



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



SAC GFCM
Sub-Committee on Stock Assessment

SCSA Assessment Forms

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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 1st 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

Date*	25	November	2009	Code*	ANE1709Doc
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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 *Engraulis encrasicolus* - **ANE**
 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: ANE1709Doc

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*	Engraulis encrasicolus - ANE	Species common name*	Anchovy
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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 most of the page. It is intended for the user to provide a response or answer to a question.

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

Assessment form

Sheet B
Biology of the species

Code: ANE1709Doc

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_{∞}					
	K					
	t0					
	Data source					
Length weight relationship	a					
	b					
	M					x
	sex ratio (mal/fem)					

Comments

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

Age	M
0	1.02
1	0.82
2	0.67
3	0.57
4	0.54

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: ANE1709Doc

Data source*	Year (s)* 1975-2008
Data aggregation (by year, average figures between years, etc.)*	Catch data are relative to the total fleet (Italy, Croatia, Slovenia). Split-year was used assuming the first of June as the birth date of anchovy, e.g. split-year 2008 was formed by Jun-Dec of 2007 and Jan-May 2008.

Fleet and catches (please state units)

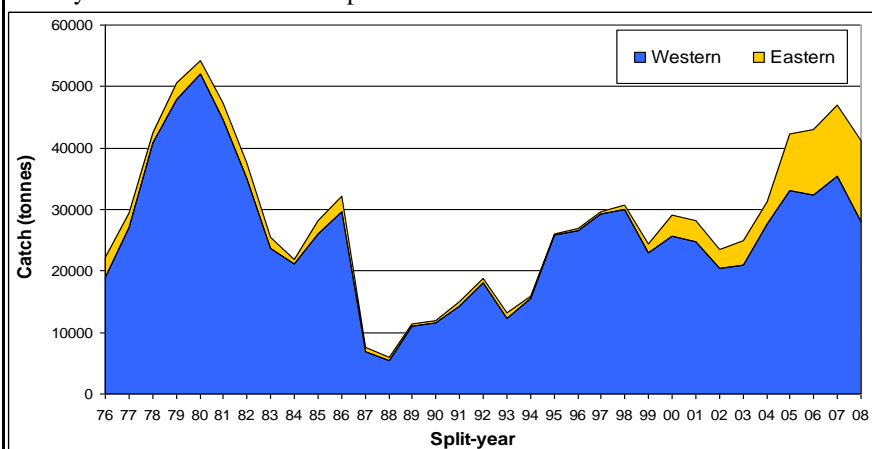
	Country	GSA	Fleet Segment	Fishing Gear Class	Group of Target Species	Species
Operational Unit 1*						
Operational Unit 2						
Operational Unit 3						
Operational Unit 4						
Operational Unit 5						

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]

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

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

Code: ANE1709Doc
#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).

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Assessment form

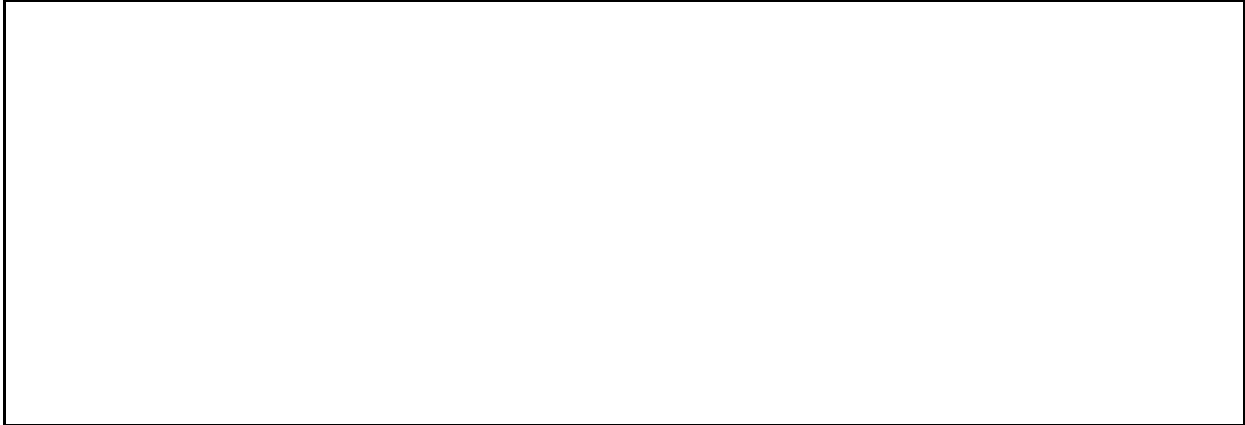
Sheet A3
Indirect methods: VPA results

Code: ANE1709Doc

#REF!

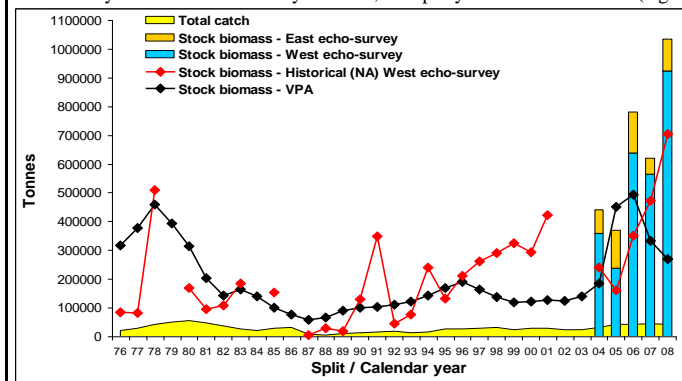
Sex*		Gear*		Analysis #*	
------	--	-------	--	-------------	--

Population in figures



Population in biomass

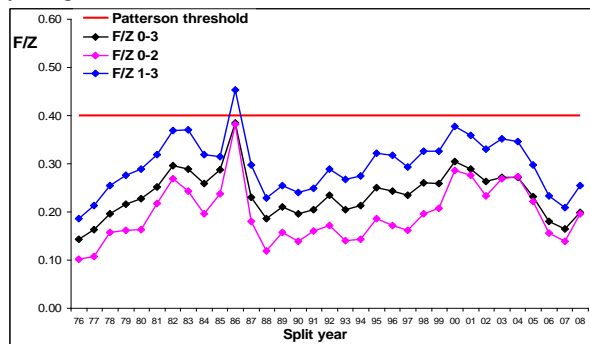
Echo-survey data are on calendar year basis, i.e. split year commercial data (e.g. catch at age) in 2008 are associated to echo-survey in 2007.



Fishing mortality rates

	1976 - 2008	1999 - 2008	2006 - 2008
Age 0	0,06	0,05	0,03
Age 1	0,24	0,3	0,14
Age 2	0,32	0,41	0,32
Age 3	0,34	0,25	0,17
Age 4+	0,34	0,25	0,17

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: ANE1709Doc

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

Unidimensional	<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 checked="" 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 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;

Bidimensional	Exploitation rate		Stock abundance	
	<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: ANE1709Doc

Management advice and recommendations*

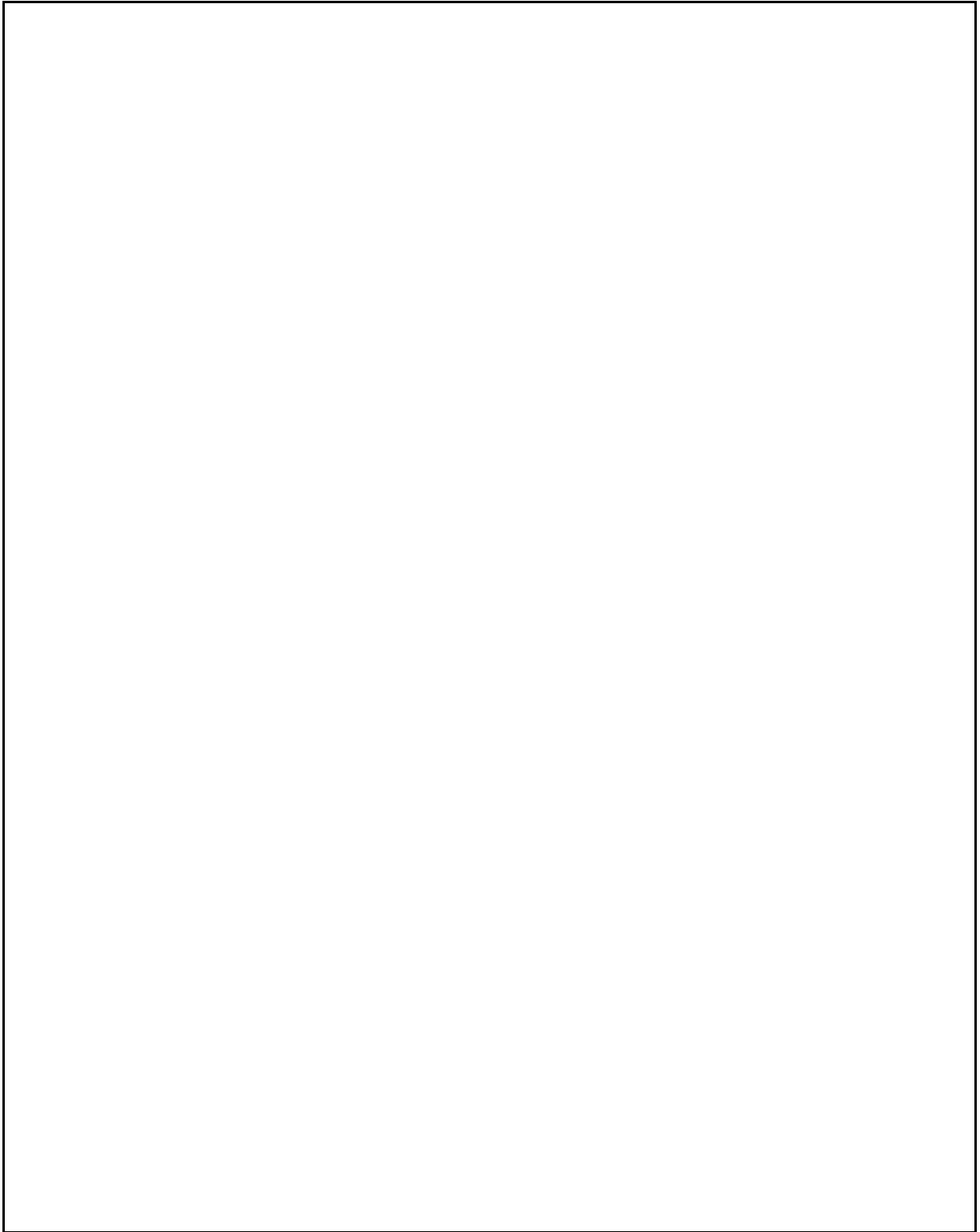
The recent exploitation rate F/Z is well under the Patterson's threshold 0.4. Thus, anchovy stock could be considered as moderately exploited.

However, strong changes over time are commonly observed in the abundance of small pelagics, in particular anchovies (Jacobson et al., 2001). In the past, the biomass of this stock dropped at very low level in 1987 with consequent crisis of Italian fishery. After this collapse, recovery took place, but fluctuations still occurred, in particular in recent years. Moreover, an increase was observed in the total catch of most recent years. Finally, in comparison with previous assessments, precautionary natural mortality rates (i.e. $M = 0.6$ 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

Engraulis encrasicolus - ANE

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*

M - Moderately exploited, exploited with a low level of fishing effort. Believed to have some limited potential for expansion in total production;

Exploitation rate

Stock abundance

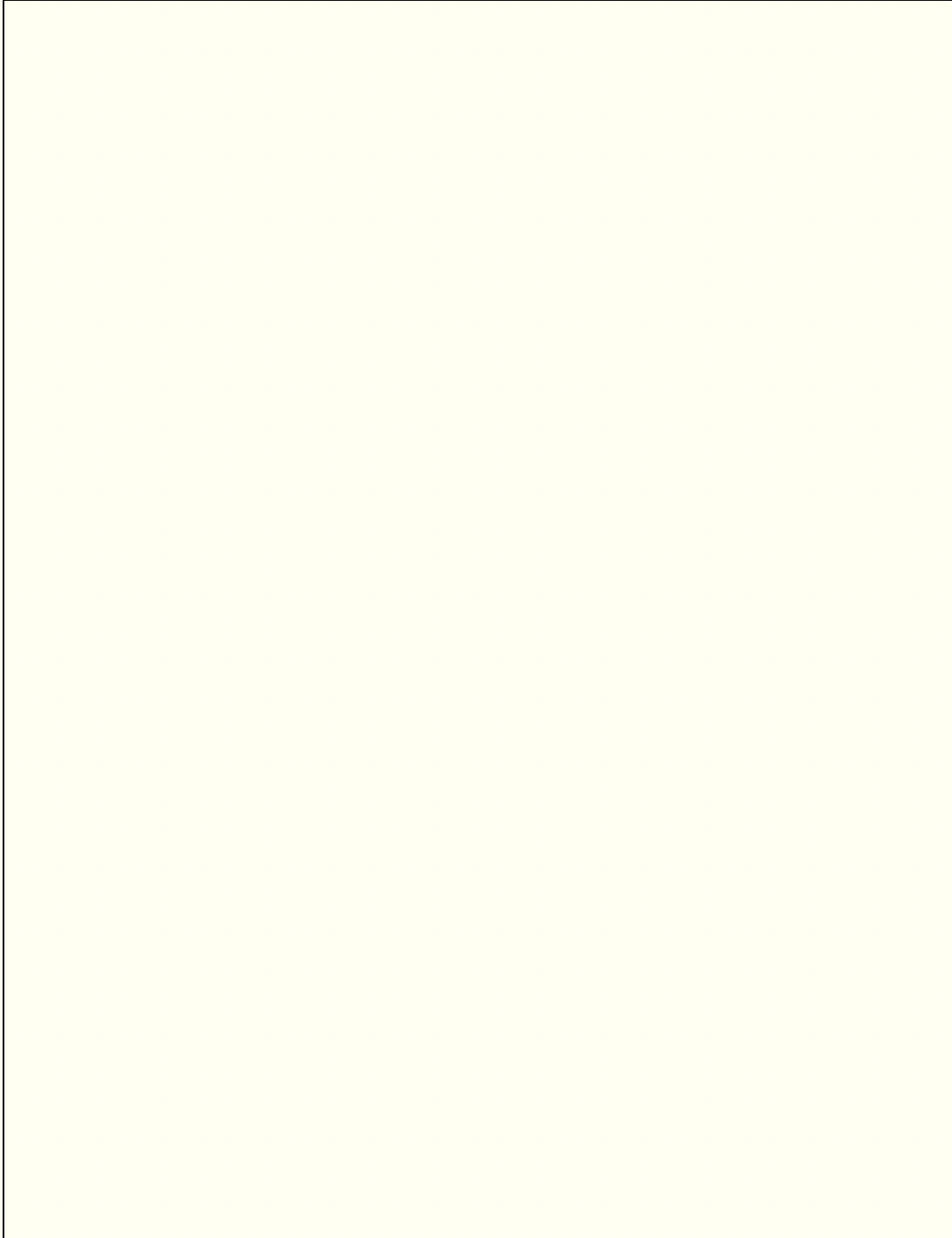
Comments

Management advice and recommendations*

The recent exploitation rate F/Z is well under the Patterson's threshold 0.4. Thus, anchovy stock could be considered as moderately exploited.

However, strong changes over time are commonly observed in the abundance of small pelagics, in particular anchovies (Jacobson et al., 2001). In the past, the biomass of this stock dropped at very low level in 1987 with consequent crisis of Italian fishery. After this collapse, recovery took place, but fluctuations still occurred, in particular in recent years. Moreover, an increase was observed in the total catch of most recent years. Finally, in comparison with previous assessments, precautionary natural mortality rates (i.e. $M = 0.6$ 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*



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

Assessment of Anchovy (*Engraulis encrasicolus* - ANE) 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, Carni P, Colella S, De Felice A

Description of fishery:

Source of management advice:

Exploitation rate:

Stock abundance:

Comments:

Management advice and recommendation: The recent exploitation rate F/Z is well under the Patterson's threshold 0.4. Thus, anchovy stock could be considered as moderately exploited.

However, strong changes over time are commonly observed in the abundance of small pelagics, in particular anchovies (Jacobson et al., 2001). In the past, the biomass of this stock dropped at very low level in 1987 with consequent crisis of Italian fishery. After this collapse, recovery took place, but fluctuations still occurred, in particular in recent years. Moreover, an increase was observed in the total catch of most recent years. Finally, in comparison with previous assessments, precautionary natural mortality rates (i.e. $M = 0.6$ for all age classes) were not used in the present analysis.

Advice for scientific research:

