GENERAL FISHERIES COMMISSION FOR THE MEDITERRANEAN (GFCM)

INTERNATIONAL COMMISSION FOR THE CONSERVATION OF ATLANTIC TUNAS (ICCAT)

REPORT OF THE FIRST MEETING OF THE AD HOC GFCM/ICCAT WORKING GROUP ON SUSTAINABLE TUNA FARMING/FATTENING PRACTICES IN THE MEDITERRANEAN

Rome, Italy, 12-14 May, 2003

1. Opening of the Meeting

The meeting was held at FAO Headquarters. Mr Alain Bonzon, Secretary of GFCM, opened the meeting and welcomed participants (**Appendix 1**). Mr Bonzon explained that the Tuna Fattening/Farming Working Group (WG) had been set-up following a 2002 decision by GFCM which, in view of the recent expansion of tuna farming in the Mediterranean, decided that it needed practical guidelines to ensure the sustainability of this activity.

2. Arrangements

Mr Bonzon explained that a Coordinating Committee had been created to facilitate the work of the WG. That Committee met on January 24, 2003, to set up a proposed work plan for the WG to consider. Part of the plan included a draft survey outline to determine the current situation of bluefin farming practices in the Mediterranean, which was previously distributed to potential WG participants. **Appendix 2** provides a list of documents distributed at the meeting, including the draft survey outline.

3. Election of the Chairman and appointment of Rapporteurs

Victor Restrepo (ICCAT), who had served as Chairman of the Coordinating Committee, was elected as Chairman of the First WG Meeting. Alessandro Lovatelli, Technical Secretary of GFCM-CAQ, and the Chairman were asked to share responsibilities for drafting the report.

4. Adoption of the Agenda

The Agenda (**Appendix 3**) was adopted with a change of a word from "aquaculture" to "farming". The Chairman noted that Item 6 referred to the survey form from which information would be collected, while Item 7 referred to the information itself.

5. Review of the Working Group Mandate

The Chairman referred to a document that reflected the WG's mandate as envisioned by GFCM and slightly modified by the Coordinating Committee (**Appendix 4**). The Chairman proposed that the WG participants concentrate on producing practical guidelines that are more technical than legal in nature. He also expressed his view that WG members should be represented primarily in their personal capacities in a multi-disciplinary group, rather than as government representatives. After some discussion, WG members agreed with the mandate presented in **Appendix 4** and with the Chairman's proposition. Further discussion led the WG to conclude that it needed to:

(A) Summarize the current situation of bluefin tuna farming in the Mediterranean,
(B) Analyze (A) to identify problem areas with respect to the issues to be addressed,
(C) Propose solutions to (B).

It was noted that scientists from some of the countries that either fish for farming or that conduct farming operations in the region were absent. Several WG members stated that it would be useful to get them involved at a later stage so as to obtain a more complete product.

The issue of definitions was discussed at different times during the meeting. The WG agreed to use the SAC definition of "farming" with a slight modification (below) in a broad sense. To many participants, both "farming" and "fattening" are part of a continuum in a special case of "aquaculture" (capture-based aquaculture). It was agreed that the important thing was not so much to develop a precise definition, but rather to make sure all WG participants had the same process in mind when considering the process of Mediterranean Bluefin Tuna Farming.

> "***Tuna Farming***. *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 a few years. Fish weight increment and 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 prices 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.*" (SAC, 2002)

6. Development of a Survey on the Current Situation

It was noted that the draft survey outline to which this Agenda Item refers had been drafted by the Coordinating Committee and that it had been circulated to many potential WG members well in advance of the meeting for their comments. Nevertheless, the Chairman stated that it would be useful to review the contents of the draft survey point by point as a group.

The WG spent considerable time reviewing the draft document and made multiple changes to it. The final version agreed to by the WG is given in **Appendix 5**.

7. Review of available information to-date

Several participants had prepared summaries of the bluefin tuna farming situation in their countries which were presented during the meeting and are briefly summarized below. It was noted that in most cases the information presented was only partial with regards to the survey outline developed under Agenda Item 6. Thus, the individual country reports were treated as being preliminary and are not attached to this report.

7.1 Croatia

The farming of BFT in Croatia has developed rapidly since 1996. Initially, purse seine-caught BFT were fattened over a period of 4-6 months before being harvested and exported to the Japanese market. Recently, an entirely new concept has developed: Small- to medium-sized fish are being fattened for over 2 or even 3 years, before being shipped. This practice is aimed at improving the limited fishing quota, by increasing the BFT products biomass without increase of fishing mortality, and at raising the value of the product, thus obtaining a better market price.

Based on the draft WG survey questionnaire, some preliminary information was collected from five out of six Croatian BFT farmers, and reported to the WG. Regarding the capture fisheries data collection, the main constraints focused on the accuracy of catch estimations and size-composition data, thus affecting the accuracy of cage input data.

A study is being carried out currently within the framework of BYP on the growth rate of small bluefin tuna when reared in grow-out floating cages. This should include a study on equations concerning conversion of the tuna products weight (originating from cages) into the round weight of the fish. It was also suggested to start research activities on acoustic aimed at arriving refining data collection on catch and size-composition.

7.2 Greece

Greece had reported prior to the meeting that it currently had no bluefin farming activities nor was it fishing bluefin destined for farming.

7.3 Italy

Italy reported that some farming activity has been taking place recently in Sicily but that relevant data, if any, are under the jurisdiction of regional authorities.

7.4 Japan

Japan has no activities in bluefin tuna fishing for farming or farming itself. However, the majority of farmed tuna from the Mediterranean is exported to Japan. The quantity of the various farmed bluefin tuna products imported into Japan was reported to the WG. This amount has increased sharply since 1996 (261 tonnes) to 2002 (13 153 tonnes - round-weight basis). Major export countries in recent years include Spain, Croatia, Malta and Italy. Japan provides detailed statistics of farmed bluefin import by country of origin, type of product and by year of import.

It was pointed out that the place of the first shipment is well documented, but the origin of fish (i.e. the flag of fishing vessels) is not always available. It was felt that in some cases there may be a possibility of the same fish being exported into more than one product and hence reported twice. It was confirmed that the "round" product means fish handed to a Japanese factory ship directly from the farmers. It was hoped that in the future bluefin statistical documentation identifies separately those volumes of fish which are farmed.

7.5 Malta

Tuna farming started in the year 2000. The number of licensed farms is five but not more than three have been operational up to now. Live tuna stocking in the cages for fattening originates from neighbouring countries purse seining fleets. Malta is at present developing a pilot purse seine fishery but is largely involved in longlining.

The fattened fish is sold fresh and frozen to Asian markets mainly Japan. Inputs into cages need to be covered by ICCAT statistical documents and re-export documents are issued on harvest. Over and underestimates into ICCAT statistical documents have both been experienced in the past years.

The volume of production has grown from around 300 to 2 000 tonnes in 2002. The collective capacity of the farms is 3 225 tonnes and all are situated offshore outside bays in waters that are 50 m deep or more. Environmental impact studies prior to commencement and continuous monitoring during and after the farming activity are carried out.

7.6 Morocco

Morocco reported that it had no bluefin farming activity for purse-seine caught fish. However, some amount of fish caught in traps is kept for fattening.

7.7 Spain

With regards to capture fisheries, a purse-seiner fleet composed of 6 vessels operates in the Levante area from April to October with towing operations occurring in May-July and lasting up to 20 days (1 knot speed). BFT catches in 1996-2001 averaged annually 1 500 tonnes with a fish-size range of 10-200 kg (mean weight: 25 kg). The percentage of BFT catch destined to farming has progressively increased from 40 to 70%. Towing usually causes less than 10% of mortality.

BFT farming started in 1985 in the south of Spain. Up to 1996 only two farms (Barbate and Ceuta) were transferring post-spawning BFT caught in traps (Almadraba) to cages for fattening. Since then, nine new farms have been established in the Murcia Region (South-East Spain). New installations will be probably placed in Cataluña and the Canary and Balearic Islands.

BFT farms usually employ circular ring-type cages of 50-90 metres in diameter. Seed fish come from Spanish and French fleets and recently also from Italian, Tunisian and Croatian fleets. Fattening lasts 4-6 months. Production in 2002 reached over 47 000 tonnes. Mortality was less than 10% caused by problems when transferring the fish from the towing cage or by occasional bad sea conditions (e.g. turbidity). Growth varies from 10 to 40% depending on the initial fish size (better in smaller fish). Food consists mainly of mackerel,

sardine and eventually squid or other locally fished species. Conversion rate was 13-20:1. Over 95% of production is exported to Japan either fresh or frozen, whole or in loins.

To obtain a license (10 to 20 years) from national and regional administrations an Environmental Impact Assessment and yearly survey of its impact on the location is required. Farm capacity is limited, normally around 1 000 tonnes. There has been some conflict with fishermen and "green forces", but also some positive effects on employment at a local level and on the regional economy.

Several research activities have been carried out in the last five years by public research centres in close collaboration with the industry, mostly on reproduction (supported by EU funds), nutrition, environmental studies, food processing (slaughtering methods, flesh quality control). It was pointed out that the DOTT Conference held in February 2002 and the REPRO-DOTT EU project which started last January aim at controlling BFT reproduction in captivity. The latter DOTT initiative is the submission of proposal to the EU 6 Research Framework Program (FP6) regarding a feasibility study to create a BFT European Centre for basic and applied research.

7.8 Turkey

Turkey has been involved in BFT capture since 1985, possessing a remarkable fishing fleet consisting of over 100 purse seiners. BFT farming started in 2002 with 28 purse seiners situated in three farm sites (two in the Mediterranean and one in the Aegean Sea). By the end of 2002, Turkish farms were producing 1 960 tonnes of farmed BFT. Although a new activity in the country, BFT farming is having an important socio-economic impact.

Turkish BFT farmers are eager to contribute to scientific studies and research activities aimed at achieving a sustainable farming activity. In this respect, the Turkish BFT Farmers' Association has recently donated 30 BFT specimens for a tagging project to be jointly conducted between the University of Bari (Faculty of Veterinary Medicine) in Italy and the University of Istanbul (Faculty of Fisheries) in Turkey. The Association will also cover food and accommodation expenses for both research teams. Furthermore, an additional project aimed at investigating the Environmental Impacts of Tuna Farming is now being studied by the University of Aegean and funded by one of the private BFT farming companies in Turkey.

A Workshop on Farming, Management and Conservation of BFT in the Eastern Mediterranean Sea was organized by the Turkish Marine Research Foundation (TUDAV) from 5 to 7 April 2003 in Istanbul, Turkey. The aim of this Workshop was to focus interest on BFT in the Eastern Mediterranean Sea. The proceedings of the Workshop are available from tudav@superonline.com.

7.9 Others

After the presentations, WG participants noted that other countries were also (or could become) important either in the capturing or the farming of bluefin in the Mediterranean, such as: France, Tunisia, Libya, Algeria, Cyprus, Syria, Israel and Lebanon. The WG stressed that it was very important to make every attempt so that these countries would provide the necessary information for the WG to carry out its job. To this end, it was agreed that the following contacts should be established: Isik Oray with eastern Mediterranean countries;

Alain Bonzon with all GFCM member countries; COPEMED coordinator, with COPEMED participants.

7.10 Summary

Although some of the national reports presented were still incomplete, the WG noted that some common problems were evident from the presentations, such as:

- Difficulties in estimating total biomass and size composition of bluefin in the purse seines and in the pens and cages;
- Incomplete knowledge about gains in weight/size during the farming period as a function of various factors (initial size, time kept, diet, etc.);
- Incomplete knowledge about conversion rates during farming:
- Incomplete knowledge about the relationship between diet and final product quality;
- Lack of information about quality control mechanisms in place during farming;
- Difficulties in determining the origin of fish based on the current ICCAT catch documentation scheme.

8. Future Workplan for the Working Group

The WG discussed at length its future workplan and what it should achieve. It was agreed that the WG's final product (guidelines) should be finalized by spring, 2004. With this target in mind, it was discussed whether it would be useful to hold a large workshop during the intervening period and, if so, what were the goals of the workshop, who would participate in it, and what would be the necessary logistical arrangements. In the end, the WG decided that instead of holding a large and potentially expensive workshop, it would be more cost-effective to have more meetings of the Working Group itself, although with the possibility of enlarging the WG by inviting experts in various fields.

The WG asked the GFCM Secretariat to contact those members, who had previously expressed interest in hosting a meeting of the WG to consider hosting a second WG meeting in December, 2003. ADRIAMED and COPEMED were also invited to support financially, if possible, the participation of key experts from the region who might not be able to participate otherwise.

The WG agreed that considerable work would need to be done before its next meeting to prepare national reports, to summarize them, to analyze them, and to identify key problems and offer potential solutions. The preparation of the "national reports" should be done by WG members following the outline developed under Item 6 (**Appendix 5**). The WG recommended that the summary/analysis of these reports and other preparatory work be completed before the next meeting to be carried out under the following leadership (who could solicit help from others, as necessary):

Andreina Fenech-Farrugia:	Capture Fisheries component
Alessandro Lovatelli:	Farming component
Peter Miyake:	Market and Trade component

The workplan agreed-to by the WG is as follows:

Dates	Action	Description
July 14, 2003	Completion of National Reports	By WG members in every country involved in BFT farming. Reports should be sent electronically to Victor Restrepo
July to September, 2003	Summary and analysis of National Reports	By Fenech-Farrugia, Lovatelli and Miyake. The analysis should lead to the grouping of issues/themes, the identification of problems, and the drafting of possible solutions.
September 29, 2003	Distribution of analyses and summaries	Analyses in previous step to be sent to all WG members (routed by Victor Restrepo)
Early October, 2003	Progress reports to GFCM and ICCAT	By Victor Restrepo. Prepare brief summary to inform the two Commissions about what the WG is doing (GFCM will meet 14-17 October; ICCAT will meet 17-24 November)
December 15-17, 2003	Second WG Meeting	Venue to be sought by Alain Bonzon upon consultation with potential hosts. The main goal will be to produce a first complete draft of the guidelines.
January-March, 2004	Updating of National Reports	By WG members, primarily for the purpose of completing information on the 2003 fishing/fattening season.
3 days, March-May, 2004	Third WG Meeting	Venue to be sought by Alain Bonzon upon consultation with potential hosts. The main goal will be to finalize the guidelines.

In terms of composition, it was agreed that it would be more efficient for the WG not to grow too much. It was recommended that the next WG meeting be composed by this meeting's participants, other intended participants to this meeting who were unable to make it, and some outside experts, for example a scientist familiar with Australia's experience in SBT farming, a person expert in the Spanish farming activities, a person expert in purse seining activities, and experts in other pertinent fields such as acoustic and visual sampling techniques.

9. Other matters

No other matters were discussed.

10. Preparation of the Report

Most of the report was prepared and adopted during the meeting. Country summaries (Item 7) were prepared by presenters and circulated by correspondence after the meeting.

11. Endorsement of the conclusions and recommendations

There was complete agreement on all decisions made by the WG. The meeting was adjourned.

APPENDIX 1

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APPENDIX 2

LIST OF DOCUMENTS

General Working Documents

➢ GFCM/ICCAT/2003/1	Provisional Agenda and Timetable
➢ GFCM/ICCAT/2003/2	Terms of Reference
➢ GFCM/ICCAT/2003/3	Draft Outline for National Reports on Current Bluefin Farming Practices in the Mediterranean

Information Documents

➢ GFCM/ICCAT/2003/Inf.1	Provisional List of Documents
➢ GFCM/ICCAT/2003/Inf.2	Provisional List of Participants

Other Documents

➢ FAO Fisheries Report No.689	GFCM Report of the Third Session of the Committee on Aquaculture, Zaragoza, Spain, 25-27 September 2002 (English and French)
➢ GFCM Report 27	GFCM Report of the Twenty-Seventh Session, Rome, Italy, 19-22 November 2002 (English)
➢ DOTT-EU	DOTT-Preliminary Study - First Socio-Economical Indicators, February 2002

APPENDIX 3

AGENDA

1. Opening of the Meeting

2. Arrangements for the Meeting

3. Election of the Chairman / Appointment of Rapporteur/s

4. Adoption of the Agenda

5. Review of the Working Group Mandate

6. Development of Survey on Current Situation

    6.1 Capture fisheries component
    6.2 Farming component
    6.3 Market-side component

7. Review of Available Information to-date

    7.1 Statistical Issues
    7.2 Biological Issues
    7.3 Management Issues
    7.4 Potential Environmental Issues
    7.5 Potential Social/Economical Issues
    7.6 Other Issues

8. Future Workplan for the Working Group

9. Other Matters

10. Preparation of the Report

11. Endorsement of Conclusions and Recommendations

APPENDIX 4

WORKING GROUP MANDATE

The rapid recent development of tuna farming (tuna "fattening") practices in the Mediterranean has been accompanied by a series of concerns about the sustainability of this important industry and about its impacts. The mandate of the Working Group (WG) is to develop practical guidelines to address known problems and propose research needed in order to investigate potential problems. Emphasis of known problems should be given towards the solution of those issues related to the collection of fishery and farming statistics. The report of the WG should also contain a snapshot of current bluefin farming practices in the Mediterranean. Geographical scope should be limited to the Mediterranean; however, the WG may wish to consult outside experts about their experience elsewhere.

List of issues to be addressed:

Statistical issues:
- Accurate estimation of total weight of the catch from the wild
- Accurate estimation of the biological characteristics of the catch from the wild (e.g. size composition)
- Accurate statistics on the origins of the catch (flag, area, season, transfer and destination)
- Accurate statistics on purse seine fishing operations, fishing effort and fishing strategy
- Accurate estimates of growth and conversion rates in cages

Biological issues:
- Availability of biological samples to perform scientific studies (e.g. fecundity, reproduction and growth)

Management issues:
- Monitoring of compliance with current regulations (e.g. TACs and size limits)
- Gear conflicts (e.g. between towed cages and long lines)
- Shifts in the spatial-temporal distribution of fishing efforts
- Pressure (current and potential) to increase fishing efforts and targeting of small to medium-size bluefin tuna
- Potential impacts of re-stocking with hatchery-raised tuna

Potential environment issues:
- Impact on wild marine populations used as bait
- Pollution, contamination and possible alteration of local environments
- Contamination of farmed tunas by chemicals, metals, drugs, etc.

Potential social and economical issues:
- Interactions with other coastal activities (e.g. tourism and small-scale fisheries) from an economic point of view
- Other gear and fishing operation conflicts
- Interactions between aquaculture operations (competition for bait)

Other issues:

As deemed necessary by the Working Group

APPENDIX 5

FINAL NATIONAL SURVEY FORM

GFCM/ICCAT *Ad Hoc* Working Group on Sustainable Tuna Farming/Fattening Practices in the Mediterranean

National Reports Survey Form on current Bluefin Tuna Farming Practices in the Mediterranean

Instruction for filling the survey form

The objective of this survey is to collect comprehensive and detailed data about the development of tuna farming practices in the Mediterranean, with special focus on the current situation. The survey is composed of three main sections: (1) Capture, (2) Farming and (3) Marketing. The persons working on the survey form should strive to complete the survey as much as possible, while respecting confidentiality requirements of individual companies. In some cases, it may be appropriate to provide several versions of a particular table so as not to aggregate too may pieces of information into a single entry.

Conversion values to estimate the whole weight of fish from various product types used in the ICCAT are listed for reference and use in case no specific values are available for some product types. If specific values are available at individual farms, those values have to be used. In such cases, specify the equation and also indicate the range of sizes used to derive the equation.

Even if confidentiality is required for data entered, an attempt should be made to fill all entries by using, for example, codes or aggregating data or simply noting "data is available, but confidential".

The Survey Form is divided in three sections, (1) capture fisheries, (2) farming and (3) markets and trade. Countries should complete those sections when engaged in one or more of the activities described in the three sections. In fisheries capture section, however, point 1.4 describes the bluefin tuna transportation operation. If any given country is not engaged in capturing fish, but involved in transportation, please complete point 1.4.

Summary (maximum 2 pages) should be attached in the beginning of the National Survey describing general aspect of bluefin farming activities in the country including history, present status and future prospect, if any and possible.

Country: _____
Prepared by: _____
Affiliation: _____
Address: _____
Tel/Fax: _____
Email: _____

1. CAPTURE FISHERIES

A.1 Are vessels flying the flag of your country involved in the capture of bluefin destined for farming anywhere?
YES _____ NO _____

A.2. Are vessels flying the flag of other countries involved in the capture of bluefin destined for farming in your country?
YES _____ NO _____

B.1 Are vessels flying the flag of your country involved in the transport of bluefin destined for farming anywhere?
YES _____ NO _____

B.2 Are vessels flying the flag of other countries involved in the transport of bluefin destined for farming in your country?
YES _____ NO _____

If the answer to either **A.1** *or* **B.1** *is* YES*, please complete the remainder of Section 1. If the answer is NO, please explain if there are currently any plans for vessels flying the flag of your country to get involved in the capture of bluefin tuna for farming in the Mediterranean.*

1.1. Description of Bluefin Fishing Fleet (and of tug boats, if applicable)
Describe the fishing fleet, including:

- Number and type of vessels
- Home ports
- Fishing (towing) gears
- Search strategy (aerial search; cooperation between boats, etc.)
- Areas of operation
- Season of operation
- Duration of towing operations
- Other relevant fleet information

Note: Include a description of tuna traps if they are used for catching bluefin that are destined for farming.

1.2. Catch and Effort of your Flag Vessels
Provide as complete as possible the following statistics:

Year	BFT Catch (mt)	Effort (Specify Units used)	Size Range (kg)	Mean Size (kg)	% of Catch destined for Farming	Country of Destination	Comments
1996							
1997							
1998							
1999							
2000							
2001							
2002							
2003							

1.3. Description of Method to Estimate Magnitude and Characteristics of the Catch
- Explain how the overall catch (tons) is estimated (e.g., logbooks, observers, etc.)
- Explain how catch is sampled (for size composition, etc.)
- What are the main sources of uncertainty in estimating catches and size composition?

1.4. Estimates of Mortality
- What percentage of the fish dies during the fishing operation?
- What percentage of the fish dies during transport to farming?

1.5. Commercialization
- To what countries does the catch destined for farming go?
- Other relevant information on how the catches are commercialized

1.6. Socio-Economic Aspects (include fishing, searching, towing, sampling)
Provide the information on the following, over time if appropriate:
- Number of people employed in fishing operations
- Describe flow of people employed from/to other activities
- Any available economic information (e.g., subsidies)

1.7. Interactions
Describe known interactions between fishing and:
- Other fishing activities
- Other

2. FARMING/FATTENING PRACTICES

A. Has there been any Mediterranean bluefin farming activity in your country since 1996?
YES _____ NO _____

If the answer is YES*, complete Section 2. If the answer is* NO*, are there currently any plans/studies to establish farms in your country?*

2.1. Description of the Farms
Here "farms" generally refers to operations of similar characteristics, usually by a given company in a given area. The description should be as detailed as possible while respecting confidentiality requirements, if any.
- Number, size and location
- Farm site characteristics (be as explicit as possible, e.g.: water depth, shore distance, proximity to other fish farms, proximity to urban areas, proximity to marine reserves, typical characteristics of the water during fattening season, etc.)
- Typical input season
- Capacity (specify if capacity is mandated by government or set by farm operators)
- Farming equipment (marine cages, size, net depth, boats, etc.)
- Source of seed fish (local fishing fleet; or other flags)

2.2. Inputs to the Farms

Provide the following statistics on capacity and inputs to the farm:

Year	Flag of Origin of seed fish	Number of Cages	Total Farm Volume (m^3)	Input Season (month)	BFT Introduced (mt)	BFT Size Range (kg)	BFT Mean size (kg)	Comments
1996								
1997								
1998								
1999								
2000								
2001								
2002								
2003								

2.3. Description of Method to Estimate Magnitude and Characteristics of the Inputs

- Describe how the inputs (magnitude and size distribution) are estimated
- Describe whether the same pen receives different inputs during a given fattening season

2.4. Outputs

- Describe the duration of the fattening/growing season (months, range and mean)
- Describe the output (production) season (months, range and mean)

Provide the following statistics on production:

Year	BFT Produced (mt)	BFT Size Range (kg)	BFT Mean Size (kg)	Comments
1996				
1997				
1998				
1999				
2000				
2001				
2002				
2003				

2.5. Mortality

- Farming season and duration
- What percentage of the farmed tuna dies while in captivity?
- Describe other relevant mortality information (incl. diseases)
- Describe the fate of the dead fish

2.6. Growth

- What is the relationship between weight gain and explanatory variables, such as initial size, temperature, and time in captivity?

2.7. Other Data

- Describe other types of data collected by the farms (e.g., on reproduction, behaviour, etc.)

2.8. Feeding

- What are the tuna fed (incl. species composition; food supplements)?
- What are the sources of fish used for feeding (comment on the sources of small pelagics and whether those stocks of small pelagics are assessed and managed by a relevant RFB or government)?

- Describe feeding (quantity, frequency and quality)
- Provide estimates of food conversion over fattening season (kg gained by BFT divided by kg of feed used; explain the basis for the calculation - dry or wet weight -)
- Provide information on monitoring of feeding with regards to food safety: are antibiotics, hormones or chemical additives used? Are chemical analyses of the food or of the bluefin conducted regularly? Are any such controls voluntary or mandated by legislation?
- Other relevant feeding information

2.9. Commercialization

- To what countries are the products sold (provide quantities, if available)?

Provide the following information:

Year	Country of Destination	Type of Product (with conversion factor* to the whole fish)	Amount Produced (mt)	Fresh (mt)	Frozen (mt)	Amount Exported (mt)	Fresh (mt)	Frozen (mt)	Comments
1996									
1997									
1998									
1999									
2000									
2001									
2002									
2003									

***NOTE**: If you have accurate conversion factors, please report them and apply them. Otherwise, the following conversion factors can be used to estimate round weight for various product types:

Belly meat x 10.28	= round weight	Gilled & Gutted weight x 1.16	= round weight
Dressed weight x 1.25	= round weight	Other products x 2.0	= round weight
Fillets x 1.67	= round weight		

- What types of products are obtained? (fresh; frozen; belly meat, loins, etc.)
- Provide available estimates between product type and whole fish weight

2.10. Legal Framework

- Describe the legislation that regulates the issuance of permits for farms (i.e., the mechanisms in place - local or national - that govern the permitting process)
- Describe the specific requirements that are needed to obtain a license for a farm (e.g., distance from shore, distance from marine reserves, capacity, etc.)
- Describe what types of environmental impact studies are needed before permits are issued
- Describe what types of environmental impact studies are required for monitoring purposes while the farm is in operation

2.11. Environmental Aspects

- Are there perceived/factual interactions with the environment (explain if studies have been conducted to test for the interactions, who made the study and what were the conclusions)?

- Are harmful metals or harmful chemicals or drugs in the fish measured before and after farming? If yes, specify them. Are there mechanisms in place to establish the traceability of the product for the purpose of ensuring food safety?

2.12. Socio-Economic Aspects

Provide the information on the following

- Number of people employed in farming/processing operations; structure of employees in terms of skills; flow of workers from/to other activities
- Overall economic impact of farming, including profitability
- Any available economic information (e.g., subsidies)

2.13. Research

- Describe past, present and planned studies carried out in the farms
- Are farming operations accessible to researchers (describe particular studies)?
- Do farming operations hire their own researchers? For what studies?

2.14. Interactions

Describe known interactions between farming and:

- Other fishing activities
- Others

3. MARKETS AND TRADE

A. Is your country involved in the buying of farmed Mediterranean bluefin products?
YES _____ NO _____

If the answer is YES*, please complete Section 3.*

3.1. Statistics

Provide statistics on purchased farmed Mediterranean bluefin products by year, country and product type:

Year	Country of Origin	Country of Shipment	Type of Product	Amount Frozen Products (mt)	Amount Fresh Products (mt)	Estimated Whole Fish Weight (mt)*	Comments
1996							
1997							
1998							
1999							
2000							
2001							
2002							
2003							

* Provide conversion factors used (see Table 2.9)

3.2. Economic Data

- How are the products marketed?
- Provide available information on prices
- Other relevant economic information