CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

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Doha (Qatar), 13-25 March 2010

SUPPLEMENTARY INFORMATION ON THE PROPOSAL TO INCLUDE ATLANTIC BLUEFIN TUNA[1] (*THUNNUS THYNNUS* LINNAEUS 1758) ON APPENDIX I OF CITES IN ACCORDANCE WITH ARTICLE II 1 OF THE CONVENTION

1. The attached document has been submitted by the Principality of Monaco[*].

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[*] *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

[1] *www.cites.org/common/cop/15/raw_props/E-15 Prop-MC T thynnus.pdf*

SUMMARY

Since the Proposal to include Atlantic bluefin tuna (*Thunnus thynnus* Linnaeus 1758) on Appendix I of CITES was submitted by the Principality of Monaco[2] in October 2009, additional information has become available. The International Commission for the Conservation of Atlantic Tunas (ICCAT) Scientific Committee on Research and Statistics (SCRS) conducted an evaluation of the status of Atlantic bluefin tuna populations with respect to the CITES biological listing criteria[3] and the FAO's *ad hoc* expert advisory panel has also evaluated the proposal. Further relevant scientific papers have been published in the meantime. ICCAT, meeting in Recife, Brazil 9-15 November 2009 announced revised management measures to take effect from the 2010 season[4]. This document synthesises the additional information relevant to the evaluation of the Proposal for inclusion of *Thunnus thynnus* on CITES Appendix I. We respectfully request that this document, and the ICCAT SCRS report, be posted to the CITES CoP website as an informational document. In summary:

1. The new information confirms that the species meets the biological criteria for Appendix I, with more than 95% probability in some modelling scenarios.

2. The majority of the FAO Ad Hoc Panel concluded that the available evidence supports the inclusion of the species in Appendix I.

3. The revised management measures adopted by ICCAT represent an improvement but, even if fully enforced, are not sufficient to yield a high probability that the stocks will recover above the Appendix I thresholds within 10 years. Indeed, the information made available at the ICCAT meeting confirmed that the Total Allowable Catch adopted for the eastern Atlantic stock of bluefin tuna for 2010 has less than a 50% probability of recovery of the species by 2023.

4. The evidence points to the conclusion that inclusion of this species in CITES Appendix I will, by reducing the pressure on the stocks, buy time to develop and implement more effective management measures, thereby creating the conditions for a sustainable management regime that would allow a well-regulated fishery and regulated, non-detrimental international trade.

1. Introduction

The Principality of Monaco submitted a proposal to the CITES Secretariat to include Atlantic Bluefin Tuna (*Thunnus thynnus* Linnaeus 1758) on Appendix I of CITES in accordance with Article II 1 of the Convention. This document outlines new information and developments since October 14th 2009, the deadline for submission of proposals for consideration at CoP15, and provides more details on the management of the Atlantic bluefin tuna fishery by ICCAT, the Regional Fisheries Management Organisation (RFMO) responsible for managing the species.

2. Further scientific analysis indicating that Atlantic bluefin tuna meets the criteria for CITES Appendix I

Further to the information provided in the proposal and supporting statement on the status of Atlantic bluefin tuna, on 21-23rd October 2009, the ICCAT SCRS held a special session to consider the status of Atlantic bluefin tuna populations with respect to CITES Biological Listing Criteria. The session was formally an extension of the SCRS Annual Meeting which took place from the 5th – 9th October. This section of the document explains the findings of the SCRS analysis which was undertaken during the special session.

The CITES listing criteria for commercially exploited aquatic marine species

In order to understand the evaluation by the ICCAT SCRS it is necessary to refer to the details of the CITES listing criteria for commercially exploited aquatic species.

The defining document on criteria for amendment of the Appendices, Resolution Conf. Conf. 9.24 (Rev. CoP14)[5] includes biological and trade criteria for Appendices I and II, and guidelines for their

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2 *www.iccat.int/Documents/Meetings/Docs/PA2-604 [eng/fra/esp].pdf*
3 www.iccat.int/Documents/Meetings/COMM2009/PressReleaseCom2009-[eng/fra/esp].pdf
4 *www.cites.org/[eng/fra/esp]/res/all/09/E09-24R14.pdf*
5 *www.cites.org/[eng/fra/esp]/cop/13/doc/E13-57.pdf*

interpretation and application. A species qualifies for inclusion in CITES Appendix I when it is or may be affected by trade, and meets at least one of the biological criteria (Conf 9.24, Annex 1).

The current version of the criteria Resolution include the addition of specific guidelines for the application of the decline criterion (C) to commercially exploited aquatic species. These additional guidelines were developed through extensive consultation with Parties, experts and other organisations, primarily the FAO[6,7]. The general criteria (Annex 5) allow a population decline to be expressed in two different ways: (i) overall long-term extent of decline; or (ii) recent rate of decline from a baseline level of abundance or area of distribution. The data used to estimate or infer a baseline for extent of decline should extend as far back into the past as possible.

The specific guidelines for commercially exploited marine species specify that the historical rate of decline should be the primary criterion for consideration of listing of species in Appendix I, but that the recent rate of decline can also be considered. The guideline for the recent rate of decline is that which would drive the population down from the current level to the historical extent of decline guideline (i.e. 5-20% of baseline for exploited fish species). The formulation of the decline guidelines for commercially exploited aquatic species can lead to some confusion, because both historical extent of decline and recent rate of decline are to be computed relative to the same historical baseline. The extent of decline required to qualify for Appendix I is the same in both cases. The difference is that the end point for the recent rate of decline need not be based on the current level, but on a projection of up to 10 years into the future. In either case, however, the historical baseline going as far back as possible should be used as a reference point.

ICCAT SCRS evaluation of population status relative to the CITES listing criteria

The ICCAT SCRS decided in advance to set terms of reference[8] for its evaluation. They included provisions to conduct an independent review of the status of the species relevant to the CITES Appendix I biological criteria (and not an evaluation of the proposal itself or an analysis of any management considerations). They based their evaluation on the 2008 SCRS assessment

(ICCAT, 2009)[9] of the stocks, complemented by additional analyses. The SCRS was provided with a detailed explanation of the CITES criteria by a representative of the CITES Secretariat.

Without repeating the entire ICCAT SCRS analysis[10], it is important to stress that using the combined modelling scenarios the SCRS found that the probabilities of meeting the CITES Appendix I historical decline criterion using the SSB_0 baseline range from 96-99% for both Atlantic bluefin tuna stocks. The SSB_0 baseline is the computed historical spawning stock biomass prior to exploitation, going as far back as possible—as required by the CITES criteria.

6 www.cites.org/[eng/fra/esp]/cop/13/doc/E13-57.pdf

7 *2nd FAO Technical Consultation on the suitability of the CITES criteria for listing commercially exploited aquatic species. www.fao.org/DOCREP/MEETING/003/Y1455E.HTM*

8 *www.iccat.int/Documents/Meetings/Announce/SCI-062_[eng/fra/esp].pdf*

9 *www.iccat.int/Documents/CVSP/CV064_2009/no_1/CV064010001.pdf*

10 *http://iccat.int/Documents/Meetings/Docs/PA2-604%20ENG.pdf*

Cumulative probabilities of stock decline are shown in Figure 1:

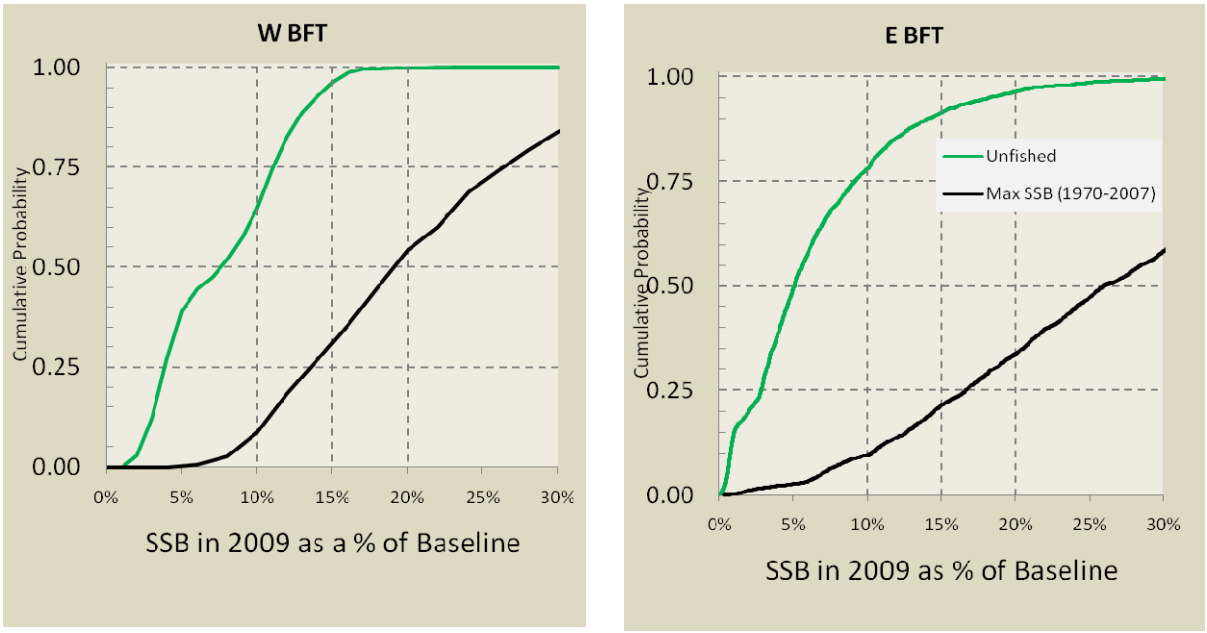

Figure 1. Probabilities of current status (2009) lower than different percentages of historical baseline[11]. "Unfished" refers to the SSB_0 baseline.

The SCRS did not address the question of whether the species meets the criteria for CITES Appendix II. The criteria for CITES Appendix II relate primarily to the necessity to regulate trade, although biological considerations play a role in determining whether they are met. In any case, an Appendix II listing would be of limited significance for the conservation of this species, because Article XIV of CITES can be read as exempting from CITES trade controls those specimens or products of marine species that are taken in accordance with a pre-existing convention such as ICCAT.

General remarks relating to the SCRS evaluation

Subsequent to the outcome of the SCRS meeting, opponents of the CITES listing have focussed their attention on the validity of the estimates of the unfished biomass for the eastern stock. The SCRS itself recognised that the range of estimates is rather wide: it exceeds 11 million tonnes in some core scenarios (and possibly much higher values in individual replicates). It is probably fair to say that the VPA method used in the SCRS assessments is not optimized for the estimation of unfished biomass, because it does not constrain the starting stock size relative to the unfished level (for example, by using plausible ranges for the historic catch prior to the start of the assessment data series).

However, even when the scenarios with the most conservative (lowest) estimates of unfished biomass are used (80,000 t for the western stock; 1 million t for the eastern stock, both of which are plausible), both stocks have a high probability of meeting the listing criteria. Accordingly, Monaco is content to use these estimates as the reference point. Monaco also shares the view, expressed by the CITES Secretariat, that, while the uncertainties in the overall data may appear considerable to the tuna specialists that attend SCRS meetings, they are vastly less than those that surround most species for which CITES has taken decisions heretofore, even for Appendix I. Efforts to reduce the uncertainty in the estimates of the unfished biomass may merit attention, but would not really impact the conclusions relating to the probability of meeting the CITES listing criteria at the current time.

With respect to the projections of the stocks to 2019, the SCRS report cautions that past projections of stock status have proven overly optimistic. Examples of this phenomenon include the predictions, contained in the 2002 and 2004 assessments of the western stock that the stock would recover strongly under a TAC of 2,500 t. In the 2008 assessment, no significant recovery is evident, despite recent catch averaging considerably less than 2,500t. The SCRS has tended to be more cautious about making future projections for the eastern stock, due to doubts over the reliability of catch data, but it is also evident that the assessments of a few years ago were too optimistic (see Annex I)..

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[11] http://www.iccat.int/Documents/Meetings/COM2009-Pre/Annex%20to%20PA2.rar

3. Evaluation of the proposal by FAO

Under the terms of a Memorandum of Understanding between the United Nations Food and Agriculture Organisation (FAO) and CITES, FAO conducted as scientific and technical review of the 6 proposals currently on the agenda for CITES CoP15 to list commercially exploited aquatic species on the CITES Appendices via an *ad hoc* expert advisory panel, which met from the 7th – 12th December 2009. The advisory panel, convened by the FAO Secretariat, consisted of 22 international fishery experts from 15 different countries. The full report from the advisory panel was not available at the time of writing this document, however FAO had released a summary of their findings: "*The panel did not reach consensus regarding the proposed listing under CITES Appendix I of Atlantic bluefin tuna (Thunnus thynnus), however a majority of the panel agreed that the available evidence supports the proposal*.[12]".This majority of support from the advisory panel constitutes a strong vote of confidence and agreement with the necessity of a CITES Appendix I listing for this species, and with the fact that the science confirms that the species qualifies for inclusion in Appendix I.

It is our understanding that there was overwhelming support for the majority view on the FAO Panel. The preliminary summary of the advisory panel[13] clarified that the issue on which the panel was not able to reach consensus was whether the correct baseline from which to assess decline was maximum spawning biomass (SSB_{max}) for the period assessed (which commenced in 1970), or estimated pre-exploitation spawning biomass (SSB_0). However, CITES Resolution Conf. 9.24 (Rev. CoP14)[14] states that "*the data used to estimate or infer a baseline for extent of decline should extend as far back into the past as possible.*" This clearly indicates that the most appropriate baseline is pre-exploitation spawning biomass (SSB_0), as confirmed by a majority of advisory panel members: "*the majority of members of the Panel considered that estimates of B_0 were preferable to use for the baseline because they took account of the reduction of the population by removals prior to the start of the assessment series*."That was also the view of the CITES Secretariat, articulated at the ICCAT meeting as well as the ICCAT SCRS meeting.

The advisory panel further acknowledged that "*there have been serious flaws in the recent management of the eastern component, including TACs set above scientific recommendations at unsustainable levels, and a large illegal component of the fishery making appreciable catches*"

and noted that "*An Appendix I listing would be likely to reduce the bluefin catches from both component populations. This would assist to ensure that recent unsustainable catches in the east Atlantic and Mediterranean are reduced*."

4. New ICCAT management decisions

ICCAT's 2009 meeting was held in Recife, Brazil from the 9th – 15th November. A number of new management measures were introduced, however these are not sufficient to recover the eastern Atlantic bluefin tuna stock, and it is unclear whether they will even prevent further declines. This section of the document summarises the main outcomes of ICCAT's 2009 meeting, and assesses their relative strengths and weaknesses.

Quota: The Total Allowable Catch (TAC) for the western stock of Atlantic bluefin tuna was not changed. The TAC for the eastern stock was been set at 13,500 t for 2010. This represents a reduction of 6,450 t (compared to the 19,950 t for 2010 established by ICCAT Recommendation 08-05 previously in force). However this TAC is the result of a political compromise, and is neither designed to recover the stock nor to meet the objectives of the ICCAT Commission as established by its own basic texts. ICCAT postponed the adoption of a science-based recovery plan to its meeting in November 2010. The information made available during the meeting showed that if the TAC were chosen based on recovery of the stock, it would have been lower. According to the ICCAT SCRS Chairman, a TAC of 8,000 t would have only a 50% chance of achieving ICCAT's recovery goals (i.e. recovering the stock by 2023 to a level which would allow the maximum sustainable yield to be harvested without harming the stock, known as 'B_{MSY} by 2023'). Managing an already fragile stock with just a 50% chance of success is not appropriate, and the agreed quota of 13,500 t is extremely unlikely to recover the stock by 2023.

Additionally, the management of the Atlantic bluefin tuna fishery by ICCAT has a long history of fishing at levels significantly higher than the agreed TAC—including significant illegal, unreported and unregulated (IUU) fishing, notably by Mediterranean countries. In 2007, SCRS estimated that 31,500 t were taken in excess of the agreed

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12 *FAO Press Release, 14th December 2009. Available at: www.fao.org/news/story/en/item/38195/icode/*

13 *FAO* Ad Hoc *Expert Advisory Panel Preliminary Summary. Available at: www.fao.org/fileadmin/user_upload/newsroom/docs/panel_preliminary_summary.pdf*

14 *CITES Resolution Conf. 9.24 (Rev. CoP14) is available at www.cites.org/eng/res/09/09-24R14.shtml*

TAC. In 2008, whilst some improvements have been in terms of enforcement, SCRS still estimates that up to 10,252 t of bluefin tuna may have been taken in addition to the reported catch. Many ICCAT Contracting Parties do not appear to have taken measures to combat IUU fishing. In addition, ICCAT members were unable to agree on a decrease of the fishing and farming capacity of the bluefin tuna fleet to levels commensurate with the newly established TAC for 2010, therefore creating a situation that may well result again in high levels of IUU catches during this year's fishery. Overcapacity in the fishery, fuelled by the demand of the international markets, is known to have been the main driver of illegal catches in past years.

The new management measures do not, therefore, change the determination that the species qualifies and should be included in Appendix I. Furthermore, the CITES Parties have decided, through the criteria and other discussions at meetings of the CoP, to always reference current population status against historical baselines—rather than predicting outcomes of altered management regimes.

In summary, all ICCAT has committed to currently is a quota for 2010 which is 68% higher than the quota that, if perfectly enforced, would recover the stock with only a 50% probability. The much needed science-based recovery plan has been relegated to "future projects", and even then ICCAT has only committed to a recovery plan in 2010 with a 60% chance of success.

Fishing closure: Purse seine fishing in the Mediterranean has been cut from two months to only one month per year. It should be pointed out however that both SCRS and the 2008 Independent Review of ICCAT recommend closing the fishery during the entire spawning period, meaning the months of May, June and July. That is fairly standard fishery management, where a fishery is closed during the species spawning period. **The current closure does the opposite**, by allowing fishing during the peak of spawning (15 May – 15 June), precisely when tuna are more vulnerable to purse seine gears. Purse seine catches during the newly closed period of 15 April – 15 May are relatively marginal, meaning that this restriction will not have a substantial impact on reducing fishing.

5. Extensive lack of compliance and IUU fishing

Over the last decade, the Mediterranean bluefin tuna fishery has witnessed extremely high levels of illegal, unreported and unregulated (IUU) fishing, with real catches as high as twice the TAC in recent years.[15] While some progress has been made recently, it has been short compared to the scale of IUU fishing and overcapacity in this fishery. The discussions and information presented at the 2009 ICCAT annual meeting raised significant concerns about continued IUU catches in the fishery and support the need to buy time so that countries can adapt the size of their fleets to the reduced catches and fishing seasons required to recover this depleted stock. ICCAT members could also use this time to improve their monitoring, control and surveillance capabilities. Monaco wishes to re-stress its view that a halt of international trade in bluefin tuna should provide this time to effectively tackle the main driver of IUU fishing in the fishery: rampant overcapacity fulfilling the unsustainable demand from the international markets.

Even though recognising some progress, there are three main areas of concern to support the statement above:

a) Continued levels of illegal activities: even with an unprecedented fisheries control deployment in the Mediterranean established by the EU and after the introduction of an International Joint Inspection Scheme by ICCAT, high levels of serious infringements have continued to be found both in 2008 and 2009. A report by the EU concludes that in 2009, infractions were found in one third of all the tug boats inspected;[16] the same EU report from the 2008 fishing season[17] had found infringements in 40% of the inspections on tug boats.[18] These figures would imply that one third of the bluefin tuna transported to fattening cages in the Mediterranean (the bulk of the catch) had been so without the required guarantees of its legal origin and would possibly qualify as IUU fish. During the special meeting of the ICCAT Compliance Committee in March 2009[19] it was observed that carrier vessels were not submitting VMS data (vessel positions) to the Secretariat as required by the existing regulations. It was also observed that "*some CPCs have not yet*

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15 *The ICCAT SCRS estimated a catch of 61,000 t of eastern bluefin tuna in 2007. Report of the Standing Committee on Research and Statistics. September 29 to October 3, 2008. Madrid, Spain.*

16 *European Community.* Report on the implementation of the ICCAT Recovery Plan for Bluefin tuna in 2009. *15 October 2009.*

17 Specific Report regarding the implementation of the Joint Development Plan for bluefin tuna fishing activities in 2008 in the Mediterranean Sea and Atlantic – Preliminary version (updated to 15 October except where otherwise indicated).

18 "54 apparent infringements have been detected and the corresponding procedures have been launched. Nearly all apparent infringements have been discovered in fishing vessels and tugs. In the specific case of tugs, more than 40% of the inspections have found an apparent infringement. The main apparent infringements discovered are related with catch documentation and VMS (76%)."

19 *COC-302/2009.* Report of the inter-sessional meeting of the Compliance Committee.

established transmission of VMS data to the Secretariat". There has been a minimum compliance with the five days reporting requirement under the ICCAT Catch Documentation Scheme and the quality of data in the document has been considered very poor in many cases.[20] One of the largest bluefin tuna fleets in the Mediterranean, the Turkish fleet, was denounced by ICCAT parties as being involved in widespread violations of the rules in 2009, raising significant concerns about the levels of IUU catches that season.

b) Unreported catches: Effectively combating IUU fishing, let alone meeting the most basic requirements for an effective management, requires at a minimum fulfilling existing obligations to report and communicate catch and effort data. This is basic to ensure compliance with the rules and to facilitate the work of scientists and managers. ICCAT contracting parties continue to fail to meet such requirements. In the bluefin tuna fishery, catch data is often inconsistent and incomplete, making it impossible to monitor quotas or accurately determine the status of the stocks. In June 2008, ICCAT scientists were unable to provide a new assessment of the bluefin tuna population because basic catch data and size information was not available. This resulted in a letter of complaint addressed to the ICCAT Chairman.[21] The ICCAT independent performance review qualified this problem as a *"wilful disregard for the ICCAT process".* But this situation has continued in 2009 and as a result the great majority of countries participating in the bluefin tuna fishery have been formally identified for issues of non-compliance including, almost unanimously, not complying with reporting requirements in the fishery.

c) Excessive fishing capacity: The underlying problem of excessive fishing capacity is at the core of the problems to control this fishery. The 2009 ICCAT annual meeting failed again to adequately address this problem by agreeing on capacity management plans which will, if adequately enforced, still keep the Mediterranean fleets well above the TAC agreed for 2010.

6. Historical context of ICCAT

A major factor predicating the need for a CITES Appendix I listing for Atlantic bluefin tuna is the inability of ICCAT to manage the fishery sustainably and prevent its precipitous decline. As such it is important for CITES Parties to be aware of the history of ICCAT and the bluefin tuna

Key points to note:

- ICCAT has agreed several bluefin tuna rebuilding plans in the last 30 years, none of which have succeeding in recovering either the western or eastern stocks.

- In 1992 (CoP8) Sweden submitted a proposal to list Atlantic bluefin tuna on the CITES Appendices. ICCAT committed to several measures and the proposal was withdrawn; without the pressure of CITES, mismanagement of the Atlantic bluefin tuna stocks quickly exacerbated in the following years.

- ICCAT has repeatedly set quotas far in excess of the advice provided by the SCRS

- ICCAT has consistently failed to eliminate IUU fishing

- ICCAT's own independent performance review deemed management of the East Atlantic and Mediterranean bluefin fishery to be an "*international disgrace*" with "*indications that collapse could be a real possibility.*" The report recommended ICCAT to immediately suspend fishing until its members show they "*can control and report on their catch*."

- In its 2009 meeting in Recife ICCAT, in an unprecedented move, formally identified many of its Contracting Parties for failure to comply with the rules, particularly those applying to the management of the Atlantic bluefin tuna. The breach of the rules in 2009 included international trade operations on Atlantic bluefin tuna endorsed by the relevant country authorities without mandatory catch documentation.

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[20] *See page 17 of document COC-303/2009.* Secretariat Report to the Compliance Committee.

[21] "*We only have Task I (total catch) and Task II (catch/effort and size samples) from three of CPCs that have quotas in the Eastern Atlantic and Mediterranean, which amount to less than 15% of the Total Allowable Catch [...] Consequently, we will not be able to evaluate the status of the eastern stock as of 2007, nor we will be able to carry out the review of the progress of the plan that has been requested from us.*" ICCAT CIRCULAR 1227/08. *Letter from scientists participating at BFT stock assessment session to ICCAT Chair*. Madrid, 27 June 2008.

7. New scientific information relevant to enforcement of an Appendix I listing

Some countries have expressed concerns about the practicalities of enforcing a CITES Appendix I listing for Atlantic bluefin tuna (i.e. a prohibitions on all international commercial trade,) due to 'look alike' issues with other tuna species. However there are new methods, documented in the scientific literature (Lowenstein *et al*, 2009; Viñas and Tudela, 2009), which use gene sequencing to accurately distinguish between tuna species. This methodology will therefore allow for effective enforcement of trade restrictions. Furthermore this methodology makes it possible to conduct systematic or random checks on tuna products in international trade, and thus detect or discourage any large-scale mislabeling of bluefin products to evade Appendix I trade restrictions. Finally, the main importing country is Japan—which has the legal, regulatory, and technological capability to fully enforce the provisions of Appendix I.

8. Future management

The listing of a species on CITES Appendix I is not an end in itself, but an emergency measure to ensure the recovery of species which are threatened by unsustainable trade. Ideally the result of listing the species on Appendix I should be to initiate recovery of the wild populations and to reduce the pressure thereon to a sufficient extent to provide time to develop and implement effective measures to ensure that future trade is sustainable. When this is achieved, the species can be safely removed from Appendix I (and as per Reso. Conf. 9.24, transferred to Appendix II). In the case of Atlantic bluefin tuna, this will clearly require joint efforts of ICCAT and CITES, the Flag States and the trading States, in addition to the input of expert bodies such as FAO. To this end, the Principality of Monaco has submitted a Draft Resolution (CoP15 Doc 52) to CoP15, which calls *inter alia* for the development of sustainable fishing plans, for the conclusion of a Memorandum of Understanding between ICCAT and CITES to help combat IUU fishing, and for a mechanism to remove the species from Appendix I once the required conditions are met.

It's been argued that Appendix I listing might compromise the ability of Atlantic bluefin tuna experts to assess stock status in the future due to the fisheries-dependent nature of some of the data required for feeding the models. However, it is important to remind that fisheries for domestic trade will continue supplying information to science and that, if necessary, additional scientific sampling programmes can be implemented, as it is common practice worldwide with highly restricted fisheries.

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Viñas J, Tudela S (2009) A Validated Methodology for Genetic Identification of Tuna Species (Genus *Thunnus*). PLoS ONE 4(10): e7606. doi:10.1371/journal.pone.0007606

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With respect to the projections of the stocks to 2019, the SCRS report cautions that past projections of stock status have proven overly optimistic. Examples of this phenomenon include the predictions, contained in the 2002 and 2004 assessments of the western stock, that the stock would recover strongly under a TAC of 2,500t (Fig. 2a). In the 2008 assessment (Fig. 2b), no significant recovery is evident, despite recent catches averaging considerably less than 2,500t. The SCRS has tended to be more cautious about making future projections for the eastern stock, due to doubts over the reliability of catch data, but also here it is evident that the assessments of a few years ago (see for example 2004 assessment in Fig. 3a) were too optimistic when compared with the 2008 estimate (Fig. 3b). The discrepancy may have been caused by the large unreported catches occurring in the late 1990's and the 2000's.

Fig. 2a. BFT Western stock: 2004 ICCAT assessment
(left: low recruitment scenario; right: high recruitment scenario).

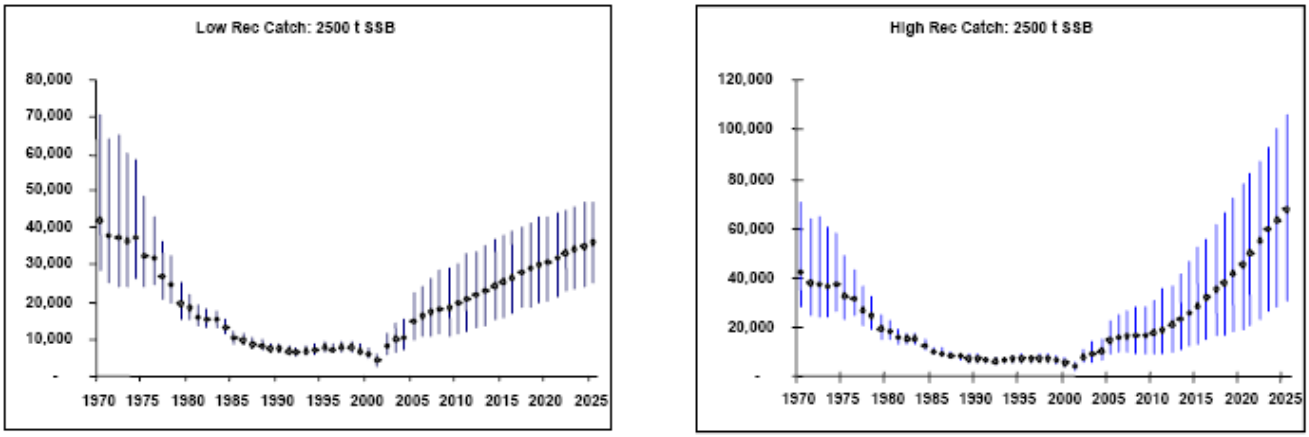

Fig. 2b. BFT Western stock: 2008 ICCAT SCRS assessment

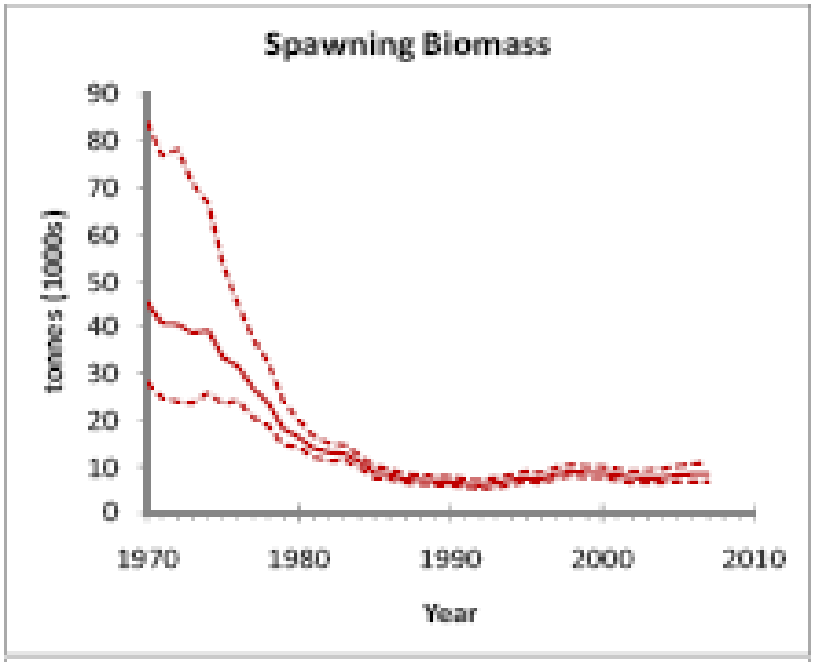

Fig. 3a. BFT Eastern stock; 2004 ICCAT SCRS assessment.

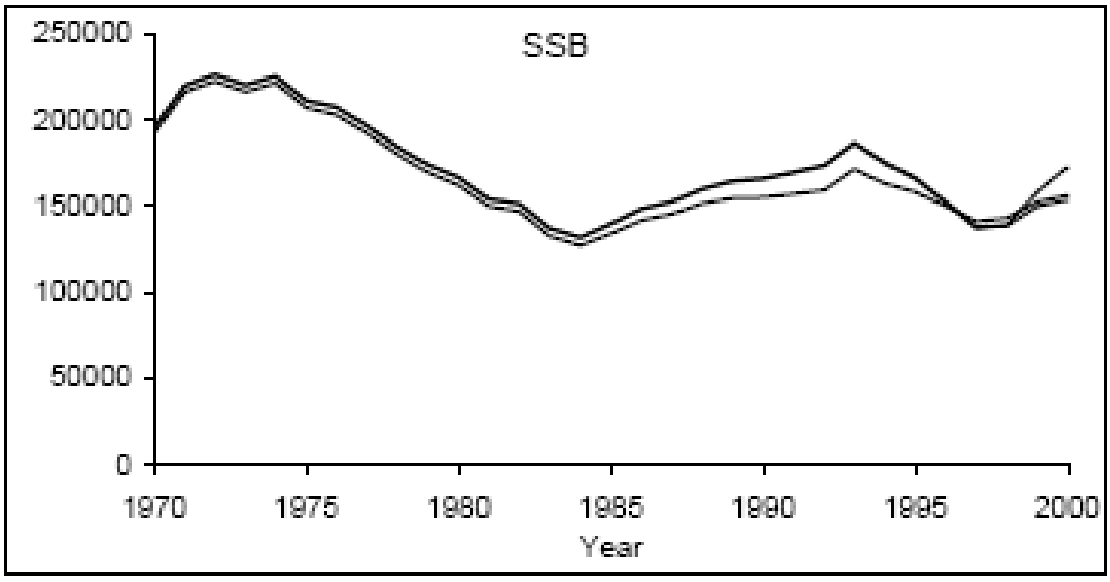

Fig. 3b. BFT Eastern stock: 2008 ICCAT SCRS assessment

[run6 = reported catch; run7 = adjusted catch]