model)?

Small-scale fisheries does not favour a global co-management system. It is more interested in the development of a ITQ system. However, a common management of TFC at the PO level could help to better plan production and to exchange quotas in real time. Having said this however, PACA has only one PO.

3.19. If you prefer a system based on the CTQ model, how would you define the "community"? (for example considering fishing districts, fisheries consortia, category associations)

A CTQ management by PO or "prud'homie" could be interesting both for fleet and resource management. In Mediterranean France, "prud'homies de pêche" (cofrarias en Espagne) have already legislative power, although they are not independent jurisdictional bodies according to article 234 of the Treaty on the Functioning of the European Union.

3.20. What do you think of the EU fishing vessel decommissioning schemes?

EU measures for scrapping vessels should be maintained for a longer time, or alternatively new measures should be implemented for fleet renewal with new vessels at lower fishing capacity in order to increase sustainability of the sector. The current CFP measures to adapt fleet capacity (public support for exiting the sector) are not satisfactory for enhancing economic, social and environmental sustainability of fisheries. PACA Region supports the view presented by the European Parliament rapporteur Alain Cadec to delegate decisions on vessel scrapping at the Member State and basin level.

3.21. Do you think that the adoption of a TFC system would lead to a fleet reduction in your Region?

Yes ☒
No ☐
I don't know ☐

For what reasons?

See previous answer (3.20).

3.22. In your Region, what is the position of fishermen and category associations with regard to TFCs?

Fishermen and Producers Organizations, CNPMEM, CRPMEM PACA, CCR Méditerranée and the Regional Council are all against the application of a TFC system in Region PACA, since TFC are not appropriate for the fisheries system which is not based on quotas (except for the bluefin tuna). If TFC are put in place at the national level, only about ten fishing vessels (> 12 m) would be interested by such a system in Region PACA.

3.23. *Are there any studies or surveys on this issue? (if possible, please include relevant material and/or provide a reasoned list of documents)*

Yes ☐
No ☒
I don't know ☐

Detailed explanation and implemented actions (if any):

CCR Med and CRPMEM PACA have provided recommendations indicating that a TFC system is not appropriate for the Regional situation.

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3.24. In your Region, do you think that stakeholders are well aware of TFC-related issues?

Yes ☒
No ☐
I don't know ☐

Detailed explanation and implemented actions (if any):

See answer 3.22.

3.25. Is there a legal framework that can be related to the concept of transferable concession at the national and regional level?

Yes ☒
No ☐
I don't know ☐

Detailed explanation: *(please provide also indication of the specific regional/national laws)*

In France there is a system of licences and special fishing permits (permis de pêche spéciaux, PPS). A TFC without quotas could be assimilated to a fishing licence.

3.26. In your Region, are there many dispensations from the fishing restrictions set by European legislation? (*e.g.* fishing period, fish size, fishing gears)

Yes ☐
No ☒
I don't know ☐

Detailed explanation: *(please provide also indication of the specific regional/national laws)*

European regulations in the fisheries sector are usually translated into national rules without derogations. Where derogations have been made, they are related to the definition of stricter regulations (for example, the distance from the coast of trawl fishing is 1500 m for the EU rules, but it is 3000 m for French rules).

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Corsica Region (FRANCE)

1st Thematic Section: Options for Quota determination and allocation criteria

OPTION 1: Quota in terms of resource quantity that can be caught by a fishing vessel *(quota is calculated as a portion of the total allowed catches)*	
ADVANTAGES	**DISADVANTAGES**
Biological, Ecological, Environmental aspects	
1. It could keep catches within safe biological limits. 2. It can be applied to single species fisheries. 3. Smaller vessels could sell their quotas to bigger ones and cease their activity. This could decrease fishing pressure on resources. 4. For strictly single-species fisheries (e.g. swordfish, bluefin tuna) it may be appropriate to set quotas.	1. For the majority of the species, there is a lake of biological and ecological data to proof the effectiveness of the quotas. For example, the most valuable specie in Corsica, the red spiny lobster *Palinurus elephas*, have a 5 months larval life, that make difficult the understanding of the stock-recruitment relationship 2. Necessity of very accurate studies on the resource quantity and status: introduction of a degree of uncertainty. 3. For most species, especially demersal ones, there are no exhaustive resource assessments for quota determination. 4. There are no exhaustive data which allow to assign quotas to the different GSA areas for each species. 5. Quotas assigned to each species could differ among areas, even if vessel characteristics are the same, due to differences in the ecological features of each area and in the species biology (e.g. distribution throughout the life cycle). 6. In Corsica, the majority of the species of commercial interest are part of multispecific communities, and it is not possible to catch them as single species. 7. Discards tend to increase without biological benefits. 8. Due to the short life cycle of many Mediterranean species, quotas can include adults as well as juveniles according to the chosen fishing period. 9. Small fishing vessels may sell their TFCs to bigger vessels which concentrate their catches in restricted areas. This would determine an increase of the fishing effort in specific areas. 10. In Corsica, quotas are very difficult to control because of the lake of landing structure like auction, the presence of more than 30 ports, and the direct selling.
Economic aspects	
1. Quotas put a limit on quantities that can be sold, and in certain periods quotas can cause an increase in market prices (if the same product is not brought to the market from other fishing areas, its economic value	1. Quotas are usually reached in a short time, and this could cause long inactivity periods or the use of quotas allocated to other species, with a high probability of catching also species for which the quota has already

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increases). 2. Smaller vessels could decide to sell part of their quotas to bigger vessels, thus obtaining an economic gain. 3. Quotas may give a higher value to licences and thus to fishing vessels. This may be relevant if the new EMFF does not provide financial support for vessel scrapping and/or sets limits to supports for renewal. Quotas could therefore be an advantage for fishermen, in that they give an added value to their vessels and could allow to gain higher monetary reward to fishermen who cease their activity. For that, quotas must be allow to a fishing vessel (or license) but not to the ship owner.	been reached (in this case it is most likely that species for which the quota has been reached are discarded). 2. The quota will be reached trying to catch fish of the size/age class at higher market value. In Corsica, bigger size fish have a higher commercial value. In these cases the risk is that fishermen selectively keep on board bigger-size individuals and discard the residual catches (this is both an economic and a biological consideration). 3. The controls carried out to verify catch quantities on fishing vessels have high costs and are often uneffective, as demonstrated in Northern Europe. These costs would have to be beard by fishermen. 4. In the case of transnational resources, quotas should be shared between neighbouring countries and respected also in neighbouring areas, but this is difficult to apply and control. 5. There is the risk to concentrate quotas in a few hands, if small size vessels sell their quotas to big vessels. 6. The distribution of national quotas among fishermen could lead to anomalies related to the different distribution of fish resources in the different areas. This could lead to the uneven distribution of quotas among fishing vessels with similar characteristics but operating in areas with different resource availability. 7. Fishermen that do not obtain quotas or have lower quota values are penalized from the economic point of view. 8. The operational and maintenance costs of fishing vessels are high. Allocating TFCs on the basis of catch quotas may lead to a further decrease in the profitability of fisheries, especially if quotas are assigned to species with low market value.
Social aspects	
1. Maybe, fixing quotas could develop better collaboration between fishermen and could improve the position of the regionals institutions (e.g. prud'homies). Currently, professional activity became more individualist regarding the last century.	1. Each fishing area hosts populations characterised by specific territorial and seasonal features. Quotas can modify fishing areas according to the distribution and movements of species for which a quota has been assigned, thus modifying the typical fishing areas of the different fisheries segments. 2. As soon as a quota is reached, fishing must be suspended, and this means longer periods of inactivity and no direct incomes for fishermen. 3. Fixing quotas could reduce the time spent out at sea, and this could lead fishing vessel's owners to cut the number of crew members. 4. Smaller vessels could sell their quotas to bigger ones and cease their activity. This would cause a loss of working places.
ALLOCATION CRITERIA	

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Currently, the only quotas in Corsica concern the bluefin tuna. There is just 5 boat with special permit (i.e. PPS : permis de pêche spéciale) who can catch this resource. Quota is allocated to the island.

The problematic of the allocation criteria:

In the case of quota allocated to fishing vessel (with licence, authorization or PPS), which allocation criteria must be establish? The same quotas could be done for all fishing vessel, but boats are often different in many points. Hence, allocation criteria could be considered with:

- Technical trait of the boat like horsepower/size/tonnage: it is not proof that a big boat catch more fishes than a smaller one.
- Crew member: man can think that a crew composed by 2 fishermen have a fishing effort and catches more important that a single fisherman.
- Landing in the last few year: currently, there is insufficiently data declared on logbook by fishermen or collect by scientist to retain this criteria.

Finally, there is probably not one solution for the choice of allocation criteria, and the best way could be perhaps to find a solution after debate with professional organizations.

The problematic of the target species:

In Corsica, the two main fish catch by longline are bluefin tuna and swordfish. When bluefin tuna quota is closed, fishermen could work again with longline to catch swordfish, without major fishing mortality because many tuna could return alive at sea. But it's not the case with the main fishing gear used by the quasi totality of the small-scale fishery: trammelnet. This gear catches multiple species like sparidae, scorpeanidae, mullidae, various cephalopod and crustacean. Majority of catch are dead during net hauling. The instauration of quotas for a single specie favour discards.

OPTION 2: Quota as a portion of the total fishing time independent of the species
(only the total time for which a vessel is allowed to fish is considered, with no restrictions on chosen areas or caught species)

ADVANTAGES	DISADVANTAGES
Biological, Ecological, Environmental aspects	
1. Environmental pressure will not increase since the overall time spent fishing will be kept constant or will decrease as a consequence of quota setting. 2. If the fixed quota is lower than the current total fishing time, the fishing effort would decrease with positive impacts on the status of stocks. 3. It reduces discards and accessory catches. 4. If fishing times could be related to the life cycles of the species of main interest, this would allow to better safeguard those species.	1. Fishing time cannot be calibrated on each and every species' dynamics, and even associating it to the species of main interest may be very difficult. 2. The MSY goal for each species will not be reached, since fishermen will use their fishing time to catch whatever species, taking into account only the economic gain. 3. Fishing time cannot be associated to a biological community because fishermen will catch species wherever it is more profitable. 4. Fishing effort would be concentrated in periods which are more economically convenient or environmentally favourable, with the risk of stock overexploitation during such periods.
Economic aspects	
1. Since the total fishing time is limited, the best meteorological conditions can be chosen throughout the year.	1. Fishing time is lower, and thus catches and economic revenues will probably be lower too. 2. The total fishing time cannot be flexibly varied

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2. Smaller vessels could decide to sell their time-quotas to bigger vessels. 3. A decrease in costs due for instance to lower fuel consumption, since fishing trips can be betters planned and optimized. 4. Quotas may give a higher value to licences and thus to fishing vessels. This may be relevant if the new EMFF does not provide financial support for vessel scrapping and/or sets limits to supports for renewal. Quotas could therefore be an advantage for fishermen, in that they give an added value to their vessels and could allow to gain higher monetary reward to fishermen who cease their activity.	according to market requirements. 3. In the last portion of the year, many vessels will have already finished their fishing time. 4. If fishing effort is concentrated in certain periods, this may cause the landing of high fish quantities all in the same period, thus causing a decrease in prices.
Social aspects	
1. The time to be spent out at sea can be better planned throughout the year, and this will improve the quality of life.	1. Difficulties in calibrating fishing time allocation for vessels of different size and using different fishing systems. 2. Daily fishing times can be very different, ranging from 10 to 24 hours, fixing a maximum number of fishing days can make "working days" longer in terms of hours spent out at sea. 3. Controls must be very intense in order to avoid infringements. 4. In Corsica, man can think that quota as a portion of the total fishing time is impossible to control, because off the multiple port spread out 1 000 km coastline. 5. If quota is allowed to the Corsican fleet and not for each fishing vessel, it will generate many conflicts through the profession.
ALLOCATION CRITERIA	
Based on the existing fleet and on number of fishing vessels in each category, a total number of fishing days is assigned for each fishing system. This total number of fishing days is allocated among vessels in that category, so that a specific number of fishing days will be assigned to each vessel. Since the 80', Corsican fleet decreases slowly and regularly. In many cases, old fishermen leave the fishery and younger men do not recover their boats. Hence, after a departure of a fisherman, the free quota in term of number of fishing day: • Could be redistribute to other fishermen if state of resource is acceptable, • Could be attribute to another entry to the fishery, • Could be give up if resource decreases.	
OPTION 3: <u>Quota as a portion of the total fishing capacity</u>, considering the overall fishing time and the overall horsepower/size of fishing vessels ***(the quota is assigned to each vessel as a function of its horsepower/size and the maximum fishing time, and therefore it will vary according to a fishing vessel's characteristics)***	
ADVANTAGES	**DISADVANTAGES**
Biological, Ecological, Environmental aspects	

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1. Each fishing vessel operates with quota restrictions, which are mainly related to its horsepower/size, and it can catch a certain amount of fish (of whatever species) during a specific fishing time. 2. Small vessels could sell their quotas and the fleet could be restructured, causing a reduction in fishing effort and a lower pressure on fish stocks.	1. There is no connection between quotas of allowed catches and levels of resource exploitation for each species, and thus the benefits on the status of specific stocks cannot be evaluated. 2. The decrease in fishing effort is not targeted on specific species, and thus it is not possible to control pressure levels on specific species (especially those that should be more safeguarded). 3. In Corsica, it is not proved that a big vessel fish more than a smaller one. So, this criterion could not be efficient for the sustainable exploitation of the resource.
Economic aspects	
1. Bigger vessels will get more quotas. 2. Smaller vessels could sell their quotas to bigger ones thus obtaining a direct monetary reward.	1. Only the declared (registered) horsepower can be considered for quota allocation, but the real horsepower of fishing vessels is often higher than the registered one. 2. The quota allocated to same-horsepower fishing vessels will not have the same value for each one of them, since the real value depends on the species composition of catches, which varies according to fishing areas (for instance it is different in coastal and deep sea areas). 3. In Corsica, it is not proved that a big vessel has got a higher profit than a smaller one. Other consideration like crew members could be considered.
Social aspects	
1. Job contracts can be fairer because the maximum fishing time is clearly stated.	1. Risk to increase fishing capacity in order to obtain more quotas. 2. When the quota limit is reached, fishermen will have no direct incomes. 3. An income reduction can be expected for both vessel owners and crew. 4. Smaller vessels (lower horsepower) would get very small quotas and thus would not obtain sufficient economic gains from their fishing activity anymore.
ALLOCATION CRITERIA	
The fleet in Corsica is composed by 5 % trawlers characterized by an important horsepower and tonnage. So, 95 % of the fleet is a small-scale fishery with low technical capacity. For them, it exist important differences for length/horsepower/tonnage between the fishing vessels, but this parameter is not correlated with the number of day at sea and with the landing. In fact, increase the horsepower in Corsica is mainly associated with an improvement of the security, but not with an amplification of the fishing effort. Hence, from this observation, a quota based as a portion of the total fishing capacity is maybe the worst criteria in a Corsican point of view.	

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2nd Thematic Section: Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues

2.1. What are the main species of commercial interest caught in your Region?

Netters: spiny lobster (Palinurus spp.) ; spider crab (Maja squinado) ; lobster (Homarus gammarus) ; scorpion fish (Scorpaena scrofa) ; anglerfish (Lophius spp.) ; john dory (Zeus faber) ; red mullet (Mullus spp.) ; Sparidae; grouper (Serranidae spp.) ; fork-beard (Physis spp.) ; ray (Raja spp.) ; cuttlefish (Sepia spp.) ; octopus (Octopus vulgaris)

Long liners: swordfish (Xiphias gladius) ; tuna (Thunnus spp.)

Bottom trawlers: Norway lobster (Nephrops norvegicus), European hake (Merluccius Merluccius), blue whiting (Micromesistius poutassou) ; several species of octopuses and squids.

2.2. Do you have in your Region an archive/database with a detail of catch data for each fishing district? And for each fishing vessel (quantities in kg/ton of species of commercial interest)? *(please indicate the source of data and the competent authority for archive/database implementation and update)*

Yes ☐
No ☒
I don't know ☐

Detailed explanation:

For The fishing data for Corsica are very partial. Since a few years ago, fishermen have to fill in logbooks (catches declarations). Like in the PACA region, this data aren't treated by France Agrimer yet, by lack of financial means.

The Office de l'Environnement de la Corse (OEC) implemented spiny lobster fishing monitoring between 2004 and 2010. The monitoring was done by Stareso (STAtion de REcherche Sous marines et Océanographiques from Calvi) and catch data concerning Palinurus elephas only are available for Corsica.

In southern Corsica, the RNBB (Réserve Naturelle de Bonifacio) has been carrying out an artisanal fishery monitoring for many years. Catch data for various commercial species exist locally.

Since 2011, catch data are collected for the DPMA (Direction des Pêches Maritimes et de l'Aqualculture) by Stareso. This monitoring samples netters, long liners and bottom trawlers, but the data aren't treated yet.

2.3. In certain areas (*e.g.* Scotland, Iceland) ITQ (Individual Transferable Quotas) are mainly assigned on the basis of fishing vessels' catch histories (species and quantities caught in recent years by each vessel – usually the last three years). Do you think this system would be appropriate and feasible for your Region?

Yes ☐
No ☒
I don't know ☐

For what reasons?

More than 95% of fisheries are small-scale fisheries. Data catch declared by fishermen are scant and not always reliable. Thus, the ITQ assigned on the basis of fishing vessels' catch histories does not seem to be an adequate management policy for the Corsica.

2.4. If you think that a system based on catch histories is appropriate for your Region, how would you assign quotas to "new entries"?

Possession of a fishing license (and special fishing permission - PPS: permis de pêche speciale - for blue fin tuna and swordfish) is required to practice any form of commercial fishing in Corsica. The number is determined by the French State. Moreover, the number of vessels tends to decrease these last years.

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2.5. Do you think that the concept of Maximum Sustainable Yield (MSY) is appropriate and exhaustive for the development of sustainable fisheries management models?

Yes ☐
No ☒
I don't know ☐

For what reasons?

MSY is a complex concept who seems inappropriate for Corsica for many reasons:

- MSY concept is based on a good knowledge of species' stocks. At the moment, halieutic data (catch and fishing effort) are not sufficient.

- There is a lack of biologic and ecologic knowledge about the majority of Corsican commercial species, in particular about stock/recruitment relationship. For example, spiny lobster data collected in Corsica between 2004 and 2011 indicate an important fluctuation of production with a constant global fishing effort. This record was attributed to a very successful recruitment in 2003, a phenomenon not well understood by biologists, mainly because of a long larval phase (i.e. 5 month).

2.6. If you think that the concept of MSY is not appropriate or exhaustive, what resource assessment models would you suggest as more suitable?

Before development of stock management models, it seems necessary to:

- Get long term halieutic data,

- Develop biologic and ecologic studies,

- Implement an ecosystemic approach.

2.7. Is discard a common practice in your Region?

Yes ☐
No ☒
I don't know ☐

Netters: this fishery is characterized by few discard, and most of catches are commercialized.

Long liners: the long line is a very selective gear; the majority of undersized fishes can be released alive.

Bottom trawler: in this fishery, discards are more important but the discard concerns mainly non-commercial species. Moreover, bottom trawler represent less than 5% of the Corsican fleet

2.8. Do you think that a TFC system could enhance the practice of discards?

Yes ☐
No ☒
I don't know ☐

Non- commercial species discards:

If a fisherman runs out of blue fin tuna quota, he could keep on using pelagic long lines to catch other great pelagic fish (swordfish and albacore). One associated risk is that accidentally caught blue fin tuna must be returned to the water. With the TFC system, this fisherman could buy a part of another fisherman blue fin tuna quota. Thus, blue fin tuna catch could be commercialized instead of being rejected.

This management measure will have no benefit for the netters and trawlers funds because their discards of commercial species are limited.

Commercial species discards:

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The TFC will have no influence on this type of discard.

2.9. How would you calibrate a TFC system in your Region, taking into account (i) catch limits (TAC and contingencies) and (ii) fishing effort (fishing capacity times fishing activity)?

From a general perpective, it seems difficult to calibrate a TFC system in Corsica, taking into account both parameters, because there is no robust system to reliably quantify catch and fishing effort. No quota exists in the Mediterranean Sea, except for blue fin tuna. Only 5 vessels with special fishery permission (PPS) can catch this species. All these vessels are less than 12 m long. The majority of bottom trawlers are more than 12 m long but this fishery is not subject to any quota. To conclude, any vessel of the Corsican fleet is eligible for TFCs.

2.10. How would you calibrate a TFC system in your Region, taking into account the main fisheries systems? Please consider in particular issues related to (i) multispecific fisheries; (ii) different fishing gears used for a single species; (iii) prevalence of small-scale fisheries.

Will likely be difficult to calibrate a TFC system for Corsica these parameters. Small-scale fisheries represent 95% of Corsican fleet. They are, by definition, using multiple fishing gears (nets, traps, longlines…) to catch multiple species (spiny lobsters, sparids, Scorpaenidae, Serranidae…). In this context, TFCs seems be inappropriate for the Corsican fleet. After all, the most selective gear in Corsica is the pelagic long line, which targets tuna and swordfish.

2.11. Would you limit TFCs only to certain:

- Types of fisheries resources?

  Yes ☒
  No ☐
  I don't know ☐

  For what reasons?

Only for overexploited species. Species choice must rely upon sufficient biologic, ecologic and halieutic knowledge.

- Fishing areas?

  Yes ☐
  No ☒
  I don't know ☐

  For what reasons?

It would be preferable to fix territorial boundaries on an ecosystemic level rather than an administrative level. Thus, for a better resources management, TFC should be applied at stock reparation area scale for particular species.

- Fleet segments and fisheries systems?

  Yes ☒
  No ☐
  I don't know ☐

  For what reasons?

In Corsica, TFC could be tested on pelagic long lines (which target tuna and swordfish). They represent the only fishery segment currentky submitted to quotas. Tryouts should be realized on the entire island since long liners are rare and management measures could be assesed easily.

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- Other specificities?

Yes ☐
No ☐
I don't know ☒

Quotas don't seem be an appropriate management measurevfor the Corsican fleet that fishes many species using different fishing gears.

2.12. Do you think that TFCs should be finely tuned on regional market trends, within the TAC and national contingency limits allocated on an annual basis?

Yes ☐
No ☒
I don't know ☐

For what reasons?

Nowadays, the market is mainly regional, with few exports. Fishing activity in Corsica is mostly regulated by the demand, which in turns depends of touristic fluxes, and is accordingly very seasonal (important fishing activity during summer, reduced fishing activity during winter.

3rd Thematic Section: Fisheries management model based on a TFC system: Social, Economic and Regulatory issues

3.1. How are fisheries rights currently regulated in your Region? Is there a Rights Based Management (RBM) system that can be compared to a quota/concession system?

License system supervises fishery rights for each vessel. This license is allocated by the Direction Régionale des Affaires Maritimes de Corse, by delegation of Préfecture de Région for one year. There are three kind of license: bottom trawleing, coastal small-scale fishery, offshore small-scale fishery. Special fishery permission (PPS) is required in some cases, like the only species submitted to quotas in the Mediterranean (blue fin tuna and swordfish).

3.2. In your Region, fisheries rights are regulated and assigned mainly according to:

Territorial criteria ☐
Biological criteria ☐
Economic criteria ☐
Other criteria ☒

Detailed explanation:

In Corsica, total fishing effort is limited by total fleet engine power and by the total number of fishing vessels. Total attributable engine power is defined by a ministerial decree. A license and engine power is attributed specifically to each vessel. The engine power cannot be change without authorization of the granting services.
Similarly to the Marche region, new entries have to obtain a license. Given the European restrictions about fishing effort limitation, the purchase and the group of many low engine power licenses is the only way to increase the engine power of a single vessel. The decrease in the number of vessels is a direct consequence of this phenomenon.

3.3. How would you define the concept of "Fishing Concession", both on legal and economic terms?

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Fishing licenses allow utilization of different gears that specifically target different species. Thus, like Marches region, fishing concession could be assimilate to Corsican fishing license, but without catches or fishing days number restriction.

3.4. How would you interpret the concept of "Transferable Concession" in your Region? (for example, consider if it may be related to a system based on fisheries rights, licences, quotas or combined solutions, and how transferability could be defined)

Fishing licenses can be bought and sold only like a single entity, No partial transferable system exist.

Blue fin tuna quotas are defined to regional scale, and not on a individual scale. Thus, fishermen possessing a blue fin tuna PPS have to share the regional quota without transferability restriction of fishing rights.

3.5. What is the most effective way to adapt the concept of "Transferable Fishing Concession" to your regional context?

TFC does not seem to be an appropriate management for Corsica. As noted above, the existing fishing license system is satisfactory and relatively effective.

TFC seems delicate to set up because of specific features of the Corsican fisheries:

-Catches limitation is difficult to put into practice given the number important of landing ports and the absence of commercializing structures.

- Fishing day limitation is quite inefficient because of difficult control.

3.6. Do you think that a TFC system would be appropriate at all in your regional context?

Yes ☐

No ☒

I don't know ☐

For what reasons?

In the Corsican context, where more than 95% of vessels are small-scale fisheries, TFC will be misunderstood and not well accepted by fishermen.

Furthermore, to be effective, this management policy require monitoring and control operations that will be impossible to carry out by competent authorities (absence of fishing auction center, many landing ports, lack of means by authorities, etc.).

Corsican fleet is mainly composed of little vessels that are economically and socially vulnerable and yield marginal landings of sea products. One of the TFC hazards would be that the small-scale fisheries could disappeare in favor of larger, economically stronger companies.

3.7. Do you agree in making TFC systems facultative and discretionary for Member States?

Yes ☒

No ☐

I don't know ☐

For what reasons?

TFC can be an effective way to manage fishery if these measures come along with dialogue with motivated fishermen. Denmark is the best example of good TFC management. Nevertheless, TFC as defined in the new CPF do not seem applicable in the Mediterranean context. As noted above, there are too many regional specificities that prevent this management measure (predominance of small-scale fisheries, difficulty of control, etc.).

3.8. The CFP reform proposal has indicated that TFCs should be given for a period of 15 years. What would be the optimal duration of a concession according to your regional context? *(please explain also for what reasons)*

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The state of fish stocks can change quickly. Thus, for an adequate resources management, TFC should be changed regularly according to the fish stocks' health.

3.9. What is your position on the transferability criteria/modes suggested by the CFP reform proposal?

Over the last few years, the number of fishing vessels has fallen by nearly a third. Moreover, the sector currently suffers from economic and social difficulties. Considering this, Corsican fisheries might be defined as being in crisis.

Incomes constantly decrease. As a result, it could be difficult for small artisanal vessels to buy TFC, and they could disappear in favor of larger, economically stronger companies that could hold an important part of the quotas.

3.10. Do you think that there should be some restrictions on the transferability of concessions at the territorial level?

Yes ☒
No ☐
I don't know ☐

If yes, which ones?

Transferability of concession can be limited at a regional level.

For what reasons?

If no territorial limitation is defined for transferability of concessions, the principle of relative stability which bases all political distribution of fishing rights for decades will be seriously weakened. Thus, big industrial fishery companies could be granted the biggest part of quotas. Eventually, this would lead to the elimination of artisanal fisheries, that constitute an essential social and economic fabric for many Mediterranean regions, including Corsica. The establishment of TFC without limitations is not compatible with sustainable small-scale fishery.

3.11. Do you think that there should be some restrictions on the transferability of concessions with regard to fishing vessels/fisheries systems (for example only fishing vessels above 12 meters; all vessels with towed gears)?

Yes ☐
No ☒
I don't know ☐

For what reasons?

Transferability limitation with regard to fisheries systems does not seem necessary if the following restrictions are implemented:

- Increase of small-scale fishery quota;

- Limitation of quota by ship owner;

- Unilateral transferability of quotas between trawlers and small-scale fishery: the artisanal vessels could buy quota shares from trawlers, while trawlers couldn't buy from the artisanal vessels.

This way, TFC could be adopted with less consequence on small-scale fisheries activities.

3.12. Do you think that there should be some restrictions on the transferability of concessions with regard to fish categories (for example demersal/pelagic fish, small size pelagic/big pelagic fish)?

Yes ☒
No ☒
I don't know ☐

For what reasons?

One powerful argument in favor of restrictions on the transferability is an easier control of leisre fishing. Nevertheless, one of main features of small-scale fishery in Corsica is the used fishing gear polyvalence. Fishermen

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adapt their practices according to available resources. The non-transferability between fish categories could be weakening an already in difficulty activity.

3.13. Do you think that TFCs are an appropriate tool to increase competitiveness in the fisheries sector?

Yes ☐
No ☒
I don't know ☐

For what reasons?

Using TFC like a tool to increase competitiveness between vessels seems inappropriate in the Corsican context. Indeed, less competitive vessels would be pushed out of the fleet, leading to significant job losses. This competitiveness notion has to be used with caution because it does no take social factors into account.

3.14. What are the main pros and cons of using TFCs for competitiveness, especially considering your regional context?

TFC are not appropriate in the Mediterranean context. Indeed, it is a small-scale multi-specific and multi-gear fishery. Competitiveness increase could lead to the disappearance of this kind of vessels in favor of bigger and more competitive ships. This phenomenon would end in an important social cost for unsecured stocks preservation.

3.15. Do you think that TFCs increase job entry barriers for new generations?

Yes ☒
No ☐
I don't know ☐

For what reasons?

One of the first goals of TFC is to reduce fishing overcapacity, through decrease of fishing vessels number. Thus, this management measure tends to restrict new entries in the fleet and consequently job creation. In additional, since fishing sector is already in crisis, TFC will make young fishermen installation even more difficult. Indeed, allowed fishing vessels will have a higher market value according to their fishing access rights.

3.16. Do you think that there is a high risk of TFC concentration in the hands of a few vessel owners?

Yes ☒
No ☐
I don't know ☐

For what reasons?

As we have seen previously, one of major risks of this management will be that some big companies centralize most of quotas. This phenomenon has been observed in Iceland, with far from negligible social and economic consequences. Moreover, the risk is even stronger in the Mediterranean, because of fleet characteristics (more than 90% are small-scale fisheries).

3.17. How would you avoid the risk of excessive concentration? (*e.g.* exclusion of small-scale fisheries, % of concessions set aside for new entries, etc)

To avoid excessive concentration to a few beneficiaries, it would be important to:

- Limit quota number for each ship owner;

- Exclude small-scale fisheries of transferable concession system.

3.18. Do you prefer a system based on quotas managed and transferable on an individual basis (ITQ model), or a system based on wider quotas co-managed at the community level (CTQ model)?

It would be preferable to implement management at community level. Indeed, CTQ model would lead to:

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- A better management of the common resource;
- A greater cohesion within the profession and consequently, better application of TFC.

3.19. If you prefer a system based on the CTQ model, how would you define the "community"? (for example considering fishing districts, fisheries consortia, category associations)

In Corsica there are no fishing consortia. On the other hand there are 4 prud'homie and one regional fishing comity that would be playing a preponderant role in the CTQ model. The prud'homies are an old institution (prud'homie of Bastia created in 1801) acknowledged and respected by insular fishermen.

3.20. What do you think of the EU fishing vessel decommissioning schemes?

Fishing vessel decommissioning schemes are an efficient measure. Indeed, this can quickly adjust fishing fleet according to the state of fishes stocks. One of the possible drawbacks is the cost of this scheme. Nevertheless, this management measure allows fishermen to obtain an important financial input for a possible conversion.

3.21. Do you think that the adoption of a TFC system would lead to a fleet reduction in your Region?

Yes ☒
No ☐
I don't know ☐

Fishing sector is currently in crisis and new management measures will probably lead to a decrease of fishing vessels number.

3.22. In your Region, what is the position of fishermen and category associations with regard to TFCs?

The great majority of Corsican fishermen does not think that TFC would be efficient for regional fishery management. When fishermen know the TFC rationale, they are worried because of Iceland experience. In fact, almost all Corsican fishermen misunderstand quota, TAC and TFC concept because just a few boat (i.e. 5 pelagic long liner in 2012) are concerned by quotas in the island. Moreover, the Corsican fishery organization (i.e. regional fishing committee, "prud'homies de pêche") disapproves this mesure.

3.23. Are there any studies or surveys on this issue? *(if possible, please include relevant material and/or provide a reasoned list of documents)*

Yes ☐
No ☒
I don't know ☐

3.24. in your Region, do you think that stakeholders are well aware of TFC-related issues?

Yes ☐
No ☒
I don't know ☐

3.25. Is there a legal framework that can be related to the concept of transferable concession at the national and regional level?

Yes ☐
No ☒
I don't know ☐

Detailed explanation: *(please provide also indication of the specific regional/national laws)*

Fishing license existing in Corsica can be assimilated to fishing concessions, but without catches and fishing day limitations.

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3.26. In your Region, are there many dispensations from the fishing restrictions set by European legislation? (*e.g.* fishing period, fish size, fishing gears)

Yes ☒
No ☐
I don't know ☐

Detailed explanation: (*please provide also indication of the specific regional/national laws*)

There are no dispensations from fishing restrictions set by European legislation in Corsica. Furthermore, there are national, regional and prud'homale regulations that can be more restrictive that European legislation. For example, spiny lobster fishery in Corsica is closed to October to March. This management measure is a regional legislation and it is therefore not applied in continental France, or in other Member States.

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Valencia Region (SPAIN)

1st Thematic Section: Options for Quota determination and allocation criteria

In general, options for quota determination and advantages and disadvantages related to each option are similar to those highlighted by Marche Region. The current Spanish national government does not fully agree with the new CFP. The regional government is in line with the national administration. The main problem lies in the definition of "traditional fishing" in terms of vessel's length and working hours. Some fishing vessels in Spain are over 12 m length, but they are still fully dedicated to traditional fishing, so TFCs should not apply to them.

2nd Thematic Section: Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues

2.1. What are the main species of commercial interest caught in your Region?

Main species from extractive fishing are: Sardine, Sardinella, Anchovy, Octopussy, Hake, Horse Mackerel, Blue Whiting, Red mullet and Angler.

2.2. Do you have in your Region an archive/database with a detail of catch data for each fishing district? And for each fishing vessel (quantities in kg/ton of species of commercial interest)? *(please indicate the source of data and the competent authority for archive/database implementation and update)*

Yes ☒
No ☐
I don't know ☐

Detailed explanation:

The Regional Department of Agriculture, Fishing and Food publishes in its web page annual statistics on captures per species, tonnes, provinces, ports, etc. http://www.agricultura.gva.es/web/web/guest/la-conselleria/estadisticas/datos-basicos-del-sector-agroalimentario/estadisticas

2.3. In certain areas (*e.g.* Scotland, Iceland) ITQ (Individual Transferable Quotas) are mainly assigned on the basis of fishing vessels' catch histories (species and quantities caught in recent years by each vessel – usually the last three years). Do you think this system would be appropriate and feasible for your Region?

Yes ☐
No ☒
I don't know ☐

For what reasons?

This system seems not to be useful for the Mediterranean. The Spanish Government requests a review of the consideration of artisanal fishing to protect it from the system of ITQs, more suitable for high seas and high altitude fisheries. Its application to traditional fishing would cause areas highly dependent could see deprived their chances of survival. With regard to ITQs, the Ministry of Agriculture believes that the new regulation has to allow the free transfer of fishing concessions and its application solely on the management of fisheries for which Total Allowable Catch (TACs) and quotas are established and that, except for the bluefin tuna, the Mediterranean remains, for now, out of the system.

2.4. If you think that a system based on catch histories is appropriate for your Region, how would you assign quotas to "new entries"?

For the moment, new entries are not considered in the Valencia fishing system, in fact, the fleet is decreasing. In any case, new entries should not receive higher quotas than those assigned to existing similar vessels.

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2.5. Do you think that the concept of Maximum Sustainable Yield (MSY) is appropriate and exhaustive for the development of sustainable fisheries management models?

Yes ☐
No ☒
I don't know ☐

For what reasons?

The position of the Spanish regions is that this concept would be very harmful if applied in 2015 as foreseen. The present position is to delay its application to 2020 since it would suppose important restrictions in captures in the next years. This concept only considers the environmental aspect without including social and economical issues.

2.6. If you think that the concept of MSY is not appropriate or exhaustive, what resource assessment models would you suggest as more suitable?

Mandatory temporary catching stops is a management model applied in Spain and that has demonstrated the recovery of fisheries areas.

2.7. Is discard a common practice in your Region?

Yes ☒
No ☐
I don't know ☐

Detailed explanation:

In the province of Castellon, main concern for surface longliner and purse-seine fishers is the increasing on discards of bluefin tuna due to the increasing of tuna shoals.

The "Fishing Cities Association (AECIPE)", located in the province of Alicante has released in July 2012 a project to face the problem of fishing discards. One of the concerns to cope with is the significant amounts of dead fish coming from discards which arrive to the beaches, causing certain impacts on tourism and bathing water quality.

http://www.presspeople.com/pr/diputacion-nota-prensa-descartes-pesqueros

2.8. Do you think that a TFC system could enhance the practice of discards?

Yes ☐
No ☐
I don't know ☒

For what reasons, and which solutions would you suggest in order to prevent this problem?

Certain experiencies as the Danish suggest a good and wel balanced TFC system should reduce discards. The scientific assessments at present will determine the real impact of discards and the best fishing practices in order to avoid this problem.

In order t avoid discards certain measures could be effective:

- More selective fishing gear for the area and kind of fish. One complaint among Spanish fishermen is that usually those more harmful fishing boats have more quotas assigned than those that are more selective.

-Establishing sustainable quotas taking into consideration environmental, economic and social aspects.

-Boosting of artisanal and traditional fishing arts, that reduces significatively undesired catches.

-Scientific studies on main marketable species discarded by using certain fishing gear or practices could improve and rationalize the assignment of quotas

2.9. How would you calibrate a TFC system in your Region, taking into account (i) catch limits (TAC and contingencies) and (ii) fishing effort (fishing capacity times fishing activity)?

It is a quite complicated issue in the Mediterranean. The UICN concludes after a study performed in the Mediterranean that more than 40 marine species could disappear in the next years. Marketable species like bluefin

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tuna, grouper, corbin or hake are seriously threatened. A free fishing system wouldn't be a solution before this forecast but establishing TACs and fishing effort should imply a very deep knowledge of the fisheries status, based on realistic scientific assessments and not only in forecasts or statistics. TFC system based on TACs wouldn't be the ideal system for the Mediterranean.

2.10. How would you calibrate a TFC system in your Region, taking into account the main fisheries systems? Please consider in particular issues related to (i) multispecific fisheries; (ii) different fishing gears used for a single species; (iii) prevalence of small-scale fisheries.

This system could fit better for the Mediterranean case. A system based on multispecific fisheries, assigning quotas to a TFC for several species in the same fishery would imply a rationalization of discards, however this system could be unstable and not always feasible due to the specifities of each fishery. The boost of specific fishing gears and small-scale fisheries would be, under a good management a better option in order to decrease overexploitation impacts. The calibration of this system would suggest a previous deep and wide scientific assessment in order to know the real impact of its application on fishing resources. In the case of bluefin tuna for instance, the assignment of a TAC would be a function of the number of big breeding tunas estimated in a certain fishery. These ones shouldn't be ever catched. The use of traditional gear for this species and the right selection of catching depth could help in the calibration of the system. It is a matter of change of culture and not only an economic issue.

2.11. Would you limit TFCs only to certain:

- Types of fisheries resources?

  Yes ☐
  No ☐
  I don't know ☒

  For what reasons?

We think TFCs should be applied in a certain matter to every fisheries resource, using different criteria depending on the type of resource. Exceptions could be considered always after corroborated scientific assessments.

- Fishing areas?

  Yes ☐
  No ☒
  I don't know ☐

  For what reasons?

Fishing areas free of TFCs are in danger at mid-term to suffer overexploitation or other negative impacts. A light TFC system should be always applied as a prevention method.

- Fleet segments and fisheries systems?

  Yes ☐
  No ☐
  I don't know ☐

  For what reasons?

Traditional fishing has demonstrated to be a source of employ, a sustainable practice that respects the environment. More quota assigned to this kind of fishing would reduce discards and would dynamize the fishing sector even reducing the size of certain fleet. A problem in Spain is that is quite difficult to explain the fishermen that a boat 12.5 meters in length will be considered industrial fishing over another 11.5 meters in lenght that is considered traditional, while boarding the same number of crew, fishing in the same fishery, using the same type of fishing, having their base and selling their catch on the same port.

- Other specificities?

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Yes ☐
No ☒
I don't know ☐

For what reasons?

High biodiversity in a relatively small sea leads to many problems for establishing quotas and criteria for calibrating TFCs systems. These problems could be reduced by high level scientific assessments and high doses of political and social commitment.

2.12. Do you think that TFCs should be finely tuned on regional market trends, within the TAC and national contingency limits allocated on an annual basis?

Yes ☒
No ☐
I don't know ☐

For what reasons?

Regional approaching is a common request in the Spanish fishing sector. This could be good in order to specify species to be catched and tuning better quotas and catching methods.

3rd Thematic Section: Fisheries management model based on a TFC system: Social, Economic and Regulatory issues

3.1. How are fisheries rights currently regulated in your Region? Is there a Rights Based Management (RBM) system that can be compared to a quota/concession system?

/

3.2. In your Region, fisheries rights are regulated and assigned mainly according to:

Territorial criteria ☐
Biological criteria ☐
Economic criteria ☐
Other criteria ☒

3.3. How would you define the concept of "Fishing Concession", both on legal and economic terms?

/

3.4. How would you interpret the concept of "Transferable Concession" in your Region? (for example, consider if it may be related to a system based on fisheries rights, licences, quotas or combined solutions, and how transferability could be defined)

/

3.5. What is the most effective way to adapt the concept of "Transferable Fishing Concession" to your regional context?

/

3.6. Do you think that a TFC system would be appropriate at all in your regional context?

Yes ☐
No ☒
I don't know ☐

3.7. Do you agree in making TFC systems facultative and discretionary for Member States?

Yes ☒

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No ☐
I don't know ☐

3.8. The CFP reform proposal has indicated that TFCs should be given for a period of 15 years. What would be the optimal duration of a concession according to your regional context? *(please explain also for what reasons)*

/

3.9. What is your position on the transferability criteria/modes suggested by the CFP reform proposal?

/

3.10. Do you think that there should be some restrictions on the transferability of concessions at the territorial level?

Yes ☐
No ☒
I don't know ☐

3.11. Do you think that there should be some restrictions on the transferability of concessions with regard to fishing vessels/fisheries systems (for example only fishing vessels above 12 meters; all vessels with towed gears)?

Yes ☐
No ☒
I don't know ☐

3.12. Do you think that there should be some restrictions on the transferability of concessions with regard to fish categories (for example demersal/pelagic fish, small size pelagic/big pelagic fish)?

Yes ☒
No ☐
I don't know ☐

3.13. Do you think that TFCs are an appropriate tool to increase competitiveness in the fisheries sector?

Yes ☐
No ☒
I don't know ☐

3.14. What are the main pros and cons of using TFCs for competitiveness, especially considering your regional context?

/

3.15. Do you think that TFCs increase job entry barriers for new generations?

Yes ☒
No ☐
I don't know ☐

3.16. Do you think that there is a high risk of TFC concentration in the hands of a few vessel owners?

Yes ☐
No ☐
I don't know ☒

3.17. How would you avoid the risk of excessive concentration? (*e.g.* exclusion of small-scale fisheries, % of concessions set aside for new entries, etc)

/

3.18. Do you prefer a system based on quotas managed and transferable on an individual basis (ITQ model), or a system based on wider quotas co-managed at the community level (CTQ model)?

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3.19. If you prefer a system based on the CTQ model, how would you define the "community"? (for example considering fishing districts, fisheries consortia, category associations)

/

3.20. What do you think of the EU fishing vessel decommissioning schemes?

/

3.21. Do you think that the adoption of a TFC system would lead to a fleet reduction in your Region?

Yes ☒
No ☐
I don't know ☐

3.22. In your Region, what is the position of fishermen and category associations with regard to TFCs?

/

3.23. Are there any studies or surveys on this issue? *(if possible, please include relevant material and/or provide a reasoned list of documents)*

Yes ☐
No ☐
I don't know ☒

3.24. in your Region, do you think that stakeholders are well aware of TFC-related issues?

Yes ☐
No ☒
I don't know ☐

3.25. Is there a legal framework that can be related to the concept of transferable concession at the national and regional level?

Yes ☒
No ☐
I don't know ☐

3.26. In your Region, are there many dispensations from the fishing restrictions set by European legislation? (*e.g.* fishing period, fish size, fishing gears)

Yes ☐
No ☒
I don't know ☐

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Marche Region (ITALY)

1st Thematic Section: Options for Quota determination and allocation criteria

OPTION 1: Quota in terms of resource quantity that can be caught by a fishing vessel	
ADVANTAGES	**DISADVANTAGES**
Biological, Ecological, Environmental aspects	
1. It could keep catches within safe biological limits. 2. It can be applied to single species fisheries and it has given good results with sedentary species. The maximum daily allowable catch per vessel has already been put in place for clams. 3. Quotas would make more sense if they are applied to catches rather than to landings, in order to avoid an increase in discards which is very difficult to control. 4. Smaller vessels could sell their quotas to bigger ones and cease their activity. This could decrease fishing pressure on resources.	1. For most species, especially demersal ones, there are no exhaustive resource assessments for quota determination. 2. There are no exhaustive data which allow to assign quotas to the different GSA areas for each species. 3. Quotas assigned to each species could differ among areas, even if vessel characteristics are the same, due to differences in the ecological features of each area and in the species biology (e.g. distribution throughout the life cycle). 4. Several species of commercial interest are part of multispecific communities, and it is not possible to catch them as single species. 5. Discards tend to increase without biological benefits. 6. Due to the short life cycle of many Mediterranean species, quotas can include adults as well as juveniles according to the chosen fishing period.
Economic aspects	
1. Quotas put a limit on quantities that can be sold, and in certain periods quotas can cause an increase in market prices (if the same product is not brought to the market from other fishing areas, its economic value increases). 2. For some fishing systems, such as anchovies caught by light fishing and purse seine, fixing quotas could give a higher value to catches and more stable prices throughout the year. 3. Smaller vessels could decide to sell part of their quotas to bigger vessels, thus obtaining an economic gain.	1. Quotas are usually reached in a short time, and this could cause long inactivity periods or the use of quotas allocated to other species, with a high probability of catching also species for which the quota has already been reached (in this case it is most likely that species for which the quota has been reached are discarded). 2. The quota will be reached trying to catch fish of the size/age class at higher market value. This means younger individuals for many Mediterranean commercial species (octopus, cuttlefish, squids, mullets, etc). In other cases, such as anchovies, bigger size fish have a higher commercial value. In these cases the risk is that fishermen selectively keep on board bigger-size individuals and discard the residual catches (this is both an economic and a biological consideration). 3. The controls carried out to verify catch quantities on fishing vessels have high costs and are often uneffective, as demonstrated in Northern Europe. These costs would have to be beard by fishermen. 4. In the case of transnational resources, quotas should

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	be shared between neighbouring countries and respected also in neighbouring areas, but this is difficult to apply and control. 5. There is the risk to concentrate quotas in a few hands, if small size vessels sell their quotas to big vessels that can more easily bear with market fluctuations. 6. Quotas for different species could be traded between vessels, for instance one could exchange a few "higher value" Norwegian prawn quotas and get a lot of mullet or anchovy quotas.
Social aspects	
1. Fixing quotas could favour the aggregation of fishermen in consortia or producers associations in order to improve market relationships. 2. Fixing quotas could decrease the total amount of time spent out at sea, thus improving the quality of life.	1. Each fishing area hosts populations characterised by specific territorial and seasonal features. Quotas can modify fishing areas according to the distribution and movements of species for which a quota has been assigned, thus modifying the typical fishing areas of the different fisheries segments. 2. As soon as a quota is reached, fishing must be suspended, and this means longer periods of inactivity and no direct incomes for fishermen. 3. Fixing quotas could reduce the time spent out at sea, and this could lead fishing vessel's owners to cut the number of crew members. 4. Smaller vessels could sell their quotas to bigger ones and cease their activity. This would cause a loss of working places.
ALLOCATION CRITERIA	
A quota is determined for each GSA and for each species, adopting a precautionary approach. The quota fixed for each species is subdivided among authorized fishing systems, and then it is allocated to the fishing vessels which are registered in each category. Specific allocation criteria can vary. Same quotas for all fishing vessels in a category and in a GSA, or quotas proportional to horsepower/size of vessel, or quotas proportional to a fishing vessel's catches based on landings in the last few years. In addition, some fishing such as sole or cuttlefish fishing, is carried out in coastal areas, whereas other, such as Norway prawn or hake fishing is carried out in the middle of the sea (areas more difficult and more expensive to reach), and this must also be taken into account when allocating quotas.	
OPTION 2: Quota as a portion of the total fishing time independent of the species. Here we do not consider caught species but the length of time for which a vessel is allowed to fish, with no restrictions on chosen areas or species.	
ADVANTAGES	**DISADVANTAGES**
Biological, Ecological, Environmental aspects	
1. Environmental pressure will not increase since the overall time spent fishing will be kept constant or will decrease as a consequence of quota setting.	1. Fishing time cannot be calibrated on each species' dynamics. 2. The MSY goal for each species will not be reached,

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2. If the fixed quota is lower than the current total fishing time, the fishing effort would decrease with positive impacts on the status of stocks. 3. It reduces discards and accessory catches.	since fishermen will use their fishing time to catch whatever species, taking into account only the economic gain. 3. Fishing time cannot be associated to a biological community because fishermen will catch species wherever it is more profitable. 4. Fishing effort concentration in periods which are more economically convenient, with the risk of stock overexploitation during such periods.
Economic aspects	
1. Since the total fishing time is limited, the best meteorological conditions can be chosen throughout the year. 2. Smaller vessels could decide to sell their time-quotas to bigger vessels. 3. A decrease in costs due for instance to lower fuel consumption, since fishing trips can be better planned and optimized.	1. Fishing time is lower, and thus catches and economic revenues will probably be lower too. 2. The total fishing time cannot be flexibly varied according to market requirements. 3. In the last portion of the year, many vessels will have already finished their fishing time.
Social aspects	
1. The time to be spent out at sea can be better planned throughout the year, and this will improve the quality of life. 2. Traditional fishing habits, expertise and cultural heritage can be maintained.	1. Difficulties in calibrating fishing time allocation for vessels of different size and using different fishing systems. 2. Daily fishing times can be very different, ranging from 10 to 24 hours, fixing a maximum number of fishing days can make "working days" longer in terms of hours spent out at sea. 3. Controls must be very intense in order to avoid infringements.
ALLOCATION CRITERIA	
Based on the existing fleet and on number of fishing vessels in each category, a total number of fishing days is assigned for each fishing system. This total number of fishing days is allocated among vessels in that category, so that a specific number of fishing days will be assigned to each vessel. The number of fishing days will tend to decrease throughout the years, causing an income reduction and an abandonment of the profession by several fishermen.	
OPTION 3: Quota as a portion of the fishing capacity. An overall fishing time and an overall proportional horsepower/size of fishing vessels must be determined. The quota is assigned to each vessel as a function of its horsepower and the maximum fishing time, so that TFC will vary according to fishing vessels' characteristics (horsepower/size).	
ADVANTAGES	**DISADVANTAGES**
Biological, Ecological, Environmental aspects	
1. Each fishing vessel operates with quota restrictions which are mainly related to its horsepower, and it can catch a certain amount of fish (of whatever	1. Catches are usually composed by a mixture of higher and lower value species; with a fixed quota, lower-value catches are discarded and the pressure on

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species) during a specific fishing time. 2. Small vessels could sell their quotas and the fleet could be restructured, causing a reduction in fishing effort and a lower pressure on fish stocks.	higher-value ones will increase. 2. There is no connection between quotas of allowed catches and levels of resource exploitation for each species, and thus the benefits on the status of specific stocks cannot be evaluated. 3. With two limits, total catches allowed and fishing time, it is not possible to calibrate quotas on the available resources (fluctuations in abundance). 4. The decrease in fishing effort is not targeted on specific species, and thus it is not possible to control pressure levels on specific species (especially those that should be more safeguarded). 5. If a specific reduction in fishing time or allowed catches is not put in place, there will be no benefits in terms of levels of resource exploitation, and thus in expected future catches (this has also socio-economic implications).
Economic aspects	
1. Bigger vessels will get more quotas. 2. Smaller vessels could sell their quotas to bigger ones thus obtaining a direct monetary reward.	1. Only the declared (registered) horsepower can be considered for quota allocation, but the real horsepower of fishing vessels is often higher than the registered one. 2. The controls should be doubled, on quantities of catches and on fishing times. 3. The quota allocated to same-horsepower fishing vessels will not have the same value for each one of them, since the real value depends on the species composition of catches, which varies according to fishing areas (for instance it is different in coastal and deep sea areas).
Social aspects	
1. Fishing habits will not vary much, apart from a stricter control on catch quantities and fishing times. 2. If the days to go fishing can be freely chosen by fishermen throughout the year, only respecting the maximum fishing time allowed, some restrictions are avoided (Saturdays and Sundays can become fishing days, etc). 3. Job contracts can be fairer because the maximum fishing time is clearly stated.	1. Risk to increase fishing capacity in order to obtain more quotas. 2. When the quota limit is reached, fishermen will have no direct incomes. 3. An income reduction can be expected for both vessel owners and crew. 4. Smaller vessels (lower horsepower) would get very small quotas and thus would not obtain sufficient economic gains from their fishing activity anymore.
ALLOCATION CRITERIA	
The total fishing capacity for each GSA is determined and then subdivided among fishing systems. Within each fishing system, the parameter on which to calculate the fishing capacity is determined (length, horsepower, tonnage, etc) and the quota for each fishing vessel is allocated in a proportional way (tons of catches allowed according to a vessel's characteristics). Such a quota will indicate the maximum quantity of fish that can be	

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caught in a maximum number of days (freely chosen by fishermen throughout the year). This quota would assign a specific "value" to each fishing vessel. For instance, bigger vessels that can operate even with very bad weather conditions could get a higher time-quota. In the long run smaller vessels could be "forced" to sell their quotas since economic gains are too low, thus reducing fleet consistency.

GENERAL CONSIDERATIONS:

The options highlighted above can be considered as "pure options", but there can be many more possible options where a number of factors are combined, for instance taking into account combinations of catch limits for different species, groups of species, fishing areas, fishing systems, fishing times. If we want a direct connection with a species' level of exploitation (fishing pressure on a specific species), we will have to determine quotas as quantities that can be caught for each species, but this will always be associated to accessory catches of other commercial species. If there are no limits in catches allowed for each single species, there will be a more intense fishing pressure on higher-value species, so that these will tend to be overexploited, and the lower-value species will tend to be discarded.

In all cases and whatever the option chosen, controls will have to be stricter, both on landings and out at sea, with higher costs and obligations. As a matter of fact, a TFC system based on quantities could make more sense if applied to catches rather than to landings, but this would imply the implementation of complex control systems on board fishing vessels.

It must also be considered that for most species and areas (GSA), both in Italy and in the rest of the Mediterranean, there are no exhaustive data on the overall state of exploitation of resources, and quotas could only be assigned adopting a precautionary approach (which is very restrictive).

Finally, if small scale fishing is kept out of the TFC system, a thorough control on the overall catches cannot be carried out. In fact, small scale fisheries can have a significant incidence on the overall catches, especially considering juveniles and during certain times of the year.

In the Mediterranean, a TFC system based on quotas of caught fish, with all the limitations discussed above, could be appropriate only if applied to single species fisheries, such as clam or anchovy fishing. In general terms, the most appropriate TFC system, despite the disadvantages discussed above, could be the one based on the allocation of a time-quota calculated according to the fishing vessel characteristics (*e.g.* length, horsepower, tonnage). However the results of this choice would be highly unpredictable, since specific tests and experiments have never been carried out until now.

2nd Thematic Section: Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues

2.1. What are the main species of commercial interest caught in your Region?

Anchovies; Sardines; Hakes; Anglers; Soles; Red mullets; Mutable nassa; Musky octopus; Cuttlefish; Squids; European flying squids; Clams; Caramote prawns; Mantis shrimps; Norwegian prawns.

2.2. Do you have in your Region an archive/database with a detail of catch data for each fishing district? And for each fishing vessel (quantities in kg/ton of species of commercial interest)? *(please indicate the source of data and the competent authority for archive/database implementation and update)*

Yes ☐
No ☒
I don't know ☐

Detailed explanation:

Some data for the Region have been collected by IREPA. CNR-ISMAR of Ancona has carried out a data collection on a sample of fishing vessels and data have then be extrapolated to the whole fleet.

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2.3. In certain areas (*e.g.* Scotland, Iceland) ITQ (Individual Transferable Quotas) are mainly assigned on the basis of fishing vessels' catch histories (species and quantities caught in recent years by each vessel – usually the last three years). Do you think this system would be appropriate and feasible for your Region?

Yes ☐
No ☒
I don't know ☐

For what reasons?

Catches declared by fishermen are not always reliable, and something similar to what happened with tuna quotas could occur, since fishermen often try and sell some fish through unofficial channels.

2.4. If you think that a system based on catch histories is appropriate for your Region, how would you assign quotas to "new entries"?

The fisheries sector will keep showing a decreasing trend and therefore it will be difficult to see new entries, except for situations in which new vessels are purchased by one own's quota. In any case, new entries should not receive higher quotas than those assigned to existing similar vessels. New entries can also refer to old vessels entering new areas.

2.5. Do you think that the concept of Maximum Sustainable Yield (MSY) is appropriate and exhaustive for the development of sustainable fisheries management models?

Yes ☐
No ☒
I don't know ☐

For what reasons?

The MSY concept is highly theoretical. It cannot be applied to resources which are highly interrelated and variable over time. In the Adriatic sea, the state of populations is determined by recruitments rather than by fishing mortality, since most species have a short life cycle.

2.6. If you think that the concept of MSY is not appropriate or exhaustive, what resource assessment models would you suggest as more suitable?

Constant direct methods such as echo surveys in the field should be carried out with standardised equipment. Abundance/density indexes and trends could thus be determined, and consequently mortality rates could be calculated. If the resource showed a decrease, the quota would be proportionally decreased, if the resource showed a recovery trend, the quota could be raised again.

2.7. Is discard a common practice in your Region?

Yes ☐
No ☒
I don't know ☐

Detailed explanation:

Only for bottom trawling there is a significant discard of non-commercial species or of species that cannot be sold because they are below legal size. Pelagic trawling can sometimes favour discard as a consequence of multispecific catches. For instance sardines in many areas are discarded due to their low commercial value.

2.8. Do you think that a TFC system could enhance the practice of discards?

Yes ☒
No ☐
I don't know ☐

For what reasons, and which solutions would you suggest in order to prevent this problem?

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If a species that cannot be sold is caught with the target species, the only solution for a fisherman is to discard it, unless forced by law to land it. The only effective solution would be to apply TFC to catches rather than to landings, but this would imply much stricter controls on board which are not feasible at the moment.

2.9. How would you calibrate a TFC system in your Region, taking into account (i) catch limits (TAC and contingencies) and (ii) fishing effort (fishing capacity times fishing activity)?

I would not apply it. A quota system is in general not suitable for the Mediterranean, as defined by the CGPM. It would be an anomaly at the international level in the management of Mediterranean resources and the other European countries do not apply it.

A system very similar to TFC is however applied to clams and in some cases to anchovy fishing in Marche Region.

2.10. How would you calibrate a TFC system in your Region, taking into account the main fisheries systems? Please consider in particular issues related to (i) multispecific fisheries; (ii) different fishing gears used for a single species; (iii) prevalence of small-scale fisheries.

I would not calibrate it. The resources, except for clams and small-size pelagic fish such as anchovies and sardines, are caught with different fishing gears and systems, and often also in different areas.

The overall composition and proportion of caught species differs between fishing areas and systems. Calibrations or differences in quota allocations would create negative reactions.

2.11. Would you limit TFCs only to certain:

- Types of fisheries resources?

  Yes ☒
  No ☐
  I don't know ☐

  For what reasons?

Only to single species fisheries and with direct management by fishermen consortia or producers organizations, which have the responsibility to determine the quota within the overall limits defined by Member States.

- Fishing areas?

  Yes ☒
  No ☐
  I don't know ☐

  For what reasons?

Only to limited areas and on single species fisheries (for instance in coastal areas within one mile from the shoreline for clams).

- Fleet segments and fisheries systems?

  Yes ☒
  No ☐
  I don't know ☐

  For what reasons?

Only to hydraulic dredges with self-management. TFC could be tested also for anchovies (pelagic trawling or purse seining), but the experiment should be carried out on all Adriatic fleets, in order to assess if this type of approach can be a real solution to improve both the fisheries sector and the state of resources or not. At the moment the main problem is the economic assessment of the fish at the market level; in many cases the high quantities of anchovies that reach the markets cause a strong decrease in prices.

- Other specificities?

  Yes ☐

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No ☒

I don't know ☐

For what reasons?

A quota system is not appropriate for resources at high biodiversity, caught using different fisheries systems by fishing vessels which are not standardized.

2.12. Do you think that TFCs should be finely tuned on regional market trends, within the TAC and national contingency limits allocated on an annual basis?

Yes ☐

No ☐

I don't know ☐

For what reasons?

The market is very wide and there is the possibility to enter different market segments, also out of the TFC (purchasing quotas of societies which own TFC, without providing evidence that TFC were sold).

3rd Thematic Section: Fisheries management model based on a TFC system: Social, Economic and Regulatory issues

3.1. How are fisheries rights currently regulated in your Region? Is there a Rights Based Management (RBM) system that can be compared to a quota/concession system?

Fisheries rights are regulated through a system of licences released by the State. A licence authorizes a fishing vessel to catch fish with a specific fishing gear and system. Licences usually last 8 years and can be renewed.

3.2. In your Region, fisheries rights are regulated and assigned mainly according to:

Territorial criteria ☐

Biological criteria ☐

Economic criteria ☐

Other criteria ☒

Detailed explanation:

Licences have been assigned to the existing vessels on a specific date, which was agreed upon by the relevant authorities. The fleet has subsequently decreased and the release of new licences has been forbidden. In order to enter the fleet, a licence must be purchased, either with or without a fishing vessel. Licences are assigned on the basis of size/horsepower of a vessel. In order to operate with a big (or high horsepower) fishing vessel, several small vessels must be dismantled.

3.3. How would you define the concept of "Fishing Concession", both on legal and economic terms?

Fishing concessions are very similar to licences. But the latter do not give restrictions on quotas of catches or fishing days. The fishing effort is regulated by reducing the number of licences through vessel scrapping without allowing new entries.

3.4. How would you interpret the concept of "Transferable Concession" in your Region? (for example, consider if it may be related to a system based on fisheries rights, licences, quotas or combined solutions, and how transferability could be defined)

The transferability of licences is done with a sell/purchase process on the whole fishing vessel or on portions of it (carats). An owner society could trade some of his "quotas" (vessel carats), still keeping its name on the licence but sharing property on one or more vessels. Similarly, a legal entity may own carats of one or more vessels without having its name on the licence.

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3.5. What is the most effective way to adapt the concept of "Transferable Fishing Concession" to your regional context?

There is no reason to move to TFC since they are similar to licences, but they have additional restrictions, such as setting quotas in terms of max quantity of catches allowed, or time-quota in terms of total fishing time allowed. These factors would reduce the value of licences, which currenty do not have restrictions in terms of quotas or time to be devoted to fishing.

3.6. Do you think that a TFC system would be appropriate at all in your regional context?

Yes ☐
No ☒
I don't know ☐

For what reasons?

Fishermen should be involved in fisheries management and made more responsible only through a direct participation in the development of management plans. In Marche Region, management plans imply that fishermen receive a specific fishing permit (to be added to the licence) only if they agree upon respecting the management measures included in the plan. All this considered, there is no need for developing a TFC system.

3.7. Do you agree in making TFC systems facultative and discretionary for Member States?

Yes ☒
No ☐
I don't know ☐

For what reasons?

There can be ecological or social contexts where TFC can be used, even if current experiences show that concessions are a way to expel significant percentages of fishermen from the market, with no benefits for the production (constantly decreasing).

3.8. The CFP reform proposal has indicated that TFCs should be given for a period of 15 years. What would be the optimal duration of a concession according to your regional context? *(please explain also for what reasons)*

If a fisherman invests his capital in a fishing vessel, he does not think that he will lose it after 15 years, and the average age of the Italian fleet is much higher. After 15 years the TFC will have to be renewed, as it happens with licences (every 8 years) and since the aim is to reduce the activity, there will be no room for new entries, unless other fishermen leave the sector and sell their TFC.

3.9. What is your position on the transferability criteria/modes suggested by the CFP reform proposal?

The value of a TFC is proportional to the potential income that will allow to obtain. At the moment the fisheries sector is in crisis and there are no buyers, and only vessel scrapping allows to exit the sector without losing too much. If quantities of fish caught and fishing times are decreased by assigning TFC and thus fixing quotas, the economic situation will become even more negative and concessions will not be transferable (no gains in buying them).

3.10. Do you think that there should be some restrictions on the transferability of concessions at the territorial level?

Yes ☐
No ☒
I don't know ☐

For what reasons?

It is not necessary to set limits to a sector that in just a few years has lost 6000 vessels, and where many more exits are likely to occur. Costs have significantly increased and business budgets are negative; resources have not increased even if the fleet and fishing time have decreased.

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3.11. Do you think that there should be some restrictions on the transferability of concessions with regard to fishing vessels/fisheries systems (for example only fishing vessels above 12 meters; all vessels with towed gears)?

Yes ☐
No ☒
I don't know ☐

For what reasons?

It is sufficient to set restrictions in order to avoid that TFC for gillnetting are transferred to trawling, whereas the other way round could be allowed. Even without setting restrictions, nobody would go fishing if no potential revenues are seen.

3.12. Do you think that there should be some restrictions on the transferability of concessions with regard to fish categories (for example demersal/pelagic fish, small size pelagic/big pelagic fish)?

Yes ☒
No ☐
I don't know ☐

For what reasons?

With regard to fish categories, transferability should be determined by the Authority that releases licences, permits, concessions, in order to orientate catches on the resources that are more available and economically sustainable.

3.13. Do you think that TFCs are an appropriate tool to increase competitiveness in the fisheries sector?

Yes ☐
No ☒
I don't know ☐

For what reasons?

TFC do not improve the sector situation or increase production. TFC bring restrictions that are often set without a thorough knowledge of the matter, and the tendency is to bring too much standardization and simplification to a highly complex sector.

3.14. What are the main pros and cons of using TFCs for competitiveness, especially considering your regional context?

There are in general no pros. Fixing strict rules on quantities that can be caught and/or fishing times does not support competition, but it rather implies the imposition of the same conditions and controls for all. In terms of competition, the only likely effect is that many small enterprises cease the activity by selling their TFC to bigger and more competitive enterprises. TFC could bring benefits only to anchovy fishing, if the same approach is applied to the whole GSA 17. But this should be verified with pilot tests in the field as a first step.

3.15. Do you think that TFCs increase job entry barriers for new generations?

Yes ☒
No ☐
I don't know ☐

For what reasons?

In order to enter the profession, TFC or licences must be purchased, and this has a cost which is proportional to the potential incomes. Building or buying a fishing vessel in order to get a TFC is very expensive, usually too expensive compared to potential incomes, considering the current crisis of the sector. In addition a concentration of TFC could cause an exit of small fishing vessel, thus making new entries to the profession even more difficult.

3.16. Do you think that there is a high risk of TFC concentration in the hands of a few vessel owners?

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Yes ☐
No ☐
I don't know ☒

For what reasons?

It is difficult to foresee TFC markets and prices. In certain cases the monopoly can be obtained through a concentration of licences rather than the organisation of fishermen in Consortia or Producers Organisations.

3.17. How would you avoid the risk of excessive concentration? (*e.g.* exclusion of small-scale fisheries, % of concessions set aside for new entries, etc)

The best system is the exclusion of small-scale fisheries, and exclusion for those species which do not have a quota in the Mediterranean (only tuna has a quota).

3.18. Do you prefer a system based on quotas managed and transferable on an individual basis (ITQ model), or a system based on wider quotas co-managed at the community level (CTQ model)?

Perhaps it is better an ITQ. Aspects that are too theoretical and unpredictable should be avoided.

3.19. If you prefer a system based on the CTQ model, how would you define the "community"? (for example considering fishing districts, fisheries consortia, category associations)

/

3.20. What do you think of the EU fishing vessel decommissioning schemes?

Decommissioning is a system to accelerate scrapping. The costs are high but the parameters for the payment can be reduced. Even without scrapping supported by public funding, if an activity does not give economic gains it will cease.

3.21. Do you think that the adoption of a TFC system would lead to a fleet reduction in your Region?

Yes ☒
No ☐
I don't know ☐

For what reasons?

Introducing new restrictions (quota and/or fishing days), the potential income for each enterprise is reduced. As a consequence, some of the fishermen will have to exit the sector (without being replaced) because staying in the sector is not remunerative anymore.

3.22. In your Region, what is the position of fishermen and category associations with regard to TFCs?

They are mainly worried, because they know what has happened with tuna quotas, which has caused almost the disappearance of a sector. Fishermen that catch small-size pelagic fish however, would support the introduction of quotas for anchovies.

3.23. Are there any studies or surveys on this issue? *(if possible, please include relevant material and/or provide a reasoned list of documents)*

Yes ☐
No ☐
I don't know ☒

Detailed explanation and implemented actions (if any):

Since it is not possible to know how a TFC system could be designed, it is difficult to draw theoretical scenarios. Where TFC have been applied, they have caused a decrease in both fleet and production.

3.24. in your Region, do you think that stakeholders are well aware of TFC-related issues?

Yes ☐

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No ☒

I don't know ☐

Detailed explanation and implemented actions (if any):

The sector has not well understood how the new system would work, since it is managed with a top-down approach with regard to quotas and fishing times. As it always happens, the sector will become aware once measures are applied.

3.25. Is there a legal framework that can be related to the concept of transferable concession at the national and regional level?

Yes ☒

No ☐

I don't know ☐

Detailed explanation: *(please provide also indication of the specific regional/national laws)*

Fishing licence set by Law n. 41/82 and subsequent regulations is similar to TFC, it has a 8 year duration, but it has no quota or time restrictions.

3.26. In your Region, are there many dispensations from the fishing restrictions set by European legislation? (*e.g.* fishing period, fish size, fishing gears)

Yes ☐

No ☒

I don't know ☐

Detailed explanation: *(please provide also indication of the specific regional/national laws)*

In Marche Region there are no dispensations from the fishing restrictions set by EU rules. Rules create problems (minimum size for clams, anchovies, sardines, hakes, etc) but dispensations have not been claimed.

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Liguria Region (ITALY)

2nd Thematic Section: Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues

2.1. Quali sono le principali specie di interesse commerciale catturate nella Sua Regione?

Nasello, potassolo, triglia di fango, moscardino bianco, gamberi rossi, scampi, acciuga, sardina, pesce spada, palamita.

2.2. Esiste nella Sua Regione un registro/database con il dettaglio delle catture (quantità in kg/ton delle specie di interesse commerciale) per compartimento di pesca? E per imbarcazione? *(specificare la fonte dei dati e l'autorità di pertinenza per il mantenimento del registro/database)*

Sì ☐
No ☒
Non so ☐

2.3. In alcune aree (*e.g.* Scozia, Islanda) le ITQ (*Individual Transferable Quotas*) vengono prevalentemente assegnate in base alla "*catch history*" (storia delle catture in termini di specie e quantitativi pescati in anni recenti – in genere ultimi tre anni) di ciascuna imbarcazione. Ritiene che ciò sia fattibile ed appropriato per il contesto regionale di riferimento?

Sì ☐
No ☒
Non so ☐

Per quali motivi?

Difficoltà a ricostruire le serie storiche.

2.4. Se ritiene che un sistema basato sulle *catch histories* sia appropriato per la Sua Regione, come assegnerebbe le quote ai "nuovi ingressi"?

/

2.5. Ritiene che il concetto del Rendimento Massimo Sostenibile (*Maximum Sustainable Yield,* MSY) sia appropriato ed esaustivo per lo sviluppo di modelli di gestione della pesca sostenibili?

Sì ☐
No ☒
Non so ☐

Per quali motivi?

In concetto di MSY è teorico. Non è applicabile in risorse con forti interrelazioni, variabili nel tempo.

2.6. Nel caso si ritenga il concetto di MSY non appropriato o esaustivo, su quali modelli di stima della risorsa ci si dovrebbe basare?

Sulla sorveglianza locale della risorsa con apposite campagne a mare monitoraggio delle quantità pescate. Individuazione di indicatori specifici per verificare l'andamento della risorsa e con ciò gestire lo sforzo di pesca.

2.7. Nel contesto regionale di riferimento i rigetti (*discard*) sono una pratica diffusa?

Sì ☐
No ☒
Non so ☐

Spiegazione di dettaglio:

Riguardano principalmente la pesca a strascico. Gli altri attrezzi sono molto più selettivi e specifici.

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2.8. Ritiene che il sistema TFC può favorire la pratica dei rigetti (*discard*)?

Sì ☒
No ☐
Non so ☐

Per quali motivi, e quali soluzioni proporrebbe per ovviare al problema?

Se una specie non può essere venduta, ma è catturata insieme alle specie bersaglio, non vi sono soluzioni, viene buttato via in mare o se obbligati, portate a terra. L'unica soluzione efficace sarebbe quella di applicare le TFC alle quantità catturate, piuttosto che a quelle sbarcate, ma questo implicherebbe uno sforzo di controllo a bordo al momento non praticabile.

2.9. Come modulerebbe il sistema TFC nel contesto regionale di riferimento considerando (i) limiti di cattura (TAC e contingenti) e (ii) sforzo di pesca (capacità di pesca x periodo di attività)?

Non lo applicherei.

2.10. Come modulerebbe il sistema TFC nel contesto regionale di riferimento considerando i metodi di pesca prevalenti? Si considerino in particolare le problematiche relative a (i) pesca multispecifica; (ii) diversi attrezzi da pesca che insistono su una singola specie; (iii) prevalenza piccola pesca.

Non lo applicherei per la prevalenza di pesca multi specifica, l'uso di diversi attrezzi per la singola specie e la prevalenza della piccola pesca.

2.11. Limiterebbe le TFC solo a determinate:

- Tipologie di pescato?

  Sì ☐
  No ☐
  Non so ☒

  Per quali motivi?

Sarebbe forse possibile applicarle solo per alcune tipologie di pesca monospecifiche, previa verifica della reale incidenza della presenza di altre specie.

- Zone di pesca?

  Sì ☐
  No ☐
  Non so ☒

  Per quali motivi?

Solo se ci fossero aree di pesca monospecifica.

- Segmenti della flotta e sistemi di pesca?

  Sì ☐
  No ☐
  Non so ☒

  Per quali motivi?

Come sopra, alla flotta specializzata in catture monospecifiche, previe verifiche dell'incidenza di cattura di specie accessorie a valore commerciale.

- Altre specificità?

  Sì ☐
  No ☐
  Non so ☒

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2.12. Ritiene che le TFC dovrebbero tenere conto degli andamenti di mercato regionali, entro i limiti delle TAC e relativi contingenti nazionali assegnati su scala annuale?

Sì ☐
No ☐
Non so ☒

3rd Thematic Section: Fisheries management model based on a TFC system: Social, Economic and Regulatory issues

3.1. Come viene regolato al momento il diritto alla pesca nel contesto regionale di riferimento? Esiste un sistema basato sui diritti (*Rights Based Management*, RBM) comparabile ad un sistema di quote/concessioni?

Gli imprenditori ittici sono semplicemente titolari di licenze di pesca per uno o più attrezzi, senza l'imposizione di quote. Fa, in un certo senso, eccezione la pesca del rossetto, regolamentata da un Piano di gestione approvato dalla CE per la GSA 9, che individua le imbarcazioni autorizzate, il numero massimo di giorni di pesca ed è stato fissato un limite minimo di catture per verificare lo stato di sofferenza della specie.

3.2. I diritti di pesca nel contesto di riferimento sono regolati e assegnati prevalentemente secondo criteri:

Territoriali ☒
Biologici ☒
Economici ☒
Altro ☐

Descrizione di dettaglio:

Il piano di gestione del rossetto tiene conto della diffusione della pesca specifica sul territorio, della valenza socioeconomica per le imprese che la praticano e sulla sostenibilità dello sforzo sulla risorsa.

3.3. Come definirebbe il concetto di "Concessione di Pesca", sia dal punto di vista normativo che economico?

Lo immagino legato alla possibilità di pescare in un determinato spazio marino. Il che lo rende applicabile alla sola piccola pesca da posta.

3.4. Come può essere interpretato il concetto di "Concessione di Pesca Trasferibile" nella Sua Regione? (ad es. tale concetto può essere riconducibile ad un sistema basato su diritti di pesca, licenze, quote o una combinazione di modalità, e come viene definita la trasferibilità)

Se la concessione fosse legata all'areale marino, la trasferibilità consentirebbe di cambiare titolarità a tale concessione, permettendo così ampliamenti e scambi di concessioni.

3.5. Quale ritiene sia la soluzione più efficace per adattare il concetto di "Concessione di Pesca Trasferibile" al contesto regionale di riferimento?

Farne oggetto di piani di gestione locali la cui regia deve essere in mano agli stessi pescatori coadiuvati da organismi di ricerca per la verifica d'efficacia.

3.6. Ritiene in linea generale che il sistema TFC sia appropriato per la Sua Regione?

Sì ☐
No ☒
Non so ☐

Per quali motivi?

Gli stessi elencati nela 2° parte del questionario

3.7. E' d'accordo sul fatto di rendere i sistemi TFC facoltativi e discrezionari a livello di ciascuno Stato Membro?

Sì ☒

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No ☐
Non so ☐

Per quali motivi?

Vi possono essere contesti ecologici o sociali ove le concessioni possono essere utilizzate, anche se le esperienze esistenti hanno mostrato che le concessioni sono un metodo per espellere dal settore grosse percentuali di pescatori, senza alcun beneficio per la produzione che è diminuita.

3.8. La proposta di riforma della PCP ha previsto una eventuale durata delle concessioni di 15 anni. Qual è secondo Lei la durata ottimale delle TFC considerando il contesto regionale di riferimento? *(si prega di motivare la risposta)*

Quando si investe un capitale per realizzare un motopesca non si pensa di perderlo dopo 15 anni, l'età media della flotta italiana è molto superiore. Dopo 15 anni la TFC dovrà essere rinnovata, come accade per le licenze di pesca (ogni 8 anni) e poiché lo scopo è ridurre l'attività, non vi sarà spazio per nuovi ingressi, salvo che altri si ritirino e vendano la loro concessione.

3.9. Qual è la sua posizione sui criteri/modalità di trasferibilità delle TFC indicati nella proposta di riforma della PCP?

Il valore per trasferire una concessione è proporzionale al reddito che permette di ottenere. Attualmente la pesca è in sofferenza e non vi sono acquirenti e solo la demolizione permette di uscire dal settore senza grosse perdite. Riducendo quantità e tempo di pesca la situazione economica peggiorerà per cui non vi sarà trasferibilità.

3.10. Ritiene che si debbano fissare delle restrizioni sulla trasferibilità delle concessioni a livello territoriale?

Sì ☐
No ☒
Non so ☐

Per quali motivi?

Non è necessario porre dei limiti ad un'attività che in pochi anni ha perso 6000 motopesca e appena possibile vedrà la fuga di molti altri. I costi sono aumentati notevolmente ed i bilanci dell'imprese sono negativi; le risorse non sono migliorate pur avendo ridotto flotta e tempi di pesca.

3.11. Ritiene che si debbano fissare delle restrizioni sulla trasferibilità delle concessioni a livello di tipologie di imbarcazioni/sistemi di pesca (ad es. solo imbarcazioni di lunghezza >12 m; tutto lo strascico)?

Sì ☐
No ☒
Non so ☐

Per quali motivi?

E' sufficiente stabilire che concessioni per reti fisse non possono passare a reti da traino, mentre può essere possibile il contrario. Anche senza limiti non vi sarà nessuno che acquisterà concessioni per andare a pescare senza una prospettiva di guadagno. Molto quindi dipende dal prezzo delle concessioni rispetto all'effettivo valore.

3.12. Ritiene che si debbano fissare delle restrizioni sulla trasferibilità delle concessioni a livello di tipologie di pescato (ad es. pelagico/demersale, pesce bianco/pesce azzurro, piccoli pelagici/grandi pelagici)?

Sì ☒
No ☐
Non so ☐

Per quali motivi?

La trasferibilità per tipologia di pescato dovrebbe sempre essere autorizzata dall'autorità che rilascia le licenze, permessi, concessioni per orientare i prelievi sulle risorse disponibili ed economicamente sostenibili.

3.13. Ritiene che le TFC siano uno strumento adeguato per aumentare la competitività del settore della pesca?

Sì ☐

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No ☒
Non so ☐

Per quali motivi?

Non migliora il settore né porta incrementi di produzione. Porta limitazioni definite da non pescatori che non hanno sempre il polso del settore, per cui la competitività viene azzerata per rendere tutti uguali.

3.14. Quali ritiene siano i principali pro e contro dell'uso di TFC per la competitività, tenendo presente il contesto regionale di riferimento?

Non vi sono pro. Stabilire regole rigide su quantità pescabili e tempi di pesca non favorisce la competizione, ma impone condizioni e controlli uguali per tutti. Le TFC potrebbero comportare benefici nel caso della pesca delle acciughe se solo lo stesso approccio venisse applicato a tutta la GSA di riferimento. La questione è infatti oggetto di valutazione da parte dei pescatori .

3.15. Ritiene che le TFC aumentino le difficoltà di accesso alla professione da parte delle nuove generazioni?

Sì ☐
No ☐
Non so ☒

Per quali motivi?

Dipende dal prezzo della TFC, cui deve sommarsi quello dell'acquisto ed armamento dell'imbarcazione. Il tutto deve garantire un guadagno. Inoltre la concentrazione delle TFC potrebbe far si che pescherecci più piccoli cessino la loro attività, rendendo ancor più difficoltoso qualsiasi nuovo accesso alla professione.

3.16. Ritiene che il rischio di concentrazione delle concessioni in poche mani sia alto?

Sì ☐
No ☐
Non so ☒

Per quali motivi?

E' difficile prevedere il mercato delle concessioni con i prezzi. A volte il monopolio può ottenersi concentrando le licenze, anziché organizzare le Organizzazioni di Produttori o i Consorzi.

3.17. Come ovvierebbe a tale problema? (*e.g.* esclusione piccola pesca, % concessioni per *new entries*, etc)

Il sistema migliore è l'esclusione della piccola pesca, ed esclusione per quelle specie che in Mediterraneo non fanno quota (solo il tonno ha una quota).

3.18. Ritiene che sia meglio un sistema di quote gestite e trasferibili su base individuale (modello ITQ), oppure un sistema basato su quote più ampie cogestite a livello di comunità (modello CTQ)?

La creazione di comunità di cogestione delle risorse non riesce a decollare nel contesto ligure.

3.19. Nel caso si ritenga preferibile optare per un modello CTQ, come stabilirebbe la "comunità" di riferimento? (ad es. a livello di marinerie, consorzi di pesca, associazioni di categoria)

/

3.20. Qual è la sua posizione nei confronti delle misure UE per il disarmo dei pescherecci?

L'arresto definitivo è un sistema per accelerare i disarmo e la demolizione. Il costo è notevole ma possono ridursi i parametri per il pagamento. Anche senza disarmo incentivato, se l'attività non rende è destinata a morire.

3.21. Ritiene che l'utilizzo di un sistema TFC porterebbe ad una riduzione della flotta nella Sua Regione?

Sì ☒
No ☐
Non so ☐

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Per quali motivi?

Introducendo nuove limitazioni (quota e/o giorni di pesca) si riduce la redditività potenziale dello stesso numero di imprese, per cui alcune saranno costrette ad uscire senza essere rimpiazzate perché non remunerative.

3.22. Come viene visto il sistema TFC dai pescatori e dalle Associazioni di Categoria della Sua Regione?

In genere con molte preoccupazioni, perché conoscono quanto è successo per la pesca del tonno, con l'introduzione di quote e quasi scomparsa di un settore. I pescatori che si dedicano alla cattura di pesce azzurro vedrebbero invece di buon occhio l'introduzione di quote per le acciughe. La piccola pesca è assolutamente contraria per i motivi già elencati.

3.23. Sono stati fatti degli studi o approfondimenti a riguardo? *(se possibile, allegare i materiali di pertinenza e/o fornire una lista ragionata dei documenti esistenti)*

Sì ☐
No ☐
Non so ☒

Spiegazione di dettaglio ed eventuali azioni implementate:

Sono stati effettuati solo dei sondaggi presso il comparto.

3.24. Ritiene ci sia consapevolezza da parte degli stakeholders sul tema TFC nella Sua Regione?

Sì ☐
No ☒
Non so ☐

Spiegazione di dettaglio ed eventuali azioni implementate:

Il settore non ha ancora ben compreso cosa significhi il nuovo sistema, gestito dall'alto per le quote e tempi di pesca, come per tutte le misure ne prenderà coscienza nel dettaglio dopo che sarà stato adottato. Allo stato attuale delle conoscenze, vi è condivisione solo da parte del comparto di pesca dell'acciuga, che però vorrebbe giungere alla definizione di quote in autogestione

3.25. Esistono delle normative in qualche modo riconducibili al concetto di concessione trasferibile a livello nazionale e regionale?

Sì ☒
No ☐
Non so ☐

Spiegazione di dettaglio: *(indicare anche gli estremi delle norme nazionali/regionali)*

La licenza di pesca stabilita dalla Legge 41/82 e successive norme è una specie di concessione di pesca trasferibile, di durata 8 anni, solo che non prevede quote o limiti temporali.

3.26. Considerando le limitazioni imposte dalle normative europee in contesto di pesca, vengono fatte molte deroghe nel contesto regionale di riferimento? (*e.g.* fermo pesca, taglie, attrezzi)

Sì ☐
No ☒
Non so ☐

Spiegazione di dettaglio: *(indicare anche gli estremi delle norme nazionali/regionali)*

Sussiste solo la deroga per la pesca al rossetto (dimensioni maglie, distanza dalla costa) valida per tutta la GSA9. Le norme creano problemi (taglia minima vongole, alici, sardine, naselli ecc.) ma non sono state richieste deroghe.

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Toscana Region (ITALY)

1st Thematic Section: Options for Quota determination and allocation criteria

OPZIONE 1: Quota pescabile intesa come quantità di pesce per motopesca	
VANTAGGI	**SVANTAGGI**
Aspetti Biologici, Ecologici, Ambientali	
1. Per pesche strettamente monospecifiche (pesca del rossetto, pesca della seppia e del polpo con le nasse, palangari a pesce spada, tonni e occhioni, ecc.) potrebbero essere individuate delle quote.	1. I pescherecci più piccoli potrebbero decidere di vendere la propria quota ai pescherecci più grandi, determinando l'accentramento di quote su determinate imbarcazioni dalle caratteristiche simili che incidono sugli stessi areali. Il risultato sarebbe un aumento dello sforzo di pesca in determinati areali. 2. Per la piccola pesca artigianale multispecie sorgerebbero difficoltà per l'individuazione della quota per singola specie.
Aspetti Economici	
1. Le quote di pesca, in linea generale, valorizzano la licenza di pesca e quindi incidono sul valore delle imbarcazioni. Ciò è particolarmente significativo nell'eventualità che il nuovo FEAMP non preveda contributi per le demolizioni e/o limiti la possibilità di ammodernare. Le quote di pesca rappresentano quindi un vantaggio per le imprese in quanto il possesso di TFC può incidere sul valore dell'imbarcazione e può rappresentare la buona uscita per i pescatori che cessano l'attività. 2. Il sistema delle TFC legato alla quantità di pescato può comportare benefici economici se messo in relazione ad una politica di qualità del prodotto che aumenti il prezzo del pescato alla produzione.	1. La quantità pescabile dal motopeschereccio, calcolata sulla base della quota nazionale stabilita per ogni singola specie può provocare anomalie derivanti dalla diversa disponibilità di risorse nei diversi areali di pesca. Ciò può determinare l'attribuzione di quote che possono risultare insufficienti per pescherecci della stessa tipologia strutturale ma che operano in ambienti diversi. 2. Chi rientra comunque nel sistema pesca ma non ha quote attribuite o ha parametri bassi di prelievo è indubbiamente penalizzato dal punto di vista economico. 3. Il periodo attuale è caratterizzato dalla presenza di un forte aumento dei costi di gestione della barca. L'introduzione delle TFC intesa come quantità di pescato può determinare la non redditività dell'attività, soprattutto in relazione alla tipologia di specie oggetto di prelievo (facendo riferimento al valore commerciale della specie pescata). 4. Qualora il sistema delle TFC per quote dovesse comportare una riduzione del prodotto sbarcato, si potrebbe determinare un aumento del prezzo del prodotto con il rischio di perdita di fette di mercato e/o di prodotto invenduto. Si rischia di ridurre ulteriormente il margine già esiguo di guadagno del pescatore.
Aspetti Sociali	
1. In assenza di attività di pesca a causa del raggiungimento delle quote, il pescatore può	1. Se si determinano le condizione di redditività più basse, automaticamente ne consegue una riduzione

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dedicarsi alle attività connesse, le quali generalmente sono a carattere familiare e coinvolgono anche giovani e donne.	occupazionale con perdita di posti di lavoro.
OPZIONE 2: Quota del tempo di pesca complessivo indipendente dalle specie pescate. In questa opzione non si considerano le specie pescate ma il tempo di pesca permesso per ogni motopesca andando questo a pescare ove ritiene più conveniente.	
VANTAGGI	**SVANTAGGI**
Aspetti Biologici, Ecologici, Ambientali	
1. Applicando il TFC in relazione al ciclo biologico di una o più specie, si potrebbe tutelare al meglio la risorsa	1. Determinare il TFC come quota del tempo di pesca potrebbe comportare un accentramento dello sforzo di pesca in periodi dell'anno particolarmente favorevoli, con conseguente aumento delle attività di pesca in quel periodo (ad es. con aumento del tempo di pesca o del n. delle cale). Ciò perché il pescatore tenderebbe a concentrare le sue giornate di pesca nei periodi più favorevoli dal punto di vista meteorologico.
Aspetti Economici	
1. Vedi punto 1 degli aspetti economici opzione 1	1. Se si verificasse la concentrazione dello sforzo di pesca in determinati periodi, si potrebbe verificare lo sbarco di prodotto in quantità eccessive, con conseguente diminuzione del prezzo del prodotto . 2. Rende i pescatori più deboli nei confronti del mercato.
Opzione 3: TFC – attribuendo una quota per ogni sistema di pesca ed area di pesca, sia per specie che per gruppi di specie, ad esempio per tonnellate di triglie per lo strascico nella GSA 17.	
VANTAGGI	**SVANTAGGI**
Aspetti Economici	
1. Vedi punto 1 degli aspetti economici opzione 1 2. Con questo sistema si potrebbe gestire il settore sia dal punto di vista socioeconomico che della risorsa (soprattutto quella legata alla piccola pesca) in maniera appropriata. 3. La scelta del TFC per area si lega in maniera particolare all'attuazione degli interventi che vengono realizzati nell'ambito dei piani di gestione locali, quindi consentirebbe di favorire il perseguimento degli obiettivi previsti dalla PCP ed in particolare dal Regolamento sul Mediterraneo (1967/2006). Attraverso l'applicazione di misure di carattere locale si possono applicare in maniera appropriata gli interventi socioeconomici volti a compensare eventuali perdite di reddito derivanti dall'applicazione di misure di riduzione dello sforzo di pesca.	1. Rischio di un'ingessatura del sistema. Si possono presentare difficoltà oggettive nell'applicazione di un sistema che di fatto potrebbe bloccare l'operatività delle barche in GSA che non comprendono i compartimenti marittimi d'iscrizione del motopesca. Le campagne di pesca al di fuori della GSA di appartenenza potrebbero non essere più possibili. Ciò potrebbe comportare una riduzione del reddito e la perdita di certi tipi di pesca (es: pesca del pesce spada).

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2nd Thematic Section: Fisheries management model based on a TFC system: Biological, Ecological and Environmental issues

2.1. Quali sono le principali specie di interesse commerciale catturate nella Sua Regione?

Naselli. Triglie di fango e di scoglio, Rane pescatrici, Sogliole, Moscardini, Seppie, Polpi di scoglio, Calamari, Mazzancolle; Pannocchie, Scampi, Acciughe, Sardine, Razze bianche, Razze chiodate, Muggini, Rossetti, Gattucci, San Pietro, Scorfani.

2.2. Esiste nella Sua Regione un registro/database con il dettaglio delle catture (quantità in kg/ton delle specie di interesse commerciale) per compartimento di pesca? E per imbarcazione? *(specificare la fonte dei dati e l'autorità di pertinenza per il mantenimento del registro/database)*

Sì, tutti i conferimenti ai mercati ittici sono registrati nelle schede ISTAT. Purtroppo la fuga di dati è sempre rilevante. Per alcune pesche speciali, come ad esempio il rossetto, ARPAT registra le catture giornaliere da molti anni. ARPAT, mensilmente registra anche il prodotto dello sbarcato del porto di Viareggio da oltre 20 anni.

2.3. In alcune aree (e.g. Scozia, Islanda) le ITQ (Individual Transferable Quotas) vengonoprevalentemente assegnate in base alla "catch history"(storia delle catture in termini di specie e quantitativi pescati in anni recenti – in genere ultimi tre o quattro anni) di ciascuna imbarcazione. Ritiene che ciò sia fattibile ed appropriato per il contesto regionale di riferimento?

No ☒

Per quali motivi?

Per l'areale toscano è molto rappresentata la piccolo pesca multi-attrezzo, multi-specie e artigianale. Si rischia di accentrare le quote nelle imbarcazioni che pescano di più, creando di fatto una flotta specializzata che insiste su determinati areali.

2.4. Se ritiene che un sistema basato sulle catch histories sia appropriato per la Sua Regione, come assegnerebbe le quote ai "nuovi ingressi"?

/

2.5. Ritiene che il concetto del Rendimento Massimo Sostenibile (Maximum Sustainable Yield,MSY) sia appropriato ed esaustivo per lo sviluppo di modelli di gestione della pescasostenibili?

Sì ☒

Per quali motivi?

Il MSY è appropriato ma può essere applicato solo su determinate specie. Può creare dei problemi nella determinazione dei parametric in relazione a sistemi di pesca che comportano il prelievo di più specie.

2.6. Nel caso si ritenga il concetto di MSY non appropriato o esaustivo, su quali modelli di stima della risorsa ci si dovrebbe basare?

/

2.7. Nel contesto regionale di riferimento i rigetti (discard) sono una pratica diffusa?

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Sì ☒

2.8. Ritiene che il sistema TFC può favorire la pratica dei rigetti (discard)?

Non so ☒

Per quali motivi, e quali soluzioni proporrebbe per ovviare al problema?

Dipende da come viene applicator il TFC.

2.9. Come modulerebbe il sistema TFC nel contesto regionale di riferimento considerando (i) limiti di cattura (TAC e contingenti) e (ii) sforzo di pesca (capacità di pesca x periodo di attività)?

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2.10. Come modulerebbe il sistema TFC nel contesto regionale di riferimento considerando i metodi di pesca prevalenti? Si considerino in particolare le problematiche relative a (i) pesca multispecifica; (ii) diversi attrezzi da pesca che insistono su una singola specie; (iii) prevalenza piccola pesca.

TFC per areali di pesca e segmento di pesca (TFC legato all'attività e non alla specie).

2.11. Limiterebbe le TFC solo a determinate:

- Tipologie di pescato?

  No ☒

- Zone di pesca?

  Sì ☒

- Segmenti della flotta e sistemi di pesca?

  Sì ☒

- Altre specificità?

  No ☒

2.12. Ritiene che le TFC dovrebbero tenere conto degli andamenti di mercato regionali, entro i limiti delle TAC e relativi contingenti nazionali assegnati su scala annuale?

Sì ☒

Per quali motivi?

Perchè l'istituzione delle TFC incide necessariamente sull'operato delle barche, sui periodi di pesca e sulle specie pescate, e di conseguenza sul mercato. TAC e relative contingenti nazionali non possono essere ignorati.

END OF REPORT

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