



***EU FP7 Project CREAM  
Coordinating research in support to application of EAF  
(Ecosystem Approach to Fisheries) and management  
advice in the Mediterranean and Black Seas***

***Deliverable 5.5  
ITCs Report***

Start date of project: 01/05/2011

Duration: 36 months

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Lead partner for deliverable: Mediterranean Agronomic Institute of Zaragoza / International  
Centre for Advanced Mediterranean Agronomic Studies

WP leader: Dunixi Gabiña

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**"ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. SCIENTIFIC BASES"**

Varna (Bulgaria), 3-7 February 2014

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### **REPORT CREAM COURSE 2.**

**"ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. MANAGEMENT AND DECISION MAKING"**

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**REPORT CREAM COURSE 1**

**“ECOSYSTEM APPROACH TO FISHERIES IN THE  
MEDITERRANEAN AND BLACK SEAS  
SCIENTIFIC BASES”**

**Varna (Bulgaria), 3-7 February 2014”**



## **Background and objectives**

The course was included within the activities planned under the WP 5 (Training and capacity building, Dissemination) of the CREAM Project (Coordinating research in support to application of EAF and management advice in the Mediterranean and Black Seas).

The course was addressed to fisheries researchers and with the objective of training scientists and advisors in advanced approaches and tools of EAF that are better adapted to the nature of the Mediterranean and the Black Sea. The course intended not only to present the theoretical elements but also to guide participants on how to put theory into practice through case studies. It also aimed that participants, by the end of the course, would:

- be aware of the research needs in the context of EAF for a more informed decision making.
- have gained experience in the application of the main methods and mathematical models of EAF.
- be familiar with the use of a wide range of indicators and reference points of ecological, economic and social nature in EAF.
- have an up-to-date overview of technological innovations for sustainable management.
- be in a position to establish institutional and personal relations that would favour a future exchange of experiences and strengthen cooperation in the EAF application in the region.

## **Organization**

The course was jointly organized by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (IAMZ), and the CREAM Project (Coordinating Research in Support to Application of Ecosystem Approach to Fisheries and Management Advice in the Mediterranean and Black Seas) of the European Commission Seventh Framework Programme, with the collaboration of the Food and Agriculture Organization of the United Nations (FAO), through the Fisheries and Aquaculture Department.

The course was hosted by the Institute of Oceanology in Varna, Bulgaria, and was held at the Grand Hotel Dimyat over a period of 1 week, from 3 to 7 February 2014, in morning and afternoon sessions, for a total of 34 hours.

The course was given by well qualified lecturers participating in the CREAM Project and invited experts from international institutions, and from universities and research centres in different countries.

## **Course preparation**

The programme of the course was discussed and agreed at the *ad hoc* working group that met in Zaragoza on 15 and 16 May 2013: Gabriela BIANCHI (FAO, Rome, Italy), Jordi LLEONART (ICM-CSIC, Barceona, Spain), Francesc MAYNOU (ICM-CSIC, Barceona, Spain), Paolo SARTOR (CIBM, Livorno, Italy) as well as Dunixi GABIÑA, Manuela CERESO and Bernardo BASURCO from CIHEAM-IAMZ, Zaragoza, Spain.

The course programme had an applied research approach, and included a combination of lectures, computer-based demonstrations and practical work on indicators development and use. The programme of the course was organized in the following sessions:

1. Knowledge needs for EAF
2. Sustainability of target species
3. Ecological aspects
4. Social and economic aspects
5. New model developments: integrated end-to-end models
6. Indicators, targets, reference points
7. Low Impact and Fuel Efficient (LIFE) fishing
8. Practical work

The detailed programme of the course is included in the leaflet in **Annex I**. Timetable of the course is attached as **Annex II**.

### **Guest lecturers**

The course counted on the expertise of 12 qualified lecturers participating in the CREAM Project and invited experts from international institutions and from universities and research centres in different countries.

**Annex III** contains the contact details of guest lecturers contributing to conferences, case studies and the coordination of group work sessions.

### **Course coordination**

The scientific coordination of the course was covered by J. Lleonart and F. Maynou (ICM-CSIC, Barcelona, Spain) and the administrative coordination was covered by B. Basurco (CIHEAM-IAMZ, Zaragoza, Spain).

### **Publicity**

Following the design of the course programme by the group of experts, the IAMZ prepared a brochure for publicity including the objectives of the course, the programme, the lecturers and information on the organization of the course, scholarships etc. Copy of the brochure is attached as **Annex I**.

The IAMZ was in charge of giving as much publicity as possible to the course (via regular mail, e-mail and through IAMZ website). In addition, all CREAM partners were asked to publicize the course and propose candidates from their respective countries.

IAMZ undertook the reception of the applications and related documentation (application forms and curricula vitae).

### **Applications and selection of candidates**

The deadline for the submission of applications was 15 November 2013. All applications were examined by the IAMZ Selection Committee and a list of selected candidates and grants and discussed with J. Lleonart and F. Maynou (ICM-CSIC, Barcelona, Spain). In summary, 67 applications from 16 different countries were received, reflecting the interest raised by the topic of the course. **Annex IV** presents the summary of received candidatures.

A total of 33 candidates from 15 countries were selected and contacted by the IAMZ, which was also in charge of arranging the travel to Spain for all grantees.

### **Participants**

Finally, 31 experts from the following 16 countries attended the course: Algeria (1), Bulgaria (4), Croatia (1), Cyprus (1), Egypt (2), Georgia (1), Greece (2), Italy (2), Israel (1), Lebanon (2), Malta (2), Morocco (1), Romania (2), Spain (5), Tunisia (2) and Turkey (3). Participants came from different national administrations, universities, research institutions and private companies. The CREAM project financed the travel and accommodation expenses of 25 participants, and the accommodation expenses of 3 additional participants. Three self financed Bulgarian participants also attended. **Annex V** presents the list

of participants, indicating their country of origin, institution and professional profile. **Annex VI** includes the contact details of participants.

## Documentation

All course participants and guest lecturers received a course folder with detailed information about the course (programme, timetable, list and addresses of participants and lecturers, etc.), as well as the teaching material provided by lecturers (print-outs of lecturers' Power points, articles, bibliography, etc.).

In addition to the usual folder, all course participants and guest lecturers were able to access the above mentioned material as well as further information, such as additional articles, reports and photos on the CIHEAM-IAMZ Virtual Campus (<http://intranet.iamz.ciheam.org/moodle/>).

## Results

At the end of the course, the participants presented the results of their respective working group case study exercises, followed by an open discussion. In general, participants gave a very positive opinion about the programme of the course as well as its organization. They also provided some practical suggestions with a view to the organization of a future edition of this course.

As for the results of the course survey distributed to all participants, the majority of the guest lecturers were evaluated very positively. Finally, the table below shows a summary of the different aspects addressed in the survey.

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Summary scores (from 0 to 5) for the following aspects of the course	
Programme of the course	4.2
Lecturers of the course	4.1
Pedagogical system used	3.8
Level of the course	4.2
Documentation distributed	4.5
Quality of organization	4.8
Advantage taken from the course	4.4
Discussions	4.1
Global score of the course	4.3

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At the end of the course, all participants received a certificate duly signed by the Director of the IAMZ and the course Scientific Coordinator.





**ANNEX I**  
**PUBLICITY BROCHURE**





CIHEAM

International Centre for Advanced  
Mediterranean Agronomic Studies  
Mediterranean Agronomic Institute of Zaragoza



CREAM Project  
European Commission, Seventh Framework Programme



Food and Agriculture Organization  
of the United Nations  
Fisheries and Aquaculture Department

## Advanced Course

# ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. SCIENTIFIC BASES

Varna (Bulgaria), 3-7 February 2014

### 1. Objective of the course

Increasing concerns on the sustainability of marine fisheries and the ecosystems within which they occur are resulting in urgent and high-level demands for responsible actions and efforts at the international, regional and national levels, including the Mediterranean and Black Sea regions.

The ecosystem approach to fisheries (EAF) was developed in response to the need to implement the sustainability principles embodied in the Convention on Biological Diversity (CBD) and FAO's Code of Conduct for Responsible Fisheries. It is based on best practices in fisheries management but broadens its scope to explicitly consider ecosystem interdependencies, the social and economic benefits that can be derived from its utilization, and the interactions of fisheries with external drivers such as climate change, habitat destruction and pollution.

The Mediterranean and Black Sea fisheries are mainly local and small scale, catching a large number of species with many different gears. Assessments have been based primarily on classical single species approaches, which do not take into account the complexity of the fisheries being assessed or the ecosystem exploited and the socioeconomic context. There is therefore a need to develop approaches to provide more appropriate scientific advice for managers, and support implementation of the EAF. The CREAM Project (Coordinating research in support to application of EAF and management advice in the Mediterranean and Black Seas) is a coordination action funded by the EU-FP7. Its objective is to establish an effective collaboration network on EAF among key role players in Mediterranean and Black Sea fisheries research and management. The project has a strong training and capacity building component in order to help harmonize data collection and methodologies used in fisheries assessment and management in the Mediterranean and Black Sea.

The objective of the course is to train scientists and advisors in advanced approaches and tools of EAF that are better adapted to the nature of the Mediterranean and the Black Sea. The course is intended not only to present the theoretical elements but also to guide participants on how to put theory into practice through case studies.

By the end of the course the participants will:

- Be aware of the research needs in the context of EAF for a more informed decision making.
- Have gained experience in the application of the main methods and mathematical models of EAF.
- Be familiar with the use of a wide range of indicators and reference points of ecological, economic and social nature in EAF.
- Have an up-to-date overview of technological innovations for sustainable management.

- Be in a position to establish institutional and personal relations that will favour a future exchange of experiences and strengthen cooperation in the EAF application in the region.

Consequently, the course will help national experts in fisheries assessments to improve advice to managers on the status of exploited ecosystems and the implications of potential management options.

### 2. Organization

The course is jointly organized by the **International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM)**, through the **Mediterranean Agronomic Institute of Zaragoza (IAMZ)**, and the **CREAM Project (Coordinating Research in Support to Application of Ecosystem Approach to Fisheries and Management Advice in the Mediterranean and Black Seas)** of the European Commission Seventh Framework Programme, with the collaboration of the **Food and Agriculture Organization of the United Nations (FAO)**, through the **Fisheries and Aquaculture Department**.

The course will be hosted by the Institute of Oceanology in Varna, Bulgaria, taught by well qualified lecturers participating in the CREAM Project and invited experts from international institutions, and from universities and research centres in different countries.

The course will be held over a period of 1 week, from 3 to 7 February 2014, in morning and afternoon sessions.

### 3. Admission

The course is designed for 25 professionals with a university degree, and is directed mainly to researchers involved in the ecosystem approach to fisheries, working in the Mediterranean or Black Seas. Postgraduate students whose subject matter research is related to the topic of the course are also welcome.

All lectures and class material will be given in English.

A second CREAM course on "Ecosystem approach to fisheries in the Mediterranean and Black Seas. Management and decision making", targeted to fisheries decision makers, managers and technical advisors, will be held on 10-14 March 2014 in Zaragoza, Spain.

Please display on a notice board if possible



CIHEAM

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See updated information at

[www.iamz.ciheam.org](http://www.iamz.ciheam.org)

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INFORMATION  
CONTINUES  
OVERLEAF



## 4. Registration

Application forms may be obtained from:

Instituto Agronómico Mediterráneo de Zaragoza  
Avenida de Montañana 1005, 50059 Zaragoza (Spain)  
Tel.: +34 976 716000 - Fax: +34 976 716001  
e-mail: iamz@iamz.ciheam.org  
Web: www.iamz.ciheam.org

Candidates should send the completed application form to the above address, accompanied by a detailed *curriculum vitae*, stating degree, diplomas, experience, professional activities, language knowledge and reasons for applying to the course. Copies of certificates should be enclosed with the application.

The deadline for the submission of applications is **15 November 2013**.

Applications from those candidates who cannot present their complete records when applying, or those requiring authorization to attend the course, may be accepted provisionally.

Registration fees for the course amount to 450 euro. This sum covers tuition fees only.

## 5. Scholarships

Candidates from Mediterranean and Black Sea countries may apply for scholarships covering registration fees, and for scholarships covering the cost of travel and full board accommodation.

## 6. Insurance

It is compulsory for participants to have medical insurance valid for Bulgaria. Proof of insurance cover must be given at the beginning of the course. Those who so wish may participate in a collective insurance policy taken out by the Organization, upon payment of the stipulated sum.

## 7. Teaching organization

The course requires personal work and interaction among participants and with lecturers. The international characteristics of the course favour the exchange of experiences and different points of view.

The programme will be taught through a combination of lectures, computer-based demonstrations and practical work on indicators development and use. These activities will illustrate the course content and will enable participants to put theory into practice.

Participants are encouraged to present their own work/research related to the course content through a poster presentation. This activity will be a valuable method to present their results and meet with the lecturers and other course participants for in-depth discussions.

## 8. Programme

### 0. Opening and CREAM project presentation (1.5 hours)

#### 1. Knowledge needs for EAF (1.5 hours)

- 1.1. EAF principles and concepts
- 1.2. Science for management
- 1.3. Stakeholder participation in knowledge generation for EAF

### 2. Sustainability of target species (1 hour)

- 2.1. The role of classical stock assessment in the framework of EAF
- 2.2. From single to multispecies VPA

### 3. Ecological aspects (11 hours)

- 3.1. Ecosystem level impacts
  - 3.1.1. Trophic web
  - 3.1.2. Community structure
  - 3.1.3. Habitat
  - 3.1.4. Species diversity
  - 3.1.5. Productivity
- 3.2. Ecosystem assessment
  - 3.2.1. Ecosystem models
    - 3.2.1.1. Models: types, characteristics, potential and limitations
    - 3.2.1.2. Data-poor approaches (size spectra, biomass trophic spectra)
    - 3.2.1.3. Balanced harvesting
  - 3.2.2. The spatial dimension of EAF
    - 3.2.2.1. GIS, VMS and satellite imaging
    - 3.2.2.2. Spatial models (SPACE, FAST)
    - 3.2.2.3. Models for MPA (ECOSPACE)
    - 3.2.2.4. Optimization of reserve design
  - 3.2.3. Productivity susceptibility assessment (PSA)
  - 3.2.4. Decision support systems
    - 3.2.4.1. Bayesian belief networks
    - 3.2.4.2. Multicriteria decision analysis and risk assessment

### 4. Social and economic aspects (4 hours)

- 4.1. Cost and benefits analysis
- 4.2. Economic valuation of marine ecosystems services
  - 4.2.1. Theory of ecosystem services
  - 4.2.2. Market values. Bioeconomic models
  - 4.2.3. Non-market values. Methodology
- 4.3. Institutional and stakeholders analysis

### 5. New model developments: integrated end-to-end models (4 hours)

- 5.1. Principles of integrated end-to-end models
- 5.2. Modelling ecosystem regime shifts
- 5.3. Integrating hydrographical and biological models with a spatial dimension

### 6. Indicators, targets, reference points (4 hours)

- 6.1. Type: ecological, economic and social
- 6.2. Development of indicators: methodological aspects
- 6.3. Implementation of ecological and economic indicators: data needs, use, potentials and limitations. Indicators in the EU Marine Strategy Framework Directive (MSFD)

### 7. Low Impact and Fuel Efficient (LIFE) fishing (2 hours)

- 7.1. Advances in gear technology for species and size selectivity, and for reduction of the environmental impact
- 7.2. Energy saving schemes

### 8. Practical work (8 hours)

- 8.1. Model demonstrations
  - 8.1.1. ATLANTIS application in Sicilian Channel
  - 8.1.2. ECOPATH with ECOSIM application in the Adriatic and in the Black Sea
- 8.2. Computation and use of ecological and economic indicators
  - 8.2.1. Fishing in balance indicators
  - 8.2.2. Mean trophic level
  - 8.2.3. Family of the MSFD Descriptor 3 size indicators

### 9. Final remarks and discussion (1 hour)

## GUEST LECTURERS

F. CAROCCI, FAO, Rome (Italy)  
M. COLL, CSIC-ICM, Barcelona (Spain)  
C. CHABOUD, UMR IRD/Univ. Montpellier II/Ifremer, Sète (France)  
G. DASKALOV, IBER, Sofia (Bulgaria)  
F. FIORENTINO, CNR-IAMC, Mazara del Vallo (Italy)  
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**ANNEX II**  
**COURSE TIMETABLE**



**CREAM Project Course 1 - ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. SCIENTIFIC BASES,**  
Varna (Bulgaria), 3-7 February 2014

Hour	Monday 3	Tuesday 4	Wednesday 5	Thursday 6	Friday 7
9:00-10:00	0. Opening and CREAM project presentation <b>J. Lleonart</b>  1.1. EAF principles and concepts <b>J. Lleonart</b>	3.2.2.1. Spatial dimension of EAF - GIS, VMS and satellite images <b>F. Carocci</b>	3.2.4.2. Multicriteria decision analysis and risk assessment <b>N. Nikolova</b>	8.1.2. Model demonstration: ECOPATH with ECOSIM application in the Black Sea <b>G. Daskalov</b>	7. Low Impact and Fuel Efficient (LIFE) fishing <b>P. Suuronen</b>
10:00-11:00		3.2.2.2. Modeling the marine space using GIS <b>F. Carocci</b>			
<b>Coffee break</b>					
11:30-12:30	2. Sustainability of target species <b>J. Lleonart</b>	3.2.2.3. Models for MPA (ECOSPACE) <b>G. Daskalov</b>	4.1. Cost and benefits analysis 4.2. Economic valuation of marine ecosystems services <b>C. Chaboud</b>	5.2. Assessing the spatial distribution of species using Bayesian hierarchical models <b>M.G. Pennino</b>	6.3.1. Implementation of ecological indicators <b>J. Vigneau</b>
12:30-13:30	1.2. Stakeholders participation to fisheries management according to EAF - <b>F. Fiorentino</b>	3.2.2.4. Optimization of reserve design <b>K. Stergiou</b>	8.2. Computation and use of ecological indicators <b>J. Vigneau, F. Maynou</b>		
<b>Lunch break</b>					
15:00-16:00	3.1. Ecosystem level impacts <b>K. Stergiou</b>	3.2.3. Productivity susceptibility assessment (PSA) - <b>F. Maynou</b>	4.3. Institutional and stakeholders analysis <b>R. Franquesa</b>	Indicators, targets, reference points 6.1. Type: ecological, economic and social <b>J. Vigneau</b>	8.2. Computation and use of ecological indicators <b>J. Vigneau, F. Maynou</b>
16:00-17:00	3.2.1. Ecosystem models <b>F. Maynou</b>	3.2.4.1. An Introduction to Bayesian Statistic - <b>M.G. Pennino</b>	6.3.2. Implementation of economic indicators <b>R. Franquesa</b>	6.2. Development of indicators: methodological aspects <b>J. Vigneau</b>	9. Final remarks and discussion <b>J. Lleonart, V. Raykov, G. Daskalov, J. Vigneau, F. Maynou</b>
<b>Coffee break</b>					
17:30-18:30	3.2.1. Ecosystem models <b>F. Maynou</b>	8.1.1. Spatial Management of demersal Resources for Trawl fisheries - <b>F. Fiorentino</b>	5.1. Trophic cascades and regime shifts in the Black Sea <b>G. Daskalov</b>	8.2. Computation and use of ecological indicators <b>J. Vigneau, F. Maynou</b>	





**ANNEX III**

**GUEST LECTURERS' CONTACT DETAILS**





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International Centre for Advanced  
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Mediterranean Agronomic Institute of Zaragoza



CREAM Project  
European Commission, Seventh Framework Programme



Food and Agriculture Organization  
of the United Nations  
Fisheries and Aquaculture Department

Advanced Course

# ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. SCIENTIFIC BASES

Varna (Bulgaria), 3-7 February 2014

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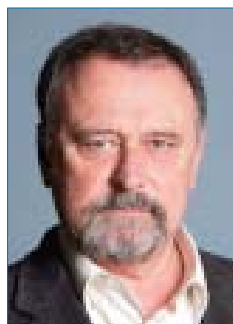


CREAM Project  
European Commission, Seventh Framework Programme



Food and Agriculture Organization  
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My Citations: <http://scholar.google.bg/citations?user=IY0Gr5YAAAAJ&hl=en>



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**CIHEAM**

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CREAM Project  
European Commission, Seventh Framework Programme



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**ANNEX IV**

**SUMMARY OF CANDIDATURES RECEIVED**





**CREAM Course 1**  
**ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACKSEAS**  
**SCIENTIFIC BASES**  
**Varna (Bulgaria), 3-7 February 2014**

**SUMMARY OF RECEIVED CANDIDATURES**

<b>COUNTRY</b>	<b>No. Candidatures</b>
ALGERIA	4
BULGARIA	4
CROATIA	1
CYPRUS	2
EGYPT	4
GEORGIA	1
GREECE	6
IRAN	1
ITALY	4
LIBANON	4
MALTA	4
MOROCCO	2
ROMANIA	4
SPAIN	8
TUNISIA	8
TURKEY	10
<b>TOTAL</b>	<b>67</b>

**ANNEX V**

**LIST OF PARTICIPANTS**



**CREAM Project Course 1 - ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACKSEAS. SCIENTIFIC BASES**  
**Varna (Bulgaria), 3-7 February 2014**

**LIST PARTICIPANTS**

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**ANNEX VI**

**PARTICIPANTS' CONTACT DETAILS**





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CREAM Project  
European Commission, Seventh Framework Programme



Food and Agriculture Organization  
of the United Nations  
Fisheries and Aquaculture Department

Advanced Course

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SCIENTIFIC BASES**

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Advanced Course

# ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. SCIENTIFIC BASES

Varna (Bulgaria), 3-7 February 2014

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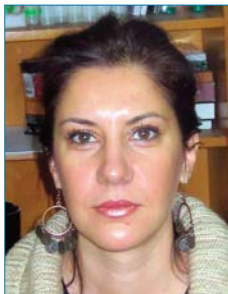
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Advanced Course

# ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. SCIENTIFIC BASES

Varna (Bulgaria), 3-7 February 2014

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Advanced Course

# ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. SCIENTIFIC BASES

Varna (Bulgaria), 3-7 February 2014

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**REPORT CREAM COURSE 2**

**“ECOSYSTEM APPROACH TO FISHERIES IN THE  
MEDITERRANEAN AND BLACK SEAS.  
MANAGEMENT AND DECISION MAKING”**

**Zaragoza (Spain), 10-14 March 2014**



## **Background and objectives**

The course was included within the activities planned under the WP 5 (Training and capacity building, Dissemination) of the CREAM Project (Coordinating research in support to application of EAF and management advice in the Mediterranean and Black Seas).

The course was addressed to fisheries decision makers, managers and technical advisors, and aimed to provide an overview of Ecosystem Approach to Fisheries (EAF) concepts, methods and tools, and to guide the participants through the main steps of the fisheries planning and management process required for the practical implementation of the EAF. It also aimed that participants, by the end of the course, would be:

- aware of the ecological context of the fisheries and related assessment methods.
- conscious of the social and economic implications of EAF and of the importance of the stakeholders' involvement in the management process to ensure a successful EAF implementation.
- informed on the main methods and mathematical models applied in EAF.
- familiar with the use of a wide range of indicators and reference points of ecological, economic and social nature in EAF.
- in a position to establish institutional and personal relations that would favour a future exchange of experiences and strengthen cooperation in the EAF application in the region.

## **Organization**

The course was jointly organized by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (IAMZ), and the CREAM Project (Coordinating Research in Support to Application of Ecosystem Approach to Fisheries and Management Advice in the Mediterranean and Black Seas) of the European Commission Seventh Framework Programme, with the collaboration of the Food and Agriculture Organization of the United Nations (FAO), through the Fisheries and Aquaculture Department.

The course was held at the Mediterranean Agronomic Institute of Zaragoza, and was held over a period of 1 week, from 10 to 14 March 2014, in morning and afternoon sessions, for a total of 38 hours.

## **Course Preparation**

The programme of the course was discussed and agreed at the *ad hoc* working group that met in Zaragoza on 15 and 16 May 2013: Gabriela BIANCHI (FAO, Rome, Italy), Jordi LLEONART (ICM-CSIC, Barceona, Spain), Francesc MAYNOU (ICM-CSIC, Barceona, Spain), Paolo SARTOR (CIBM, Livorno, Italy) as well as Dunixi GABIÑA, Manuela CERESO and Bernardo BASURCO from CIHEAM-IAMZ, Zaragoza, Spain.

The course programme had an applied management approach. Formal lectures were complemented with applied examples, detailed case studies and debates. Furthermore, during the course, participants were asked to work in groups on a practical exercise, based on real case studies, with the objective of understanding the process of designing an EAF management plan. This exercise was designed to enable participants to put theory into practice and gain experience on practical application of EAF principles. The programme of the course was organized in the following sessions:

1. EAF principles and concepts
2. EAF management process
3. The social and economic dimension of EAF
4. Co-management: involving stakeholders in EAF
5. Science to support EAF management: methodologies and tools
6. EAF in practice: case studies

The detailed programme of the course is included in the leaflet attached as **Annex I**. The timetable of the course is attached as **Annex II**.

### **Guest lecturers**

The course counted on the expertise of 12 well-qualified lecturers participating in the CREAM Project and invited experts from international institutions and from universities, research centres, NGOs and professional associations in different countries.

**Annex III** contains the contact details of guest lecturers contributing to conferences, case studies and the coordination of group work sessions.

### **Course coordination**

The scientific coordination of the course was covered by J. Lleonart (ICM-CSIC, Barcelona, Spain) and the administrative coordination was covered by B. Basurco (CIHEAM-IAMZ, Zaragoza, Spain).

### **Publicity**

Following the design of the course programme by the group of experts, the IAMZ prepared a publicity leaflet including the objectives of the course, the programme, the lecturers and information on the organization of the course, scholarships etc. Copy of the brochure is attached as **Annex I**.

The IAMZ was in charge of giving as much publicity (via regular mail, e-mail and through IAMZ webpage) as possible to the course. In addition, all CREAM partners were asked to publicize the course and propose candidates from their respective countries.

IAMZ also undertook the reception of the applications and related documentation (application forms and curricula vitae).

### **Applications and selection of candidates**

The deadline for the submission of applications was 2 December 2013. All applications were examined by the Selection Committee of IAMZ and a list of selected candidates and grants was proposed and discussed with J. Lleonart (ICM-CSIC, Barcelona, Spain). In summary, 66 applications from 15 different countries were received, which shows the interest raised by the topic of the course. **Annex IV** presents the summary of received candidatures.

A total of 31 candidates from 15 countries were selected and contacted by the IAMZ, which was also in charge of arranging the travel to Spain for all grantees.

### **Participants**

Finally, 27 experts from the following 14 countries attended the course: Algeria (1), Bulgaria (2), Cyprus (1), Egypt (2), Georgia (1), Greece (1), Italy (2), Lebanon (2), Malta (1), Morocco (2), Romania (1), Spain (6), Tunisia (3) and Turkey (2). Participants came from different national administrations, research institutions and private companies. The CREAM project financed the travel and accommodation expenses of 23 participants. Four self-financed Spanish participants from private institutions/companies also attended the course. **Annex V** presents the list of participants, indicating their country of origin, institution and professional profile. **Annex VI** includes the contact details of participants.

## Documentation

All course participants and guest lecturers received a course folder with detailed information about the course (programme, timetable, list and addresses of participants and lecturers, etc.), as well as the pedagogical material provided by lecturers (print-outs of lecturers' Power points, articles, bibliography, etc.). The FAO Department of Fisheries and Aquaculture distributed some related publication, i.e. Toolbox for Applying the Ecosystem Approach to Fisheries.

In addition to the usual folder, all course participants and guest lecturers were able to access the above mentioned material as well as further information, such as additional articles, reports and photos on the CIHEAM-IAMZ Virtual Campus (<http://intranet.iamz.ciheam.org/moodle/>) to.

## Results

At the end of the course, the participants presented the results of their respective working group case study exercises, followed by an open discussion. In general, participants gave a very positive opinion about the programme of the course as well as its organization. They also provided some practical suggestions with a view to a future edition of this course.

As for the results of the course survey distributed to all participants, the majority of the guest lecturers were evaluated very positively. Finally, the table below shows a summary of the different aspects addressed through the survey.

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Summary scores (from 0 to 5) for the following aspects of the course	
Programme of the course	4.4
Lecturers of the course	4.3
Pedagogical system used	3.9
Level of the course	4.2
Documentation distributed	4.5
Quality of organization	4.7
Advantage taken from the course	4.3
Discussion	3.9
Global score of the course	4.4

---

At the end of the course, all participants received a certificate duly signed by the Director of the IAMZ and the course Scientific Coordinator.





**ANNEX I**  
**PUBLICITY BROCHURE**





CIHEAM

International Centre for Advanced  
Mediterranean Agronomic Studies  
Mediterranean Agronomic Institute of Zaragoza



CREAM Project  
European Commission, Seventh Framework Programme



Food and Agriculture Organization  
of the United Nations  
Fisheries and Aquaculture Department

## Advanced Course

# ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. MANAGEMENT AND DECISION MAKING

Zaragoza (Spain), 10-14 March 2014

### 1. Objective of the course

Increasing concerns on the sustainability of marine fisheries and the ecosystems within which they occur are resulting in urgent and high-level demands for responsible actions and efforts at the international, regional and national levels, including the Mediterranean and Black Sea regions.

The ecosystem approach to fisheries (EAF) was developed in response to the need to implement the sustainability principles embodied in the Convention on Biological Diversity (CBD) and FAO's Code of Conduct for Responsible Fisheries. It is based on best practices in fisheries management but broadens its scope to explicitly consider ecosystem interdependencies, the social and economic benefits that can be derived from its utilization, and the interactions of fisheries with external drivers such as climate change, habitat destruction and pollution.

The Mediterranean and Black Sea fisheries are mainly local and small scale, catching a large number of species with many different gears. Assessments have been based primarily on classical single species approaches, which do not take into account the complexity of the fisheries being assessed or the ecosystem exploited and the socioeconomic context. There is therefore a need to develop and provide more appropriate scientific advice for managers in support to the implementation of the EAF. The CREAM Project (Coordinating research in support to application of EAF and management advice in the Mediterranean and Black Seas) is a coordination action funded by the EU-FP7. Its objective is to establish an effective collaboration network on EAF among key role players in Mediterranean and Black Sea fisheries research and management. The project has a strong training and capacity building component in order to help harmonize data collection and methodologies used in fisheries assessment and management in the Mediterranean and Black Sea.

This course will provide an overview of EAF concepts, methods and tools, and guide the participants through the main steps of the fisheries planning and management process required for the practical implementation of the EAF. In addition, by the end of the course the participants will:

- Be aware of the ecological context of the fisheries and related assessment methods.
- Be conscious of the social and economic implications of EAF and of the importance of the stakeholders' involvement in the management process to ensure a successful EAF implementation.
- Be informed on the main methods and mathematical models applied in EAF.
- Be familiar with the use of a wide range of indicators and reference points of ecological, economic and social nature in EAF.
- Be in a position to establish institutional and personal relations that will favour a future exchange of experiences and strengthen cooperation in the EAF application in the region.

### 2. Organization

The course is jointly organized by the International Centre for Advanced Mediterranean Agronomic Studies (CIHEAM), through the Mediterranean Agronomic Institute of Zaragoza (IAMZ), and the CREAM Project (Coordinating Research in Support to Application of Ecosystem Approach to Fisheries and Management Advice in the Mediterranean and Black Seas) of the European Commission Seventh Framework Programme, with the collaboration of the Food and Agriculture Organization of the United Nations (FAO), through the Fisheries and Aquaculture Department.

The course will be held at the Mediterranean Agronomic Institute of Zaragoza, taught by well qualified lecturers participating in the CREAM Project and invited experts from international institutions and from universities, research centres, NGOs and professional associations in different countries.

The course will be held over a period of 1 week, from 10 to 14 March 2014, in morning and afternoon sessions.

### 3. Admission

The course is designed for 25 professionals in fisheries with a university degree, and is directed mainly to decision makers, managers and technical advisors working in the Mediterranean or Black Seas.

Given the diverse nationalities of the lecturers, knowledge of English and French will be valued in the selection of candidates, since together with Spanish, they will be the working languages of the course. However, if necessary, the IAMZ will provide simultaneous interpretation of the lectures.

A first CREAM course on "Ecosystem approach to fisheries in the Mediterranean and Black Seas. Scientific bases", targeted to fisheries researchers, will be held on 3-7 February 2014 at Varna, Bulgaria.

### 4. Registration

Application forms may be obtained from:

Instituto Agronómico Mediterráneo de Zaragoza  
Avenida de Montañana 1005, 50059 Zaragoza (Spain)  
Tel.: +34 976 716000 - Fax: +34 976 716001  
e-mail: iamz@iamz.ciheam.org  
Web: www.iamz.ciheam.org

Please display on a notice board if possible



CIHEAM

Instituto Agronómico Mediterráneo de Zaragoza  
Avenida de Montañana 1005, 50059 Zaragoza, Spain  
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E-mail: iamz@iamz.ciheam.org

See updated information at

[www.iamz.ciheam.org](http://www.iamz.ciheam.org)

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INFORMATION  
CONTINUES  
OVERLEAF



Candidates should send the completed application form to the above address, accompanied by a detailed *curriculum vitae*, stating degree, diplomas, experience, professional activities, language knowledge and reasons for applying to the course. Copies of certificates should be enclosed with the application.

The deadline for the submission of applications is **2 December 2013**.

Applications from those candidates who cannot present their complete records when applying, or those requiring authorization to attend the course, may be accepted provisionally.

Registration fees for the course amount to 450 euro. This sum covers tuition fees only.

## 5. Scholarships

Candidates from Mediterranean and Black Sea countries may apply for scholarships covering registration fees, and for scholarships covering the cost of travel and full board accommodation in the Hall of Residence on the Campus of Aula Dei.

## 6. Insurance

It is compulsory for participants to have medical insurance valid for Spain. Proof of insurance cover must be given at the beginning of the course. Those who so wish may participate in a collective insurance policy taken out by the Organization, upon payment of the stipulated sum.

## 7. Teaching organization

The course requires personal work and interaction among participants and with lecturers. The international characteristics of the course favour the exchange of experiences and different points of view.

The programme has an applied approach. Formal lectures are complemented with applied examples, detailed case studies and debates. Furthermore, during the course, participants will work in groups on a practical exercise, based on real case studies, with the objective of understanding the process of designing an EAF management plan. This exercise will enable them to put theory into practice and gain experience on practical application of EAF principles.

Participants will be asked to prepare, before the beginning of the course, a brief summary on EAF initiatives in their countries/regions. These reports will be shared with lecturers and participants.

## 8. Programme

### 0. Opening and CREAM project presentation (1.5 hours)

#### 1. EAF principles and concepts (2.5 hours)

- 1.1. EAF concept development
- 1.2. Overview of instruments at international and regional level
  - 1.2.1. UNCLOS, UN Fish Stock Agreement
  - 1.2.2. International conventions: CBD, Code of Conduct, WSSD, Rio+20
  - 1.2.3. Regional conventions: EU Directive, Bucharest Convention, GFCM
  - 1.2.4. Jurisdictions in the Mediterranean and Black Seas

#### 1.2.5. International Plan of Action to prevent, deter and eliminate IUU fishing

- 1.3. Management of shared stocks
  - 1.4. FAO guidelines to management
- ### 2. EAF management process (19 hours)
- 2.1. Scoping and setting the broad objectives
  - 2.2. Issue identification and prioritization (risk assessment)
    - 2.2.1. Ecological aspects
    - 2.2.2. Socioeconomic aspects
    - 2.2.3. Governance aspects
    - 2.2.4. External drivers
  - 2.3. Operational objectives, indicators and targets
  - 2.4. Setting up the management system
    - 2.4.1. Identifying management measures and instruments
      - 2.4.1.1. Technical measures including marine protected areas (MPA)
      - 2.4.1.2. Subsidies and other economic schemes
      - 2.4.1.3. Access rights
    - 2.4.2. Monitoring and evaluation
    - 2.4.3. Legal and institutional aspects
  - 2.5. Debate
  - 2.6. Group work based on case studies
    - 2.6.1. Work presentation
    - 2.6.2. Working sessions
    - 2.6.3. Presentation of results and debate
- ### 3. The social and economic dimension of EAF (3 hours)
- 3.1. Who is benefiting from and who is paying for EAF? Economic and social considerations
  - 3.2. Economic valuation of marine ecosystems services
    - 3.2.1. Theory of ecosystem services
    - 3.2.2. Market values. Bioeconomic models
    - 3.2.3. Non-market values
    - 3.2.4. Implementation of payment for ecosystem services
- ### 4. Co-management: involving stakeholders in EAF (2 hours)
- 4.1. Co-management principles and implementation
  - 4.2. Challenges and opportunities of co-management
  - 4.3. Examples
- ### 5. Science to support EAF management: methodologies and tools (7 hours)
- 5.1. The spatial dimension of EAF: GIS, VMS, satellite imaging, spatial models
  - 5.2. How models can support decision making
    - 5.2.1. Models: types, characteristics, potential and limitations
    - 5.2.2. Trophic based models (ECOPATH-ECOSIM, OSMOSE, ATLANTIS)
    - 5.2.3. Bayesian belief networks
    - 5.2.4. Multicriteria decision analysis
    - 5.2.5. Management strategy evaluation (MSE)
  - 5.3. Indicators, targets and reference points relevant for management
    - 5.3.1. Type: ecological, economic and social
    - 5.3.2. Implementation: data needs, use, potentials and limitations
  - 5.4. Technological innovative tools
  - 5.5. Debate
- ### 6. EAF in practice: case studies (3 hours)
- 6.1. Implementation of local management plans
    - 6.1.1. Mediterranean sand eel fisheries in Catalonia
    - 6.1.2. Transparent goby in north-western Italy
  - 6.2. Castellammare Gulf: an example of local regulation
  - 6.3. George's bank demersal trawl fisheries

## GUEST LECTURERS

M. BERNAL, GFCM, Rome (Italy)  
G. BIANCHI, FAO, Rome (Italy)  
F. CAROCCI, FAO, Rome (Italy)  
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Ph. CURY, UMR IRD/Univ. Montpellier II/Ifremer, Sète (France)  
C. DE YOUNG, FAO, Rome (Italy)  
F. FIORENTINO, CNR-IAMC, Mazara del Vallo (Italy)

J. LLEONART, CSIC-ICM, Barcelona (Spain)  
P. NUNES, CIESM (Monaco)  
M. PULIDO, MedArtNet-España, Barcelona (Spain)  
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S. TUDELA, WWF, Barcelona (Spain)  
J. VIGNEAU, Ifremer, Port-en-Bessin (France)



CREAM Project  
European Commission, Seventh Framework Programme

**ANNEX II**  
**COURSE TIMETABLE**



**ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS.  
MANAGEMENT AND DECISION MAKING, Zaragoza (Spain), 10-14 March 2014**

Hour	Monday 10	Tuesday 11	Wednesday 12	Thursday 13	Friday 14
9:00-10:00	0. Opening and CREAM project presentation <b>J. Leonart</b>  1.4. FAO guidelines to management <b>C. De Young</b>	2.2.1. EA fisheries management process (Step 2.1) <b>T. Bahri, C. De Young</b>	2.5. Debate on "EA fisheries management" <b>T. Bahri, C. De Young, J. Leonart</b>	6.1.1. Case study: Sandeel fisheries in Catalonia <b>S. Sainz-Trápaga, M. Pulido</b>	5.4. Technological innovative tools <b>A. Sala</b>
10:00-11:00		2.6.2. Group work: working sessions	3. The social and economic dimension of EAF <b>P. Nunes</b>	5.1. The spatial dimension of EAF: GIS, VMS, satellite imaging, spatial models <b>F. Carocci</b>	5.5. Debate on "Science to support EAF management" <b>F. Carocci, Ph. Cury, A. Sala</b>
<b>Coffee break</b>					
11:30-12:30	1.2. Overview of instruments at international and regional level <b>N. Ferri</b>	2.2.2. EA fisheries management process (Step 2.2) <b>T. Bahri, C. De Young</b>	3. The social and economic dimension of EAF <b>P. Nunes</b>	5.2. How models can support decision making <b>Ph. Cury</b>	6.1.2. & 6.2. Case studies: Transparent goby in north-western Italy <b>F. Fiorentino</b>
12:30-13:30	1.3. Management of shared stocks <b>N. Ferri</b>  1.1. EAF concept development <b>T. Bahri</b>				
<b>Lunch break</b>					
15:00-16:00	2.1. EA fisheries management process (Step 1) <b>T. Bahri, C. De Young</b>	2.3 and 2.4. EA fisheries management process (Step 3 & Step 4) <b>T. Bahri, C. De Young</b>	4. Co-management: involving stakeholders into EAF <b>S. Sainz-Trápaga, M. Pulido</b>	5.3. Indicators, targets and reference points relevant for management <b>C. Montero</b>	2.6.3. Group work: Presentation of results and debate <b>T. Bahri, C. De Young, J. Leonart</b>
16:00-17:00	2.6.1. Group work: work presentation <b>T. Bahri, C. De Young, J. Leonart</b>				
17:00-19:00	2.6.2. Group work: working sessions <b>T. Bahri, C. De Young, J. Leonart</b>				





**ANNEX III**

**GUEST LECTURERS' CONTACT DETAILS**





CIHEAM

Centro Internacional de Altos Estudios  
Agronómicos Mediterráneos  
Instituto Agronómico Mediterráneo de Zaragoza



Proyecto CREAM  
Comisión Europea, Séptimo Programa Marco

Advanced Course



Organización de las Naciones Unidas  
para la Agricultura y la Alimentación  
Departamento de Pesca y Acuicultura

## ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS.

### MANAGEMENT AND DECISION MAKING

Zaragoza (Spain), 10-14 March 2014

## ADDRESSES OF GUEST LECTURERS



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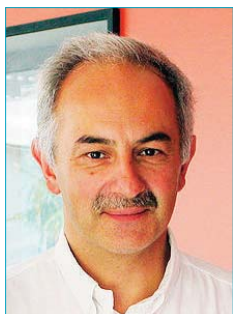
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Instituto Agronómico Mediterráneo de Zaragoza



Proyecto CREAM  
Comisión Europea, Séptimo Programa Marco



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## ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS.

### MANAGEMENT AND DECISION MAKING

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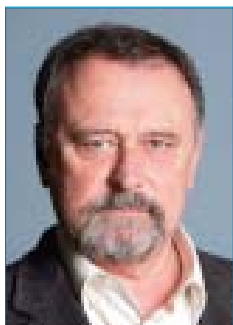
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Comisión Europea, Séptimo Programa Marco



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## ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS.

### MANAGEMENT AND DECISION MAKING

Zaragoza (Spain), 10-14 March 2014

## ADDRESSES OF GUEST LECTURERS



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## CIHEAM COURSE COORDINATOR



**BASURCO, Bernardo**

Administrator. Area of Fisheries and Aquaculture  
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**ANNEX IV**

**SUMMARY OF CANDIDATURES RECEIVED**





CREAM Course 2  
ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS.  
MANAGEMENT AND DECISION MAKING  
Zaragoza (Spain), 10-14 March 2014

**SUMMARY OF RECEIVED CANDIDATURES**

<b>COUNTRY</b>	<b>No. Candidatures</b>
ALGERIA	7
BULGARIA	3
CYPRUS	1
EGYPT	4
GEORGIA	1
GREECE	2
ITALY	2
LIBANON	3
MALTA	3
MOROCCO	8
ROMANIA	2
SPAIN	9
TUNISIA	9
TURKEY	11
UKRAINE	1
<b>TOTAL</b>	<b>66</b>



**ANNEX V**

**LIST OF PARTICIPANTS**



**CREAM Project Course 2 - ECOSYSTEM APPROACH TO FISHERIES IN THE MEDITERRANEAN AND BLACK SEAS. MANAGEMENT AND DECISION MAKING**  
**Zaragoza (Spain), 10-14 March 2014**

**LIST OF PARTICIPANTS**

<b>SURNAME, Name</b>	<b>Country</b>	<b>Institution</b>	<b>Univ. Degree / Position</b>
1. ASSAMEUR, Meriem	Algeria	MIN. PÊCHE ET RES. HALIEUTIQUES - DIR. PÊCHE MARITIME ET OCEANIQUE	Fishing engineer – fisheries and resources ...
2. DIMITROV, Dimitar	Bulgaria	BLACK SEA SUNRISE FISHERIES ASSOCIATION- FISHERIES BRANCH ORGANIZATION; DECALEGES LTD	Law - legal adviser
3. PETROV, Konstantin	Bulgaria	AGEN. FISHERIES AND AQUACULTURE - EUROPEAN AND INTERNATIONAL RELATIONS	Economics – Head intern. relations
4. IOANNOU, Natasa	Cyprus	NIREAS MARINE RESEARCH – MARINE ENVIRONMENT	Biology – scientific adviser
5. EL GAZZAR, Hisham Mohamed Abd El Aziz	Egypt	GENERAL AUTHORITY FOR FISH RESOURCES DEVELOPMENT - FISHERIES DPT.	Fisheries sc. – fisheries officer
6. MEGAHED OSMAN, Atif Salah	Egypt	GENERAL AUTHORITY FOR FISH RESOURCES DEVELOPMENT - FISHERIES DPT.	BSc. Fisheries - Fisheries specialist dept.
7. MGELADZE, Marina	Georgia	NATIONAL ENVIRONMENTAL AGENCY - FISHERIES AND BLACK SEA MONITORING CENTER	Biology - Head of biodiversity group
8. KAPIRIS, Konstantinos	Greece	HELLENIC CENTER FOR MARINE RESEARCH (HCMR) - INSTITUTE OF MARINE BIOLOGICAL RESOURCES. - ANAVISSOS	Biology - Assistant researcher
9. ROCCAPALUMBA, Salvatore	Italy	REGIONE SICILIANA – DPT. INTERVENTI PER LA PESCA – SERVIZIO BIOLOGIA MARINA	Law – Director
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**ANNEX VI**

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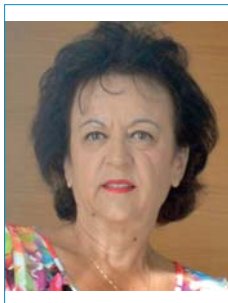
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