

SAC GFCM

Subcommittee of Stock Assessment

Date*

6

November

2010

Code*

ANE1610Pat

Authors*

Patti B., Quinci E., Bonanno A., Basilone G., Mazzola S.

Affiliation*

IAMC-CNR, Mazara del Vallo (TP), Italy

Species Scientific name*

Engraulis encrasicolus - ANE

Source: GFCM Priority Species

Geographical area*

Central Mediterranean - Strait of Sicily

Geographical Sub-Area (GSA)*

16 - South of Sicily

Combination of GSAs

1

2

3

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Assessment form

Sheet #0

Basic data on the assessment

Code: ANE1610Pat

Date*	6	Nov	2010	Authors*	Patti B., Quinci E., Bonanno A., Basilone G., Mazzola S.
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Species Scientific name*	Engraulis encrasicolus - ANE	Species common name*	Anchovy
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Data Source

GSA*	16 - South of Sicily	Period of time*	1998-2009
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Description of the analysis

Type of data*	Landings, Acoustics, DEPM (only for years 1998, 2000-2001, 2005-2006)	Data source*	Database of IAMC-CNR, Capo Granitola-Campobello di Mazara (TP), ITALY.
Method of assessment*	Comparison of acoustics biomass estimates and estimated landings	Software used*	No specific stock assessment software was used

Sheets filled out

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

Comments, bibliography, etc.

Patti B., Bonanno A., Basilone G., Goncharov S., Mazzola S., Buscaino G., Cuttitta A., García Lafuente J., García A., Palombo V., Cosimi G. (2004). Interannual fluctuations in acoustic biomass estimates and in landings of small pelagic fish populations in relation to hydrology in the Strait of Sicily. *Chemistry and Ecology*, 20(5): 365-375.

Basilone G., Guisande C., Patti B., Mazzola S., Cuttitta A., Bonanno A., Kallianiotis A. (2004). Linking habitat conditions and growth in the European anchovy (*Engraulis encrasicolus*). *Fishery Research*, 68, 9-19.

Graphs for diagnostics are in the previous sheet ("Other"). DEPM biomass estimates for years 1998, 2000, 2001, 2005 and 2006 are also given for comparison purposes. The assessment relies on the assumption of acoustic surveys providing absolute estimates of biomass at sea (tonnes). This assumption can be partly tested by confronting those estimates with the DEPM estimates for some years. In general DEPM estimates were quite close to the acoustics. So the former assumption is considered to be globally acceptable.

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Sheet B
Biology of the species

Code: ANE1610Pat

Biology

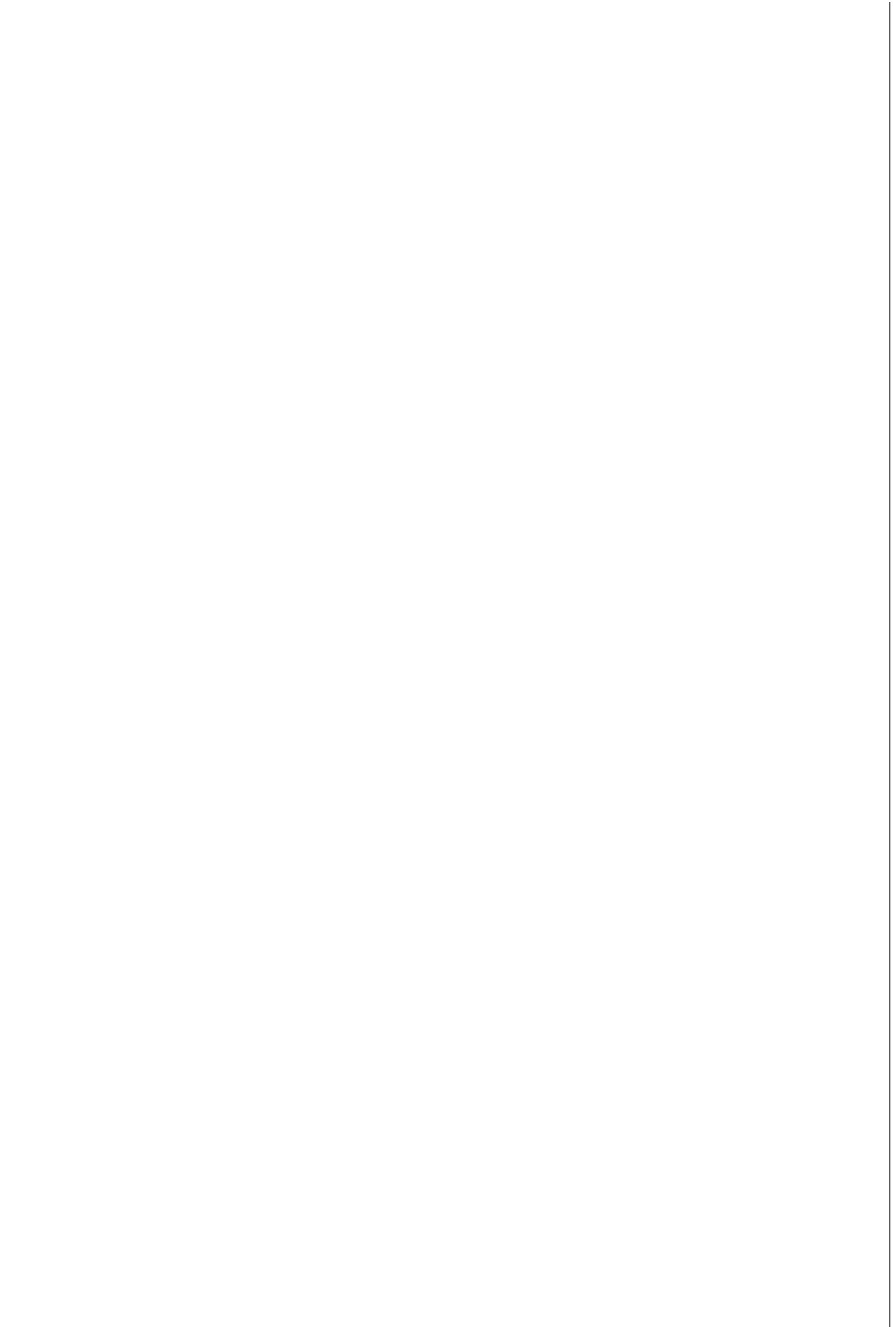
Somatic magnitude measured (LH, LC, etc)*				LT		Units*	cm
Sex	Fem	Mal	Both	Unsexed			
Maximum size observed				18.0	Reproduction season	Spring-Summer	
Size at first maturity				11.2	Reproduction areas	South Sicilian Shelf	
Recruitment size				9.0	Nursery areas	Cape Passero area	

Parameters used (state units and information sources)

Sex	M	F	O					
Growth model	VBGF	VBGF	VBGF					
Data source	Samples	Samples	Samples					
L_{∞} (growth)	17.5	18.6	18.6					
K (growth)	0.33	0.29	0.30					
t_0 (growth)	-1.87	-1.94	-1.81					
length-weight								
a (length-weight)			0.0089					
b (length-weight)			2.98					
sex ratio	22920	22456	1.02					
M			0.66	Pauly (1980) empirical relationship				

Comments

VBGF parameters from Basilone et al. (2004). Linking habitat conditions and growth in the European anchovy (*Engraulis encrasicolus*). Fishery Research, 68, 9-19.



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Sheet P1

General information about the fishery

Code: ANE1610Pat

Data source*	Port of Sciacca	Year (s)*	1998-2009
Data aggregation (by year, average figures between years, etc.)*	by year, average 1998-2009		

Fleet and catches (please state units)

	Country	GSA	Fleet Segment	Gear Class
Operational Unit 1*	ITA	16	H - Purse Seine (12-24 metres)	01 - Surrounding Nets
Operational Unit 2	ITA	16	J - Pelagic Trawl (12-24 metres)	03 - Trawls
Operational Unit 3				
Operational Unit 4				
Operational Unit 5				

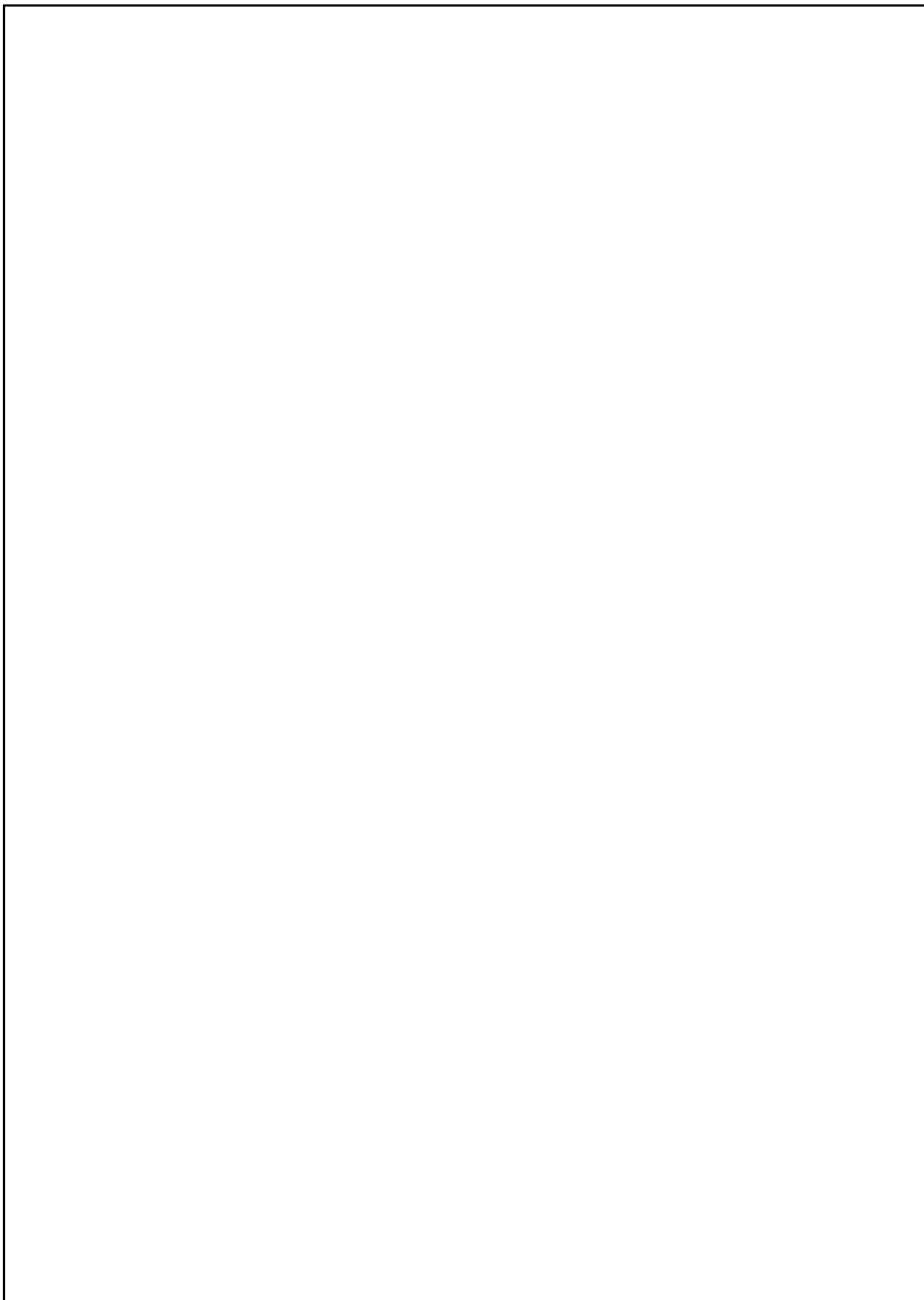
Operational Units*	Fleet (n° of boats)*	Catch (species assessed)	Other species caught	Discards (species assessed)	Discards (other species caught)	Effort units
ITA 16 H 01	17	711 t	sardine	negligible	negligible	fishing
ITA 16 J 03	30	1,024 t	sardine	negligible	negligible	fishing
	* Dec 2006 census data	ave 1997-2009				
Total	47	1,735 t				

Legal minimum size	9 cm
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Comments

Landing data from Sciacca port are reported here because of its importance (it accounts for about 2/3 of total landings) in GSA 16 and the availability of a longer time series (1998-2009) compared to the official data for the whole GSA 16 (2002-2009).

A fry fishery is also operating in GSA16 for two months, during the winter (approximately during February-March).



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Sheet P2a
Fishery by Operational Unit

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Data source*	Port of Sciacca	OpUnit 1*	ITA 16 H 01
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Time series

Year*	1998	1999	2000	2001	2002	2003
Catch	885	81	619	830	627	318
Minimum size						
Average size L_c						
Maximum size						
Fleet						

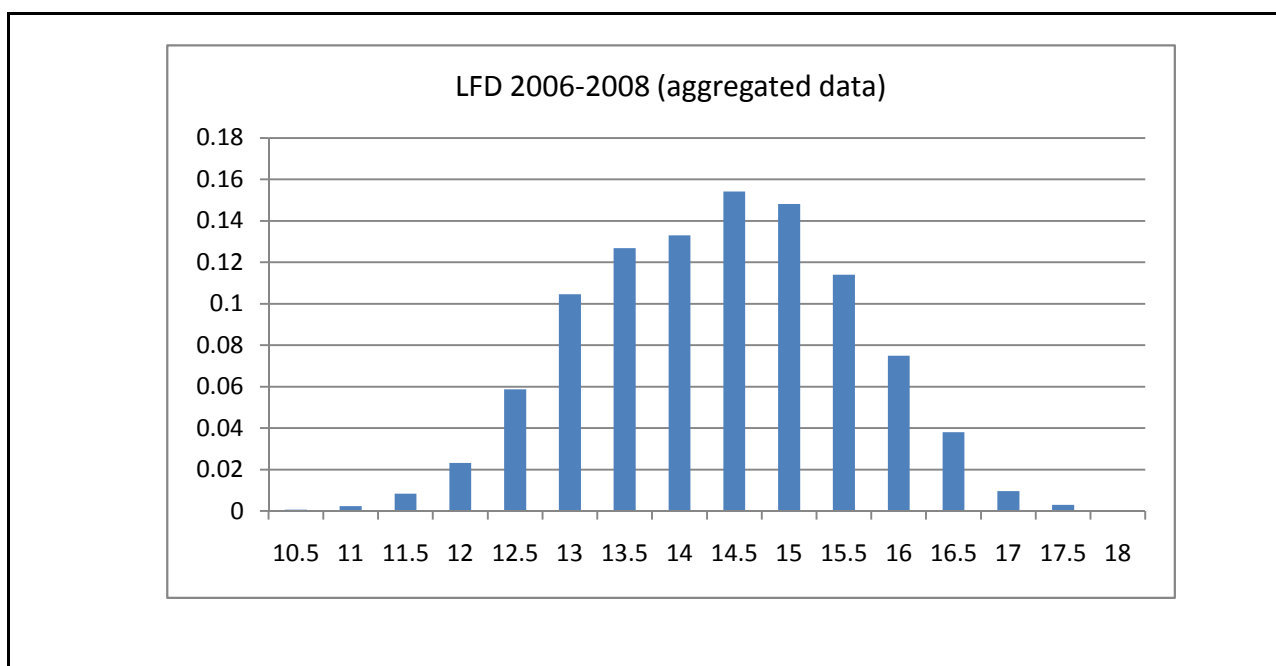
Year	2004	2005	2006	2007	2008	2009
Catch	781	660	1553	224	1469	799
Minimum size						
Average size L_c						
Maximum size						
Fleet						

Selectivity

Remarks

L ₂₅		
L ₅₀		
L ₇₅		
Selection factor		

Structure by size or age



years 2006-08 from DCR. LFD take into account both O.U. operating in GSA16.

TL	2006	2007	2008
10.5	0.2	0.0	0.0
11	0.5	0.1	0.1
11.5	1.9	0.6	0.1
12	5.7	1.1	0.2
12.5	12.2	3.6	1.9
13	16.7	8.4	6.2
13.5	16.9	13.7	7.4
14	13.8	18.1	8.0
14.5	13.5	19.6	13.1
15	8.3	16.0	20.1
15.5	5.4	9.7	19.2
16	3.0	6.1	13.4
16.5	1.5	2.3	7.7
17	0.4	0.8	1.7
17.5	0.0	0.0	0.9
18	0.0	0.0	0.1

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Sheet P2a
Fishery by Operational Unit

Code: ANE1610Pat

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Data source*	Port of Sciacca	OpUnit 2*	ITA 16 J 03
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Time series

Year*	1998	1999	2000	2001	2002	2003
Catch	477	46	466	1482	851	718
Minimum size						
Average size L_c						
Maximum size						
Fleet						

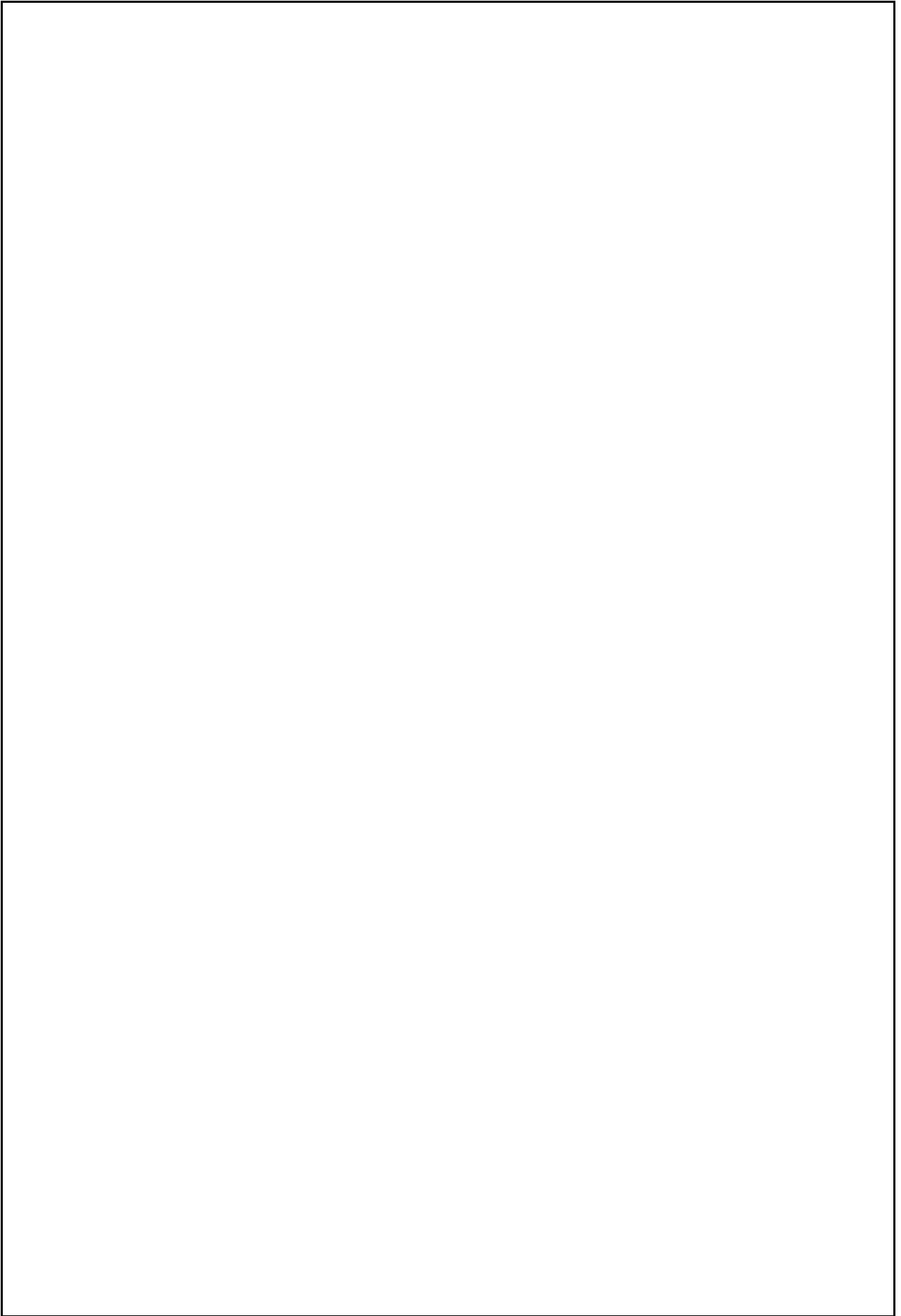
Year	2004	2005	2006	2007	2008	2009
Catch	813	2181	1656	484	1400	2617
Minimum size						
Average size L_c						
Maximum size						
Fleet						

Selectivity

Remarks

L ₂₅		
L ₅₀		
L ₇₅		
Selection factor		

Structure by size or age



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Sheet P2b
Fishery by Operational Unit

Code: ANE1610Pat

Page 1 /

Data source*

OpUnit 1*

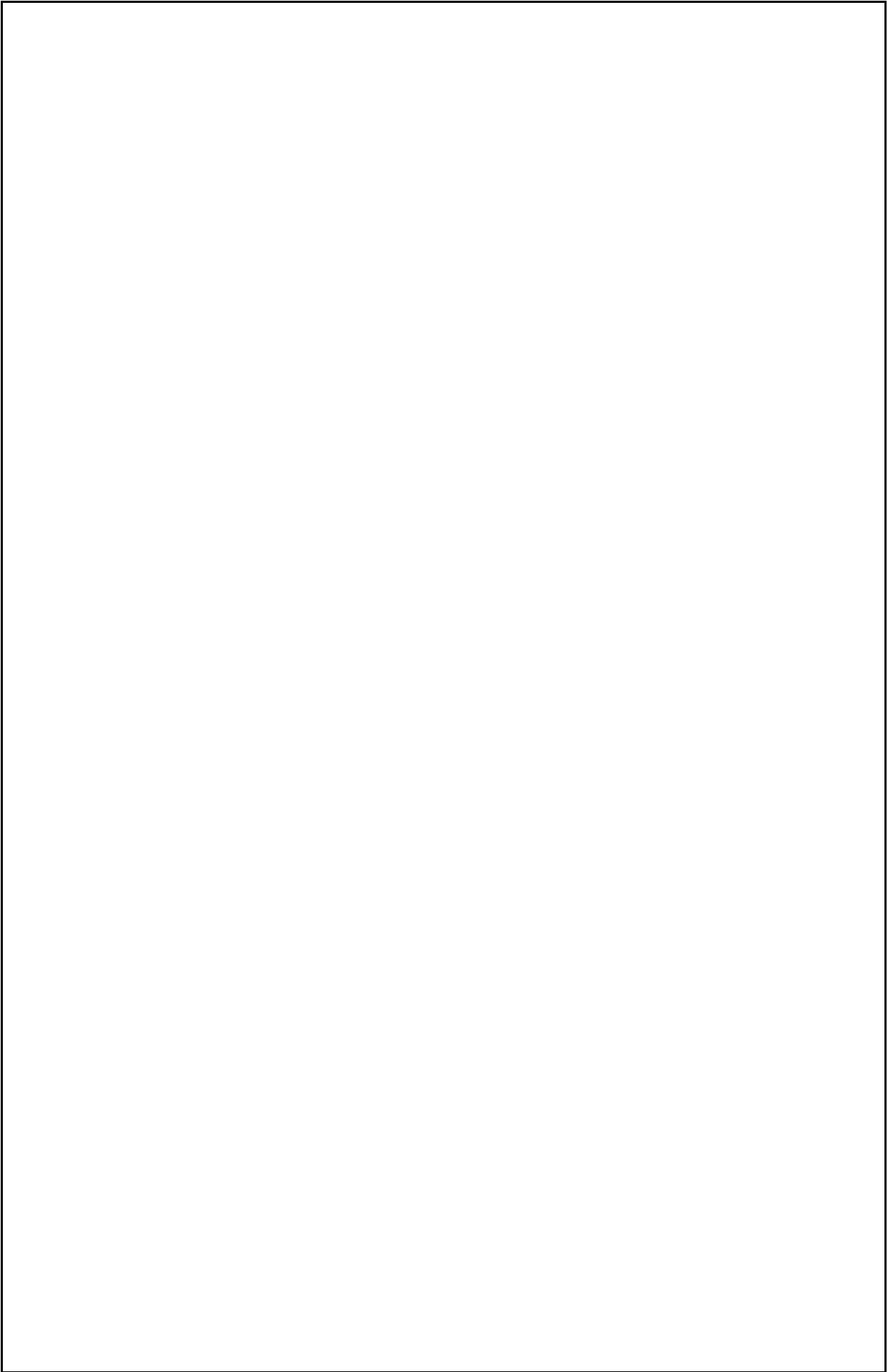
ITA 16 H 01

Regulations in force and degree of observance of regulations

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Accompanying species

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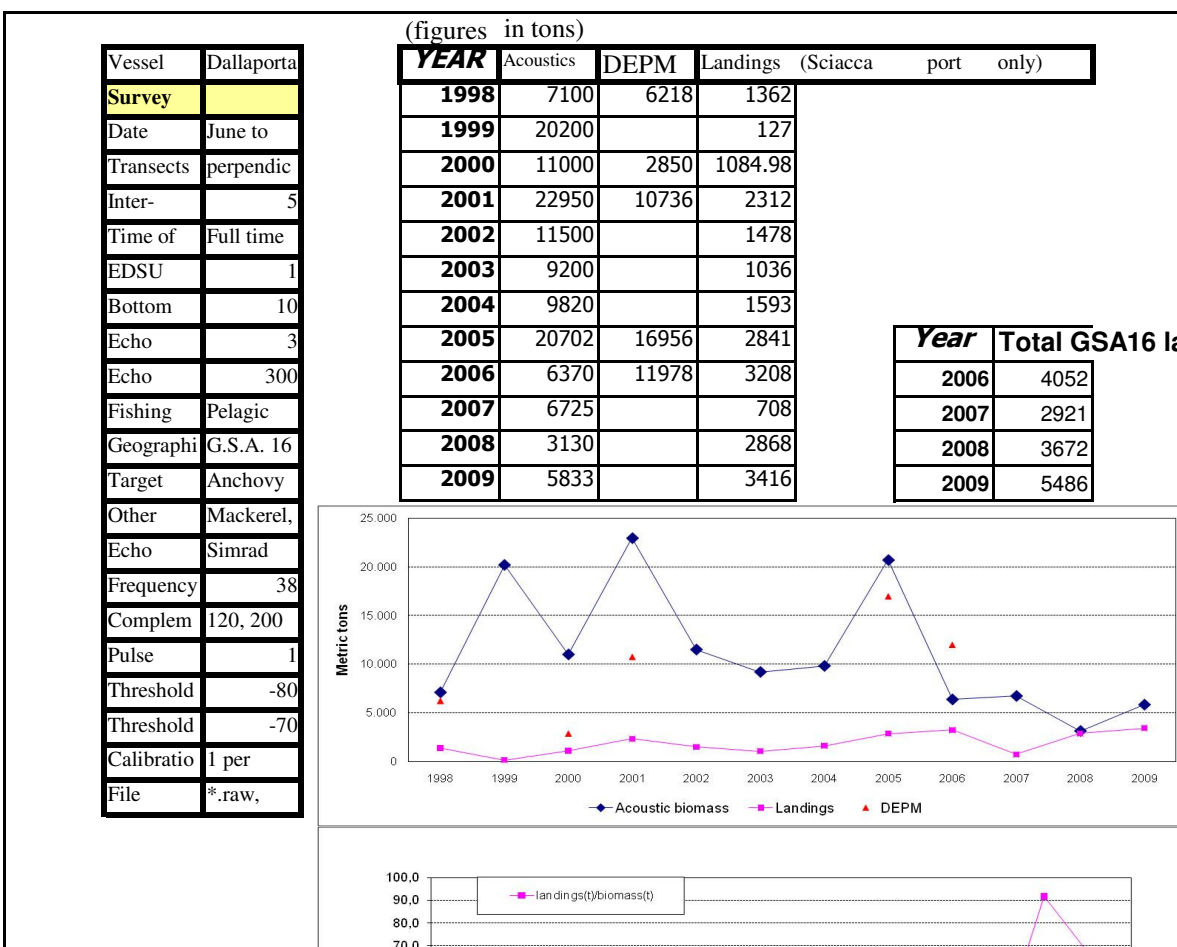
Sheet other

Code: ANE1610Pat

Other assessment methods

Acoustics

Vessel: R/V Dallaporta
 Date: June to September
 Transects design: perpendicular to bathymetry
 Area covered: 2500 nm²
 Inter-transect distance (nm): 5
 Time of day: Full time
 EDSU (nm): 1
 Bottom depth (min, m): 10
 Echo sounding depth (min, m): 3
 Echo sounding depth (max, m): 300
 Fishing gear: Pelagic trawl
 Geographic area: G.S.A. 16 (1998-2010), 15 (2004-2010)
 Target species: Anchovy and Sardine
 Other species: Mackerel, Sardinella Horse mackerel
 Echo sounder: Simrad Ek-60
 Frequency for assessment (kHz): 38
 Complementary frequencies (kHz): 120, 200
 Pulse duration (ms): 1
 Threshold for acquisition (db): -80
 Threshold for assessment (db): -70
 Calibration (No per survey): 1 per survey
 File format: * .raw * .bat * .idy



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Sheet D
Diagnosis

Code: ANE1610Pat

Reference points

Criterion	Current value	Units	Reference Point	Trend	Comments
B					
SSB					
F					
Y					
CPUE					
Exploitation					
Exploitation	0.79			increasing	Average of the rates Landings(t)/Biomass(t) over the last four years (2006-2009). The exploitation rate is calculated using DCR data for the whole GSA16.

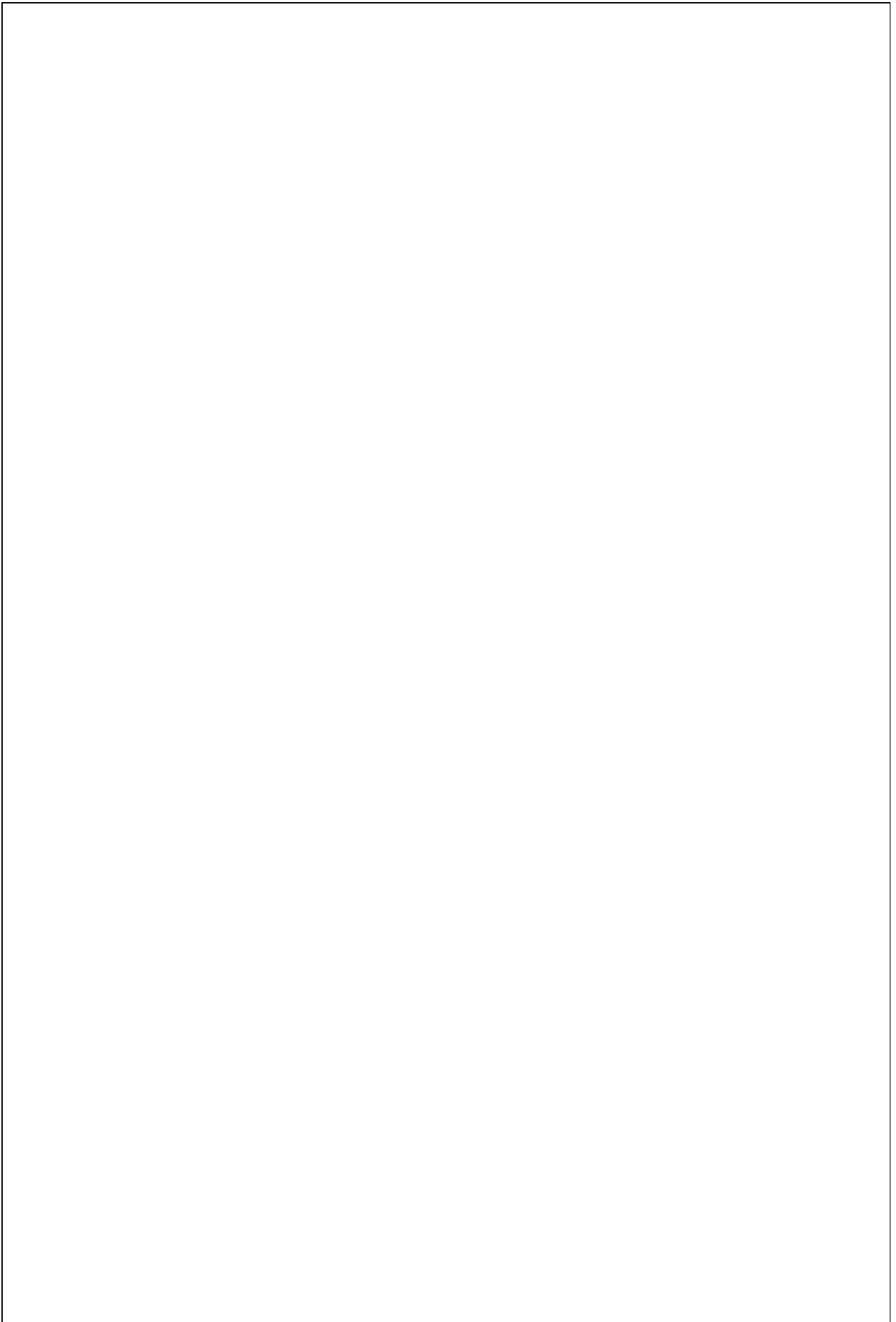
Stock Status* Use one (or both) of the following two systems for the stock assessment status description

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

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

Comments

Graphs for diagnostics are in the previous sheet ("Other"). DEPM biomass estimates for years 1998, 2000, 2001, 2005 and 2006 are also given for comparison purposes. The assessment relies on the assumption of acoustic surveys providing absolute estimates of biomass at sea (tonnes). This assumption can be partly tested by confronting those estimates with the DEPM estimates for some years. In general DEPM estimates were quite close to the acoustics. So the former assumption is considered to be globally acceptable.



Management advice and recommendations*

The series of biomass estimates for the anchovy population show a marked decreasing trend, despite quite large inter-annual fluctuations, from a maximum of about 22,900 t in 2001 to a minimum of 3,100 t in 2008. Latest biomass estimates (2006-2009 surveys) are the lowest of the series.

The stock biomass did not recover from the 2006 drop in biomass (-69% from July 2005 to June 2006), and also further decreased (-53%) in 2008. This fact, along with the quite high and increasing catches and exploitation rates but with high variability experienced over the last years, indicate that current levels of fishing effort may not be sustainable. In addition, negative effects on these populations could result from pressure of other fishing gears on pre-juvenile stages (locally known as "bianchetto" or "neonata"). This fishing activity is allowed for two months during the winter (February-March), so it essentially affects sardine but it may also be relevant for anchovy in case seasonal restrictions are not properly enforced.

Given that biomass was very low for four consecutive years (2006, 2007, 2008 and 2009) and the increasing trend in exploitation rate, fishing effort should not be allowed to increase.

Abstract for SCSA reporting

Authors	Patti B., Quinci E., Bonanno	Year	2010
Species Scientific name	Engraulis encrasicolus - ANE		
	Source: GFCM Priority Species		
Geographical Sub-Area	16 - South of Sicily		

Fisheries (brief description of the fishery)*

In Sciacca port, the most important base port for the landings of small pelagic fish species along the southern Sicilian coast (GSA16), explaining for about 2/3 of total landings in GSA 16, two operational units are presently active, purse seiners and pelagic pair trawlers. Average anchovy landings over the period (1997-2009) were about 1,700 metric tons, with large interannual fluctuations. Anchovy biomass, estimated by acoustic methods, ranged from a minimum of 3,100 tons in 2008 to a maximum of 23,000 tons in 2001.

Source of management advice*

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

Census data for catch and effort information (on deck interviews) in Sciacca port. Estimated landings (sampling data) for the whole GSA 16 from official DCR programme. Biological samples for fish biology information. Acoustic data for fish biomass evaluations.

Stock Status*

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Exploitation rate

High fishing mortality

Stock abundance

Low abundance

Comments

Graphs for diagnostics are in the previous sheet ("Other"). DEPM biomass estimates for years 1998, 2000, 2001, 2005 and 2006 are also given for comparison purposes. The assessment relies on the assumption of acoustic surveys providing absolute estimates of biomass at sea (tonnes). This assumption can be partly tested by confronting those estimates with the DEPM estimates for some years. In general DEPM estimates were quite close to the acoustics. So the former assumption is considered to be globally acceptable.

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