



GENERAL FISHERIES COMMISSION FOR  
THE MEDITERRANEAN  
COMMISSION GÉNÉRALE DES PÊCHES  
POUR LA MÉDITERRANÉE



SAC GFCM  
Sub-Committee on Stock Assessment

## SCSA Assessment Forms

> Enter <



Tool designer (GFCM consultant)	<b>Federico De Rossi</b>
FAO backstopping officer for SCSA	<b>Jordi Lleonart</b>
SCSA coordinator	<b>Constantina Karlou-Riga</b>
GFCM Bio-Statistician	<b>Matthew Camilleri</b>
GFCM Deputy Executive Secretary / Adviser fisheries management	<b>Abdellah Srour</b>

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

**PLEASE READ CAREFULLY BEFORE STARTING THE DATA ENTRY**

### Macro - Security settings

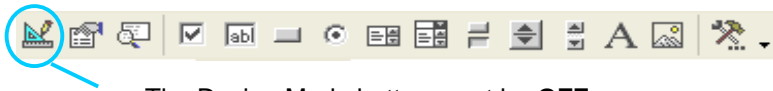
In order to ensure the proper full working of this Data Entry System, **the macros must be allowed to run.**

To change the security settings, please go to: **Tools > Macro > Security** and then select the **Medium** level. Close and re-open the file.

Now you are ready to start by clicking on the Cover button!

### Control toolbox settings

To visualize the **Control toolbox** go to: **View > Toolbars > Control toolbox**



The Design Mode button must be **OFF**.

### WARNINGS



Please do not try to **Delete, Rename, Move** or **Copy** any Excel Worksheets.



Right now it is not possible to **Print** the completed worksheets only.




Once the data entry process is completed, the **file size** will be increased significantly. Before sending it by email, please compress the file by using any zip tool available in your pc.


### Colours and symbols meaning

#### WORKSHEETS

Green ► Not compulsory sheet


Orange ► Compulsory sheet

Red ►  Not completed sheet


Bright green ►  Completed sheet

#### CELLS

Black asterisk ► \* Compulsory sheet/field

Turquoise ►  Compulsory field not yet completed

White ►  Free cell

Light green ►  Cell with the scroll-down menu

Light yellow ►  Auto-complete cell

### Excel shortcuts

**Ctrl + C** Copy

**Ctrl + V** Paste

**Ctrl + X** Cut  
**Ctrl + Z** Undo  
**Ctrl + P** Print  
**Alt + Enter** Line break within a cell

For more detailed information about Excel shortcut and function keys, please refer to the Microsoft website. > [CLICK HERE](#) <

**SAC GFCM**  
**Sub-Committee on Stock Assessment**

**SCSA Assessment Forms Release 2 (2007) beta version**

Since the SAC, and SCSA, inception (1999) a set of assessment forms were made available to scientists in order to provide a common framework to present assessments.

It has been decided to present a new release of these forms to facilitate their use. We took advantage of these upgrade to modify and amend some aspects. We would like to receive comments and suggestions from the users in order to improve the forms.

The structure of this new release is basically the same. The differences are:

- Migration from Word to Excel
- Some fields (yellow) are filled automatically
- Some sheets have been added
  - o A cover sheet with title, authors, species and GSAs
  - o A new sheet "other" allowing to include assessments based on methodologies other than the usual ones.
  - o An abstract sheet to be included (copy/paste) in the SCSA report
- It is more clear what sheets or fields are compulsory to fill
- The sheets for direct methods have not been yet upgraded

**Excerpts from the presentation of 1<sup>st</sup> version of the assessment forms (1999), however the sheet "other" can be used in such a case**

Each assessment consists of several sheets. Each assessment will take, at least, one sheet of paper numbered "0" (Sheet #0) and will also include no less than one copy of sheets "B", "P1" and "P2a" (now using the current "operational units" terminology). It is not compulsory to fill out any of the other sheets that make up this assessment form, but the person in charge is supposed to fill out some of them: otherwise no assessment is actually made. There may be more than one copy in several cases. Sheets "D" (diagnosis) and "Z" (conclusions and recommendations) should be considered as essential too.

Sheet	Title	Contents	# of sheets	Priority
0	Preliminary basic data on the assessment	Species, person in charge, date and code. All the sheets that belong to the same assessment share this code.	1	Indispensable
B	Biology of the species	Biological parameters used in the analyses (it is assumed that only one set of parameters is used).	1	Indispensable
P1	General information about the fishery	Catches by gear and associated fleet.	1 or more	Indispensable
P2a	Fishery by Operational Unit	Time series for the operational in question, including structure by size (or age).	At least as many as the OU numbers	Indispensable
P2b	Fishery by Operational Unit	Accompanying species and regulations applicable to operational unit.	At least as many as the OU numbers	If available
G	Indirect methods: global model	Description of model, data, parameters and results of each analysis.	As many as used in the analysis	If available
A1	Indirect methods: VPA, LCA	Description of model used and of general results of an analysis.	As many as used in the analysis	If available
A2	Indirect methods: data	Description of data used by gear for the analysis in A1.	As many as used in the analysis by OU	If available, requires A1
A3	Indirect methods: results of VPA	Detailed description of results by gear, structured by size or age.	As many as used in the analysis by OU	If available, requires A1
Y	Indirect methods: Y/R	Description of model, data, parameters and results.	As many as used in the analysis	If available
Other	Other assessment methods	Description of model, data, parameters and results of other assessment methods not included in the previous sheets.	1	If available
D	Diagnosis	Synthesis of results of analyses and diagnosis on the state of resources.	1	Indispensable
Z	Objectives and recommendations	Set the objectives to be attained and recommendations for their attainment.	1	Indispensable

C	Comments	At the option of the person in charge.	Unspecified	If available
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## SAC GFCM Sub-Committee on Stock Assessment

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<b>Date*</b>	<b>25</b>	<b>November</b>	<b>2009</b>	<b>Code*</b>	<b>PIL1709Doc</b>
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**Authors\***

Document prepared by the AdriaMed working group for small pelagics coordinated by Santojanni A. and Cingolani N.  
 Acknowledgements: Leonori I., Belardinelli A., Campanella F., Carpi P., Colella S., De Felice A., Donato F., Panfili M., Marceta B., Modic T., Plibersek K.

**Affiliation\***

- 1) CNR-ISMAR, Ancona (Italy)
- 2) Fisheries Research Institute of Slovenia, Ljubljana (Slovenia)
- 3) Institute of Oceanography and Fisheries, Split (Croatia)
- 4) Food and Agriculture Organization, Roma (Italy)

**Species Scientific name\***

**1**     *Sardina pilchardus* - **PIL**  
 Source: GFCM Priority Species

**2**  
 Source: -

**3**  
 Source: -

**Geographical area\***

Northern and central Adriatic Sea (southern limit: Gargano Promontory).

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

17 - Northern Adriatic

Combination of GSAs    1  
                                      2  
                                      3


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

Assessment form

Sheet #0

Basic data on the assessment

Code: PIL1709Doc

Date*	25	Nov	2009	Authors*	Document prepared by the AdriaMed working group for small pelagics coordinated by Santojanni A. and Cingolani N. Acknowledgements: Leonori I., Belardinelli A., Campanella F.,
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Species Scientific name*	Sardina pilchardus - PIL	Species common name*	Sardine
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**Data Source**

GSA*	17 - Northern Adriatic	Period of time*	1975-2008
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**Description of the analysis**

Type of data*	Catch at age and abundance index for tuning.	Data source*	
Method of assessment*	Virtual Population Analysis (VPA) with Laurec-Shepherd tuning.	Software used*	Darby C.D., Flatman S. 1994.

**Sheets filled out**

B	P1	P2a	P2b	G	A1	A2	A3	Y	Other	D	Z	C
1	---	#REF!	#REF!	#REF!	#REF!	#REF!	---	#REF!	#REF!	1	1	#REF!

**Comments, bibliography, etc.**

Patterson K. 1992. Fisheries for small pelagic species: an empirical approach to management targets. Review of Fish Biology and Fisheries, 2: 321-338.

Gislason H., N. Daan, J.C. Rice, J.G. Pope. 2008. Does natural mortality depend on individual size? ICES CM 2008/F:16.

Cardinale M., A. Abella, V. Bartolino, F. Colloca, J.M. Bellido, A. Di Natale, J.L. Bigot, F. Fiorentino, M. Garcia Rodriguez, M. Giannoulaki, G. Petrakis, L. Gil de Sola, G. Pilling, P. Martin, L.F. Quintanilla, M. Murenu, G.C. Osio, A. Santojanni, P. Sartor, M.T. Spedicato, V. Ticina, H.J. Rätz, A. Cheilari. 2008. Report of the SGMED-08-04 Working group on the Mediterranean, Part IV. Editors: Cardinale M., H.J. Rätz, A. Cheilari. EUR - Scientific and Technical Research Series. 728 pp.

Santojanni A. 2009. Comments on "Is anchovy (*Engraulis encrasicolus*, L.) overfished in the Adriatic Sea?" by Klanjscek and Legovic [Ecol. Model. 201 (2007): 312-316]. Ecological Modelling, 220: 430-433.

**Comments, bibliography, etc.**

Sheet #0 (page 2)



A large, empty rectangular box with a thin black border, occupying the majority of the page. This area is typically used for providing detailed responses or evidence during an assessment.

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

Assessment form

Sheet B  
Biology of the species

Code: PIL1709Doc

**Biology**

Somatic magnitude measured (LH, LC, etc)*				Total length.	Units*	cm
Sex	Fem	Mal	Both	Unsexed		
Maximum size observed					Reproduction season	
Size at first maturity					Reproduction areas	
Recruitment size					Nursery areas	

**Parameters used (state units and information sources)**

		Units	Sex			
			female	male	both	unsexed
Growth model	$L_{\infty}$					
	K					
	t0					
	Data source					
Length weight relationship	a					
	b					
	M					
	sex ratio (mal/fem)					

**Comments**

M at age (in years) estimated by Gislason's method:

Age	M
0	0.75
1	0.68
2	0.58
3	0.53
4	0.49
5	0.47
6	0.43
7	0.42
8	0.42
9	0.41

A large, empty rectangular box with a thin black border, intended for entering comments.

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

Assessment form

Sheet P1

General information about the fishery

Code: PIL1709Doc

<b>Data source*</b>	<b>Year (s)*</b> 1975-2008
Data aggregation (by year, average figures between years, etc.)*	Catch data are relative to the total fleet (Italy, Croatia, Slovenia).

### Fleet and catches (please state units)

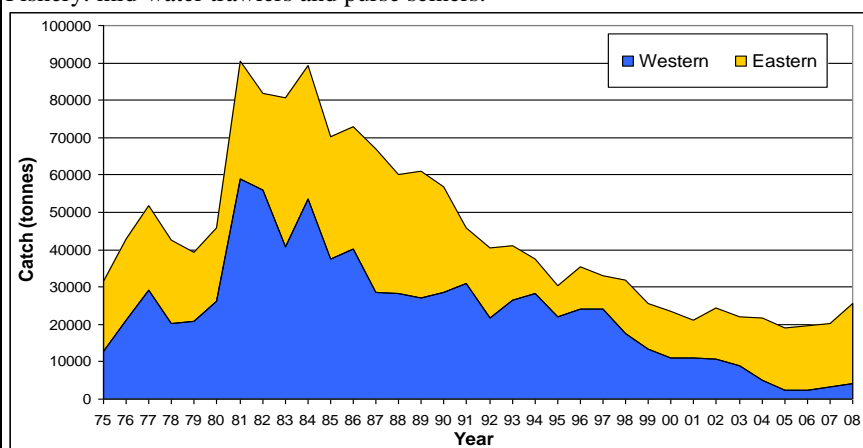
	Country	GSA	Fleet Segment	Fishing Gear Class	Group of Target Species	Species
Operational Unit 1*						
Operational Unit 2						
Operational Unit 3						
Operational Unit 4						
Operational Unit 5						

Operational Units*	Fleet (n° of boats)*	Kilos or Tons	Catch (species assessed)	Other species caught	Discards (species assessed)	Discards (other species caught)	Effort units
Total							

Legal minimum size

### Comments

Fishery: mid-water trawlers and purse seiners.



Total catch for both western and eastern sides of Adriatic.

Comments

**Comments**

[Empty rectangular box for comments]

<b>SAC GFCM - Sub-Committee on Stock Assessment (SCSA)</b>	
Assessment form	Sheet A1 Indirect methods: VPA, LCA

Sex*	M+F
------	-----

Code: PIL1709Doc
#REF!

Analysis # *	VPA
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**Time series**

Data	Size	Age
(mark with X)		x

Model	Cohorts	Pseudocohorts
(mark with X)	x	

Equation used		Tuning method	Laurec-Shepherd
# of gears		Software	Darby C.D., Flatman S. 1994.
$F_{terminal}$			

**Population results (please state units)**

	Sizes	Ages		Amount	Biomass
Minimum			Recruitment		
Average			Average population		
Maximum			Virgin population		
Critical			Turnover		

**Average mortality**

	Total	Gear				
$F_1$						
$F_2$						
Z						

(F1 and F2 represent different possible calculations. Please state them)

**Comments**

Tuning on abundance (number) at age derived from echo-surveys carried out in both western and eastern sides of Adriatic (since year 2004).

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

Assessment form

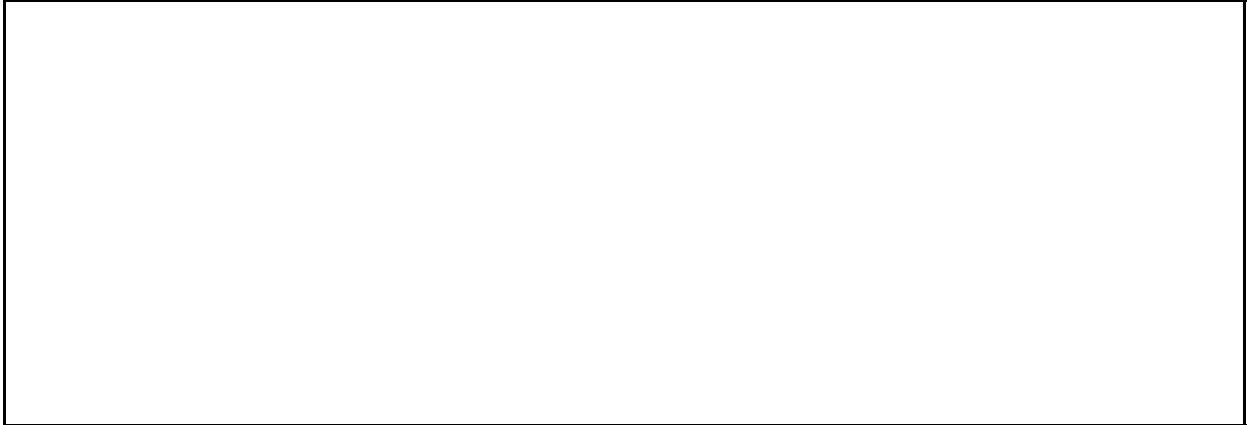
Sheet A3  
Indirect methods: VPA results

Code: PIL1709Doc

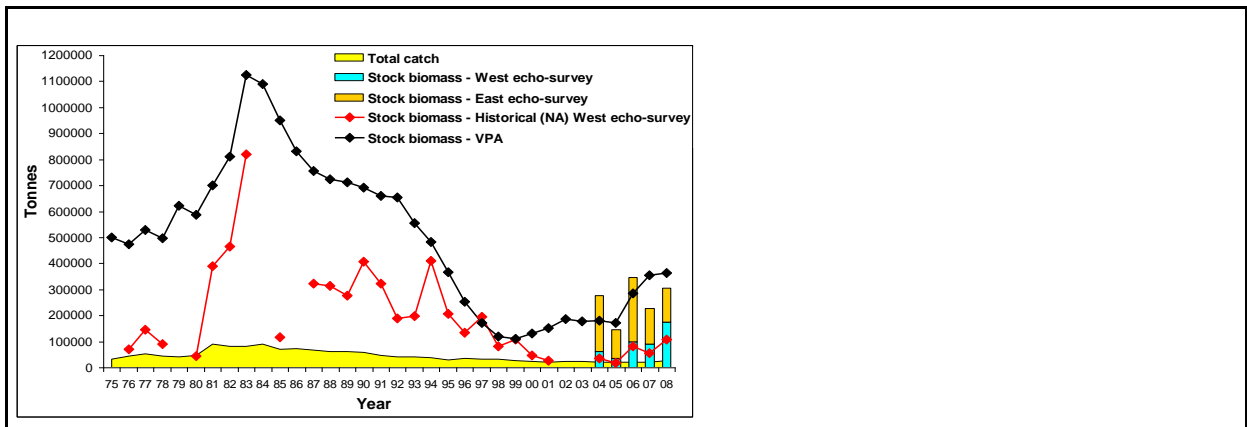
#REF!

Sex*		Gear*		Analysis #*	
------	--	-------	--	-------------	--

**Population in figures**



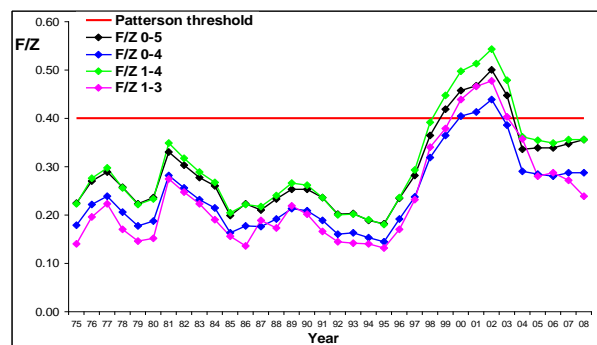
**Population in biomass**



**Fishing mortality rates**

	1975 - 08	1999 - 08	2006 - 08
Age 0	0,01	0,01	0,01
Age 1	0,07	0,09	0,03
Age 2	0,22	0,41	0,19
Age 3	0,4	0,8	0,57
Age 4	0,55	0,89	0,83
Age 5	0,62	1,1	0,91
Age 6+	0,62	1,1	0,91

Average fishing mortality at age for three different time intervals from VPA.



Exploitation rate F/Z over years from VPA.

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

Assessment form

Sheet D  
Diagnosis

Code: PIL1709Doc

**Indicators and reference points**

Criterion	Current value	Units	Reference Point	Trend	Comments
B					
SSB					
F					
Y					
CPUE					
F/Z					

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

<b>Unidimensional</b>	<input type="radio"/>	? - (or blank) Not known or uncertain. Not much information is available to make a judgment;
	<input type="radio"/>	U - Underexploited, undeveloped or new fishery. Believed to have a significant potential for expansion in total production;
	<input type="radio"/>	M - Moderately exploited, exploited with a low level of fishing effort. Believed to have some limited potential for expansion in total production;
	<input checked="" type="radio"/>	F - Fully exploited. The fishery is operating at or close to an optimal yield level, with no expected room for further expansion;
	<input type="radio"/>	O - Overexploited. 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="radio"/>	D - Depleted. Catches are well below historical levels, irrespective of the amount of fishing effort exerted;
	<input type="radio"/>	R - Recovering. 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="radio"/>	No or low fishing	<input type="radio"/>	Virgin or high abundance
	<input type="radio"/>	Moderate fishing	<input type="radio"/>	Intermediate abundance
	<input type="radio"/>	High fishing mortality	<input type="radio"/>	Low abundance
	<input type="radio"/>	Uncertain / Not assessed	<input type="radio"/>	Depleted
			<input type="radio"/>	Uncertain / Not assessed



**Comments**

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

Assessment form

Sheet Z

Objectives and recommendations

Code: PIL1709Doc

**Management advice and recommendations\***

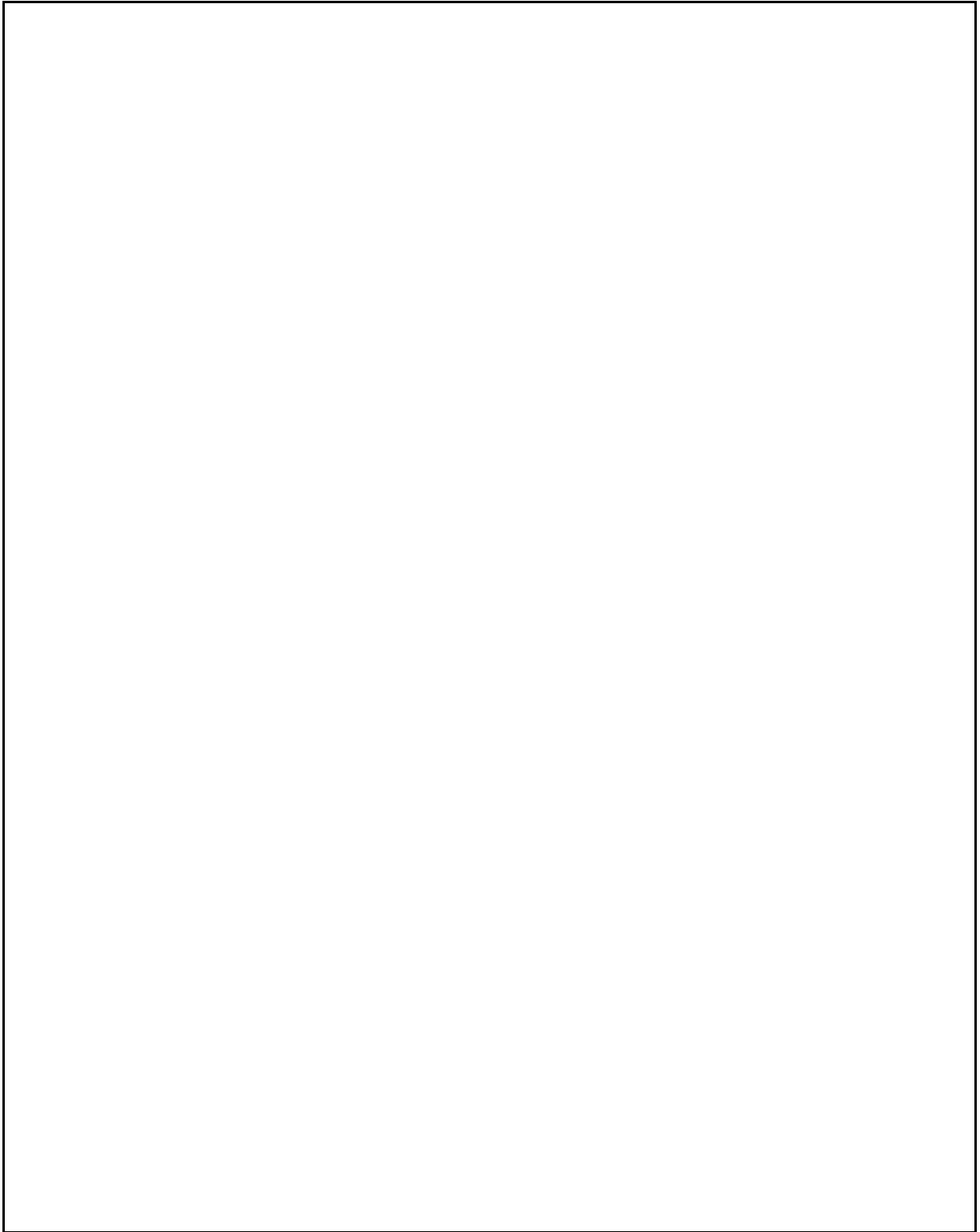
The recent exploitation rate  $F/Z$  is under the Patterson's threshold 0.4. However, this pattern is less evident than in the case of anchovy (see ad hoc form) and, what is more, the values of  $F/Z$  were around/over the threshold in the time interval 1999-2003. In particular, since the end of the 1990s, the values of  $F$  were estimated as quite high for the oldest age classes. Thus, the sardine stock could be considered as fully exploited.

In addition, a strong decline of stock biomass occurred after the peak in the first half of the 1980s. This decline was continuous till the end of the 1990s. Then, a partial recovery was observed. Finally, in comparison with previous assessments, more conservative natural mortality rates (i.e.  $M = 0.5$  for all age classes) were not used in the present analysis.

It should be noted that Adriatic small pelagic fishery is multispecies and effort on anchovy cannot be separated from effort on sardine, so that most of the management decisions should be taken considering both species.

In conclusion, it is recommended not to increase the fishing effort in next future.

**Advice for scientific research\***



## Abstract for SCSA reporting

**Authors**

Document prepared by the AdriaMed working group for small pelagics coordinated by Santojanni A. and Cingolani N.

**Year**

2009

**Species Scientific name**

Sardina pilchardus - PIL

Source: GFCM Priority Species

Source: -

Source: -

**Geographical Sub-Area**

17 - Northern Adriatic

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

**Source of management advice\***

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

**Stock Status\***

F - Fully exploited. The fishery is operating at or close to an optimal yield level, with no expected room for further expansion;

**Exploitation rate**

**Stock abundance**

**Comments**

### Management advice and recommendations\*

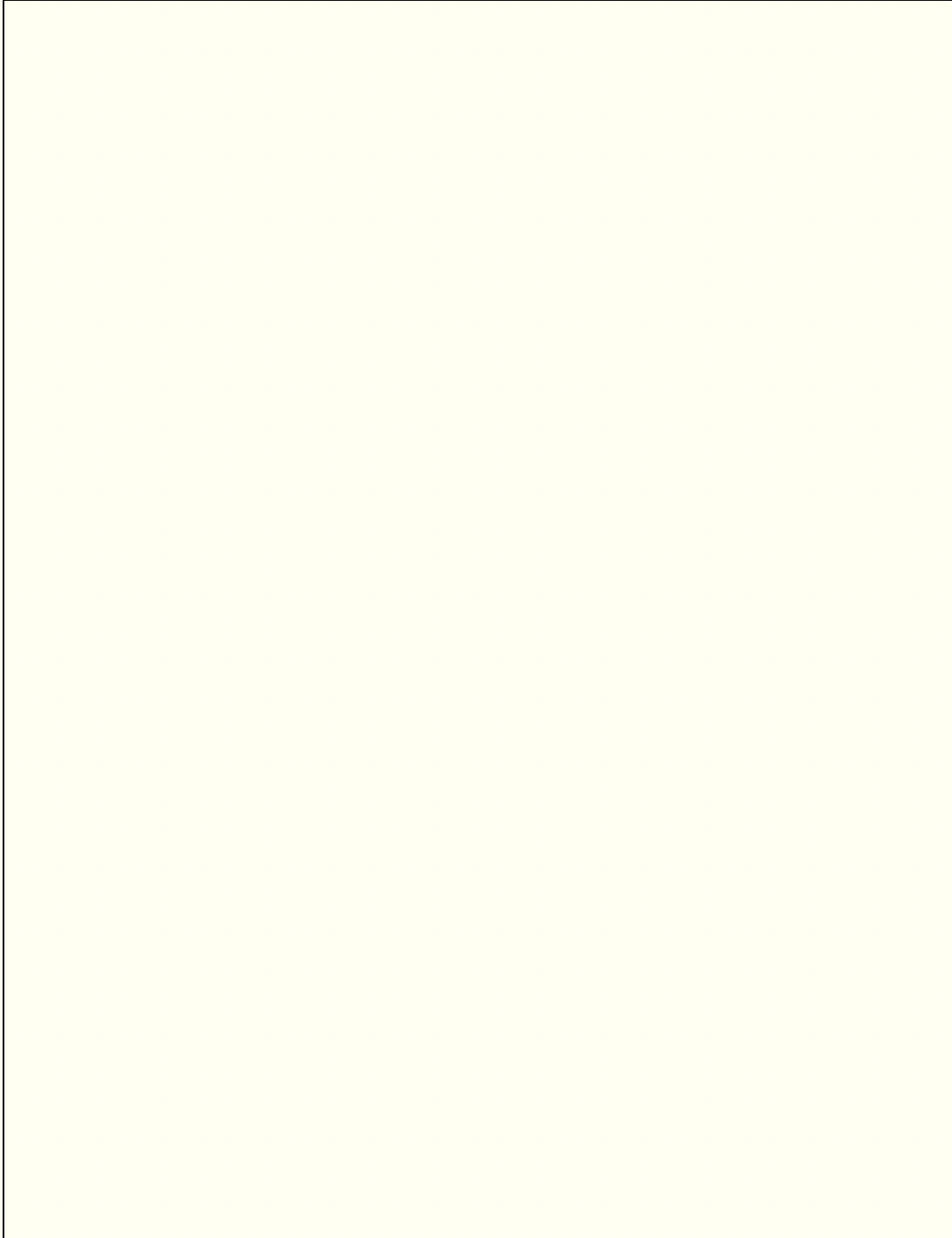
The recent exploitation rate  $F/Z$  is under the Patterson's threshold 0.4. However, this pattern is less evident than in the case of anchovy (see ad hoc form) and, what is more, the values of  $F/Z$  were around/over the threshold in the time interval 1999-2003. In particular, since the end of the 1990s, the values of  $F$  were estimated as quite high for the oldest age classes. Thus, the sardine stock could be considered as fully exploited.

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It should be noted that Adriatic small pelagic fishery is multispecies and effort on anchovy cannot be separated from effort on sardine, so that most of the management decisions should be taken considering both species.

In conclusion, it is recommended not to increase the fishing effort in next future.

**Advice for scientific research\***



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

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Assessment of Sardine (*Sardina pilchardus* - PIL ) from 17 - Northern Adriatic. Document prepared by the AdriaMed working group for small pelagics coordinated by Santojanni A. and Cingolani N.

Acknowledgements: Leonori I., Belardinelli A., Campanella F., Carpi P., Colella S., De Felice A., Donato F., Panfili M., Marceta R., Modic T., Plihersek K.

Description of fishery:

Source of management advice:

Exploitation rate:

Stock abundance:

Comments:

Management advice and recommendation: The recent exploitation rate  $F/Z$  is under the Patterson's threshold 0.4. However, this pattern is less evident than in the case of anchovy (see ad hoc form) and, what is more, the values of  $F/Z$  were around/over the threshold in the time interval 1999-2003. In particular, since the end of the 1990s, the values of  $F$  were estimated as quite high for the oldest age classes. Thus, the sardine stock could be considered as fully exploited.

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Advice for scientific research:



