Tuna farming in the Mediterranean: the bluefin tuna stock at stake

WWF's long denounced threat gets extreme

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Foreword

In May 2002 WWF released the first version of this report: "Tuna farming in the Mediterranean: the 'coup the grâce' to a dwingling population?" At that time, a still fragmentary picture made of some scattered though solid evidences was coming to light, pointing to the emergence of a new activity with a tremendous potential to put the Mediterranean bluefin tuna population at stake. Now, 2 years later, it is widely recognised among scientists and other specialists that our most pessimistic predictions have —unfortunately— been accomplished. With much more elements now for the analysis, this document (now without the question marks in the title) focuses on the most acute threat driven by current tuna farming practices on the East Atlantic bluefin tuna stock: the rampant mismanagement of the wild stock, including the increasing fishing pressure from the industrial sector and the continuous deterioration of management possibilities. This doesn't mean that the importance given to the rest of aspects dealt with in the previous version of this report has been reduced. On the contrary, local pollution, socio-economic impacts —especially on small-scale fishermen—, etc. occur everywhere in the Region, concomitantly to tuna farming developments. However, the situation vis-à-vis the impact on the integrity of the wild stock is so extreme that we have decided to make it the focus of our study.

We hope this second report will be the last one of the series, and that national and international management bodies will soon act to reverse the current unsustainable trend. We wouldn't like to issue a further report in the near future entitled "Tuna farming in the Mediterranean: the long announced collapse of the tuna fishery came true".

Summary

A new practice in the Mediterranean —tuna penning— is threatening one of our most valuable fish resources. The bluefin tuna is already under considerable pressure and has been declining for years. Now tuna farming has opened up a new section on the Japanese market, which has further increased the demand for bluefin tuna and made the situation of wild stocks even more perilous.

The rapid increase in tuna penning has changed fishing strategies in the Mediterranean. All fish caught by purse seiners are now transferred to cages for fattening, rather than sold directly. The ever-increasing demand for live tuna is boosting the fishing pressure by high-tech, large-scale purse seine fleets, to the point that both fishing and farming have clearly reached overcapacity. This situation is exacerbated by public subsidies allocated by the EU to farms and fleets.

With the new practice the reliability of catch statistics has further deteriorated —an already serious problem hampering efforts to properly manage the eastern Atlantic bluefin tuna population. In addition, demands from the tuna farming industry have created increasing fishing pressure on some local small pelagic fish stocks. Some of these fisheries affect stocks already in decline, such as the anchovy. The low conversion efficiency from feed to tuna meat also makes tuna farming a wasteful practice, entailing a high ecological footprint.

Now WWF warns that the eastern Atlantic bluefin tuna stock could collapse within the next years, unless fishing pressure is significantly lowered and tuna farming is immediately and strictly regulated by the responsible management bodies.

1. The bluefin tuna: an overview of biology and fisheries

The bluefin tuna (*Thunnus thynnus*) is a large pelagic species found both in the Atlantic (including the Mediterranean) and in the Pacific. It is a massive fish, which can grow to over 3 metres and a weight of more than 650 kg. Bluefin tuna is marvellously adapted to swimming and migrates several thousands kilometres every year. From an ecological point of view, bluefin tuna is a key species in the pelagic food web. It is a top predator that feeds on fish, squids and crustaceans —a very important ecosystem function that, to some extent, it shares with marine mammals and man.

Another relevant biological feature is the long life span of bluefin tuna; it can live more than 20 years. Sexual maturity is reached at the age of 5 to 8 years, depending on the stock. These characteristics —long life span and late sexual maturity— make bluefin tuna especially vulnerable to fishing, since it is prone to growth overfishing.

Bluefin tuna fisheries in the Atlantic are found in the areas where the species is abundant: along the North American coast, in the West Atlantic, along northern Africa and the European coasts, in the East Atlantic, as well as in most of the Mediterranean Sea. Though the biological knowledge of bluefin tuna in the Atlantic is still limited, two different stocks are believed to occur. Therefore, the International Commission for the Conservation of Atlantic Tunas (ICCAT) has defined two management units, one referring to the West Atlantic tuna and the other referring to the East Atlantic population, which includes the entire Mediterranean population. Both stocks are assessed and managed separately.

Recently, tagging studies have provided evidence of mixing of the two stocks, including transatlantic migrations. Also fisheries have quickly developed in a previously unknown area of concentration of fish in the north central Atlantic. The presence of adult fish in the central Atlantic during the spawning season adds further uncertainty to the demography of the species. All this evidence does raise questions regarding the validity of the current management scheme based on two entirely separate stocks.

Current catches from the western stock are rather modest (3,215 tonnes in 2002), the stock being clearly overexploited. A 20 year Rebuilding Program was adopted in 1998, which is now on-going. The state of the East Atlantic population, quantitatively more important, is described below. The primary spawning area for the eastern stock is the Mediterranean Sea, mainly around the Balearic Islands, the Tyrrhenian Sea and the Central Mediterranean, which implies a marked migratory behaviour by both adults and juveniles along the Mediterranean coasts as well as throughout the Gibraltar Straits.

In the Mediterranean Sea, bluefin tuna is caught mainly by purse seine and longline fleets, as well as by illegal driftnets in some areas like the Gulf of Lions. Purse seining is a rather recent catch method. It developed in the 1960's and the purse seine fleet now accounts for 60 to 80 per cent of the total Mediterranean catch. It relies on high-tech equipment and is very species-selective as well as efficient; also, contrary to what happens in other regions of the world, purse seine fishing in the Mediterranean does not entail high by catches of cetaceans. The efficiency of purse seining has lead ICCAT to establish some technical limitations in order to restrict fishing capacity, such as the decision in 2001 to ban the use of spotter helicopters or planes during the month of June.

Generally, fisheries management in the Mediterranean region involves control of fishing effort and technical measures. But in line with the stock differentiation mentioned above, ICCAT has developed a management regime for the eastern stock based on quotas (TAC) allocated on a state-by-state basis. This makes bluefin tuna the only fish resource in the Mediterranean managed through quota regimes (a single quota is set for captures in the East Atlantic and Mediterranean). However, the efficiency of the bluefin tuna management regime is limited, mainly due to the lack

of Exclusive Economic Zones (EEZ's) in the Mediterranean and the related problems of enforcing legislation in international waters. Other factors of importance are the presence of a substantial IUU fleet, either flying flags of convenience or none at all, and the high profits in the tuna fishery, which have resulted in a lack of political will to limit fishing effort. As explained below, tuna farming activities —starting in late 90's— have dramatically exacerbated the problems.

2. State and management of the Mediterranean stock

The last assessment of the conservation status of the East Atlantic bluefin tuna stock (which includes the Mediterranean population) was carried out by the Standing Committee on Research and Statistics (SCRS) of ICCAT in 2002. Though this assessment was originally scheduled for 2000, it had to be postponed due to the deficient quality of data reported. Yet in their 2002 report, the SCRS warns about the bad quality of data available to scientists and subsequently used in the assessment: it is suspected that 1) 'large quantities of undersized fish are caught but not reported' and 2) 'there has been increasing under reporting in the last few years, especially since 1998'. Besides, the SCRS acknowledged that catch per unit effort data and size data were not available for important Mediterranean countries, which led this Committee to admit not having confidence on the assessments presented, based on these data. Even so the assessments pointed to strong overexploitation, fishing mortality in 2000 being 2.5 times higher than the maximum level compatible with the adequate reproduction of the population (Fmax criterion). Overall, the scientific study concluded that under prevailing fishing conditions "current catch levels cannot be sustainable in the long-term", scientists being especially concerned by the high catches of juveniles and the "abrupt" increase of catches of large fish since 1994. In this sense, the analysis indicated that future catch levels of 26,000 tonnes or more would not be sustainable over the long-term.

To address unreported catches ICCAT compares the catch data reported by the different countries (Task 1) with the import figures to Japan (biannual Bluefin Tuna Statistical Document, BTSD). A comparison of 1999 figures amounted to an estimated 3,242 tonnes of unreported catch in the Mediterranean by Spain, Croatia, France, Italy, Portugal and Morocco. This was about 10 per cent of the quota set for that year and almost certainly still below the actual catch. Scientists close to ICCAT SCRS suspect that real captures are well beyond the quota and the reported figures on a systematic basis, and that some key fishing countries harvest several times their quota (pers. comm.).

In spite of the worrying picture provided by ICCAT scientists, the 13th Special Meeting of ICCAT held in Bilbao in 2002 adopted an unsustainable annual quota of 32,000 tonnes for the years 2003 to 2006, 23% higher than the maximum level scientifically determined. More than half this quota (18582 t) was allocated to the European Union, which highlights the responsibility of this ICCAT contracting party in the management of this stock. However, it must be highlighted that the current management system based on quotas is largely non-operational since there are no effective mechanisms in place ensuring a monitoring of overall catches in real time. This means that it is not possible to stop the whole fishery when the total annual quota has been met because neither ICCAT is receiving continuous updated information on catches during the fishing season nor it is empowered with the political mechanisms to do so. As is explained in other sections of this document, tuna farming is exacerbating this problem, and total catches on the stock on a national basis are reported to the management authority —ICCAT— a posteriori, the following year or even two years later. As for Mediterranean EU countries, the mechanisms in place under the EU legislation providing for the reporting of catches and landings (compulsory filling of logbooks, landing declarations, etc.) are poorly operational, which affect the reliability of national catch statistics.

Table 1. BFT Quotas allocated by ICCAT				
	2003	**2004**	**2005**	**2006**
Algeria	1,500	1,550	1,600	1,700
China	74	74	74	74
Croatia	900	935	945	970
European Community	18,582	18,450	18,331	18,301
Iceland	30	40	50	60
Japan	2,949	2,930	2,890	2,830
Tunisia	2,503	2,543	2,583	2,625
Libya	1,286	1,300	1,400	1,440
Morocco	3,030	3,078	3,127	3,177
Others	1,146	1,100	1,000	823

In their 2002 report, the SCRS warned that "unless the situation improves, the quality of the advice that the Committee can provide will continue to deteriorate", with fish fattening practices being identified as one of the candidate factors responsible for the deterioration in the collection of catch statistics.

3. What is farmed tuna? The production of 'farmed' tuna

An expanding practice in the Mediterranean has further complicated management of the bluefin tuna stock-tuna farming. This cannot be considered true aquaculture since the fish are not bred and reared in captivity. Instead, the rapidly growing industry is based on wild tuna caught alive from already declining stocks. Purse seines are the only mobile gear able to capture tuna alive; a feature that makes the purse seine fleets a necessary element of the tuna farming industry. This is arising in a strong and unfair competition for tuna between large-scale, high tech purse seiner fleets and traditional longliners, that compete for the same resource and share the national quotas with the former.

Indeed, in order to avoid confusion between tuna caging activities in the Mediterranean and real aquaculture, FAO proposed to the GFCM and ICCAT to adopt the term "tuna farming", linked to the following definition:

> *"Tuna farming currently involves the collection of wild fish, ranging from small to large specimens, and their rearing in floating cages for periods spanning from a few months up to 1-2 years. Fish weight increment or change in the fat content of the flesh is obtained through standard fish farming practices. Confinement of captured fish during short periods of time (2-6 months) aimed mostly at increasing the fat content of the flesh, which strongly influences the prizes of the tuna meat on the Japanese sashimi market, can also be referred to as 'tuna fattening'. Future tuna farming practices may evolve to encompass a closed life cycle, i.e. the rearing of larvae in laboratory conditions".*

Once caught, tuna is transferred alive to special towing cages, which are then transported to the farm sites by means of tug boats (other boats than fishing vessels). Input season typically extends from May/June to July/September, depending on the country. Then fish are transferred to pens, where they are fattened for a relatively short time to improve the oil content of the flesh in order to meet the Japanese market standards. Fattening period usually lasts for 6-7 months, since the peak of the demand by the Japanese market occurs by the end of the year. Fattening period can last up to 20 months in Croatia, given the smaller size of fish caged there.

According to the available information this focus on meat quality entails very low food conversion efficiency, thus resulting in an extremely wasteful practice having a very high ecological footprint. Conversion rates reported for farms in Italy, Spain and Turkey range from 10 kg to 25 kg of baitfish consumed to produce only 1 kg of tuna. So, the large amounts of fish fed to caged tuna (mainly small and medium pelagics, such as anchovy, round sardinelle, mackerel or herring) only result in a relatively modest increase in tuna biomass.

Starting only in 1996, about 21,000 tonnes of wild-caught bluefin tuna were introduced into cages in the Mediterranean in 2003 (out of a total quota for the East Atlantic and Mediterranean of 32,000 tonnes). The table below shows the share of the different countries regarding Japanese imports from the Mediterranean in 2002.

Table 2. Japanese import of farmed tuna* year 2002

Country	Estimated round weight (tonnes)
Croatia	3,190
Italy	1,641
Malta	2,311
Spain	6,006
Turkey	1,405
Total	14,553

Source: National Report of Japan to GFCM SAC in 2003

Outside the Mediterranean, the tuna farming industry is also expanding rapidly in other regions of the world like Australia, Mexico (Baja California), USA and Japan. The fattening of Southern bluefin tuna (*Thunnus maccoyii*) started in Australia (Port Lincoln) by the same time it did in the Mediterranean and reached a production of 9,245 tonnes in 2002, a three-fold increase in only 5 years. Mexican tuna farms based in Baja California deal with bigeye and yellowfin tuna (*T. obesus*

and *T. albacares*, respectively). Bluefin tuna would also be farmed in the USA and Canada. Advanced plans to start tuna farming activities involve, at least, the Marshall Islands (yellowfin) and Peru.

4. Involvement of Mediterranean countries in the fishery

The participation in the bluefin tuna fishery in the Mediterranean of the different coastal states and Japan is summarised below.

Algeria

Algeria reported to ICCAT a total bluefin catch in 2002 of 1710 t. In 2001, an investment company focused on business opportunities in fisheries, Union-Pêche, announced the launching of a project to build an entire purse seining fleet (20 vessels) aimed at tuna fishing for farms, worth 20 million $. This in spite of a modest quota (1500 t) allocated to Algeria by ICCAT only since 2003.

Croatia

The total catch of bluefin tuna in the Adriatic Sea by this country in 2002 was 977 tonnes, mostly caught by purse seine fleets and transferred to Croatian farms (100%). To meet the needs of the farming industry, the number of active purse seiners fishing for bluefin tuna increased from 19 in 1999 to 31 in 2002. Captures are based on immature animals, with the average mean size strongly decreasing in the last few years (from 24,2 kg in 1999 to only 8,2 kg in 2002).

France

France is currently the most important supplier of live tuna to Mediterranean farms (especially, the Spanish ones). With a local fleet of 40 purse seiners based in the Gulf of Lions, reported French captures in the Mediterranean amounted to 5810 t in 2002. While historically exploiting mostly North western Mediterranean fishing grounds, the last years French purse seines have extended their operations to the South of Malta as well as to the waters off Libya and Cyprus. In 2003, an industrial vessel belonging to a fleet usually working in the Southern Atlantic and the Indian Ocean was transferred to Libyan waters under a charter arrangement *(see below).*

Greece

Tuna catches in 2002 amounted to 440 tonnes, mainly through hand-lining and other artisanal gears. A few purse seiners operate on an opportunistic basis. The Ministry of Agriculture of Greece reports that in the context of advanced plans to initiate tuna farming activities in the country, authorizations will be issued to national vessels to capture and transport bluefin tuna.

Italy

A total 92 purse seiners operate in the Mediterranean. According to official statistics, they captured 4,700 tons of bluefin tuna in 2002, 86% of which was devoted to farming. According to ICCAT, tuna farming is exacerbating the problems related to the adequate monitoring of catch levels and the determination of the size composition of the catch since most of purse seine catches are sold at sea in international waters and transported to third countries.

Japan

The Japanese fishery in the Mediterranean is devoted to bluefin tuna fishing using longlines. Catch has decreased from 800 t in 1995 to 131 t in 2001, due to a reduction in fishing effort.

Libya

For 2001 Libya reported the capture of 1940 tonnes of bluefin tuna, most of it caught by the local longlining fleet. In 2003, an industrial fishing vessel flagging the French flag, with a fishing capacity of some thousand tonnes per year, was operating in Libyan waters in the context of a charter agreement between the EU and Libya. Catches by this fleet were supposed to be counted against the quota allocated by ICCAT to Libya, which amounted to only 1286 t (less than half the total fishing capacity of this vessel alone), and are presumably aimed at supplying tuna farms (there is an on-going development of tuna farms in the country).

Malta

The fishing fleet targeting tuna was composed of 52 multipurpose vessels using drifting longlines in 2001. One purse seiner was operating in 2003, supplying with live tuna the local farms. Tuna catches in 2001 were 219 tonnes.

Morocco

In 2002, Morocco reported the capture of 3008 t of bluefin tuna (including both Atlantic and Mediterranean catches).

Spain

Reported bluefin tuna catches in the Mediterranean were 2200 tonnes in 2002. Spain has 6 modern purse seiners based in the Mediterranean, which captured a total 1453 t of tuna in 2001. 70% in weight of this catch was destined to farming.

Tunisia

In 2002 the purse seine fleet targeting tuna was composed of 52 fishing boats (responsible for 96% of total tuna catch). Bluefin tuna catch in 2001 amounted to 2513 t, an important share of it (1400 t) being towed to tuna farms in Spain. After the recent establishment of tuna farming facilities in Tunisia, tuna catches from local purse seiners are probably aimed at supplying local farms.

Turkey

The start of tuna farming activities in Turkey in 2002 has resulted in a strong increase in purse seine fishing on tuna. Fishing effort has almost doubled in one year, from 28 purse seine units targeting tuna in 2002 to 50 in 2003. Bluefin tuna catch in 2002 amounted to 2300 t, 1400 of which were transferred to farms. It is important to stress here that Turkey is a contracting party to ICCAT only since August 2003 and that there is no quota for bluefin tuna allocated from ICCAT to this country for the whole period 2003-2006. In this context, production from Turkish tuna farms originated from catches by the national tuna purse seine fleet (100% of farmed tuna) would qualify as IUU-related production (that is, arising from illegal fisheries).

5. Some facts about tuna farming production in the Mediterranean

In a 2001 document the Japanese expert Dr. Miyake explained that before the development of tuna farming in the Mediterranean, the Japanese bluefin tuna market was consistent with either very high quality tuna (pre-spawners) or cheap, low quality tuna (post-spawners and juveniles). In this context, emerging tuna farming created a new medium-quality product filling the gap between these two categories on the market. Miyake already warned that the consequent increase in demand for tuna from fish farms would further increase the fishing effort, and have a very negative effect on an already severely overexploited stock.

The same author also stated that the increasing market demand for tuna was making it harder and harder to reach an agreement on how to share the quota between the fishing nations under ICCAT, and that various nations were suspected to have being “well exceeding” their quota.

In the last few years, as the volume of farmed fish has increased and the price of fresh bluefin tuna has gone down, the volume of frozen fish has become increasingly important. Frozen products affect the market less than fresh since they can be stored and then sold when the supply of fresh fish is low. Since all the farmed tuna has the high oil content that is so appreciated on the Japanese market, the portion frozen fish sold later in the season has increased. In 2002 about 60% of tuna exported to Japan from Spain was commercialized frozen.

Some relevant aspects related to tuna farming in the different Mediterranean coastal states (and Japan) are summarised below.

Algeria

In July 2001, the Algerian Fisheries Firm Union-Pêche (the first industrial subsidiary of the privately owned Union Bank, with an aim to invest in ‘first class industrial opportunities

in Algeria') announced that they had signed an agreement with the Spanish-Portuguese ship building company Navalfoz. According to the agreement, a fleet of 20 tuna vessels with a deck length of 30 metres and 1 measuring 47 metres would be built. This new fleet would be able to keep tuna alive in mobile cages, and negotiations with Japanese clients were already on-going at the time. Unfortunately, no further news on the outcome of this operation is available.

This case illustrates the powerful economic interests behind tuna farming activities that are fuelling the development of the sector in the region. The economic investments associated with this operation amounted to 20 million dollars. It is also noteworthy that this development was agreed despite the fact that Algeria did not become a contracting party to ICCAT until February 2001 and lacked any quota for bluefin tuna allocated by ICCAT until 2003. With an aim to get a better quota from ICCAT, Algeria supplied ICCAT with revised figures on national catches of bluefin tuna for the last years. The new figures showed a peak in the landings in 1993 and 1994, surprisingly the same years that ICCAT uses as the reference point for quota allocation among the different states. Algeria was finally given a quota of 1500 t, a volume of catch that doesn't justify the building of the enormous purse seine fishing capacity announced.

According to information from local sources, though, there are currently strong pressures pushing for the launching of tuna farming activities there. It is well known that in 2002, an Algerian businessman based in France had already advanced negotiations with two Japanese companies to start tuna farming activities in Algeria.

Croatia

State of the art

The fattening of bluefin tuna started In Croatia in 1996. In 2002, there were 10 farms in place in the counties of Zadar, Sibenik and Split, worth 65 floating cages. Kali Tuna, jointly owned by Croatian, Australian and Japanese interests, is the largest Croatian tuna farming company. Is was founded by Croatian expatriates in Australia, who imported into the Adriatic the know-how they acquired regarding the farming of Southern bluefin tuna in the area of Port Lincoln.

According to estimates from Japanese trade data, 3910 tonnes of bluefin tuna were introduced into Croatian farms in 2002 (a total 2628 according to Croatian sources). Though in the first 4 years of farming all live tuna was supplied by the local purse seine tuna fleet, from 2001 onwards farms also rely on the activity of foreign fleets, namely Italian, Tunisian, French and Spanish. Unlike the other farming sites in the Mediterranean, the duration of the fattening season in Croatia can last up to 20 months, due to the very small size of tuna entered into the cages.

As reported to GFCM and ICCAT, part of feedfish used by farms consists of small pelagic fish locally harvested in the Adriatic Sea. Kali Tuna in 2001 benefited from the full-time activity of 7 purse seiners targeting small pelagic fish operating for the company. One of the owners of Kali Tuna declared that the amount of anchovy needed for one year amounted to 4500 tonnes that year. All the production in shipped to Japan (40% of it frozen).

Conservation and environmental conflicts

Tuna farming in Croatia has a long history of conflicts with local communities, conservationists, the tourism sector and even the Government.

The 2 February 2003 a local referendum in the island of Vis stopped a new tuna-farming project from taking off. The community's response was the first of its kind in Croatia. Currently the local NGO Sunce is working together with the local communities to oppose to new tuna farm projects on the islands of Brac and Lastovo, where there is a strong opposition from the locals.

In March 2003 the Croatian ministry responsible for the environment released its annual report that included a list of facilities hazardous to human health. In this list, tuna farms were mentioned as presenting dangers to marine ecosystems. It was the first time in the Mediterranean that an official position on the ecological risk of tuna farming had been stated. Criteria used in the report to measure the "risky" character of the facilities included duration and intensity of the damage on nature, and the environmental impact of the production equipment. According to the report, several tuna farms did not met the obligatory environmental or administrative standards (thus violating the legislation in force). But the major risk came from the fact that the farms were often located in shallow waters, near the coast, where the rate of water renewal is too low to enable proper cleanup of tuna wastes and of the excess baitfish used to feed tuna.

Finally, it must be mention that the Adriatic anchovy stock exploited for fishfeed is quite unstable, having already collapsed in the past.

Cyprus

Tuna farming activities started in Cyprus in 2003. There are currently 2 tuna farms on the island. One of them is located on the East coast, in Northern Cyprus, in Famagusta Bay. This farm is related to the Turkish company Dardanel. The other is found in the South of the country, in the Limassol Bay and is controlled by Kimagro Fishfarming Ltd.

The farm at Limassol Bay consists of 3 cages, which were filled by live tuna caught by French and Spanish vessels.

France

The French purse seine fleet targeting tuna in the Mediterranean is the main single supplier of live tuna to the farms in the region. Their strong influence over French fisheries authorities has so far governed the French position at the GFCM and ICCAT. In some cases, this collaboration between tuna farmers and purse seine fishermen translates into the direct involvement of French fishermen in a sort of vertical integration of farming industry activities. This would explain the agreement reached in 1998 between a society of French purse seiners (Sud-Marée) and Spanish tuna farmers, which resulted in the creation of the joint company Thon de la Ferme Méditerranéenne (TFM), which got involved in the management of Spanish tuna farms.

Though there are no farms currently in place in France, plans to do so are recurrent since the start of tuna farming activities in the Mediterranean. An experimental project for a 4-cages farm was envisaged for the Fréjus gulf in French Mediterranean waters, in 2000. The proposed location was only 650 to 700 metres offshore and next to a Posidonia seagrass bed, a habitat protected under the EU Habitats Directive. An impact study based on a hydrodynamic model concluded that under conditions prevalent in spring and summer the risk of direct pollution by farm waste on the neighbouring beaches was important. Recent information points to the possibility that several farming projects are launched in France in the near future.

Details on the massive transfer in 2003 of fishing capacity from an industrial large-scale French purse seiner operating in the tropical high seas into the Mediterranean are given in a separate section of this report.

Greece

Tuna farms in Greece are planned to be operational along 2004.

Japan

Since Japan has a national longline fleet operating in the Mediterranean, the Japanese Fisheries Authority showed in the past its concern about the diminishing returns of Japanese longliners faced to the increasing competition from production of farmed tuna.

The Japanese authorities also claim that national consumer associations are increasingly worried about the supposedly much higher pollutant content in the meat of farmed tuna compared to wild-caught fish (probably linked to the use of polluted feedfish in some farms, like Baltic herring) and are strongly interested in the traceability of the product.

Other Japanese stakeholders, however, have strong vested interests in the tuna farming industry. Virtually all tuna farms export to Japan through Japanese intermediary trade companies (like Torei-Toyo Reizo, the tuna arm of Mitsubishi, Takayama, Kayo, Maruha and Mitsui) and often tuna farming companies are participated by Japanese capital (like Kali in Croatia), usually from these same companies

Libya

It is well known that Libya has already started tuna farming activities in its territory. However, the Libyan authorities are not providing ICCAT with any information thereof. Indeed, in spite of being Libya a contracting party to ICCAT and GFCM, after having been required by the Joint GFCM/ICCAT Working Group on Tuna Farming in the Mediterranean to present a 'national report' on tuna farming activities there was no reply from this country, nor any Libyan delegation has been attending the meetings of this working group. Current tuna farming activities there would involve a joint venture between a Spanish tuna farmer and local investors close to the Libyan authorities.

Malta

State of the art

Tuna farming having started as recently as in 2000, 3 tuna farms were operational in Malta in 2002, involving the use of 15 floating cages.

According to ICCAT estimates from industry data, a total 1930 t on tuna were farmed in 2002 (2259 t according to the Maltese authorities). All this tuna is imported from Italy and Libya and the resulting production is exported to Asian markets. Asian investors are involved in some of the farms (Korean partners are involved in the farm off Is-Sikka l-Bajda, controlled by Azzopardi Fisheries Ltd.).

Conservation and environmental conflicts

Conflicts related to tuna farms in Malta arose with the very start of the activity, like in Spain and Croatia. Already in 1999, Birdlife Malta warned that an application for a tuna farm project submitted to the authorities envisaged the location of cages only 300 metres offshore, threatening the important nesting colonies of seabirds found at the cliffs at Ta'-Cenc, in Gozo. The farm authorized in the Benghajsa reef (Birzebbugia), owned by Mediterranean Tuna Ltd., has been allowed to install close to a nesting colony of Shearwater birds, despite the objections made by Nature Trust (NGO based in Malta).

As for the most important farm in Malta, the one located off Is-Sikka l-Bajda and controlled by Azzopardi Fisheries Ltd, the Planning Authority Board of Malta approved its extension from 4 to 8 cages against the recommendations made by the technical advisors of the same Planning Directorate; in fact the tuna farm had already been operating with 8 cages without permission.

As for local fishermen, there have been serious frictions between local tuna fishermen (small to medium-scale longliners) and the tuna penning industry and its associated purse seine fleets. Disputes involving Italian (from the Adriatic) and Spanish fishermen, on one hand, and Maltese longliners, on the other, required the presence of the Armed Forces in 2002.

In September 2001, the Maltese national delegation to the GFCM 26th Session proposed the establishment of a box in international waters south of Malta, that would be closed to purse seine fishing. It was claimed

that increasing purse seining by a diverse fleet aimed at supplying the farms with tuna and the activity of tug boats towing the tuna cages were dramatically disturbing traditional longline fisheries by Maltese, Italian, Tunisian and Japanese fleets, as well as reducing tuna catches. The Maltese proposal was rejected following strong opposition from the EU.

Opposition from the important tourism industry also exists. Indeed, in 2002 the Malta Hotels and Restaurants Association (MHRA) complained about the increasing tuna farm activities around Malta, arguing that pollution originated from these facilities was having a negative effect on diving tourism.

Spain

State of the art

Tuna farming in Spain is highly concentrated in the region of Murcia (SE Spain), where the first farm started to export tuna to Japan as recently as in 1997. In 2003 there were 9 tuna farms in place, occupying a total sea area of 3,55 square kilometres. The different companies created are mostly owned by the groups Fuentes, Albaladejo, and Mendez, who are also involved in tuna farming business around the Mediterranean. Two further tuna farms operate in Andalusia and Ceuta, taking advantage of traditional tuna traps. Two further tuna farms were also given green light in the North of Spain, in Catalonia, one of them also belonging to R. Fuentes.

According to estimates from Japanese trade data submitted to ICCAT, 5450 tonnes of bluefin tuna were farmed in Spain in 2002. Regarding the origin of fish farmed, French and Spanish fleets were the main suppliers during the first years of farming activities. Currently, tuna caged in Spain comes from the activity of many different fleets virtually covering all Mediterranean waters (from Italy and Malta to Croatia, Tunisia, Libya and Cyprus). According to the 2003 Spanish Report to the GFCM/ICCAT Working Group on Tuna Farming, this diversification of sources partly obey to an attempt from the Spanish farming industry to overcome the binding ICCAT Recommendation 96-2 that prohibits the use of airplanes and helicopters supporting fishing operations in the Mediterranean Sea in the month of June. According to this source, Spanish farms sought increased tuna supply possibilities resulting from the violation of ICCAT rules in contracting parties facing enforcement deficits.

The value of tuna production in Spain (Murcia Region) has dramatically increased in the last few years. From only 3.1 million € in 1996 it reached 107.5 million € in 2002 (worth 2.2% of the gross product of the Region). In this context, it can be easily understood the enormous lobby power that tuna farming industrials have on both the Murcian regional and the Spanish national governments, that explains why many of the complains regarding tuna farms presented by conservationists, artisanal fishermen and scientists are usually overlooked.

Conservation and environmental conflicts

The start of tuna farming activities in Spain soon led to conflicts with the rest of stakeholders sharing the coastal fringe with. Recently, the Murcia-based NGO ANSE submitted an official complain against the Ministry of Agriculture of Murcia to the Spanish Ombudsman relating to many irregularities attributable to tuna farms in the area that were inadequately addressed by the local administration; they ranged from the lack of availability of Environmental Impact Assessment reports, the illegal extension of farms towards environmentally sensitive areas, the lack of implementation of the governmental decision to concentrate all farms on selected offshore areas, etc. The official reply from the Spanish Ombudsman fully supports ANSE's points, by stating that the Ministry of Agriculture of Murcia is totally reluctant to provide the required information, even to this institution created by the Spanish Government.

One of such denounced cases include the lack of reaction from the Regional Government regarding the setting up by the com-

pany Atunes de Levante (belonging to the group Ricardo Fuentes) of a tuna farm in August 1999 without presenting any environmental impact assessment.

Also, ANSE has criticized that the decision from the Regional Government of Murcia to create an 'aquaculture polygon' has resulted in the approval of concessions for new tuna farms instead of relocating there all tuna farms already in place, currently scattered along all the Murcian coastline, as was the original purpose of this measure.

As for local fishermen, tension soon arose between the local purse seine fleet targeting small pelagics and the tuna farmers, grouped under the association ASETUN. Local fishermen claimed that their diminishing catches were a result of the combined effects of pollution from tuna farms and the presence of cages in shallow coastal areas, with the consequence of tuna, being large predators, scaring small pelagic shoals. Anyhow, tuna farmers reached an agreement with the local purse seine sector to buy to them part of their catch of small pelagic fish, to be used as feedfish in the farms. Though this deal contributed to calm down the situation, in 2003 tuna producers broke the agreement due to the crisis created by the oversupply of the Japanese market for tuna and the subsequent dropping of prices fetched by farmed tuna, and the lower costs of frozen feedfish imported from third countries.

Besides, the use of locally harvested small pelagic fish to feed farmed tuna has increased the ecological footprint on the surrounding ecosystem. Indeed, tuna farming has indirectly driven the dynamics of the small pelagic fishery in the region; a previously valueless species —the round sardinella *Sardinella aurita*— has become an important target species very appreciated for feeding tuna. Though tuna producers say they have added value to a formerly not targeted species, there is increasing concern over cetacean specialists about the possible impact this new fishery could have on the important dolphin population in the area, that appears to partly rely on this species.

Probably, the Spanish fishermen the more strongly affected by tuna farms and the related increase in the fishing effort are surface longliners based in Murcia and Andalusia. Indeed, the effect of tuna farming on their activity is twofold: on one side, increasing high-tech purse seining is outcompeting longlines in the capture of the same fish resource, on the other, logistics related to fishing-and-farming activities (like the traffic of tugboats tugging floating cages along hundreds of miles) is damaging their set fishing gears. It is not surprising that longline fishermen based in Carboneras (Andalusia) are regularly sending complaining letters to the Spanish ministry of Fisheries asking for a stricter regulation of tuna farming and the related seining activities.

As for scientists, in June 2001 the Scientific Forum on Spanish Fishing in the Mediterranean, composed of some of the most respected fishery scientists in the region, expressed concern regarding the dramatic increase of tuna farming activities: "tuna penning is undoubtedly worsening the situation by distorting even more the management system applied to this fishery, besides its possible negative impact on the ecosystems". As for the latter aspect, a new farm project in Garrucha (Almeria, Andalusia) could negatively affect the neighbouring Natural Park of Cabo de Gata.

Finally, it is well known that planes based in Spanish airports supporting tuna purse seiners to locate bluefin shoals move to Algerian airports (Oran) in June to overcome the enforcement of the ICCAT ban on aerial support to tuna fishing.

Tunisia

It is well known that Tunisia has already started tuna farming activities in its territory. However, the Tunisian authorities are not providing ICCAT with any information thereof. Indeed, in spite of being Tunisia a contracting party to ICCAT and GFCM, after having been required by the Joint GFCM/ICCAT Working Group on Tuna Farming in the Mediterranean to present a 'national report' on tuna farming

activities there was no reply from this country, nor any Tunisian delegation has attended the meetings of this working group. In this context, WWF has recently received confirmation from the General Director for Fisheries and Aquaculture of Tunisia that there exist 6 tuna farms located in the eastern coast of Tunisia, in Chebba and Hergla, in the 'gouvernorat' of Mehdia.

Tuna farming companies from SE Spain (namely Albaladejo) would be the promoters of these farming facilities, which are strongly supported by the country's authorities.

Turkey

State of the art

Tuna farming is a very recent activity in Turkey. The first 2 farms were operational only in 2002. A total 5 tuna farms were in place in the country in 2003, worth 38 floating cages. Between 1600-1880 tonnes of tuna were introduced into the cages in 2002. That year, all the production was exported to Japan. Turkish purse seiners caught all tuna entered into Turkish cages in 2002 and 2003.

Conservation and environmental conflicts

In 2002, villagers opposed to a tuna farm project in Assos and won the court case against the farm promoters.

As mentioned earlier, Turkey doesn't have any fishing right on the Mediterranean bluefin tuna stock according to ICCAT (no quota has been allocated to Turkey for the whole period 2003-2006). This means that tuna farming production in Turkey based on local captures would qualify as IUU-related (illegal) production, in contravention of ICCAT rules for the management of the stock.

Other

According to reliable information, Lebanon and Syria would be ready to start tuna farming activities. Given that these countries are not contracting parties to ICCAT, there is a real risk that they become the farming equivalent of flag of convenience vessels, that is, that they be used to overcome internationally agreed ICCAT rules.

6. Tuna farming: the statistical nightmare that undermines management

Right after the running of the first tuna farms in the Mediterranean, in late 90's, it become apparent to tuna experts that this new practice, if not strictly regulated, would exacerbate the chronic problem of the reliability of fishing statistics for tuna in the Mediterranean. This is a crucial aspect since the management system for this species in the region is based on catch quotas, allocated by ICCAT to the different countries. This means that failing to know the right catch figures undermines any attempt to assess compliance with management measures, which promotes illegal fishing (IUU fisheries). Besides, any rational management of fish stocks must rely on regular stock assessments, which require as input data precise information about catches and size composition of fish caught. Both kinds of information are almost impossible to obtain under the new fish-for-farming scheme unless specific strict and reliable reporting mechanisms are adopted.

Already in 1998, the Standing Committee on Research and Statistics (SCRS) of ICCAT warned that uncertainty associated to catches had increased due to the development of tuna farming.

In the report of the 5th meeting of the GFCM/ICCAT Working Group held in 2000, explicit reference is made to the fact that "some bluefin tuna transhipped after catch from purse seine to farming cages might not be included in the catch statistics of the flag country of fishing vessels, particularly when the nationality of fishing country and the fish farms are different". Indeed, the Japanese tuna expert Miyake (2001) states that "the worst problem" with tuna farming is that this prac-

tice has further confused catch statistics because of transhipments at sea and the lack of data on fish weight at capture. In fact, ICCAT scientists were unable to implement the assessment of the stock scheduled in 2000 due to the lack of reliable input data.

In 2001, the scientific body of ICCAT (the SCRS) pointed out that catch figures for 1999 and 2000 were difficult to evaluate because of increasing uncertainty about 1) information from fish fattening operations and its relation to reported national statistics and 2) bluefin tuna import statistics. It also acknowledged being "especially concerned with the lack of ability to accurately track catches, catch at size, origin of catches and fishing effort expended on fish that are farmed in cages". With these considerations, it warned that due to these facts, the detail of the stock assessment scheduled in 2002 and the subsequent level of management advice would be limited.

The 6th meeting of the GFCM/ICCAT Working Group held in 2002 stressed once again the problems posed by tuna farming on the statistical reporting and the management of the stock, to which they add other potential effects on the environment and on the socioeconomy of coastal areas. In particular, it warned about a potential "General increase in fishing effort of purse seiners and, in the future, probable increase towards small to medium size bluefin tuna".

Finally, regarding the last stock assessment made by the ICCAT scientists in 2002, the low quality of the input information available led the SCRS to conclude that it was not possible to make definitive management recommendations based on the results obtained, since they were not considered to be reliable enough. Once again, the SCRS stated that fish fattening had probably led to deterioration in the collection of catch statistics, which resulted in a recognised uncertainty in catch figures.

In essence, this was the ultimate explicit recognition by bluefin tuna specialists of the impossibility to carry out a rational management of the stock under current conditions.

7. Tuna farming is increasing the fishing effort on the severely overfished bluefin tuna stock

The fact that tuna farming created a new product for the Japanese market (a medium quality Mediterranean tuna sushi, now affordable to millions of middle class citizens aware of the excellent quality of Mediterranean tuna), has had the logic consequence to further increase the fishing pressure on the tuna population. It is now crystal clear that rather than being a purely 'post-harvesting practice', disconnected from the capture fishery, tuna farming in the Mediterranean is indeed the force driving the fishery, both dimensions fishing and farming being inextricably linked. It cannot be argued any longer that the fishery is already adequately managed through the current quota allocation system, deserving to farming only a marginal attention related to the need to improve data reporting and reducing side environmental impacts. Indeed, the worst environmental impact of current farming is the effect it has on the integrity of the wild population itself.

The first consequence of tuna farming on the fishery has been to strongly privilege high tech purse seining in front all the other fishing gears in the Mediterranean, given the interest of the industry to secure live captures to fill the cages. This, in turn, has resulted in an increasing vertical integration of the business through either formal agreements between tuna fishing shipowners and farmers or, directly, through the direct involvement of the farming industry in fishing operations (like the case of Murcian producers who own some units of the Spanish and French purse seining fleet). Another direct consequence has been the rapid increase in purse seining fishing capacity. Fuelled by the high demand from Mediterranean farms, the French and Spanish tuna purse seine fleets have undergone an intense modernization the last few years (including vessel replacement by highly efficient new units), thanks to the generous utilisation of EU funds. Obviously, this has resulted in a net increase in their fishing capacity. In other countries, projects for the building of new purse seining fleets have been made

Table 3. Evolution of catches (in tonnes) on the Eastern Atlantic bluefin tuna stock and the share of purse seine production (ICCAT)

	1996	1997	1998	1999	2000	2001	2002
Purse seine catches (total)	26,344	25,006	21,608	15,636	17,341	17,324	15,830
Purse seine catches (Med.)	—	—	20,391	14,061	—	—	—
Catch (total)	50,762	46,758	39,097	32,454	33,752	34,562	0,343

public (like in Algeria or Greece), with the unhidden purpose to support new tuna farming activities. The case of Turkey is especially paradigmatic in the sense that tuna farming production is currently booming linked to domestic purse seine catches, in spite of not having been allocated any quota from ICCAT for bluefin tuna for the whole period 2003-2006.

All evidences point that after only 6 years of tuna farming practices in the Mediterranean, tuna farming have reached overcapacity with respect of fishing possibilities of purse seine fleets in the Mediterranean as determined by the total quota issued by ICCAT *(see table 3)*.

From these data and recent information on the activity of tuna fleets it is clear that, by far, the bulk of purse seine catches on the Eastern Atlantic bluefin tuna stock are made in the Mediterranean, as it is clearly shown by figures relative to 1998 and 1999 (more than 90% of total purse seine catch originated in the Mediterranean). Accordingly, total purse seine catches on this stock may be roughly assumed to originate in the Mediterranean.

The amount of bluefin tuna caged for farming in the Mediterranean in 2002, estimated from industry data and presented by Japan in a paper submitted to the ICCAT Meeting held in Dublin in 2003 amounts to a total 14,620 t. If compared to purse seine production in 2002 shown in the table above (15830 t), it is clear that that year virtually all purse seine catches in the Mediterranean were caged into tuna farms. This suggests that any further sharp increase in farmed production in the Mediterranean with respect of 2002 figures would forcedly originate from illegal overquota catches, given the current catch limit set by ICCAT at 32,000 tonnes per year for 2003-2006, that represents a theoretical freeze in fishing effort.

Nevertheless, by departing from this "saturation point" reached in 2002, information available for 2003 indicates a clearly

Tuna farming in numbers

- Around 90% of the purse seine catches over Eastern Atlantic Bluefin Tuna stock takes place at the Mediterranean.
- Practically all purse seine catches in the Mediterranean Sea are conducted to Tuna Farming.
- In 2003, 21.000 tonnes of Bluefin Tuna were introduced in Tuna farms (Japaneese Official Data).
- In the last years, the annual purse seine catches is around half of the total Bluefin Tuna catches.
- Taking 2003 Japaneese Oficial Data as a reference, WWF estimates that total catches would passed widely the 32.000 tonnes limit fixed by ICCAT for this year.

alarming trend. The report of the 2nd meeting of the ad hoc GFCM/ICCAT Working Group on Tuna Farming in the Mediterranean, held in Turkey in December 2003, reports that according to data from the Japanese industry, about 21,000 tonnes of bluefin tuna were introduced in Mediterranean cages in 2003. Whereas it is not clear if this estimate also includes inputs into unreported farms already operational that year in countries like Tunisia and Libya, it agrees with other well-informed sources that pointed to a farming capacity in Mediterranean farms in 2003 amounting to 25,000 tonnes. Given that this live tuna was almost exclusively supplied by purse seiners (except a marginal amount from traps), it is worth highlighting that the table above clearly suggests that Mediterranean purse seine catches higher that 21,000 tonnes have only historically been met with total captures of 40,000 tonnes or more. Clearly, this level of purse seine catch is not compatible with a total annual quota of 32,000 for the years 2003 2006, as it is currently in force.

To these clear evidences of increasing catches driven by farming, it adds another alarming fact verified last year, presumably related to it: the dramatic, massive transfer of fishing capacity from a highly industrialised fleet operating in tropical high seas into the Mediterranean, promoted by the European Union and Libya.

In 2002, ICCAT laid down a Recommendation (02-21) that fixed the rules for vessel chartering operations. Charter arrangements involve two nations that must be Contracting Parties to the ICCAT Convention and consist in the temporary transfer of fishing boats to third countries' waters. Chartered vessels keep their flag of origin, though captures obtained are counted against the quota allocated to the chartering country. Following the laying down of these provisions, the EU transferred to Libya under a charter arrangement one vessel belonging to a fleet of 3 industrial purse seiners formerly targeting tuna in the Southern Atlantic and the Indian Ocean. The whole fleet was authorized to operate in the ICCAT area (including the Mediterranean) for the whole of 2003.

The origin of this fleet is very well known. Formerly belonging to the Breton society Armement Coopératif Finistérien (ACF), in 1999 the three vessels were integrated into the new branch Comasud, under the control of the French multinational Intermarché. The concerned vessels are the Île Tristan, Santa Maria and Armen, built between 1975 and 1983 and with a desk length of about 55-m each.

According to the shipowning company, the three Comasud vessels have an annual joint fishing capacity of 13000 t. This is ten times the quota allocated to Libya by ICCAT (1286 t), to which the transferred vessel —the Santa María— was supposed to stick in 2003. This 'theoretical' quota constraint contrasts with the harvests obtained by these vessels during their 1998 fishing season in the Atlantic and Indian Ocean, which ranged from 2556 to 3198 tonnes of tuna each. This points to each vessel capturing that year more than double the whole Libyan quota, to which the Santa Maria was formally bound last year. Clearly, from a cost-benefit point of view this mismatch between fishing capacity and quota is a total non-sense, which makes virtually impossible for this kind of overcapacited vessels to respect such 'low' quota limits. The worst thing is that this dramatic increase in fishing capacity on the overexploited tuna stock in the Mediterranean was made with the blessing of the European Union and Libya, which took advantage of ICCAT's new provisions to create the conditions to potentially undermine ICCAT's conservation measures, by increasing the fishing pressure on bluefin tuna in the Mediterranean. Even worse, this transfer of capacity was made the first year that the so-called 'Multiyear Conservation and Management Plan for Bluefin Tuna in the East Atlantic and Mediterranean', adopted by ICCAT in 2002, entered into force. Ironically, this ICCAT decision is supposed to stabilize the annual catches at 32,000 tonnes for the period 2003-2006.

As it has been reported earlier, it is a fact that tuna farms have already been operational in Libya in 2003, in spite of this coun-

try failing to report to ICCAT their activities, as was explicitly required to do. This fact, along with the strong increase in live tuna demand from purse seiners in 2003 by Mediterranean tuna farms described above, makes it difficult not to relate the activity of this chartered vessel to the increased requirements of the tuna farming industry in the region.

8. The limits of the Japanese market for tuna

It is well known that Japan is the main market for tuna from world fisheries; it is also the underlying force driving the current development of the tuna-fishing sector in the Mediterranean. Farmed tuna from the Mediterranean has a higher oil content than its Australian equivalent and is more appreciated in Japan because the oil gives the flesh a more reddish colour which makes it more attractive. Mediterranean farmed tuna is either exported fresh by air-cargo or, more usually, deep-frozen by means of cargo vessels.

Import of farmed tuna from the Mediterranean increased dramatically in Japan since 1997, to the extent that 80% of Mediterranean tuna imported in 2002 was of farming origin *(see table 4)*. Interestingly, in his report on International Marketing of Farmed Bluefin Tuna submitted to the GFCM/ICCAT WG on Tuna Farming, the Japanese tuna specialist P. Miyake warns that “the Japanese market is not as large as many people believe” and that “the price of high quality fish is very sensitive to the quantity of fish sold daily in the market”. Tuna farming from the Mediterranean is massively shipped to Japan by the end of the year, when prices are still high and there is a high demand for the New Year.

All indications in late 2003 pointed to the saturation of the Japanese market due to the overproduction of farmed tuna from the Mediterranean. As a result, in 2003 prices fetched by Mediterranean farmed tuna in the Japanese market fell down due to an oversupply crisis, which also affected imports of wild tuna from North America and those of

Table 4. Total Bluefin Tuna imports to Japan from tuna farming by Mediterranean countrys (2002)

	Japanese Imports* (t)	
Country	**Farmed**	**Total**
Croatia	3,150	3,491
Cyprus	-—	6
France	—	97
Greece	—-	397
Italy	1,640	2,602
Libya	—	216
Malta	2,351	2,637
Spain	6,006	6,925
Tunisia	—	358
Turkey	1,405	1,405
Total	14,553	18,135

** In estimated round weight.*
Source: P. Miyake for ICCAT & GFCM, estimated from BTSD data.

farmed southern bluefin tuna (about 8,000 tonnes of this latter product are imported every year in Japan, mainly from Australia). This fact uncovered the paradox that the strong and extremely rapid development in the production of farmed tuna in the Mediterranean during the last years had been made following a purely short-term perspective, seeking immediate huge benefits, without taking into consideration the economical sustainability of the business vis-à-vis of international markets (not to speak about the commitment with the sustainability of the fishery).

As several sources point out, the market price for Mediterranean farmed tuna by the end of 2003 —the peak of the ‘harvest’ season- was well below the cost of production for Spanish tuna farms. Consequently, a large amount of tuna was stored frozen. In April 2004, right before the start of the new tuna fishing season a significant share of this production (mainly belonging to R. Fuentes)

would still be waiting to be placed into the market. This situation was bitterly denounced by the artisanal tuna fishermen, who face enormous problems to get access to the international markets, already dominated by the excess of production generated the previous season.

A this stage, faced to both, the overexploitation of the wild stock driven by fishing and farming overcapacity and the oversupply to the Japanese market, the rational reaction would be reducing production. Instead, the farming industry keeps engaged in a further increase in farmed production in the Mediterranean —fuelled by public subsidies in EU countries— whilst desperately trying to open new markets, especially in the USA, Europe and other Asian countries.

9. Subsidies to tuna farms: incentives to overexploit the wild stock

Illegitimate funds, little transparency

The exponential growth of the tuna fattening industry during last 6 years has led to the saturation of the Japanese market and has put in crisis the whole tuna sector in 2003-2004. However, companies involved in these activities are still able to keep a continued expansion thanks to public aids. Fundamentally through the Financial Instrument for Fishing Guidance (FIFG) these companies receive funds aimed at the increasing of aquaculture capacity and modernization, processing, cold stores building, auxiliary vessels purchase, research etc. The whole productive cycle has been supported by public funds since the tuna purse seining fleet —that operates to supply live tuna to the farms— has been also created and modernized through FIFG aids during the last years.

After the adoption of the new Common fisheries Policy (CFP) in December 2002 (Regulation EC 2371/2002), the Community legislation is stricter regarding the integration of environmental considerations in fishing management and important modifications have been made regarding FIFG application criteria (Regulation EC 2369/2002). Unfortunately, though, key gaps remain unsolved, such as the possibility for the tuna farming industry to benefit from current FIFG funding lines aimed at the development of fish farming which constitutes a real legal loophole.

Though subsidies for fleet renewal will be eliminated after 2004, this decision comes late regarding the conservation of bluefin tuna because the Community purse seine fleet exploiting this resource has already been strongly renewed in the last few years. Also, as mentioned above, the new FIFG Regulation still keeps financing environmentally unsustainable activities like tuna farming. Subsidies, including FIFG aids and other matching funds provided by national and regional administrations, can cover up to 75% of the investment (Regulation EC 1451/2001).

Identifying and quantifying these subsidies, despite their public nature, is a very complex task. On one hand the European Commission officially acknowledges to WWF that it is not able to identify among aquaculture projects financed by the EU those devoted to tuna farming. On the other hand, in countries like France or Italy, obtaining information on this topic is extraordinarily difficult. In Spain, where transparency seems to be somewhat higher, the information is scattered, often badly elaborated and always difficult to process.

Though the Government of Murcia Region (SE Spain) ceased to made public the list of beneficiaries from FIFG aids in 2000, it has just provided this information to WWF. The government has also provided partial information on this issue.

As for other countries, it must be highlighted that quantitative information on subsidies was not provided in none of the National Reports on tuna farming submitted to the Joint GCFM/ICCAT Working Group on Sustainable Tuna Farming in the Mediterranean, which was supposed to analyze this topic.

Aids to increase of aquaculture capacity and processing

Despite the clear environmental commitments contained in the Strategy for the Sustainable Development of the European Aquaculture (COM 2002, 511), the EU is still allowing tuna farms benefiting from FIFG funds on aquaculture.

According to the information provided by the Spanish General Direction for Fisheries, public subsides aimed at aquaculture activities allocated to the Murcia Region amounted to 5,960,160 € for the period 1994-2003. These subsides have mainly been granted to the tuna farming industry. The detailed figures provided by Murcian Government for 1999 (Suplemento num. 1 del B.O.R.M. nº 107 del 2000) and 2000-2003 (internal file) support this assertion: aids allocated to tuna farming amounted to 2,541,054.26 € (under the funding line: "aquaculture development"). In the same period, other aids to the tuna farming industry from other FIFG funding lines (e.g. processing) amounted to 1,922,788.73 €. Thus, only in the Murcia Region subsides given to tuna farming companies reached 4.5 millions € in the years analyzed. These subsides have been given to the three industrial groups devoted to this activity. In the period 1994-2003 public aids covered 57 % of total investments related to aquaculture projects benefiting from public financing in this region.

From the partial available information for the Murcia Region presented above, WWF estimates that at least 6 million € of public funds have been allocated to the development of tuna farming capacity in the whole of Spain. This figure rises to at least 9 million € if other FIFG aids benefiting this industry are included. This is a conservative estimate that does not consider other existing subsidies.

The Italian case is more difficult to be dealt with since public information regarding this topic is largely unavailable. Nevertheless, by extrapolating to the Italian industry the subsidies rate in Spain, and considering information from the Italian industry, an estimate of around 2 million € of public money devoted to tuna farming facilities emerges.

Aids to fleet modernization

The high-tech purse seine fleet, that uses aerial support to detect tuna shoals and even real-time satellite information, is a direct competitor regarding the other sectors that have traditionally exploited the same shared resource using trap nets, long lines or hand lines.

Public subsidies cover the whole fishing-and-farming process. The Spanish purse seiner fleet (6 vessels) has been completely renewed with subsidies in the recent years. Between 2000 and 2002 five of this vessels, based in Catalonia (NE Spain), have been fully renewed, increasing tonnage and horse power by a factor of two or three compared to the old vessels they replaced. The vessel Leonardo Brull II is an illustrative example. This 241 GT and 1.320 HP purse seiner has received 705.728 € (from FIFG) for its construction (total cost is 2,06 million €) replacing the former Leonardo Brull, characterised by only 113,73 GT and 560 HP.

These vessels either belong to or work for the tuna farming companies and their increased fishing capacity translates into a higher pressure on the stock. Public aids allocated to the modernization of this fleet would be around 3,5 Million €.

The powerful French purse seiner fleet (composed by 40 high-tech units) has been renewed at 85% level during the last 10 years; once again, gathering detailed information on the public subsidies involved is a very difficult task. Just as an indication, the French region of Languedoc-Roussillon has provided around 2,5 Million € to the modernization of this fleet, out of a total investment of 27,5 Million €. This fleet is a main supplier of live tuna to farms from all around the Mediterranean.

WWF has no information on the Italian case. However, taking into account that Italy is the third country that most benefited from EU funds to fleet modernisation (70,07 Mil-

lions € in FIFG 2000-2006), it is reasonable thinking that part of this budget has also reached the tuna purse seiner sector. This is all the more likely if considering that in the period 2000-2001, coinciding with the development of tuna farming in the region, this segment of the fleet has increased its total GT by 22,88 % and its total horse power by 19,73%.

Conclusion

From the available information it is possible to make a rough estimate of the total amount of public funding that has contributed to the spectacular growth of the tuna farming industry during the last few years. WWF conservatively estimates that at least 19-20 Million € of public funds have been allocated to the different stages of the whole fish-and-farming productive cycle.

Despite current fish-and-farming practices are not aquaculture they highly benefit from the existing aids aimed at the development of this sector. These illegitimate subsidies are directly resulting in overcapacity and overfishing in the Mediterranean and should be immediately removed.

It can't be ignored any longer the inextricable reliance of tuna farming on capture fisheries: the maintenance of subsidies to tuna farming constitutes a legal loophole that strongly violates the key principle underlining the recent reform of structural aids to fisheries in the EU of phasing out all subsidies promoting overfishing or destructive practices. The recent accession to EU of countries like Malta or Cyprus with important tuna farming activities makes even more urgent putting an end to this situation.

10. The myth of tuna domestication: a win-win alliance between the farming industry and aquaculture scientists (to the detriment of the wild stock)

Right from the start of tuna farming in the Mediterranean, in 1998, a far-reaching alliance was set up involving 50 experts from 12 countries, representing scientific and commercial entities. They called themselves DOTT (domestication of Thunnus thynnus) and according to their own words, the group objective was "to lay the foundation for co-operative research and development, for the domestication of Thunnus thynnus". A big conference was held in Spain in early 2002 organized by this lobby group.

This alliance between the farming industry and aquaculture scientists, strongly supported by some public research institutions (like IFREMER, in France), has a clear twofold objective. On one hand, it deliberately tries to create confusion between current tuna farming practices and the idea of the full domestication of tuna, to the benefit of the industry. On the other, it provides a big opportunity to aquaculture scientists to get public funding.

Indeed, to justify their reliance on a severely overexploited stock, tuna farmers claim to be committed to the evolution of current practices towards a closed aquaculture cycle (that is, the reproduction in captivity of the species), a situation that would make their activity independent from the overfished wild stock. Accordingly, current capture and farming practices would be just a provisional first step towards the permanent solution of the domestication. Besides, farmers seek to cultivate an apparently good image, by facilitating scientific research on live tuna in their facilities, which makes them being well considered by the authorities and scientific research centres (not to speak about their economic contribution to symposia, etc.). This permanent attempt to confound tuna farming practices and aquaculture has also the purpose to make current farming practices being eligible for public subsidies to aquaculture, something that is currently happening in the EU framework. This situation tries to mask the fact that the farming industry is driven by short-term benefits of fish-and-farming practices, not even being committed to the long-term survival of the very stock they exploit. Clearly, a hypothetical long-term domestication is not in their real agenda. This is so because tuna

farmers are primarily investors, seeking to maximize short-term benefits for the capital they have channelled, attracted by the huge benefits obtained during the first booming years of activity.

On the other hand, scientists benefit from increased opportunities of research on live caged tuna, and, especially, from public funding possibilities. For the latter purpose, all kind of demagogic arguments are employed. Since the creation of this lobby group, the related specialists are trying to convince the EU about the need to create a European research center exclusively devoted to tuna domestication, claiming that if achieved it would be a landmark in the history of livestock domestication. Misleading arguments like that 'fully domesticated tuna will replace beef in the future' (stated by the coordinator of the group at the peak of the mad cow disease crisis) or that future tuna hatcheries would allow restocking operations to rebuild the depleted wild stock are intentionally employed to convince the public opinion and the authorities that they deserve the huge funding they require (for the sake of humankind, they say), in spite of being scientifically inconsistent.

Indeed, the reproduction of tuna in captive condition has been achieved only very recently in Japan, under experimental conditions. Survival rates of larvae are very low and the process is considerably expensive. Clearly, there are no prospects for the commercial production of bluefin tuna under truly aquaculture conditions (captive reproduction) in the foreseeable future. Besides, overwhelming arguments from the perspective of the ecological sciences make this possibility a scientific non-sense. Aquaculture of carnivore species is facing a strong crisis due to the related requirements of huge amounts of wild caught feedfish (in a context of increasing global overfishing and diminishing captures from the oceans). In fact, tuna is a top predator, highly carnivore species, so it is undoubtedly the worst candidate for large-scale sustainable aquaculture practices. Indeed, current food conversion rates reported in Mediterranean tuna farms are about 15-25 kg of baitfish to produce 1 kg of tuna, which points to it being an extremely wasteful practice. In this context, it can be easily understood why the recent statement of a representative of DOTT lobby group at a GFCM/ICCAT meeting on tuna farming in the sense that 'expected bluefin tuna production raised in captivity under fully domestication conditions would amount to 30 million tonnes in 2025' comes totally out of the blue. The related amount of feedfish needed would far exceed the entire global marine fish landings.

As for the idea of restocking of the wild stock using domestically hatched larvae, it arises from a profound scientific ignorance. As every fish ecologist know, fish recruitment is a complex process governed by many biotic and abiotic factors which determine fish larvae survival, it going far beyond the release of fish hatchlings into the ocean. The early life history of bluefin tuna in the Mediterranean and the related recruitment processes are seldom know. Whereas artificial restocking lies entirely in the domain of science fiction, tuna farming is a proven threat to the integrity of wild populations.

It is time to uncover the false myths spread by those with vested interests in tuna farms, and let the public opinion and the authorities know what is really hidden behind them: the idea of the domestication of bluefin tuna, at least in the Mediterranean, is merely a cosmetic mask to hidden the current destruction of the wild bluefin tuna stock driven by booming fish-for-farming practices.

11. WWF initiatives and positive developments towards the regulation of tuna farming and the related fisheries

Since early 2001, WWF has been actively working to achieve a rational management of tuna farming practices in the Mediterranean by 1) increasing awareness about the impact of booming, unregulated tuna farming on the conservation of the

bluefin tuna wild stock and the related artisanal fisheries and 2) proactively promoting the development of regional-wide policies aiming at the sustainability of tuna fishing and farming practices.

Extensive media work in the form of international press releases and conferences, radio and TV interviews and reports in the specialized press have been issued along the last 3 years, to warn about the magnitude of the threat posed by emerging tuna farming in the region on the integrity of the highly decimated Mediterranean stock of bluefin tuna. In summer 2002, though, in the context of a field survey to the farms located off Cartagena, in SW Spain, tuna farm workers deliberated crashed their vessel against a small zodiac carrying a mixed team of marine experts belonging to WWF and the local organisation ANSE, putting their lives at risk. On the technical side, in early 2002, after putting together all relevant —but still considerably scant— information available at that time on the situation, trends and perspectives of tuna farming in the region, WWF launched the first version of this report, which soon became a reference document for researchers working on the sustainability of mariculture practices.

On top of that, WWF experts have actively contributed to workshops and seminars on tuna farming in Spain and Turkey, organized in close connection with the sector, to let them and the public managers know about WWF's concerns on the lack of sustainability of current practices and trends, always proposing possible regulatory measures to make this activity sustainable. A special effort has been made to promote the adoption of policies to make the activity sustainable with respect of the conservation of the wild stock of tuna and the integrity of marine ecosystems. At this regard, WWF has been very active in regional fisheries management bodies like the General Fisheries Commission for the Mediterranean (GFCM) and ICCAT to put the issue of the sustainability of tuna farming in the Mediterranean in the political agenda of these multilateral organisations. Parallel work has been done regarding national and regional governments from all around the Mediterranean, including the EU.

A major landmark —for that it was the first time that tuna farming was addressed by the regional management bodies— was the endorsement by the 27th Session of the GFCM in late 2002 of a formal request presented earlier by WWF to the SubComittee on Stock Assessment of the Scientific and Advisory Committee of GFCM, resulting in the creation of a specific ad hoc Joint GFCM/ICCAT working Group on Sustainable Tuna Farming Practices in the Mediterranean aimed at developing guidelines for sustainable practices. An expert from WWF was invited to join this WG. This WG met twice during the year 2003. Besides, another relevant policy outcome has been the recent adoption by ICCAT of Recommendation 03-09, in November 2003, setting up the mechanism for the compulsory statistical reporting to ICCAT of the amounts of tuna caged and produced in farms, as well as establishing a 'positive list' where to include of all tuna farming facilities authorised by the countries and allowed to operate for farming of bluefin tuna caught in the ICCAT area. Unfortunately, it has taken 7 years to adopt this necessary, basic regulation since the strong start of tuna farming activities in the Mediterranean in the mid 90's. Indeed, it has been laid down at a moment when tuna farming has completely reshaped the tuna fishery in the region and still falls considerably short in ensuring a real improvement of the situation.

WWF has also sought the creation of synergies by enhancing common actions with local NGO's dealing with the harmful effects of tuna farming in their respective Mediterranean countries. The network of Mediterranean organisations —including independent, locally-based NGO's and different WWF offices— closely monitoring tuna farming developments and denouncing bad practices related to tuna farms include Spain, Croatia, France, Italy, Malta, Morocco, Turkey, Tunisia, Cyprus and Greece. In October 2002 a monographic workshop was

held in Cartagena (Spain), the world's capital of tuna farming, gathering together representatives from the above network on NGO's with the aim to analyse the situation and developing proposals to remedy the negative trends. Coinciding with the end of the meeting a common declaration was launched, known as 'Cartagena Call for Action for Sustainable Tuna Farming in the Mediterranean' *(see Annex 1)*. Among other things, this document warned that the massive expansion in tuna farming was threatening the already over-fished wild tuna in the Mediterranean and asked for a moratorium on the development of new tuna farms in the Mediterranean. It also urged the governments around the Mediterranean, the management bodies ICCAT and GFCM, and in particular the European Union to regulate this new activity and called for an elimination of all subsidies supporting tuna farming. Barely one month after its international release, about 100 scientific experts and organizations from all around the Mediterranean and beyond had already signed the declaration, which was then brought to the 13th Special Meeting of ICCAT held in November 2002 in Bilbao (Spain).

12. Bad prospects for the future: tuna farming is getting definitely out of control, only driven by market forces

In spite of a few recent apparent improvements from international fisheries management bodies, the pace of destruction of the wild stock of bluefin tuna inhabiting the Mediterranean is clearly spiralling out driven by tuna farming overcapacity. This is happening without any kind of real public control, to the point that the only hope for this unsustainable pressure to slow down lies on the uncertain future trajectories of blind market forces themselves.

Certainly, it has been an improvement that ICCAT finally decided to regulate the statistical reporting of bluefin tuna by specifically accounting for the very existence of tuna farms (Recom. 02-10 and 03-09). Clearly, this decision comes 5 years too late, at a moment when virtually all purse seine catches are already transferred to farms, and after several years of continuous complains by scientists belonging to ICCAT's working groups arguing that tuna farming was absolutely distorting the capture statistics and size composition data that are crucial for stock assessments, which undermined the possibility to carry out any rational management of the stock. In spite of this and of clear signs that farming has reached overcapacity, which leads to increase the fishing pressure on the stock, ICCAT still tends to consider tuna farming as a 'post-harvesting practice', having no direct relationship with fisheries …

Too late and all but sufficient. As warned by some of the best specialists on bluefin tuna fisheries met in Turkey with the occasion of the GFCM/ICCAT Working Group on Tuna Farming in 2003, ICCAT Recommendation 03-09 establishing the information from farms that is to be sent by the countries to ICCAT doesn't ensure that this management organisation receives all the necessary information about the complete fish-and-farming process. In fact, it only obliges countries to report to ICCAT the total quantity of bluefin tuna caged and marketed on an annual basis, which makes impossible to know the origin of tuna caged and, even less, allowing the necessary traceability of traded tuna from farming origin.

This situation is all the more worrying since the ICCAT Bluefin Tuna Statistical Document (BFTSD), a document that must be filled describing any international transaction (import) involving bluefin tuna, doesn't apply to live tuna, thus failing to cover all transhipments at sea from purse seiners to tug boats/farms that are intrinsic to the now prevalent tuna farming practices in the Mediterranean. Furthermore, the BFTSD doesn't apply to transactions between EU countries, which would continue to mask transfers between fleets and farms from France, Spain, Malta, Italy and Cyprus even in the case this loophole were finally eliminated.

Furthermore, during the farming period the weight of tuna is thought to increase significantly, which adds further uncertainty about catch figures if looking at farmed production (a by-default value of 25% is used in ICCAT estimates of original figures). This may have strong implications for the control of quota, since there is room for countries/farms to argue high weight gains in their farms to hidden excess catches. At this regard, it is noteworthy the broad range of weight gain percentage reported for farms in Italy, Spain and Turkey (from 10% to 50%).

Finally, the delocalisation process of European farms (usually Spanish) towards North African countries —even if equally bound to ICCAT obligations—, looking for much less control for their activities is already in place, what has led to some to speak about 'IUU farms' spreading around the Mediterranean (mimicking the concept of IUU —illegal— fishing). It is worth stressing again that Libya and Tunisia didn't reported their farming activities to the GFCM/ICCAT WG on Tuna Farming last year, after having been formally required to do so, which doesn't allow to be very optimistic about the real efficacy of the 'positive list' of authorized farms provided for by ICCAT Recommendation 03-09.

In this context, it is not surprising that one of the world's leading experts on bluefin tuna trading describes tuna farming as it currently happens in the Mediterranean as the **BIG LAUNDRY MACHINE**.

During 2003 WWF contributed actively to the two meetings of the GFCM/ICCAT Working Group on Sustainable Tuna Farming/Fattening Practices in the Mediterranean that were conducted. After realizing the lack of willingness of the working group to address the real problems posed by tuna farming on the exploitation of bluefin tuna, namely the in-

WWF actions against unsustainable tuna farming

In addition of undertaken technical reports regarding the environmental threats of tuna farming industry or attending political and Scientific international forums, WWF has organised several actions to alert on this activity and its threats to bluefin tuna conservation in collaboration with other environmental NGOs during last years. Main petitions of these actions have been establishing a moratorium of new tuna farms meanwhile there is not a specific regulation for this activity and setting up control measures to guarantee that tuna farming does not threaten this species wild stock

In April 2002 ANSE, Greenpeace and WWF showed a banner in the sailing boat Else coinciding with the EU Agriculture and Fishing ministries visit to one of the Murcia tuna farms. Else boat was retained because of a Government Delegation in Murcia order hampering to give a letter to the EU 15 ministries in Juan Sebastián El Cano sailing ship. The letter informed on the impact of this activity and the organizations requests for a sustainable tuna farming.

In August 2002 a team of divers of these organizations showed a big underwater banner saying "Stop Tuna Farming" in one of the cages in Cabo Tiñoso, a high ecological value area protected by several legal figures. The pictures were widely spread by media.

A few weeks before, a big auxiliary vessel belonging to one of the farming companies was deliberated crashed against a small zodiac carrying a mixed team of marine experts belonging to ANSE and WWF that have been developing a research and monitoring program on the impact of the farms. This aggression put their lives at risk, so that this fact was denounced to the police in Murcia.

WWF proposes 4 urgent basic measures to reverse this disastrous trend

1) Establishing a specific quota for tuna caging, as a share of the total catch quota. This quota should be allocated to countries having purse-seining fleets in the Mediterranean, and be calculated according to a) national purse seine fishing capacity before the start of tuna farming activities in the region and b) current fishing possibilities allocated by ICCAT.

2) Eliminating the loopholes in EU legislation that allows tuna farms benefiting from structural funds aimed at aquaculture development. All kind of national subsidies to this activity should also be dropped, for that subsidizing farms leads to increasing fishing overcapacity.

3) Modifying the current Bluefin Tuna Statistical Document (BFTSD), to be reported by contracting parties to ICCAT informing on any trade operations involving bluefin tuna imports, so that it covers the transfer of live fish captured by one country into cages of another country.

4) Highly improving the statistical reporting requirements provided for by ICCAT Recommendation 03-09, so as to ensure the traceability of all traded tuna originating from farms in the Mediterranean. This means a reporting system to ICCAT including highly disaggregated information, at the level of the farm and even the cage, to systematically allow tracing back the flag ultimately responsible for the catch.

creasing fishing pressure on the wild stock driven by tuna farming, as well as the strongly biased composition of this working group that didn't ensure a balanced output, with many participants having evident vested interests on the tuna farming activity, WWF took the decision to withdraw from this process.

13. Conclusions and WWF recommendations

As all evidences gathered in this report strongly suggest, the fishery of bluefin tuna in the Mediterranean is currently driven by the increasing demand from the tuna farming industry, which ultimately relies on the demand from the markets and the availability of public subsidies, that reduce exploitation costs. In this context of virtual mismanagement, with enforcement of quotas impossible to validate, clear violations of ICCAT rules (i.e. Turkish catches), lack of information to carry out regular and reliable population assessments, etc., the pre-eminent role played by international markets guiding the exploitation rate of this overfished stock is a complete nonsense.

In the first version of this report, in May 2002, we wrote: "The brief history of tuna farming in the Mediterranean does not allow us to draw any very conclusive lessons learnt regarding the real magnitude of the problems. However, the rapid development of the activity fuelled by the huge economic benefits involved creates urgency". Now, after several years tightly monitoring both bluefin tuna fisheries and the evolution of tuna fattening activities in the Mediterranean we have clearly identified a continued devastating degradation of management possibilities for the East Atlantic stock of bluefin tuna, which leads us to state that what the situation now requires is urgent action (see above box).

Meanwhile, WWF calls for a strict and immediate moratorium on the development of new tuna farms in the Mediterranean, much beyond the simple creation of a positive list of

nationally authorized farms as recently adopted by ICCAT, which doesn't provide for any kind of limitation in their number.

In addition to this, the whole management scheme of bluefin tuna fishing in the Mediterranean should be substantially improved so as to enable ensuring the conservation and sustainable exploitation of the stock (see box below).

Unless purse seine fishing and tuna farming are regarded as steps of the same process, fish-and-farming, and fully addressed as a particular case of standard capture fisheries, the right approach to successfully tackle the sustainable management of the stock won't be undertaken.

WWF proposals to ensuring the conservation and sustainable exploitation of the Eastern Atlantic Bluefin Tuna stock

- Establishing a comprehensive monitoring scheme of catches in real time, at both national and international level, centralized by ICCAT. The fishing countries as well as ICCAT must have real time information about the total amount of bluefin tuna caught at any given moment. This is a basic prerequisite to make the current quota system being of real use in the effective management of the stock, allowing for the closure of the fishery when the quota has been reached.

- Setting up a comprehensive programme of on-board observers under ICCAT. The presence of observers must be compulsory for all purse seiners harvesting the Eastern Atlantic stock of bluefin tuna. They should supervise the real time reporting of catch statistics referred to above, as well ensuring the traceability of catches, from the catch to the transhipment and transfer of live fish to farms or the landing at the ports. To this end, a new reporting system identifying the origin of tuna caught during each fishing operation must be put in place.

- ICCAT should substantially reduce the current quota to achieve sustainable fishing levels according to the scientific advice. The annual quota for the East Atlantic bluefin tuna stock adopted by ICCAT in 2002 for the period 2003-2006 is 23% higher than the maximum level considered sustainable by ICCAT SCRS scientists (32,000 t and 26,000 t, respectively).

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ANNEX I

Cartagena Call for Action for Sustainable Tuna Farming in the Mediterranean

Preamble

The exponential growth of tuna farming in the Mediterranean in the last 5 years has led to an unprecedented change in the exploitation of the wild bluefin tuna stock inhabiting in the Mediterranean and adjacent Atlantic waters. According to the International Commission for the Conservation of Atlantic Tuna (ICCAT), the prolonged unsustainable fishing pressure on bluefin tuna in the region has placed this fish population in a critical overfished situation.

Farming has extensively reshaped the harvesting pattern of the species; currently most captures rely on large industrial purse-seiners equipped with sophisticated fish finder systems, able to capture live tuna which are then transferred to fixed cages located in coastal areas, where they remain for a variable period (from weeks to some months) prior to being exported to the Japanese market for sushi.

Farms, either already in place or planned, are mushrooming across Spain, Croatia, Malta, Turkey, Italy, Morocco, Greece, Tunisia, Algeria, and Libya.

This new fishing-for-farming system has rapidly developed, fuelled by the enormous economic benefits arising from the demand of the Japanese market. Driven exclusively by the expectations of huge short-term profits for a handful of investors, this 'blue-gold rush' lacks a regulatory frame.

At the same time, conspicuous harmful effects of this large-scale unregulated activity have emerged on the management and conservation of the tuna stock, the associated baitfish fisheries and the quality of coastal ecosystems. Besides, physical disturbances, unfair competition for the resource and negative effects on traditional fishing communities threaten fishermen's livelihoods.

Therefore,

We, the signatories of this Call for Action urge National and Local Governments, the European Union, the General Fisheries Commission for the Mediterranean (GFCM) and ICCAT to

1) **declare an immediate precautionary moratorium on new tuna farms**
2) **urgently develop a specific and harmonized regulatory framework for this new large-scale industrial activity**
3) **effectively monitor and adequately manage wild stock and the associated baitfish populations**
4) **minimize pollution from farms**
5) **ensure the compatibility between tuna farming practices and other human uses of the coastal fringe, including conservation needs and traditional fishing**
6) **eliminate any form of public subsidies supporting this activity**
7) **establish co-operation with Japanese and South Korean governments to ensure their support in enforcing the regulatory framework**

The signatories also strongly support all efforts promoting sustainable fisheries management in the Mediterranean. This should be focused on the rebuilding of overexploited stocks and the conservation of associated ecosystems, as well as on the maintenance of fishing livelihoods and the consolidation of the GFCM as a true regional, pan-Mediterranean effective fisheries management body.

Regulatory framework

Possible measures would include –among others- setting up an improved, stricter reporting system of tuna captured and farmed, the compulsory statistical reporting of baitfish catches, the limitation of farming to only a given fraction of the total tuna catch quota ('setting a quota inside the quota'), *specific* environmental provisions for tuna farming plants (addressing standards for maximum wastage of feed and environmental quality, proper Environmental Impact Assessments, minimum distances from the coast and minimum depths, etc.), as well as establishing areas closed to farms and fish-for-farming practices, reserved to traditional fishermen.

WWF-Canon/Michael Sutton

The Japanese demand has been fuelling the development of tuna farm facilities in the Mediterranean. More than 18,000 t of tuna are imported annually from the region.

WWF-Canon/Gérald Hibon

Farming activities started in Croatia in 1996. There are currently 10 farms in the counties of Zadar, Sibernik and Split.

WWF-Canon/Helene Petit

Tuna caught by French purse seiners in Atlantic waters. France has the most powerful purse seine fleet targeting tuna in the Mediterranean.

WWF-Canon/Jorge Bartolomé

WWF calls for urgent action to avoid the commercial extinction of bluefin tuna. A specific quota for farming is needed.

WWF-Canon/Jorge Sierra

The feeding of tuna with small pelagic fish caught by auxiliary fleets adds further pressure on Mediterranean fish stocks.

WWF-Canon/Jorge Sierra

Murcia is the world's leading region on farmed tuna production, with an annual production in 2002 reaching 107.5 million €, worth 2.12% the entire regional GNP.

WWF/Sergi Tudela

The expansion of tuna farms all around the Mediterranean, like this one in Turkey, threatens the bluefin tuna stock, one of the most valuable fish resources in the Mediterranean.

WWF/Sergi Tudela

IUU-related farming. Tuna farms in Turkey are entirely supplied with live tuna caught by the national fleet, despite the absence of a quota for bluefin tuna allocated to Turkey by ICCAT.

IFREMER

Tugging of cages with live bluefin tuna to their final destination at the farming sites. Some of the auxiliary boats involved in tuna farming operations benefit from IFOP subsidies.

WWF/Ezequiel Navío

Joint protest action by ANSE, Greenpeace and WWF in front of tuna farms in Murcia.

WWF-Canon/Jorge Sierra

Auxiliar ships, subsidised and recently built, for tuna farming. The farms in Murcia Region have received a total amount of 4.5 Million € in four years.

IFREMER

Hauling of bluefin tuna following their slaughter in a farm facility in Murcia. Imports from Spain exceeded 6,000 t in 2002, according to the Japanese authorities.

WWF's mission is to stop the degradation of the planet's natural environment and to bluid a future in which humans live in harmony with nature, by:

- ✔ conserving the world's biological diversity,
- ✔ ensuring that the use of renewable natural resources is sustainable,
- ✔ promoting the reduction of pollution and wasteful consumption.

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