

## SAC GFCM Sub-Committee on Stock Assessment

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Date\* 

5	November	2010
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Code\* 

ANE1810Man
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**Authors\***

Mandic, M., Pesic, A., Joksimovic, A., Regner, S. - 1 Leonori, I., De Felice, A., Campanella, F., Biagiotti, I. - 2 Kolitari, J. -3
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**Affiliation\***

Institute of Marine Biology (Kotor), Montenegro - 1 Institute of Marine Sciences (ISMAR -CNR, Ancona), Italy - 2 Aquaculture and Fishery Laboratory (Durrës), Albania FAO AdriaMed Project
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**Species Scientific name\***

**1**    *Engraulis encrasicolus* - ANE  
Source: GFCM Priority Species

**2**  
Source: -

**3**  
Source: -

**Geographical area\***

Adriatic Sea
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**Geographical Sub-Area (GSA)\***

18 - Southern Adriatic Sea
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Combination of GSAs

1	
2	
3	



## SAC GFCM - Sub-Committee on Stock Assessment (SCSA)

Assessment form

Sheet #0

Basic data on the assessment

Code: ANE1810Man

Date*	5	Nov	2010	Authors*	Mandic, M., Pesic, A., Joksimovic, A., Regner, S. - 1 Leonori, I., De Felice, A., Campanella, F., Biagiotti, I. - 2 Kolutari, J. -3
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Species Scientific name*	Engraulis encrasicolus - ANE	Species common name*	European anchovy
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### Data Source

GSA*	18 - Southern Adriatic Sea	Period of time*	1987, 1988, 1992-2002, 2005-2009
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### Description of the analysis

Type of data*	Biomass estimation by DEP method and by acoustic methodology	Data source*	DEPM and acoustic survey in 2008 and historical data of acoustic method
Method of assessment*	DEPM, Acoustics	Software used*	SURFER Golden Software 8, Myriax Echoview 4, ESRI Arcview 3.2

### Sheets filled out

B	P1	P2a	P2b	G	A1	A2	A3	Y	Other	D	Z	C
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### Comments, bibliography, etc.

A large, empty rectangular box with a thin black border, occupying the central portion of the page. This box is intended for the user to provide comments, a bibliography, or other relevant information.

## SAC GFCM - Sub-Committee on Stock Assessment (SCSA)

Assessment form

Sheet P1

General information about the fishery

Code: ANE1810Man

Data source*	IREPA and AdriaMed eggs and larvae survey	Year (s)*	2008
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Data aggregation (by year, average figures between years, etc.)*	by year
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### Fleet and catches (please state units)

	Country	GSA	Fleet Segment	Fishing Gear Class	Group of Target Species	Species
Operational Unit 1*	ITA	18	H - Purse Seine (12-24 metres)	02 - Seine Nets	31 - Small gregarious pelagic	ANE
Operational Unit 2	ITA	18	J - Pelagic Trawl (12-24 metres)	03 - Trawls	31 - Small gregarious pelagic	ANE
Operational Unit 3	MNE	18	H - Purse Seine (12-24 metres)	02 - Seine Nets	31 - Small gregarious pelagic	ANE
Operational Unit 4	ALB	18	H - Purse Seine (12-24 metres)	02 - Seine Nets	31 - Small gregarious pelagic	ANE
Operational Unit 5						

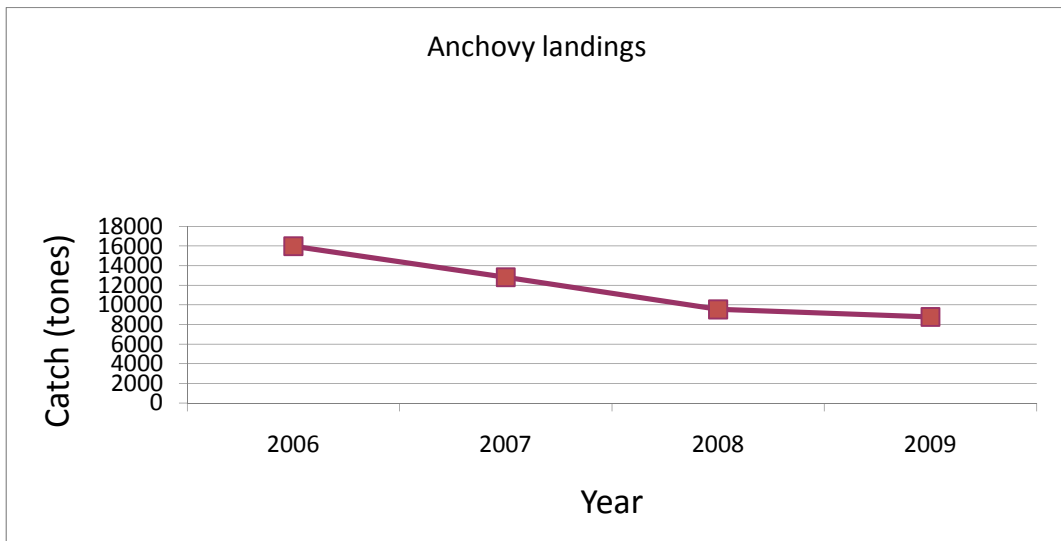
Operational Units*	Fleet (n° of boats)*	Kilos or Tons	Catch (species assessed)	Other species caught	Discards (species assessed)	Discards (other species caught)	Effort units
ITA 18 H 02 31 - ANE	7	Tons	2623				
ITA 18 J 03 31 - ANE	34	Tons	6870				
MNE 18 H 02 31 - ANE	1	Tons					
ALB 18 H 02 31 - ANE	5	Tons					
Total	47		9493				

Legal minimum size	9 cm IT and MNE, 7 cm ALB
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### Comments

<table style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Year</th> <th>Catch (tons)</th> </tr> </thead> <tbody> <tr> <td>2006</td> <td>15975</td> </tr> <tr> <td>2007</td> <td>12818</td> </tr> <tr> <td>2008</td> <td>9541</td> </tr> <tr> <td>2009</td> <td>8775</td> </tr> </tbody> </table> <div style="border: 1px solid black; padding: 5px; margin-top: 10px; text-align: center;">                     Anchovy catches in the western side of GSA 18                 </div>	Year	Catch (tons)	2006	15975	2007	12818	2008	9541	2009	8775
Year	Catch (tons)									
2006	15975									
2007	12818									
2008	9541									
2009	8775									

Comments



Anchovy landings in south-western Adriatic



## SAC GFCM - Sub-Committee on Stock Assessment (SCSA)

Assessment form

Sheet P2b  
Fishery by Operational Unit

Code: ANE1810Man

Page 1 /

Data source\*

OpUnit 1\*

ITA 18 H 02 31 - ANE

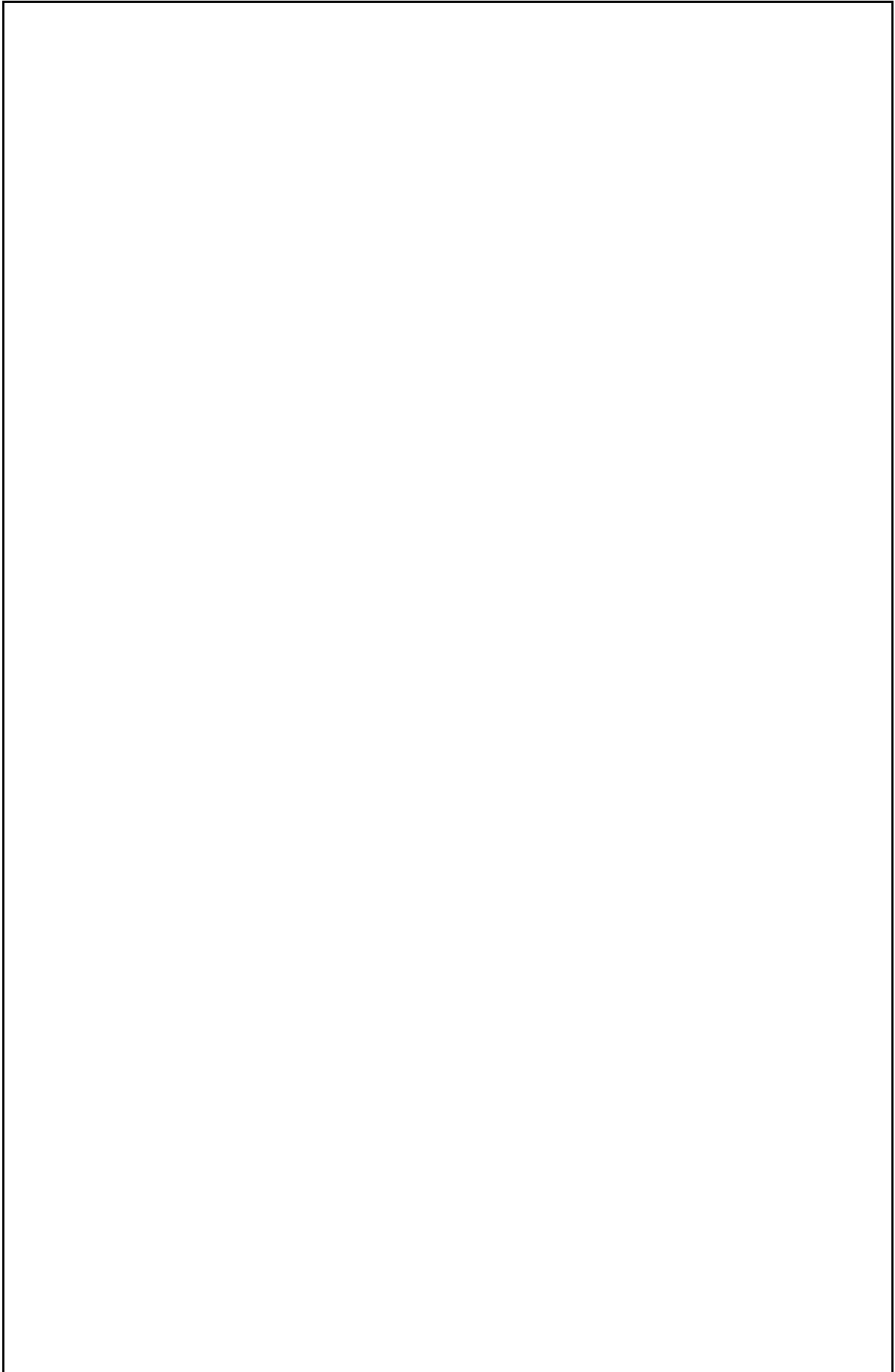
### Regulations in force and degree of observance of regulations

Regulations in GSA 18 are based on technical measures - mesh size opening, height and length of the nets, number of licences and minimum landing size.

### Accompanying species

Sardina pilchardus, Trachurus spp., Boops boops, Scomber japonicus, Spicara spp.





**SAC GFCM - Sub-Committee on Stock Assessment (SCSA)**

Assessment form

Sheet other

Code: ANE1810Man

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**Other assessment methods**

1) One assessment was conducted using Daily Egg Production Method (DEPM).  
 DEPM model:  
 The spawning stock biomass estimation is based on the model described by Parker (1980):

$$B = E/k * Frb * f * R$$

Where:

- B = spawning biomass in metric tons
- E = number of eggs produced per day over the area surveyed
- k = conversion factor from grams to metric tons
- Frb = relative batch fecundity
- f = spawning frequency
- R = sex ratio (fraction of mature females by weight)

2) The second assessment was made by means of acoustic methodology:

Biomass estimate is derived from the elaboration of acoustic data logged at three frequencies (38, 120 and 200 kHz) to calculate raw density of small pelagic fish in the study area converted into biomass per species on the base of percentage in weight of the different species and their

The t  
 below  
 levels  
 1994;  
 years  
 and t  
 50%

Vessel	R/V Dallaporta
Transect design	Parallel transects
Inter-transect distance	10 nm
Time of day	Fulltime
EDSU (nm)	1
Bottom depth (min)	10
Distance from coast	10-15 m bathymetric
Offshore extension	Mid-line or 250 m bathimetric
Fishing gear	Pelagic trawl
Echosounder	Simrad EK60
Frequency for assessment	38 kHz
Complementary frequencies	120,200 kHz
Pulse duration	1 ms
Threshold for acquisition	-80 db
Threshold for assessment	-70 dB
File format	.raw
Echopartioning into species	Frequencies comparisons, pelagic trawl, Ts analysis when needed
Notes about changes in methodology:	
Before 2008 the echosounder was the Simrad EK500	
Before 2004 it was used a single beam system at 38 kHz	
Before 2008 the survey design used was zig zag transects	

**SAC GFCM - Sub-Committee on Stock Assessment (SCSA)**

Assessment form

Sheet D  
Diagnosis

Code: ANE1810Man

**Indicators and reference points**

Criterion	Current value	Units	Reference Point	Trend	Comments
B					
SSB					
F					
Y					
CPUE					
B	60950	tons		increasing	Acoustic method - eastern side of GSA 18, 2008
SSB	52273	tons		increasing	DEPM - eastern side of GSA 18, 2008
B	141155	tons		increasing	Acoustic method - western side of GSA 18 (2008)
					Average biomass estimation from 1987 is 79132 tons (only western side)

**Stock Status\*** Use one (or both) of the following two systems for the stock assessment status description

<b>Unidimensional</b>	<input checked="" type="checkbox"/> ? - (or blank) <b>Not known or uncertain.</b> Not much information is available to make a judgment;
	<input type="checkbox"/> U - <b>Underexploited, undeveloped or new fishery.</b> Believed to have a significant potential for expansion in total production;
	<input type="checkbox"/> M - <b>Moderately exploited,</b> exploited with a low level of fishing effort. Believed to have some limited potential for expansion in total production;
	<input type="checkbox"/> F - <b>Fully exploited.</b> The fishery is operating at or close to an optimal yield level, with no expected room for further expansion;
	<input type="checkbox"/> O - <b>Overexploited.</b> The fishery is being exploited at above a level which is believed to be sustainable in the long term, with no potential room for further expansion and a higher risk of stock depletion/collapse;
	<input type="checkbox"/> D - <b>Depleted.</b> Catches are well below historical levels, irrespective of the amount of fishing effort exerted;
	<input type="checkbox"/> R - <b>Recovering.</b> Catches are again increasing after having been depleted or a collapse from a previous;

<b>Bidimensional</b>	<b>Exploitation rate</b>		<b>Stock abundance</b>			
	<input type="checkbox"/>	No or low fishing	<input type="checkbox"/>	Virgin or high abundance	<input type="checkbox"/>	Depleted
	<input type="checkbox"/>	Moderate fishing	<input checked="" type="checkbox"/>	Intermediate abundance	<input type="checkbox"/>	Uncertain / Not assessed
	<input type="checkbox"/>	High fishing mortality	<input type="checkbox"/>	Low abundance		
	<input checked="" type="checkbox"/>	Uncertain / Not assessed				

**Comments**

Stock status is marked as uncertain because the lack of long- term data on anchovy catches in all GSA 18 as well as lack of time series of biomass estimations by acoustic and DEPM (especially in the eastern side of GSA 18).

**SAC GFCM - Sub-Committee on Stock Assessment (SCSA)**

Assessment form

Sheet Z

Objectives and recommendations

Code: ANE1810Man

**Management advice and recommendations\***

Spawning stock biomass (SSB), estimated by DEPM, was conducted in Montenegrin territorial waters for the first time in August 2005 (AdriaMed eggs and larvae survey). Comparing this present results with the previous one, biomass of anchovy shows very significant increasing and it is about 5 times higher.

The results of 2008 echo survey in Montenegro and Albania (eastern GSA 18) show that the pelagic biomass has reached a good level, slightly below that of 2002 in Montenegro. Results on anchovy biomass by DEPM method in 2008 is largely in agreement with acoustic estimation. Such a good accordance between two methods can be explained by age structure of anchovy stock.

Estimation of anchovy biomass by acoustic method in western side of GSA 18 in recent years shows already known fluctuations in population dynamic of anchovy biomass (with two minima and two maximum's).

Although those results shows that anchovy population is on stable level in GSA 18 lack of long - term data on anchovy catches doesn't allow us to give a real judgment on stock status. Even if the catch records are incomplete, biomass assessments by acoustic and DEP method shows that most likely stock can sustain the current fisheries in GSA 18.

**Advice for scientific research\***

It is recommended to obtain data on anchovy catches from all countries from GSA 18 and to continue biomass assessments by both methods (acoustic and DEPM) simultaneously in all GSA 18.

## Abstract for SCSA reporting

**Authors**

Mandic, M., Pesic, A., Joksimovic, A., Regner, S. - 1  
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2 Kolutari, J. -3

**Year**

2010

**Species Scientific name**

Engraulis encrasicolus - ANE

Source: GFCM Priority Species

Source: -

Source: -

**Geographical Sub-Area**

18 - Southern Adriatic Sea

**Fisheries (brief description of the fishery)\***

**Source of management advice\***

(brief description of material -data- and methods used for the assessment)

**Stock Status\***

? - (or blank) Not known or uncertain. Not much information is available to make a judgment;

**Exploitation rate**  

Uncertain / Not assessed

**Stock abundance**  

Intermediate abundance

**Comments**

Stock status is marked as uncertain because the lack of long- term data on anchovy catches in all GSA 18 as well as lack of time series of biomass estimations by acoustic and DEPM (especially in the eastern side of GSA 18).



### Management advice and recommendations\*

Spawning stock biomass (SSB), estimated by DEPM, was conducted in Montenegrin territorial waters for the first time in August 2005 (AdriaMed eggs and larvae survey). Comparing this present results with the previous one, biomass of anchovy shows very significant increasing and it is about 5 times higher. The results of 2008 echo survey in Montenegro and Albania (eastern GSA 18) show that the pelagic biomass has reached a good level, slightly below that of 2002 in Montenegro. Results on anchovy biomass by DEPM method in 2008 is largely in agreement with acoustic estimation. Such a good accordance between two methods can be explained by age structure of anchovy stock.

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**Advice for scientific research\***

It is recommended to obtain data on anchovy catches from all countries from GSA 18 and to continue biomass assessments by both methods (acoustic and DEPM) simultaneously in all GSA 18.