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ON THE BRINK

MEDITERRANEAN BLUEFIN TUNA

THE CONSEQUENCES OF COLLAPSE

COUNTDOWN TO COLLAPSE

In May the annual Mediterranean bluefin tuna (*Thunnus thynnus*) fishing season will begin, amid concerns that the size of official quotas, illegal fishing, and fishing during the spawning season could hasten the collapse of the bluefin stock in the area.

The scientists who formally advise ICCAT[1] (the management body whose Contracting Parties collectively set annual catch quotas for tuna in the Atlantic and Mediterranean) recommended that this year's catch should be reduced from 32,000 (the 2006 quota) to 15,000 tonnes in order to prevent the stock's collapse.

In addition, the scientists recommended that the fishery should be closed from May to July during the critical spawning period. (The fishing activity is deliberately targeted at the spawning season because this is when tuna are easiest to catch, rising to the surface where they are located by spotter planes and rounded up by purse seine vessels[2]).

Ignoring the advice of its own scientists, ICCAT accepted an EU-backed plan which not only reduces the 2007 catch quotas by a mere 2,500 tonnes (as opposed to the recommended 17,000-tonne reduction), but will only begin the fishing closure in July, leaving the tuna vulnerable specially in June, when the bulk of the catch (60%) occurs.

Two ICCAT Contracting Parties – Turkey and Libya – objected to its allocated quotas by ICCAT and unilaterally decided to increase their own allocations, bringing the total annual catch for 2007 to 32,414 tonnes.

This means that instead of reducing the total catch (against 2006's) by more than half to avoid the risk of collapse, this has effectively been increased by 414 tonnes.

What is more, the actual bluefin tuna catch is much higher than that legally allocated, with substantial illegal fishing taking place. Experts estimate that this increases the total tonnage of tuna taken to at least 50,000 – more than three times the amount considered sustainable or safe by scientists.

1 International Commission for the Conservation of Atlantic Tunas, based in Madrid.
2 Purse Seiners lower a large net onto a school of fish and then pull it shut from beneath like a drawstring purse.

A HIGH PRICE TO PAY

Left unfished, bluefin tuna can grow to 4m in length, weigh 680kg and live for up to 30 years. Able to swim at speeds of about 40km per hour and dive to depths of nearly 1km, this species is one of the seas' great migrators, travelling from the tropics to the Arctic. They migrate to the Mediterranean to spawn, where they remain under the auspices of ICCAT and are at their most vulnerable, but their wide-ranging migrations mean that the same stock is fished in various locations around the East Atlantic and Mediterranean.

Ten years ago, millions of the species would travel through the Mediterranean Sea. Since then, however, the population has been declining rapidly due to the targeting of stock by industrial fishing fleets.

Considered the finest sushi in the world, the bluefin tuna carries a high value. To help meet high global demand, it is now mostly trapped, caged at sea, fattened and then killed for market in Japan, the United States and Europe.

Ecological impacts

Tuna stocks across the world are at risk, but the decline in bluefin tuna is the most severe, and Mediterranean bluefin tuna is at high risk of extinction in the near future.[3]

The removal of a species from an ecosystem has serious but unpredictable consequences.

Tuna is a top line predator and as such plays a pivotal role in maintaining the natural balance of the ocean. When top line predators are removed it can lead to a 'trophic cascade' (a domino effect whereby species throughout the trophic layers are affected). Species lower down the trophic layers – or food chain – experience unhindered growth, and this fundamentally changes the nature of the ecosystem, as the following examples demonstrate.

- Over-hunting of sea otters in the Aleutian Islands led to an expansion of sea urchin populations, which in turn over-grazed the kelp populations upon which numerous other species depend.

3 Classification by IUCN; in the case of commercial species, this may mean 'commercial extinction' where there are insufficient groupings of the species to make it commercially viable to target or catch them. By either definition, the term implies significant damage and threat to marine ecosystems.

- In the Northwestern Atlantic the overfishing and decline of groundfish species, such as cod and haddock, resulted in increases in shrimp and capelin populations.

- In the Black Sea the anchovy population expanded following the collapse of tuna-like predators such as bonito.

- The collapse of Northwestern Atlantic cod stocks as a result of overfishing resulted in the replacement of cod by shrimps, crabs and lobsters.

- The removal of urchin predators on coral reefs resulted in an increased abundance of, and alterations in the behaviour of, sea urchins and the subsequent erosion of coral reefs and decreased diversity of algal-grazing reef fish.

- The collapse in the Barents/Norwegian Sea of herring, capelin and cod fisheries as a result of climate variation and overfishing led to the mass mortality of seabirds.

Scientists believe that the collapse of bluefin tuna in the Mediterranean Sea may lead to a sharp increase in the biomass of bentopelagic cephalopods, such as squid. This would negatively affect the sardine population. In contrast, other small pelagic fish (such as the sardinelle and horse mackerel) would probably thrive because of the removal of one of their major predators.

As larger fish are removed from the ecosystem, the fishing industry progressively ‘fishes down the food web’, targeting lower trophic levels. In the Black Sea, overfishing negatively affected the stocks of demersal fish predators such as turbot, red mullet, blue whiting, and subsequently, bonito. This led to the anchovy population experiencing a stock boom, and this was then targeted for fishing instead.

Economic impacts

The current approach to tuna harvesting in the Mediterranean Sea follows a classic pattern of industrial fishing interests racing to take the last of a high-value species ahead of collapse – on the assumption that if they don’t, someone else will.

The problem of this gold rush approach is compounded by over-capacity – there are too many large boats catching too few fish, which leads to illegal fishing (fishing above quota or during the closed season, for example) to avoid an economic shortfall. Indeed, the illegal harvest has become a central factor in the economic equation.

According to ICCAT, the average annual catch per purse seine vessel is 200 tonnes (pre-2007 season), which at around 4.5 euros per kilo means earnings of 900,000 euros per vessel. With fixed costs of running such a vessel estimated at about 800,000 euros per year (including capitalisation of the mortgage), net profits per boat come to around 100,000 euros per year.

ICCAT's 200-tonne estimate of the average annual catch per vessel equates to a total fleet catch of 50,000 tonnes. The total *legal* catch for 2006 was 32,000 tonnes for the entire fleet; the remainder as estimated by ICCAT came from illegal, unregulated and unreported (IUU) fishing.

If the fleets only took the legal limit, this would equate to a 128-tonne quota per vessel. The lower catch figure would yield a net loss of 224,000 euros per year. By definition, therefore, the status quo perpetuates overfishing and illegal catches, and will inevitably lead to the stock's collapse.

Fishermen catching tuna through sustainable methods such as trapping stand to lose the most should stocks collapse. Unlike the huge industrial purse seiners, which will move on to other fish or to other seas, the small-scale and traditional fishermen will lose their livelihoods when the fish run out. It is estimated that there are around 500 jobs directly associated with trapping in Spain and 800 in Morocco. In the trap sector, bluefin tuna catches have already dropped by 80 per cent over the last five years.

The impact of a collapse extends beyond the fishermen themselves to processors, suppliers and others who are dependent on the fishing industry for employment or income. In more remote areas where alternatives are limited, unemployment and economic hardship can lead to social problems, dependence on welfare, or displacement.

When Canada instituted a moratorium on cod fishing in 1992, 40,000 fishermen and other workers became unemployed, at a cost to the Canadian government of more than $4 billion (Canadian dollars, or $2.8 billion US) over a 20-year period.[4]

The value at first sale of the entire Mediterranean bluefin tuna catch of 50,000 tonnes is estimated at around 225 million euros, creating an industry which supports many livelihoods around the Mediterranean:

According to ICCAT some 1,707 commercial vessels target bluefin tuna in the Mediterranean (12,370 if recreational fleets are taken into account).

4 http://depts.washington.edu/mpanews/MPA44.pdf

- Around 3,768 fishermen work on-board the tuna purse seiners.
- Around 1,000 fishermen depend for their livelihoods of the traditional tuna traps based in Spain and Morocco
- The Andalusian government (Spain) estimates that for every job in the tuna trap fishery, there are three additional jobs in the processing and trade sector.

It is in the long-term interests of all these industries and individuals that the tuna population is harvested sustainably to ensure its long-term profitability and survival.

RUSSIAN ROULETTE

Just how precariously close this species is to extinction – biological or commercial – is unclear.

Last year's estimated total catch of 50,000 tonnes equated to approximately one million individual fish caught. The total bluefin tuna population is estimated to be around 3.75 million. Removing one million of this stock far exceeds the natural replacement capacity of the species. This may not seem significant but a population cannot sustain itself with that magnitude of depletion. This is reflected in the scientists' report to ICCAT, which notes that current fishing is "…expected to drive the spawning biomass to a very low level. Those low levels are considered to give rise to a high risk of fishery and stock collapse."

It is impossible for scientists to predict when the collapse will come – whether it will be this season or in 2008, 2009, or beyond. It is equally impossible for the fisheries managers who set the quotas, or the fishing fleets who deplete the oceans at such high speed, to predict, but neither of these parties is showing any regard for a precautionary approach.

That the stock will collapse, however, seems unavoidable if drastic action in line with the scientific advice isn't taken.

There are several examples of top line predator stock collapse which bear similar histories to the Mediterranean bluefin tuna fishery:

- In 1989, the Canadian Department of Fisheries and Oceans ignored its own scientists who recommended a 50 per cent cut in the Newfoundland cod fishery quotas in order to prevent imminent stock collapse.[5] Three years later the stock collapsed and a moratorium on the fishery had to be implemented.

- In the 1950s, Norway was the main bluefin tuna fishing nation enjoying an abundant fishery in their own waters. When purse seining for tuna began in the Mediterranean in the late 1960s, the larger, older fish were removed first, leaving behind the smaller, younger fish which were less able to migrate to the nutrient-rich Norwegian waters. By 1970, the Norwegian stock had collapsed and it has not recovered to this day.[6]

Once a stock has collapsed, future recovery is by no means assured. The closure of the Newfoundland cod fishery in 1992 was meant to be a short-term measure; 25 years later it is still in place with only minor exceptions. The Norwegian stock remains defunct and Norway is working within ICCAT to obtain overall quota reductions, as well as stronger measures against IUU fishing in the Mediterranean, in the hope that the species' historical abundance and distribution in Norwegian waters can be regained as it recovers enough to recommence its migration.

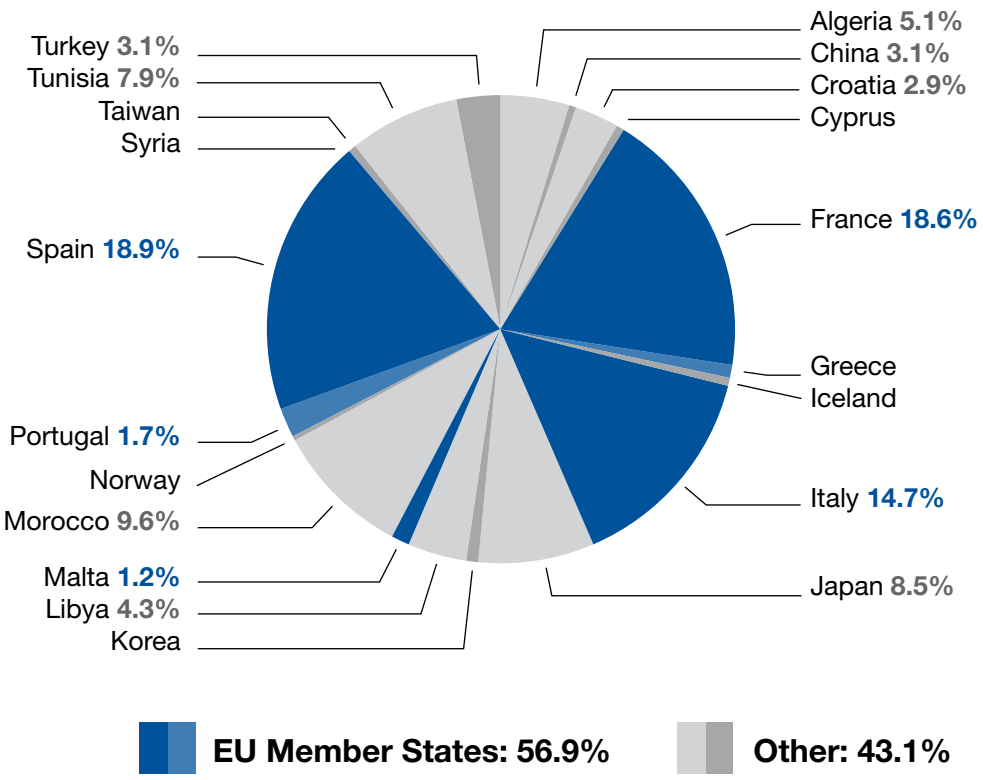
According to ICCAT's scientists: "In order to reverse these declines and to initiate rebuilding, substantial reductions in fishing mortality and catch need to be implemented."

It's not too late

As the chart below demonstrates, the European Union is responsible for the lion's share of the tuna harvest. Indeed, three EU Member States – Spain, France and Italy – together take more than 50 per cent of the total legal catch. At worst, unilateral action by the EU could make a significant difference to the impact on stocks this year; at best, it would encourage other nations to follow suit.

5 http://egj.lib.uidaho.edu/egj17/mason1.html
6 Lack of Atlantic bluefin tuna (*Thunnnus thynnus*) observations off Norway: Why did not bluefin tuna enter Norwegian waters in 2005? Leif Nøttestad and Norman Graham

ICCAT Quotas 2007 (%)



Proposed EU allocations, tonnes 2007

Cyprus	154.68
Greece	287.23
Spain	5,568.21
France	5,493.65
Italy	4,336.31
Malta	355.59
Portugal	523.88
Total European Commission quota	16,779.55
Total allowable catch (TAC) for the East Atlantic and Mediterranean bluefin tuna fishery (includes European Commission quota)	29,500

Internal allocation of the EU total quota of 16,779.55 tonnes among its Members States (Proposal for a Council Regulation not yet approved).

LISTEN TO THE EXPERTS

ICCAT's scientists have recommended a 50 per cent cut in the allocated total catch for 2007 and closure for the peak of the spawning season. They warned of a possible stock collapse if their advice was ignored.

ICCAT failed to heed this advice. If the stock does now collapse it will be very clear where the trail of accountability begins.

The EU as a block does not, however, have to accept the full quota allocated to it. Via the European Commission, which allocates individual country quotas within the EU, it could voluntarily 'hold back' 50 per cent of the total quota for conservation – effectively only allocating 50 per cent of the quota to its Member States, and thereby coming close to the scientists' recommended total annual catch.

Individual countries within the EU – or other ICCAT Contracting Parties – do not have to accept the total quota allocated to them. They can similarly 'hold back' 50 per cent.

If they do not do so, they are all complicit in what could very shortly become the next big stock collapse.

ICCAT has clearly demonstrated the problems endemic in fisheries management and their inability to maintain healthy and balanced oceans via adequate control of fishing activity. Their decision to double the catch beyond the 'safe' fishing limit for bluefin tuna is symbolic of the global failure of fisheries management and, as a result, the increasingly poor health of the world's oceans.

The demise of bluefin tuna may trigger the demise of fisheries management bodies. It is increasingly being left to wholesalers, retailers and consumers to impose sustainability on fisheries via purchasing choices. But for bluefin tuna, it may be too late.

There are too many boats chasing too few fish. This is the problem in the Mediterranean Sea and in the rest of the world's oceans. It is currently up to the management bodies to ensure that they do not cause the stocks to collapse and damage the broader ecosystems in so doing. They are increasingly demonstrating that they are not up to the task.

"The Mediterranean is at the point that if bluefin stocks are not actually collapsing, they are approaching collapse …when it got to bluefin, science just seemed to go out the window. The bottom line was that, as Chairman, I felt I was sort of presiding over the demise of one of the most magnificent fish that swims the ocean."

William T. Hogarth, Chairman of ICCAT[7]

7 http://www7.nationalgeographic.com/ngm/0704/feature1/

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- ensuring that the use of renewable natural resources is sustainable
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