

MARGINATUS

GEM's
newspaper

(Groupe d'Etude
du Mérou)



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Inside the
magazine

MPAs worldwide and *IMPAC 3*

Groupers and Brown Meagres: why should we protect them? Proposals
Special issue about « Moratorium »: successful efforts to be carried forward

Editorial

A notorious progress and an international turning point

For more than 25 years, GEM has been trying to improve knowledge about the dusky grouper's biology and ecology as well as about species related to its ecosystem like brown meagre. Thanks to the expertise of its members, GEM acquired a recognized know-how, particularly in the inventory of these fish populations both by snorkeling and scuba-diving visual census. Today, in this field, this group of experts has become unavoidable. Moreover, some of its members are highly reputed individually for their international researches particularly on these species. This allows to measure the significant improvement of our association (created by a small group of passionate people and dealing with French Mediterranean marine protected areas) that today includes 130 members from several mediterranean countries.

But things change gradually and GEM is now at a turning point in its future and works. Recent history shows us the importance of sharing information about news on marine biology. For instance, Nodavirus, that affects several fish species, is indicative of a worrisome phenomenon across the Mediterranean basin, if not beyond. Monitoring its evolution is necessary to a better understanding, to prevent or to seek for rescuing sanitary measures. From another point of view, the grouper is an indicator species of quality for measuring the status of the marine coastal habitats and for management performance in the handled or protected marine areas. The ecological approach to a phenomenon consists in a global vision that combines natural and anthropic elements associated with this phenomenon. Obviously with regard to groupers and brown meagres the global approach manifestly applies to the whole coastal area of the Mediterranean basin. Moreover, marine or coastal managers should have some benchmarks and indicators of the environmental evolution of the areas they are in charge for. So the monitoring of groupers populations as well as of their ecosystem quality represents an opportunity that is now available for everybody.

With an eye to an international approach that is now unavoidable, GEM should make available its experience and its know-how in order to contribute, as many others do, to the improvement of knowledge and to a better management of our maritime spaces as well as to enrich itself by going beyond its usual boundaries that are mostly French. This is a long-term approach that requires a further involvement and, more than ever, a true and firm « mediterranean » action.

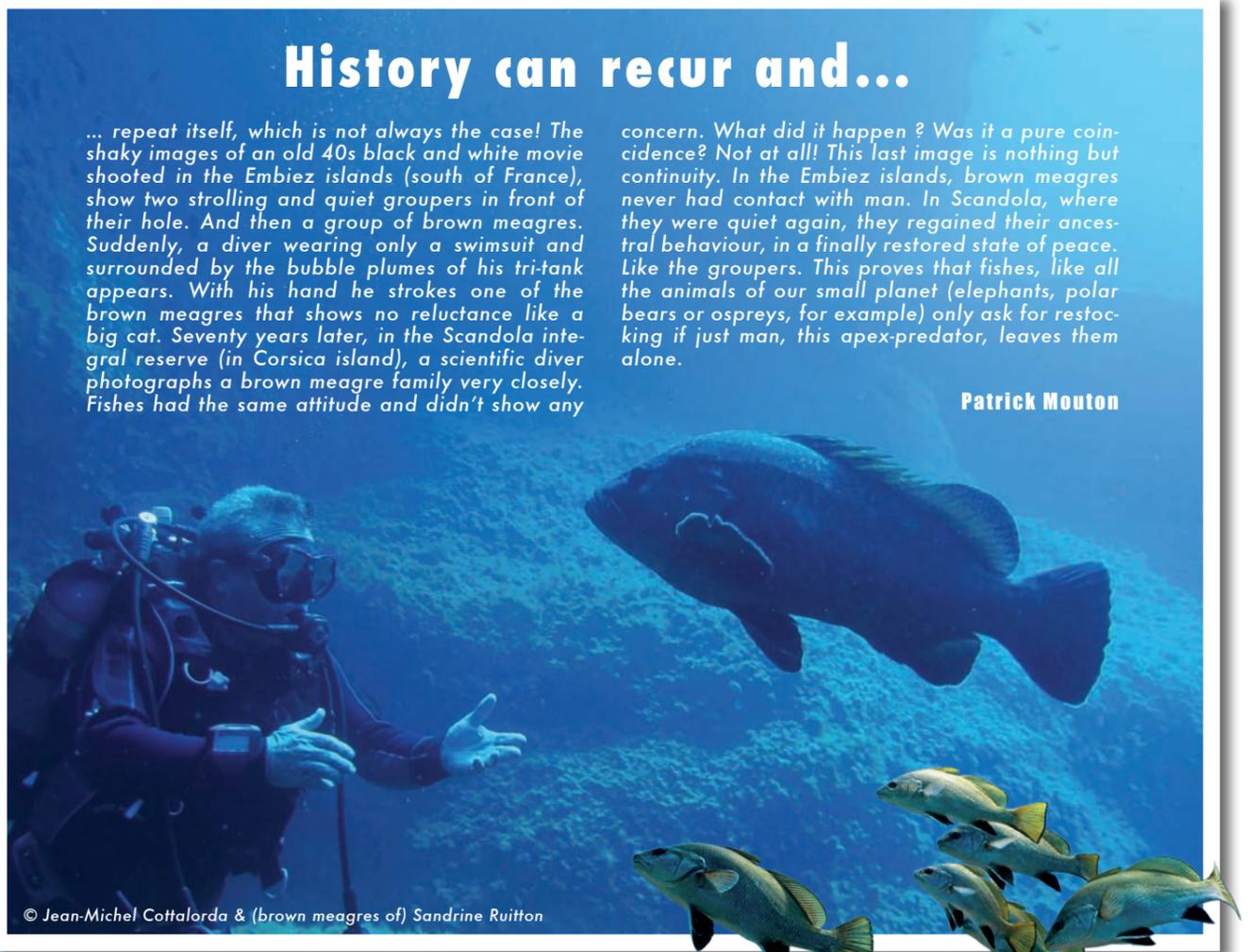
Philippe Robert,
GEM President

History can recur and...

... repeat itself, which is not always the case! The shaky images of an old 40s black and white movie shot in the Embiez islands (south of France), show two strolling and quiet groupers in front of their hole. And then a group of brown meagres. Suddenly, a diver wearing only a swimsuit and surrounded by the bubble plumes of his tri-tank appears. With his hand he strokes one of the brown meagres that shows no reluctance like a big cat. Seventy years later, in the Scandola integral reserve (in Corsica island), a scientific diver photographs a brown meagre family very closely. Fishes had the same attitude and didn't show any

concern. What did it happen? Was it a pure coincidence? Not at all! This last image is nothing but continuity. In the Embiez islands, brown meagres never had contact with man. In Scandola, where they were quiet again, they regained their ancestral behaviour, in a finally restored state of peace. Like the groupers. This proves that fishes, like all the animals of our small planet (elephants, polar bears or ospreys, for example) only ask for restocking if just man, this apex-predator, leaves them alone.

Patrick Mouton



© Jean-Michel Cottalorda & (brown meagres of) Sandrine Ruitton

Report Groupers of Brazil

Brazil: an invitation to travel! Brazil... with its carnival, its beaches, its wonderful women, its amazonian forest but also... its groupers, preferably a heavily weighted category with a big paunch. A meeting to get a further knowledge of their life and problems that go beyond boundaries...

Athila Bertoncini Andrade, in charge of the project Groupers of Brazil, is a researcher in oceanography at the Universidade Federal Fluminense. From 2006, he is an active member of the IUCN* group of experts where he assesses the status of endangered fish species of the Serranidae, Labridae and Scaridae families.

Epinephelus marginatus (the dusky grouper or « grouper » for the fishers from Vera Cruz) is an emblematic species both in Brazil and in the Mediterranean. It is popular to the point of being depicted on the reverse side of the 100-Brazilian Reais banknote (around 200 euros). Athila studies its reproduction. They are widely distributed in the southern hemisphere, from October to February, with a peak in December-January: during this period, hundreds of groupers aggregate to spawn. The first sexual maturity was observed in individuals at 47 cm and about 2 kg (these data are similar to those from Tunisian coasts). This information allows authorities to develop a species management and protection program.

In Brazil, the grouper is of some importance to artisanal fisheries. With 26 t/year landed in Santa Catarina, the artisanal fleet is responsible for 83% of the catches. One of the grouper species that occur along Santa Catarina coasts is critically endangered: it's the *Epinephelus itajara*, « the Atlantic goliath grouper », a huge grouper that can reach over 2.5 m and 450

kg. This slow-growing species can live up to 40 years. The goliath grouper, threatened by overfishing and spearfishing, has undergone population reduction and is listed in the IUCN Red List as « Critically Endangered ». Based on Athila's studies, Brazil prohibited the goliath grouper fishing and in 2002 established a moratorium for five years. Since then, harvesting of goliath grouper has been banned in the French Guyane as well. In 2012, fishermen and scientists organised a ten days campaign looking for the goliath grouper: during 48 diving sessions they could observe less than 30 individuals! It remains an easy and attractive prey for sport fishing, especially during spawning aggregations. The moratorium was renewed until 2015 but according to professional fishermen and scientists this extra



© Athila Bertoncini (athilapeixe.com)

time is too short to allow population recovery and occupancy of former areas. The census of this big species is very important. The presence of this predator of small fish and crustacean species is indicative of very good local life conditions. Despite protection, the Goliath grouper is still harvested and commercialised. The project Athila is working on to demonstrate the need for protection of this huge serranid

goes beyond the borders of Paraná State and Santa Catarina. Sponsored by an oil company, it gradually expands to the states of Rio de Janeiro, Espírito Santo, Bahia, Pernambuco and Pará.

Nardo Vicente

* IUCN: International Union for Conservation of Nature.

Vulnerable and endangered species? Why?

Because of their biological characteristics and their life history traits, some species like the Brazilian goliath grouper are subjected to different levels of fishing pressures than can lead to stock depletion and affect recovery. In the North-West Mediterranean, the dusky grouper (*Epinephelus marginatus*) and the brown meagre (*Sciaena umbra*) represent two concrete examples of the above-mentioned situation.

Species vulnerability and endangerment can be due to different factors:

- **late age of reproductive maturity** with individuals that are sexually active at a late age and at a large size (dusky grouper: > 5-7 years and 50-60 cm; brown meagre: > 3-4 years and 25-30 cm). Systematic captures of large individuals (of several decades) that have been shown to be the best spawners are more dangerous, especially in presence of sequential hermaphroditism because the largest sizes are only represented by one sex (the dusky grouper matures as a female and develops into a male at 60-80 cm and at 9-12 years, or later according to the social structure of the group).

- **a low potential of renewal** of their stock. Unlike species found in large shoals for example, dusky groupers and brown meagres have a low abundance of recruitment, a low production of juveniles and a slow growth.

- **a strong attractiveness**. Catching a grouper, a big fish highly valued for the quality of its flesh, can represent a very prestigious trophy. Like catching a brown meagre that, in addition, has large otoliths sometimes sought to make souvenir jewels.

- this vulnerability is increased by an **accessible habitat** as well as by an **aggregation and sedentary behaviour**. Thus, the dusky grouper as well as the brown meagre mainly live in or near rocky shallow habitats whose holes and caves represent accessible and predictable sites. Due to their site fidelity and quietness or even curiosity they can easily be approached. These species only spawn under certain conditions: abundant preys, high temperature (consequently near the surface), « placidity » and **aggregations** of about ten adults at least (these circumstances are rare out of some marine protected areas).

Sandrine Ruitton & Jean-Michel Cottalorda



© Sandrine Ruitton

« Moratoria » Successful efforts... to be carried forward!

In the 70s, in the North Mediterranean, the dusky grouper was almost extinct. In 1973, in the Port Cros National Park there were about 20 groupers. It was the same at the time of the establishment of the Cerbère/Banyuls and Scandola natural reserves, in 1974 and 1975. Awareness among the actors of the sea as well as later harvest prohibitions widely contributed to a progressive recovery of grouper populations in the French Mediterranean.

In 1980, Corsica adopted the first moratorium protecting the grouper from spearfishing. GEM was created in 1986. To strengthen the effect of marine protected areas, the same kind of moratorium was adopted on the continental coasts in 1993: this was a partial protection prohibiting the spearfishing of dusky grouper until 1998 and then until 2003. Since then, this kind of ban was extended to all kinds of angling, professional and recreational ones. Only artisanal fishers can catch them by using gill-nets, which is quite rare.

Renewed moratoria allowed a slow and progressive recovery of the grouper populations as confirmed by individual observations and scientific inventories. In the marine protected areas of Port-Cros, Cerbère/Banyuls and Scandola as well as immediately around them, it has been exceeded hundreds of groupers.

At the international level...

What future for these moratoria? GEM organised two symposiums gathering

the major experts on grouper. On those occasions, it was stressed the importance of maintaining and expanding them to brown meagre. Although the French efforts led to an increase in the density of groupers, the slow process of recolonization is far from being completed. And the brown meagre situation is very critical.

The exemplary French initiatives, acknowledged by IUCN* representatives, legitimises GEM to raise the awareness of Mediterranean neighbours. Representatives of riparian countries, particularly Spain and Italy, emphasized the urgent need for similar grouper protection in their countries. As now GEM members and experts are from different countries, its initiatives should be extended at international level to contribute to the management of grouper populations beyond French frontiers.

Philippe Lenfant

* International Union for Conservation of Nature.

It was yesterday... Plenty of resources quickly depleted!

Spearfisher (Moroccan champion in 1960) before swapping his speargun for camera, diver since 1956, marine biologist, scientific advisor, director of Research at the CNRS - French National Center for Scientific Research - (now retired but... still very active), Jean-Georges Harmelin goes back to some old stories and documents which are a precious evidence of past times, when our valuable elders still believed that marine resources were inexhaustible. A time when only a few dozens dared spearfishing. And Yet!

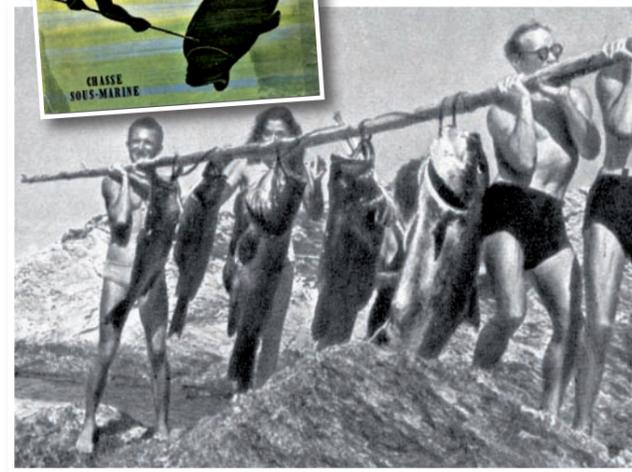
When I feel nostalgic, it happens to me to read again the few books that accompanied my discovery of the underwater world. They are all dog-eared because I often flipped through them with the enthusiasm of the young hunter I was. These spearfishing stories told about the exploits of the « goggles » at the end of the 30s and at the beginning of the 40s. Fitted out with homemade harpoons and very rudimentary equipment (without wetsuit and not always wearing « swimming appendages » or « wetsuit boots »), they offer us an unusual image of the Riviera at that time. Huge groupers (their « marine beasts ») some metres underwater, very frequent shoals of brown meagres, big amberjacks drawn near the coastline...

I start to doubt these sources! Were they liars? And what about Jacques-Yves Cousteau who filmed Frédéric Dumas while spearfishing in the Embiez islands, in 1942, in the famous documentary « 18 meters deep »*? Were they forged images?

What is most surprising is that from the beginning of the 50s, Côte d'Azur seemed to be already deprived of its most beautiful resources! But there was another Eldorado: Corsica.

Randomly, in one of these books, « La jungle du silence » written by Bernard Gorsky (Durel Editeur, 1947) it can be read: « On an evening of August

1941, we were going back to the port with a 22 kg grouper onboard... That year it seemed that fish became rare... To be polite, Bonnaud, an old fisherman and storyteller, didn't

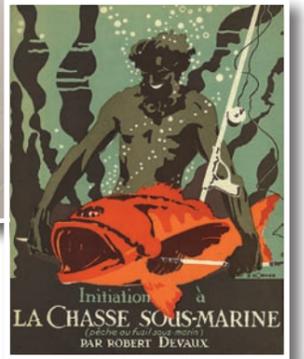
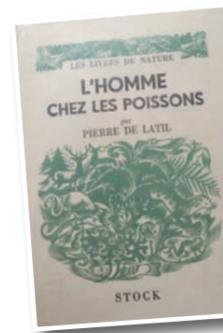


© Jacques-Yves Cousteau

* « 18 meters deep », watch this short film on www.youtube.com/watch?v=KzaZW02MA2Q

say that increasing spearfishing was contributing to this phenomenon. We would have soon understood how far he was right ». And then, further: « I saw him shooting a 18 pound dentex, at less than 1 m underwater... ».

Same refrain in « L'homme chez les poissons » by Pierre de Latil (Stock, 1951): « ... But today spearfishers catch more groupers in the sea of Provence than the imagination of the most frantic fisherman could have dreamt of in the whole Mediter-



anean sea. This will not last forever... In 1949, Victor Boffa, who probably holds the record for groupers, had his best year with 68 catches! ... As far as we know, here's the records for groupers caught from the beginning of the spearfishing... Utinel from Nice, 44 kg in Brus, near Toulon, Doctor Ojard, from Nice as well, 42 kg in Cap d'Ail... ». In the same book, Pierre de Latil mentions around ten spearfishers among those who « ... caught tens of groupers... » and he is very clear: « The pioneers of the harpoon are unanimous: at their beginnings, it was much easier to catch groupers. First, they could be found at 3 m underwater... In 1937, at the Mala Bay in Cap d'Ail, doctor Ojard shot and caught a 20 kg fish from the surface without having to dive »...

We all know what happened later: the almost extinction of groupers. Since then, thanks to awareness raising, the creation of marine protected areas and the prohibition of groupers spearfishing and angling..., we assist to their gradual return to our coasts. But... never forget the lessons of the past!

Jean-Georges Harmelin

Ecological and economic arguments... and international requirements

In support of the request of extension of the moratoria on groupers as well as of the request of its expansion to brown meagre, ecological and scientific arguments are generally made. These species are apex predators. They play an important role in the food chain and in the functioning of coastal ecosystems. Their populations strictly rely on available prey resources and fish harvesting. So they are very good indicators of the environmental status and particularly of the good status of coastal ecosystems: « as long as grouper goes well, all's well! ». And for brown meagre, it's the same.

A real economic approach to these flagship species in terms of marine tourism and not only of fishing is more and more diffused. Underwater diving and snorkeling (several tens of thousands of practitioners) and underwater tourism in general generate much more common interest and economic benefits than recreational fishing (included spearfishing). And as they are observational and not harvesting activities, they are much more sustainable.

The analysis of the legislation in force as well as of the international recommendations allows to gain a clearer understanding. Notably, these species are listed in the Annexe III of the Bern and Barcelona Conventions. So total protection under French law would be completely consistent.

Bern Convention (or « The Convention on the Conservation of European Wildlife and Natural Habitats ») was adopted in Bern (Switzerland) on the 19th of September 1979 and came into force on the 6th of June 1982. This international text was transposed into French law by means of the enforcement decree n°99-615 of the 7th of July 1999. For the brown meagre and the dusky grouper as well as for the other Mediterranean species listed in Annexe III (Protected

Fauna Species), « ... any exploitation shall be regulated in order to keep the populations out of danger ».

Out of danger? How can it be assessed? The IUCN* long and solid experience allows to develop objective criteria that are internationally acknowledged and shared. Two recent publications take stock of the status of these species**. Experts consider multiple criteria (ecological, biological, historical, socio-economic...) over several years (trend analysis instead of punctual data). These studies clearly identify major threats to different species. Among them, overfishing (notably spearfishing), aggregation spawning, longevity and late sexual maturation (sometimes complicated by protogynous hermaphroditism) are the major factors to consider brown meagre to be vulnerable and dusky grouper to be endangered.

So under the IUCN conclusions, France (Party to Bern Convention) has the obligation to adopt all necessary measures for the protection and management of these species in order to keep their populations out of danger... in a sustainable manner.

Patrice Francour & Jean-Michel Cottalorda

* International Union for Conservation of Nature.

** The first publication (2011) is about the marine fishes of the Mediterranean Sea. The latter one (2012) is about groupers of the world. Of the 163 grouper species found worldwide, 20 (among which there is the dusky grouper) are considered to be endangered.

Groupers, brown meagres and... men On the importance of the orders of magnitude

In the French Mediterranean sea, groupers are back. In the Marine Protected Areas there was an enormous increase (like that of the majority of fished species) but out of MPAs the sites where you can observe more than 5 to 10 groupers during one field trip (diving or spearfishing) are rare. And often..., aside from some jealously guarded « stones », there are even fewer brown meagres! This difference is due to harvesting: imbalances are not found in Nature. Apex predators cannot be considered responsible for that except... Man. While professional fishing is not increasing, sport fishing (included spearfishing) significantly increased. So to be concerned about sustainable conservation of the flagship species targeted by fishing (like groupers and brown meagres) is not a negligible issue.

It is impossible to enumerate all groupers and brown meagres but the order of magnitude for their current populations in our waters is only a few thousands individuals*.

Between 1930 and 1980, unwittingly, some few hundreds of pioneer spearfishers, yet unprepared and inadequately equipped, almost made the dusky grouper disappear from our coasts. But they cannot be considered guilty because even if the sea is immense, they could not imagine that some of its resources are much less. We cannot ignore it anymore especially as spearfishers are now several tens of thousands**! They are more and more performant, better equipped and some of them dive several times per month, all year round! According to available data on recreational angling, there are several tens (if not hundreds) of thousands of players that can better target their preys (Jig, electric fishing reels, sounders, GPS...).

Few thousands of groupers or brown meagres but... several tens of thousands of spearfishers and anglers! The difference between the above numbers is big enough to engage competent authorities as well as the actors of the sea.

In France, there are also several tens (if not hundreds) of thousands of scuba divers and snorkelers. But observing one species during several outings at sea has different consequences from eliminating it. Catching a beautiful big fish (seabream, dentex... or other barracuda) from a shoal of several tens of individuals has not the same impact as shooting a grouper or a brown meagre that can rarely be observed in groups of ten during one outing at sea. So spawners that are more than 30 years old (groupers >1 m long and 30 kg or brown meagre >50 cm) can disappear because of an arrow or angling! Alive, they are a pleasure for thousands of eyes and simple observation activities can generate signifi-



© Chantal Jomard



cant economic income (diving tourism and outlying sectors...).

The interest of the recreational and sport fishing in these few fragile species is understandable but conservation issue must come before in order to safeguard our future. This opinion would not be acceptable by someone who could only rely on these species for food and survival but it can be shared also by the most passionate anglers and spearfishers***. Many of them consider themselves eco-friendly practising spearfishing in a selective and sustainable way. Indeed, they have the power to reduce their catches and to shoot...or not one species.

J.-Michel Cottalorda

* Due to their ecological needs (rock habitat till 60 mt, spawning aggregations in warm water...), it is impossible to come across them in a great number in depth or in hundreds of square kilometers of sand in the Gulf of Lyon

or in the Corsican east coast, for example. The inventories taken in the MPAs allow to follow the evolution of the most important populations. Out of MPAs, density is drastically reduced, even if we extrapolate, add up and inflate these results, it is difficult to reach 15,000 groupers or brown meagres along the French Mediterranean coast.

** Since 2009, there is no obligation to declare a spearfishing activity. So, it is harder to know how many spearfishers practise today. According to estimates (most of them available in the Web) from Federations for spearfishing, blogs and other specialists there would be between 30,000 and over 100,000 (and more than 100,000 arbaletes would be sold in France), without taking into account the foreign spearfishers who land on our coasts (particularly in Corsica during the summer).

*** Anyway many spearfishers stopped fishing groupers and brown meagres before regulations, so as not to eradicate the small number of specimens they met. And they are satisfied to observe groupers and brown meagres in their habitats or to capture them on video. So they can share these encounters with more people and longer than after the return from a spearfishing session or sitting at the table eating.

Some spearfishers and their federations propose a daily quota of one brown meagre each spearfisher as well as to follow a period of biological rest. These proposals, intended to species preservation, are unfortunately inapplicable. The more regulations are complex the more they are circumventable and difficult to apply. In the present context (limited logistical and financial resources, lack of sea authorities...) no control of the quota or of the calendar period of interdiction can be contemplated. Who cannot admit we are right?

Furthermore, unfortunately these proposals will not allow to reduce the present harvesting pressure and they would risk to encourage to target the species. So they are absolutely impossible. If a spearfisher catches

10 brown meagres each year, he will not have the impression of impacting drastically. In many sites there would not be anymore. If 2,000 spearfishers catch 10 brown meagres each in the same year, it would eliminate 20,000 brown meagres. Now there are more than ten of thousands of spearfishers in France but less than 20,000 brown meagres, above all out of MPAs! In theory, every big spawner could be eliminated and the specimens which are smaller than the minimum catch size (35 cm) would continue to be captured "accidentally"!

With a reopening of the grouper spearfishing the same computations show that all the efforts made for many years (in accordance with moratoria) could be vanished in few months.

Proposals for regulations

No one can contest that the introduction of regulations in aid of the fragile species (in particular the ones with late maturity) is absolutely necessary to repopulate these species in order to not cross the threshold of the natural spawning. The sustainable common interest must take precedence over the short-run individual interest related to any activity.

It is not so easy to provide regulations for a sustainable management of species harvesting. Reflecting on and accepting it does not mean to give up freedom but it shows a strong and responsible engagement of the individuals, associations and fishing and spearfishing federations in aid of species conservation and habitat preservation on which their harvesting activity depends.

In view of the vulnerability of groupers and brown meagres and of their status at international level, of their attractiveness and the significant increase of recreational spearfishers and fishermen (their performances and technical progress) the total protection of these species could be justified. As most of the other actors of the sea, GEM prefers to suggest temporary targeted harvest bans, management of these resources and harmonisation of regulations. From 1st January 2014 for a period of 10 years instead of 5, in mainland France (included Corsica island),

the groupers and brown meagres recreational fishing would be banned. Professional fishing could be authorised with the exception of angling in mainland France (it will be still allowed in Corsica where those species are more common).

Already in force in Corsica, the protection of all grouper species living in the Mediterranean waters* would be extended to all French coastal waters.

Sandrine Ruitton & J.-Michel Cottalorda

* These species are the brown grouper (*Epinephelus marginatus*), and the much rarer goldblotch grouper (*Epinephelus costae*), mottled grouper (*Mycteroperca rubra*), Dogtooth grouper (*Epinephelus caninus*) and Atlantic wreckfish (*Polyprion americanus*). The 6th species, the white grouper (*Epinephelus aeneus*, some of which captured in Corsica), would complete this list.

GEM is interested in the rare observations of these species (see MARGINATUS n°12, on www.gemlemerou.org), as those of small dusky groupers (<12 cm in length). Please send your valuable reports (date, depth, observation site, species, size, photos, videos, contacts...) to: jean-michel.cottalorda@unice.fr



© Sandrine Ruitton

Italy: No specific regulations and... very few groupers and brown meagres

Several measures limited exploitation and fishing impact on groupers and brown meagres in Italy, but there is not any specific protection for these species.

At national level, protection/management measures for several fish species comply with European legislation. EU regulation n° 1967/2006 sets the minimum legal size limit of 45 cm for the brown grouper, for example. But this rule concerns few species and surely brown meagres are not part of.

For other species of commercial or ecological interest that are not included in the list, Italy imposes a minimum size limit. Some regions as Sardinia have autonomous regulations imposing larger limits. In Italy regulation also imposes limitations on recreational fishing at 5 kilos per day per person for all captured species. De facto a legal sized grouper can easily reach this daily limit.

Groupers and brown meagres benefit from specific management/protection regulations in the MPAs which are part of a particular law in Italy. In most of them grouper or brown meagre fishing is banned. As to professional fishing a minimal amount is tolerated considering the bycatch in

longline or gillnet fishing.

Rules for spearfishing competitions organised by FIPSAS can include measures to limit their impact on groupers and brown meagres. Catching a grouper causes penalization (loss of points). Brown meagres catching is limited to 5 individuals of 400 gr each at least. Nevertheless, in these competitions the limit of 5 kg per person per day in terms of total catch is disregarded.

In Italy groupers and brown meagres are numerous and large sized only in really protected MPAs (wilderness areas where harvesting is completely banned). It is so possible to watch more than dozens during a dive. On the contrary, it is rare to watch more than 2-3 groupers (and as to brown meagres it is rarer) in a diving out of a MPA. And these are often small sized specimens.

Paolo Guidetti* & Leonardo Tunesi**

*Univ. Nice Sophia Antipolis, EA 4228 ECOMERS, France

**ISPRA (Italian National Institute for Environmental Protection and Research), Roma, Italy

Monaco: groupers and brown meagres under protection

In accordance with Sovereign Ordinance n°10-779 of 29th January 1993 groupers and brown meagres angling and spearfishing are banned in Monaco.

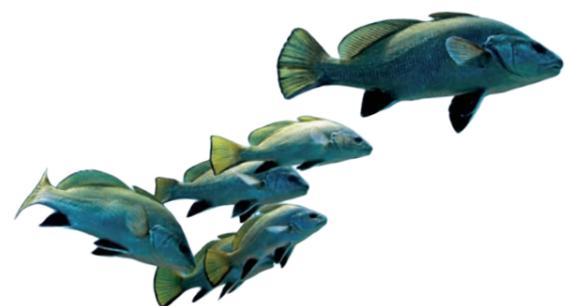
In 1995 GEM censused only 15 groupers along Monaco coast. Since 2006 the Government of Monaco wished to respect a regular inventory timing through a triennial prospection. At the end of November 2012 GEM carried out the 5th inventory: 12 divers explored Monaco 2 km coastline. They counted about 15 brown meagres and

75 groupers against 115 in 2009. The one month lag in the inventory period (difficult weather conditions) and the drop in waters temperature could explain that decrease.

Regular census of groupers and other fishes have been carried out in identified areas so as to take account of the coastal fishing pressure on grouper preys.

Raphaël Simonet,

Head of the Natural Heritage Division, Directorate of Environmental Affairs, Monaco



© Sandrine Ruitton

Important specifications and decisions

In the framework of the "Conseil maritime de façade de Méditerranée" and consultations on the management of the French Mediterranean coastal marine environment, DIRM (Direction interrégionale de la Méditerranée) was the driving force behind the work of a committee specialised in "grouper/brown meagre". The purpose of this important initiative was in particular to gather the scientific results with management proposals for these species*.

At the end of 2013 the "Conseil maritime de façade de Méditerranée" will present a dossier to the maritime Prefects who will ratify or not the management propo-

sals of which groupers and brown meagres will hopefully benefit. Crucial decisions and key timing so that those emblematic species could spawn and continue to be watched not only in a "glass case". And not only in some (really) protected marine areas!

*In March 2013 DIRM gathered delegates from the Marine Protected Areas Agency, Regional Fisheries Committees, WWF, Diving and Fishery Federations (line and spearfishing), Port Cros and Calanques National Parks, the Office of the Environment of Corsica, Scandola, Bonifacio and Cèrbère-Banyuls Nature Reserves, the Blue Coast Marine Park, several Marine Associations... and GEM, for its scientific expertise.

MPAs in the world A decisive role!

With 11 million km² of maritime areas (Canada surface area), 3% in mainland France and 97% in overseas, France is the second nation (after USA) according to the importance of waters under its jurisdiction. Its responsibility in the marine, coastal, deep or offshore ecosystems conservation is very essential as well as its MPAs crucial activity.

In this early summer the cicadas sing is deafening. Nicolas is about ten years old. He comes out of the water and places his mask and snorkel on the warm sand. He is amazed at what he has just seen. A massive concentration of Posidonia, shoals of sea breams, a splendid family of brown meagres, sponges, moss animals spread all over the rocks. A young grouper faced him for a few moment before taking refuge in its hole. Several wrasses are busy in their shelter careless about the young visitor.

Further, Dominique, one of the professional fishermen of the island, meets on the dock his colleague Jean-Claude. What a fishing today! Scorpion fishes, sea breams, wrasses and many other decent sized species, as it is quite impossible to find.

Nicolas and Dominique have a thing in common. Both make use of a MPA. Nicolas discovers the species close to surface, Dominique throws his net on the border of the marine reserve where every kind of fishing is banned. Both take advantage of the "reserve effect" namely species with many bigger and more friendly specimens. Life is in full flow in a natural harmony that can be observed in peace. For the child it means awareness of marine life and for the fisherman a "cascade effect": the advantage provided by the reserve to the close areas of which he benefits every day.

A wide array of facets

The considerations of Nicolas about his dive in a MPA call for a number of comments. A MPA is a cathedral, a mosque or a synagogue. A place of special reverence where each one behaves differently. Without making it sacred, this natural place benefits from the care of its managers, but also of those who discover and use it.

A MPA is also a bank, a place of biological enrichment thanks to the creation of a living capital whose interests are enjoyed by close areas and man exploits without touching its valuable capital. It is also a financial bank with regular economic spinoffs (Port Cros National Park yields 100 million per year to the local economy).

Moreover a MPA is a lab, a scientific research area where to increase knowledge, in favour of science but also of daily management of natural and fragile species. It allows to test and experiment technical measures, administrative or legal ones, for an efficient and long lasting management. Once those measures are approved and acknowledged, they can be exported to any similar area, protected or not.

In conclusion a MPA is also a school. A place where you try to understand the nature working and where you learn to behave coherently with species growing there. It is a place where to learn respect and "good manners" that later can be applied elsewhere, even if the official status of other natural terrestrial or marine areas is not necessarily a park or a reserve.

From now on Nicolas understands better the advantage of a MPA, even if nobody has explained to him yet that

it plays a major role to protect spawning sites of several migrant or sedentary species, to face climate change impacts successfully, to develop long lasting ecotourism plans for local inhabitants benefit or to safeguard several animal or plant species survival and health.

In accordance with the French law of 14th April 2006, a MPA can be a Natural marine Park, a national park with a marine portion, a natural reserve, a Natura 2000 site, a marine portion of the Conservatoire du Littoral domain (Coastal Conservation Authority) or a biotope protection area. A decree of 3rd June 2011 completes that list with 3 new categories derived from an international acknowledgment and a new protection oriented approach*.

Through its Marine protected area Agency (AAMP), France sets a real strategy in this field. In 2006 only 0.29% were classified as protected areas (corresponding to 5 French departments area). In 2013 2.40% were part of that categorisation (Metropolitan France half area). In 2020 20% of jurisdictional waters is forecasted to become MPAs. A part of them will be fishery reserves (about 4 times the size of Metropolitan France). Despite the current economic crisis, significant efforts are made as the recent creation of Calanques National Park in Marseille or Agoa Sanctuary in French Antilles.

In the Mediterranean, Medpan (Mediterranean protected area network) brings together about a hundred of coastal or marine protected areas, about 4% of the basin area if we consider Pelagos Sanctuary (0.4% without it). According to WWF there are 1,000 MPAs in the world that scarcely represent 2% of the total surface area of seas and oceans, but only 20% can be considered as really protected areas.

Even if we can pay tribute to high quality and efficient management of many of these areas, there is an urgent need to increase them in number until 10-15%. This must be done in aid of fishery resources conservation, preservation of ecosystems quality that is necessary to several endangered species spawning, feeding and rest. As well as in aid of the preservation of animal or plant genetic resources so essential for humankind. We can see the basic issues of international cohesiveness and coordination between national and international decisionmakers so that the strategy promoted by some countries could become widespread and develop.

Given the urgency of the situation, some national and international organisations go into action. The International Marine Protected Areas Congress from 21 to 27 October 2013 in Marseille and Corsica (IMPAC 3) is long-awaited by AAMP (French marine protected areas Agency) and IUCN (International Union for Conservation of Nature). An international event where GEM is closely involved.

Ph. Robert

*with: 1) RAMSAR sites, UNESCO world heritage sites, and biosphere reserves; 2) sites part of Barcelona Convention (SPAMI of Mediterranean), OSPAR (North-East Atlantic) Nairobi Convention (East Africa), Cartagena Convention (Antilles), CCAMLR (Antarctic); 3) Wild fauna and hunting Reserve with a marine section in the Morbihan Gulf.

GEM (under the French law of 1901) partly works thanks to its members subscription. All costs related to organisation, participation to missions, public events and conferences, as well as the creation and distribution of awareness-raising tools are financed by our public or private partners. This allows to build long lasting relationship with people and institutions particularly sensitized to marine environment domain and above all to messages conveyed by GEM. Once again we thank our faithful friends, colleagues and partners and we hope to thank them again.

Ph. Robert & Jacques Rancher



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GEM in PIM

The Mediterranean sea is dotted with islands and islets which attractiveness is often a synonym for degradation of natural resources. Since 2005 the Conservatoire du littoral (« Coastal Conservation Authority ») implements PIM initiative (Petites Îles de Méditerranée - Small Mediterranean islands) for a better naturalistic knowledge and for providing assistance to set up an integrated local management of the terrestrial and marine biological heritage of these fragile pearls. Among the experts in marine domain management who took part in PIM underwater missions in Tunisia (Galite), in Algeria (Habibas), in Morocco (Mogador) or in France (Grand Rouveau), many of them are GEM members. In June 2013, during a PIM mission in Algeria, 3 GEM members were involved again to train 50 ecoguards of the Algerian Commissariat National du Littoral (CNL) to visual fish census and some members of the

association Barbarous (from Oran) to scuba monitoring of Habibas islands. This small archipelago with an area of 80 hectares and very exploited by professional and recreational fishing, became a natural reserve. With Calypso, Captain Cousteau and his crew stopped over in 1977. As member of their expedition, one of us (Jo) met the last monk seal of the coast and also some groupers. By now the beautiful fishes are rare, but the underwater habitats potential promises abundant populations if protection asserts and preserves itself.

Partners listened to GEM. The enthusiastic Barbarous team could develop a GEM-Algeria. The relationship between CL-PIM and GEM should end in future shared actions.

Jacques Rancher,
Jo Harmelin & Ph. Robert

Impact of... protection? From predator to prey: a positive interaction

The most visible effect of establishing marine protected areas in the French coast is an increase in large predators as the brown grouper. But not to the detriment of other species...

Over the last 30 years in the Port-Cros National Park or in the Cèrère/Banyuls natural Reserve we moved up from a few dozen to more than 300 brown groupers. Such an increase poses the question about the impact of predators on other wildlife species. Will the population of other species decrease? Let us recall that large predators diet varies according to their age and size. Young and small predators attack modest preys (mollusks, crustaceans...). The predation pressure evolves over time.

After, competition between individuals of the same species will limit the growth of some or will oblige them to hunt on other territories*. In conclusion, underwater visual fish census** shows that the "reserve effect" is favorable to all species which benefit a regulation in relation to each other. Therefore interactions between prey and predator limit some species outnumbering and the mass mortality risk due to pathogens

in case of overabundance. Large predators induce to a regulation for all species along a trophic chain. Thanks to them, there are more species (but less individuals). This will assure a functional diversity within the ecosystem due to the presence of species with a diversified diet regime (plankton, alga, mollusk eaters...). So the ecosystem develops resistance and resilience against natural or anthropic troubles.

Ph. Lenfant

* The search of a new habitat would explain the moves of groupers that are attracted by the colonisation of other areas (as it can be observed in individuals provided with acoustic tags).

** Census realised within the context of national and European scientific programs BIOMEX and PAMPA.

For more information and about GEM: www.gemlemerou.org

In the website you will find many other articles, regular updates, bibliographical references, goals, missions and contacts. But also a down-

loadable version of posters, articles and papers, moratoria about grouper and all MARGINATUS numbers.

MARGINATUS is edited and distributed thanks to the active involvement of many GEM members. But its realisation is due to the efforts of its Editor in chief, Patrick Mouton, well known for his skills as maritime journalist, and Jean-Michel Cottalorda, Research Engineer at ECOMERS-UNS, key player in the coordination and realisation of the graph.

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