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Recreational maritime fishing in the Balearic Islands: Tradition and future

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SUMMARY – The Balearic Islands are the region of Spain in which recreational maritime fishing has the longest-standing tradition, social relevance and economic importance. There are about 70,000 recreational fishermen (8% of the population) that practise more than 60 different techniques, predominantly from a boat (63%) followed by coastal angling (33%). Submarine fishing, even though it is practised by a minority (4%), has a large impact on the coastal fauna. Although annual catches from recreational fishing (1200 t) are about 25% of those of the professional fleet, it is estimated that they generate an added value 4 times higher; meaning that for each kilo of fish caught, recreational fishing generates an added value 16 times higher than professional fishing. The economic, social and environmental implications of this fact are taken firmly into account in the management of the region's fishery resources. For several years, the regional Government has been implementing a series of innovative measures (vessel licences, specific close seasons, marine reserves, non-fishing days, etc.), that could serve as a sustainable management experience applicable to many other areas of the Western Mediterranean. With a view to the future, it is still necessary to apply new formulas of selective fishing, such as the introduction of minimum hook sizes, but moreover it is important to improve information and training of recreational fishermen on sustainability issues and to involve them in the management.

Keywords: Recreational maritime fishing, Balearic Islands, fisheries management.

RESUME – *"La pêche sportive maritime dans les îles Baléares : tradition et futur". Les îles Baléares sont la région d'Espagne dans laquelle la pêche récréative maritime possède la plus longue tradition, ainsi que la plus grande importance sociale et économique. Il existe environ 70 000 pêcheurs sportifs (8% de la population) qui pratiquent plus de 60 techniques différentes, au premier rang la pêche à partir d'une embarcation (63%) suivie par la pêche à la ligne côtière (33%). La pêche sous-marine, même si elle n'est pratiquée que par une minorité (4%), cause un grand impact sur la faune littorale. Bien que les prises annuelles de la pêche récréative (1200 t) ne représentent que 25% environ de celles de la flotte professionnelle, on estime qu'elles apportent une valeur ajoutée 4 fois plus grande ; ce qui signifie que pour chaque kilo de poisson pris, la pêche sportive crée une valeur ajoutée 16 fois supérieure à celle de la pêche professionnelle. Les implications économiques, sociales et environnementales de ce constat sont strictement prises en considération dans la gestion des ressources halieutiques de la région. Pendant plusieurs années, le gouvernement régional a mis en place une série de mesures innovantes (licences pour les bateaux, saisons spécifiques d'interdiction de pêche, réserves marines, jours d'interdiction de pêche, etc.), qui pourrait servir en tant qu'expérience de gestion durable applicable à plusieurs autres zones de la Méditerranée Occidentale. Pour l'avenir, il sera encore nécessaire d'appliquer de nouvelles formules de pêche sélective, telles que l'introduction de tailles minimales d'hameçons, mais surtout il est important d'améliorer l'information et la formation des pêcheurs sportifs quant aux questions de durabilité et de les impliquer dans la gestion.*

Mots-clés : *Pêche sportive maritime, îles Baléares, gestion des pêches.*

Introduction

The Balearic Islands are made up of 4 main islands and 164 islets and reefs. With a total surface area of only 5000 km^2 there are 1341 km of coastline (40.6% of the Spanish Mediterranean coast) and 10,700 km^2 of the continental shelf (Massutí, 1991). They are situated in the Western Mediterranean, in a SW to NE alignment, and open to the influence of all the shores of the Mediterranean basin, constituting a unique fishing area (Massutí, 1991; Massutí and Reñones, 2005).

Both factors make fishing in the Balearics extremely accessible, popular and varied, with a compendium of techniques that are either currently practised or used to be practised in the Western Mediterranean Basin. Therefore, on explaining what recreational fishing is like and how important it is

for the Balearic Islands it is also important to situate it within the context of the Spanish Mediterranean. Of the 5 Autonomous Communities of Spain with a Mediterranean coastline, the Balearic Islands, with only 4.4% of the population, hold 32% of the recreational fishing licences, 31.8% of the marinas and 22.1% of the recreational vessels.

The economic importance of this activity is neither well known nor recognised, but recent estimates have shown that in the Balearic Islands, recreational fishing generates an added value 4 times higher than that generated by professional fishing (TRAGSATEC, 2004).

Another important factor to be taken into account is the distribution of the administrative responsibilities for fisheries in Spain. In the Balearic waters recreational maritime fishing falls under two jurisdictions that, in principle, are independent of each other: the State jurisdiction and that of the Autonomous Community. However, the need to achieve a viable management makes both administrations cooperate with each other, given that in recreational maritime fishing there are basic norms and concepts that coincide. The main elements are the following:

(i) By definition, recreational fishing is for leisure purposes only, and catches are not destined to market, however they can be used for own-consumption.

(ii) It is free for all residents, whether national or foreign, but a licence is necessary.

(iii) It does not allow the use of nets, long-lines or traps, which are exclusive to professional fishing.

(iv) Practically all of the techniques permitted are based on hand-lines or fishing rods.

(v) The target species are fish or cephalopods.

Origin

It is difficult to know where the origin of non-professional fishing in the Balearic Islands lies, but it is a long-standing recognised practice, whose purpose was to obtain a protein supplement, which was very scarce in former times. We should not forget that in the Mediterranean, the use of rods and hand-lines was reported 2800 years ago, as Homer mentioned them in The Odyssey (Bas, 2006). However, the popularisation of recreational fishing and the concept itself as we know it today are not so ancient, possibly stemming from the second half of the nineteenth century.

The first clear references come from the Archduke Luis Salvador of Habsburgo, who writes in 1876: "the villagers living near the coast fish with a rod on Sundays and holidays first thing in the morning or at sunset on Saturdays. Some travel long distances to enjoy this leisure activity, coming down high cliffs and sometimes they can be seen where no-one would expect a man to be able to descend". In fact, he is describing perfectly one of the techniques still used today, fishing with a rod from the rocks to catch salemas and saddled seabream (Duran, 1978).

From that point onwards, works appear from scientists or travellers, who, on describing the islands, speak of how the inhabitants are fond of recreational fishing (Vuillier, 1893), and describe the wide range of methods and gears that have arisen as a result of observing fish behaviour and human ingenuity (Ferrer-Aledo, 1914; Prats, 1997). Another curiosity is that in the twentieth century, for almost 75 years, until its prohibition, in Mallorca there was a professional fishing fleet dedicated exclusively to catching bait for the recreational fishermen. Massutí (1973) cites up to 60 different techniques.

The first scientific studies on recreational fishing also come from the Balearics, in particular the work written by Miguel Oliver and Miguel Massutí in 1953 on the pearly razorfish (*Xyrichthys novacula)*, a small labrid highly appreciated by the islanders (Riera and Linde, 2001).

Description of recreational fishing in the Balearic Islands today

In spite of traditionally being undervalued in fisheries management, today there is reasonably exhaustive knowledge of the different aspects of recreational fishing. Thus, the regional Government

has a line of attention and monitoring of this type of fishing, that has improved from year to year. In particular, between the years 2000 and 2002, and co-financed with FIFG funds, an extensive survey was conducted (Morales-Nin *et al*., 2004, 2005a and 2005b). This was a pioneer study in Spain based on interviews conducted either randomly by telephone or at the port, as well as maritime and aerial censuses with the aim of obtaining a real idea of the magnitude and of the most important aspects of recreational maritime fishing in the Balearic Islands; such as the number of recreational fishermen, customs, main techniques used, catches, etc.

As for sociological characteristics and patterns of behaviour, the typical recreational fisherman would be male (91%), on average about 46 years old, fishing alone or with a partner, from his own small vessel (5-7 m length) mainly in the morning during the summer or at weekends (84%), for approximately 4 hours a day (Morales-Nin *et al*., 2005b).

As for the techniques used, they fish mainly from a boat (63%), although there is a significant coastal angling practice (33%). Submarine fishing is practised by a minority (4%).

In coastal angling, the most predominant technique is casting (*pesca de lanzado a fondo*) (83%), which is practised in various ways. On the other hand, there is a large number of possibilities to fish from a boat, although the techniques most often practised are bottom fishing in coastal areas (69%), followed by use of hand-lines. Open-sea fishing is practised by a minority as it requires large and high-speed vessels. Recreational fishing in the Balearic Islands is essentially popular and only the wealthy can afford open-sea fishing.

As for the number of recreational fishermen, there are at least 70,000 in the Balearic Islands (8% of the population), meaning that this is one of the most popular leisure activities in the region, with 80 recreational fishermen for each professional fisherman.

This enormous number of fishermen exerts pressure upon the fishery resources, as they extract a significant quantity of fish, estimated at 1209 t/year based on real catches sampled at the quayside (Morales-Nin *et al*., 2005a and 2005b). This is equivalent to 25% of the landings of the professional fleet of the Balearic Islands (estimated at 5000 t/year). For the whole of the Mediterranean, the EU (2004) estimates that the recreational fishery catches reach 10% of the total, which is double in the case of the Balearics.

Finally, an important factor to be considered is the target species. Even though the number of species that may be caught is very high (about 80 finfish and 4 cephalopods) (Direcció General de Pesca [DGP], own data) and depends on the technique used, there are large differences between fishing from boats and the coast (surface fishing) and submarine fishing.

In the first case (Fig. 1), 68.5% of the catches corresponds to 5 species (*Serranus cabrilla, Coris julis, Serranus scriba, Xyrichthys novacula* and *Diplodus annularis*), all small in size, whereas submarine fishing (Fig. 2) targets large species: *Diplodus sargus, Epinephelus marginatus, Sciaena umbra, Seriola dumerili, Symphodus tinca, Mullus surmuletus, Labrus viridis,* etc.

Effects of recreational fishing on marine resources

When this question is asked, the answers can range from considering it to be absolutely harmless to being catastrophically destructive, depending on the interests of each interviewee and also due to the inveterate tendency in the fishing world to see the straw in the eye of one's brother. However, the potential effects that fishing has on the marine world are well known and there is a huge number of scientific works on the topic. To summarise, fishing in general has four main effects:

(i) Changes in populations of target species: on one hand the number of individuals is reduced and on the other the size distribution varies. In the species where size is sex-related, the selective reduction of larger and older individuals affects the balance of the sex ratio, reducing the reproduction capacity.

(ii) By-catches. In the fishing operations, low-value or uninteresting species are also caught. If the population decrease of the incidental species does not affect the yield of the fishing ground

(sometimes it even increases!), that may lead to their practical disappearance, as is the case of many ray-fish or sharks.

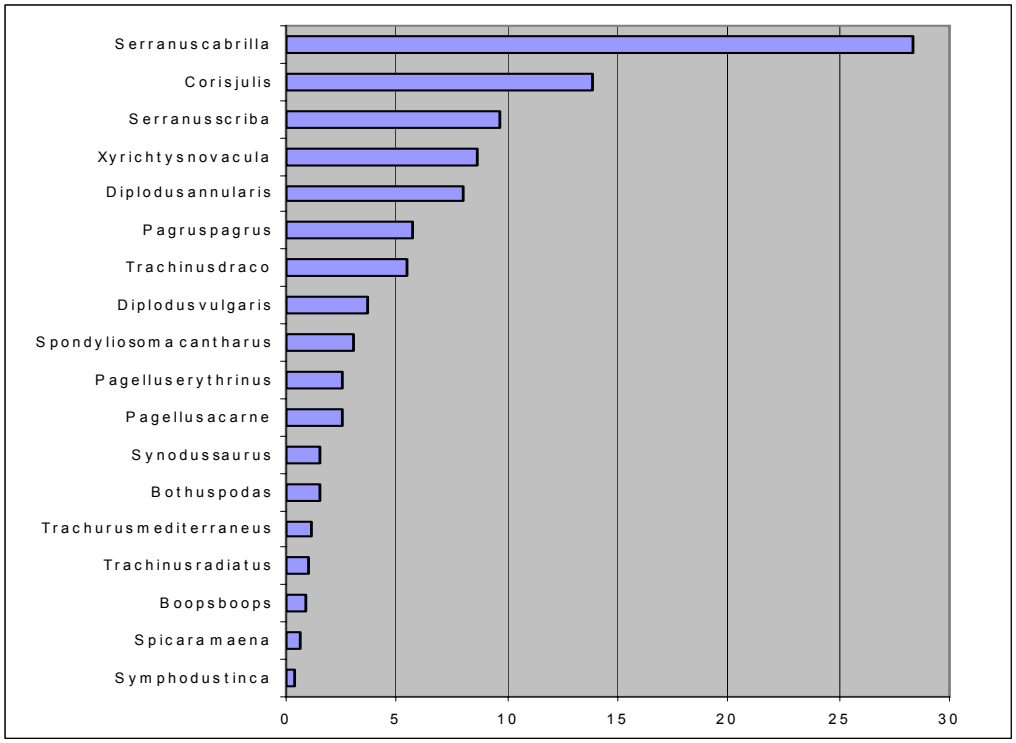

Fig. 1. Main species caught from boats and coastal angling in the Balearic Islands (in %). Source: DGP, own data.

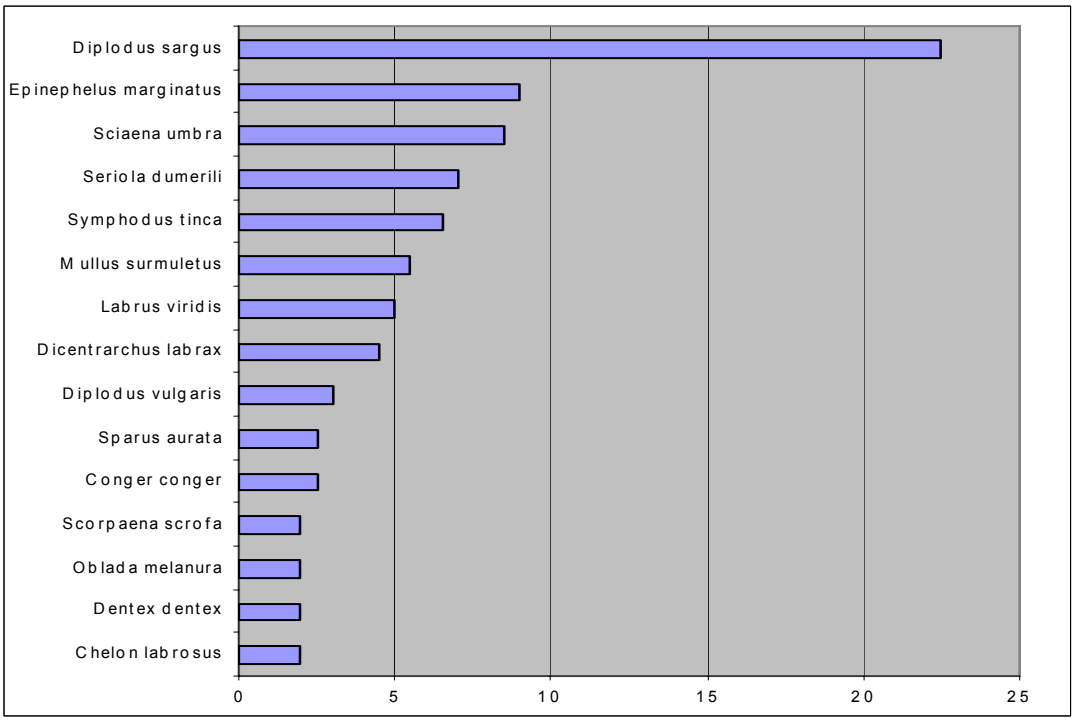

Fig. 2. Main species caught in submarine fishing in the Balearic Islands (in %). Source: Morales-Nin *et al*. (2005a) and DGP, own data.

(iii) Destruction of benthic ecosystems due to direct action. This is the case of trawling and similar systems.

(iv) Disturbance of the habitat due to the chain reaction caused by the exploitation of the fish. The most well-known case in the Mediterranean is that of sparids and coastal labrids, whose reduction favours sea-urchins which eat the algae communities on the rocky substrate (Sala *et al*., 1998), although this has been questioned recently in the case of the Balearics (Cardona *et al*., 2006).

In the Balearic Islands, surface recreational fishing produces effect i and, to a lesser extent ii, but neither iii nor iv (in accordance with Cardona *et al*., 2006), hence the fish habitat (both the physical environment and the benthic biota) is not affected. Furthermore, if we take into account that the main target species of surface fishing (Fig. 1) are all small in size, have a short life cycle and are situated at intermediate levels of the marine food chain, we may explain why the fishing grounds withstand the situation and even recover each season. On the other hand, when the activity is regulated and effort is reduced, the target species populations respond well to the management measures and recover easily.

For the same reason, in the Balearics there is a calm coexistence between surface recreational fishing and professional fishing, since, with the exception of some species such as squid, the greater amberjack (*Seriola dumerili*) or the common dolphinfish (*Coryphaena hippurus*), the main target species of professional fishing (lobster, prawns, hake, red mullet, sardine, etc.) are not target species of recreational fishing, and vice-versa.

However, we should not give the impression that recreational fishing is harmless. In the Balearic Islands, with the creation of marine protected areas, we have seen that in the areas closed to recreational fishing but open or not to artisanal fishing, all the biological indicators of the fish populations (biomass, diversity, sizes, etc.) are higher than in the free-fishing areas (Coll *et al*., 1999; Reñones *et al*., 1997 and 1999). Furthermore, the most evident effect has been seen in coastal areas with the prohibition of submarine fishing; given that in areas where this type of fishing has been prohibited, but not surface recreational fishing, the recovery of the fish populations is similar to that of the no-take areas (Coll *et al*., 2007).

Therefore, submarine fishing is a special case: although those that practise it say that it is the most selective method, in reality, where it is practised, the target species disappear radically, that is, the large-sized sedentary coastal fish (Fig. 2), Coll *et al*., 2004. These fish are higher up on the food chain than the target species of surface fishing (Fig. 1), they have a longer life cycle and a slower capacity of recovery, therefore the impact of this type of fishing is serious. If we add that the species pursued are also the preferred target of traditional artisanal fishing and that there are cases of divers that sell their catches illegally, we will understand why the status of submarine fishing in the Balearic islands is being revised today.

Fisheries management

As indicated in the introduction, the territorial distribution of responsibilities between the central and regional Administrations means that two different jurdisdictions coexist, obliging both administrations to work hand in hand so as to execute a viable management.

In fact, although both legislations are almost identical, there are exceptions: for example, the autonomous legislation prohibits the use of electric reels, which are permitted by the state legislation. On the other hand, the state prohibits the capture of crustaceans, whereas the autonomous legislation allows the capture of certain amphipods for bait.

One of the best examples of this collaboration is the case of the fishing licences: Although in Spain a licence has been compulsory since 1963 and the autonomous licence was created in 1986, very few licences were actually issued (less than 5000) up until 1999 when the introduction of a harmonised licencing system saw a spectacular increase (Fig. 3), motivated by the increase in inspection activities of the autonomous authorities, greater proximity and better capacity of information of the regional and insular administrations and more cooperation from the fishermen's associations.

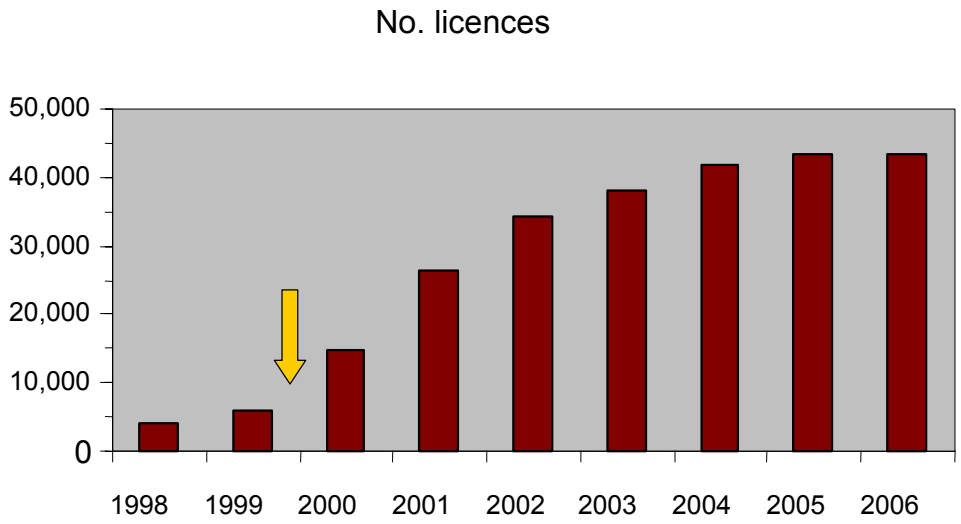

Fig. 3. Increase in the number of recreational maritime fishing licences between 1998 and 2006. Source: DGP, own data.

Today, there are 46,000 valid recreational fishing licences, but it is very probable that the real number of recreational fishermen who practise fishing is nearer 70,000. In order to make the issue of licences more agile, to eliminate the administrative offences caused by having on board non-habitual crew members that do not have a licence and in order to obtain a real census of vessels that go out to fish, the regional government has created a vessel licence that came into force in March 2007. Approximately 2000 of these licences have already been issued. This may be a very positive experience with a view to a national register of vessels used for recreational fishing, as recommended in the Fisheries White Paper (MAPA, 2007).

Another important aspect of the Balearic Islands model is the central role given to the sector, both in the maximum fisheries advisory body (Interinsular Fishing Advisory Council) and in all the monitoring commissions of the marine protected areas (there are 7, covering a total protected area of 54,000 ha). Various recreational fishing representatives participate in these bodies, besides the representatives of sports federations (Fisheries and Subaquatic activities) as well as representatives of the sailing clubs. The Balearic government has both looked favourably on and encouraged the creation of recreational fishing associations that genuinely represent the sector so they may become valid spokespeople when reaching agreements and legitimating proposals.

Another characteristic is that the General Fisheries Directorate has a unit specially devoted to monitoring annually the state of the fish populations targeted by recreational fishing. An important conclusion that arises from the 2000 and 2002 monitoring study (Morales-Nin *et al*., 2004, 2005a and 2005b), is the inappropriateness of basing management on capture data (surveys, landing statements) that are not contrasted on land, as well as the scarce utility of requiring fishermen to fill in forms about their catches if there are no means to check them. Therefore, the decisions and proposals of the Autonomous Government regarding resources and recreational fishing are always based on real catches, estimated from self-controls or voluntary inspections.

A good example is the case of the close season for the pearly razorfish, a species of great interest, ruled by a specific regulation, both for inshore/regional and offshore/state territorial waters. Since this close season was established in 2000 and after a marked decline, the mean size of this species has increased in all the fishing grounds controlled by the General Fisheries Directorate (Fig. 4).

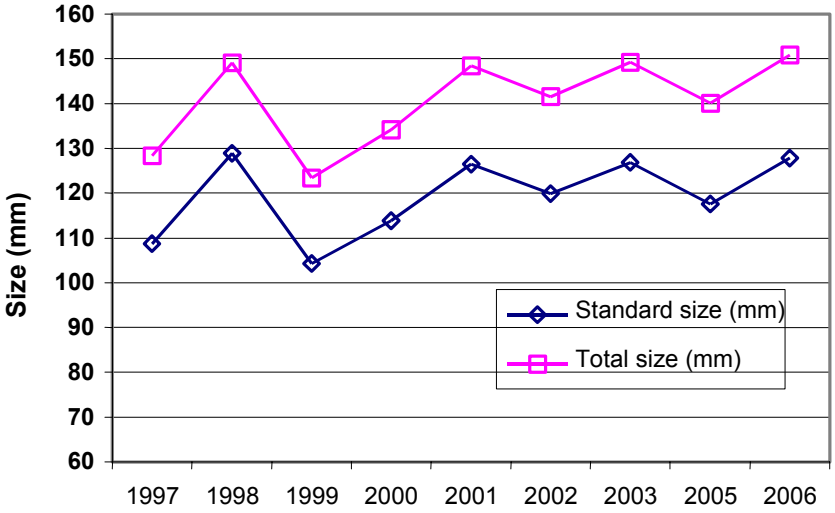

Fig 4. Evolution of the 1997-2006 mean sizes of the pearly razorfish (*Xyrichthys novacula*) in Mallorca in relation to its close season (1999). Source: DGP, own data.

A particular case is that of the results of fishing competitions, which enjoy long-standing tradition in the Balearic Islands (994 authorised for the period 2002-2007). Although, on occasions, this activity is questioned by the ecological associations, it is true that they play a certain role in fisheries management. As it is a competition, everything fished is declared and therefore results obtained are normally strict and high quality, something difficult to find in the fisheries world, and certainly much more reliable than the catches declared by the professional fleet. As observed in Australia (Gartside *et al*., 1999), if the historical series are long, they can become an excellent tool to monitor the evolution of the target populations, which is of great use in the management of recreational maritime fishing. We have also used them to show the dramatic fall in grouper populations (*Epinephelus marginatus*) off the Balearic coasts (Coll *et al*., 2004).

In all events, the present aim of the General Fisheries Directorate is the promotion of catch and release fishing and conversations are being held with the Balearic Fishing Federation, so that in 2008 all official competitions will be catch and release.

Another proposal for the future, that the General Fisheries Directorate is already applying in the marine protected areas, is the establishment of minimum hook sizes for bottom-line fishing, the most popular type of recreational fishing in the Balearics.

Three years of studies (2004-2006) and more than 10,000 fish caught have confirmed something well expected, that the mean size of the fish caught decreases with the size of the hook (Fig. 5). This is basically due to the fact that small fish are not caught with large hooks, which facilitates compliance with the minimum capture sizes established in the regulations. Furthermore, it has also been shown that the hook size does not affect the yield (in weight) of the catch, which depends more on the skill of the fisherman and on the fishing area, rather than the "hook" factor.

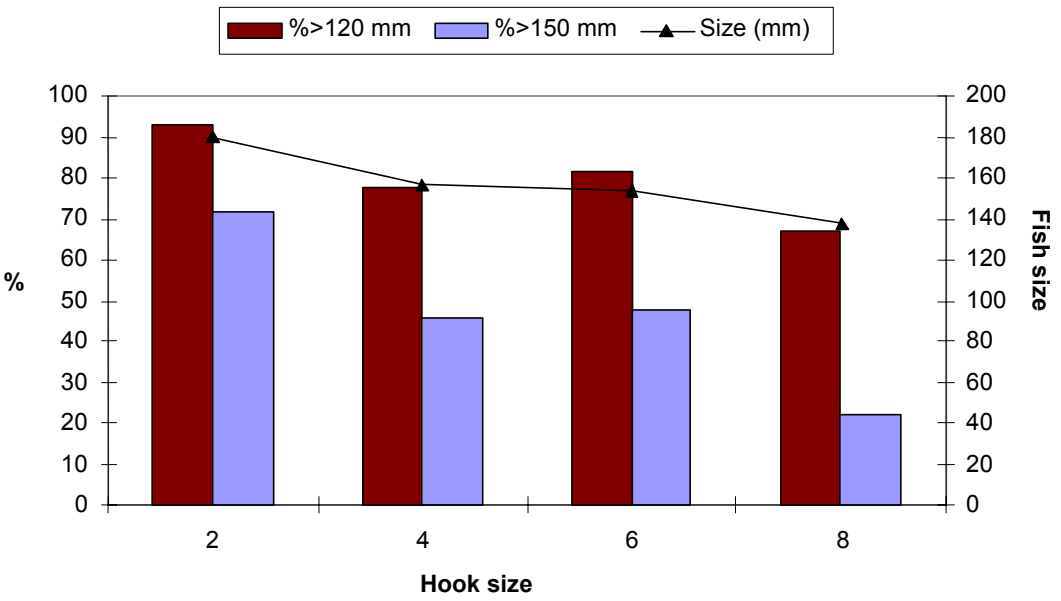

Fig. 5. Relationship of hook size and fish size. Source: DGP, own data. Note: Hook size is expressed according to the traditional numbering used in Spain, which correspond to the following gap sizes: No. 2 = 8.5 mm; No. 4 = 7.3 mm; No. 6 = 6.24 mm; No. 8 = 5.55 mm.

The future

In my opinion, the future is based on two basic pillars: the perserverance in the resource conservation measures and the improvements in information and communication to the recreational fishermen, to explain them the fishing regulations and the biological and scientific reasons upon which they are based.

Very often, many recreational fishermen are unfamiliar with management regulations because the administration is not capable of reaching them (the case of the licences is a good example), and therefore the regulations are not complied with. Thus, for the future it is reasonable to consider training courses on the concept of responsible fishing for recreational fishermen.

Furthermore, the recreational fishing sector must be more aware of the need to conserve resources and should be actively involved in their defence, demanding that the public managers establish measures to ensure the maintenance of the fish populations. In the case of the Balearics, and eventually, the whole Mediterranean, recreational fishermen should realise that for each fish killed, a much higher added value is generated than industrial fishing, and with much less ecological damage, whether direct or collateral. In fact it is possible to establish viable recreational fisheries without having to kill the fish.

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