

SAC GFCM

Subcommittee of Stock Assessment

Date*

6	November	2010
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Code*

PIL1610Pat

Authors*

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

IAMC-CNR, Mazara del Vallo (TP), Italy
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Species Scientific name*

<i>Sardina pilchardus</i> - <i>PIL</i>
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Source: GFCM Priority Species

Geographical area*

Central Mediterranean - Strait of Sicily
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Geographical Sub-Area (GSA)*

16 - South of Sicily

Combination of GSAs

1
2
3

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Sheet #0

Basic data on the assessment

Code: PIL1610Pat

Date*	6	Nov	2010	Authors*	Patti B., Quinci E., Bonanno A., Basilone G., Mazzola S.
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Species Scientific name*	Sardina pilchardus - PIL	Species common name*	sardine
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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 and Acoustic biomass estimates.	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.

Graphs for diagnostics are in the previous sheet ("Other").
The assessments on the assumption of acoustic surveys providing absolute estimates of biomass at sea (tonnes).

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Sheet B
Biology of the species

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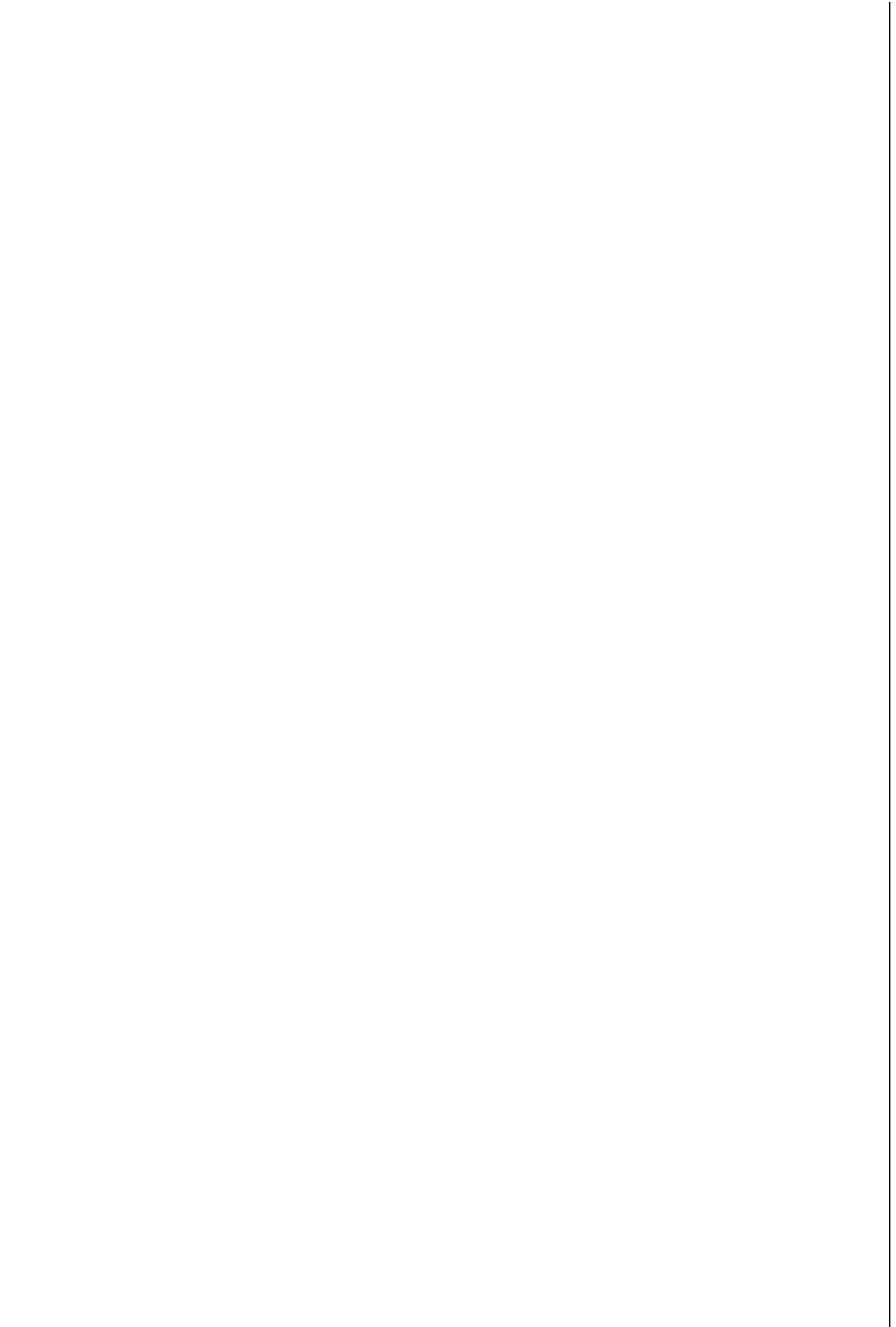
Biology

Somatic magnitude measured (LH, LC, etc)*		LT			Units*	cm
Sex	Fem	Mal	Both	Unsexed		
Maximum size observed				20.0	Reproduction season	Autumn - Winter
Size at first maturity	11.5	11.6	11.5		Reproduction areas	South Sicily
Recruitment size					Nursery areas	South Sicily

Parameters used (state units and information sources)

Sex	Both							
Growth model	VBGF							
Data source	Samples							
L_{∞} (growth)	20.5							
K (growth)	0.21							
t_0 (growth)	-4.26							
length-weight								
a (length-weight)	0.0028							
b (length-weight)	3.37							
sex ratio								
M	0.51							Pauly (1980) empirical relationship

Comments



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Sheet P1

General information about the fishery

Code: PIL1610Pat

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				

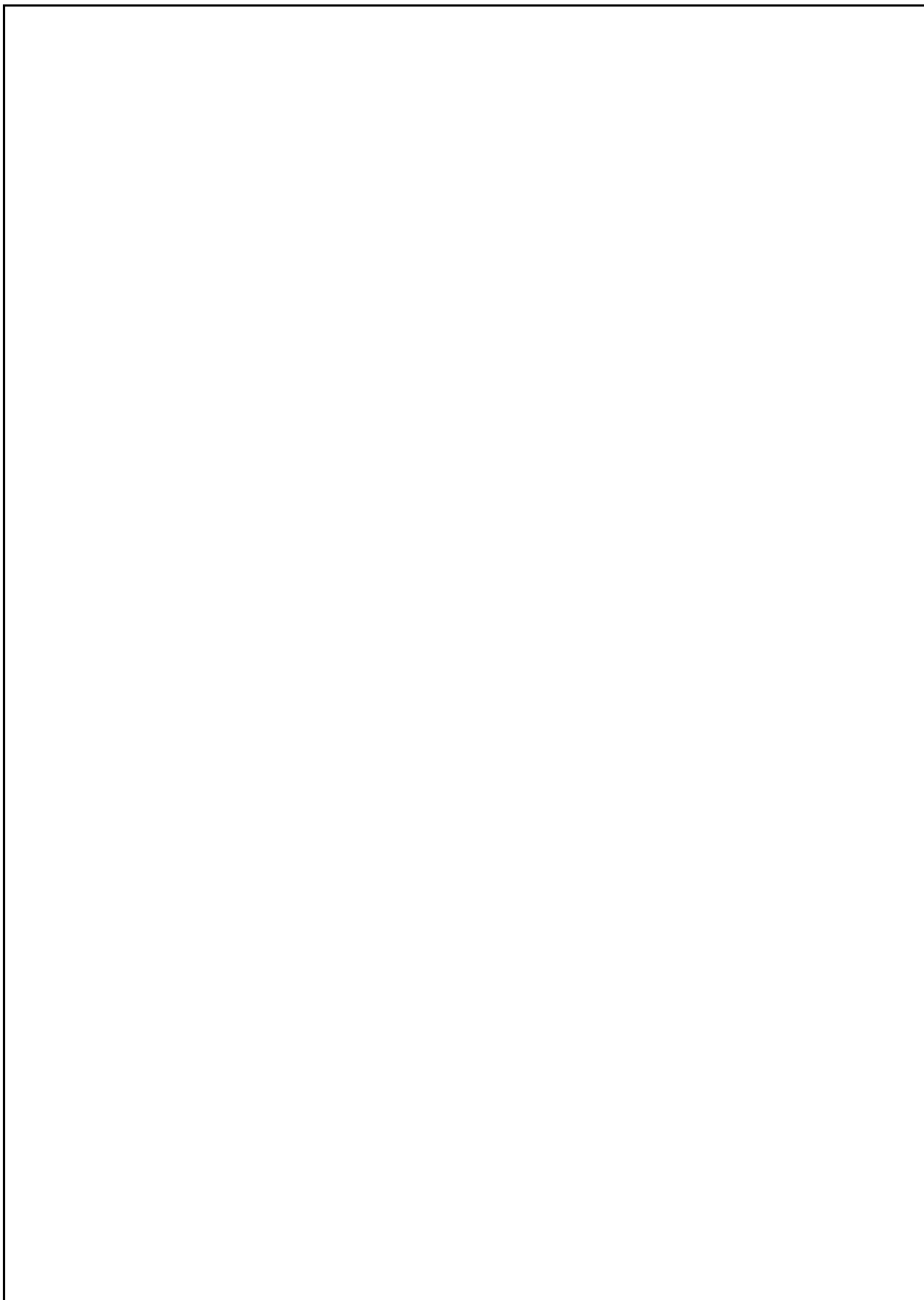
Operational Units*	Fleet (n° of boats)*	Catch (species assessed)	Other species caught	Discards (species assessed)	Discards (other species caught)	Effort units
ITA 16 H 01	17	687 t	anchovy	negligible	negligible	fishing
ITA 16 J 03	30	750 t	anchovy	negligible	negligible	fishing
	* Dec 2006	ave 1998-2009				
Total	47	1,437 t				

Legal minimum size	
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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	1047	444	978	638	1020	455
Minimum size						
Average size L_c						
Maximum size						
Fleet						

Year	2004	2005	2006	2007	2008	2009
Catch	403	518	331	363	1089	799
Minimum size						
Average size L_c						
Maximum size						
Fleet						

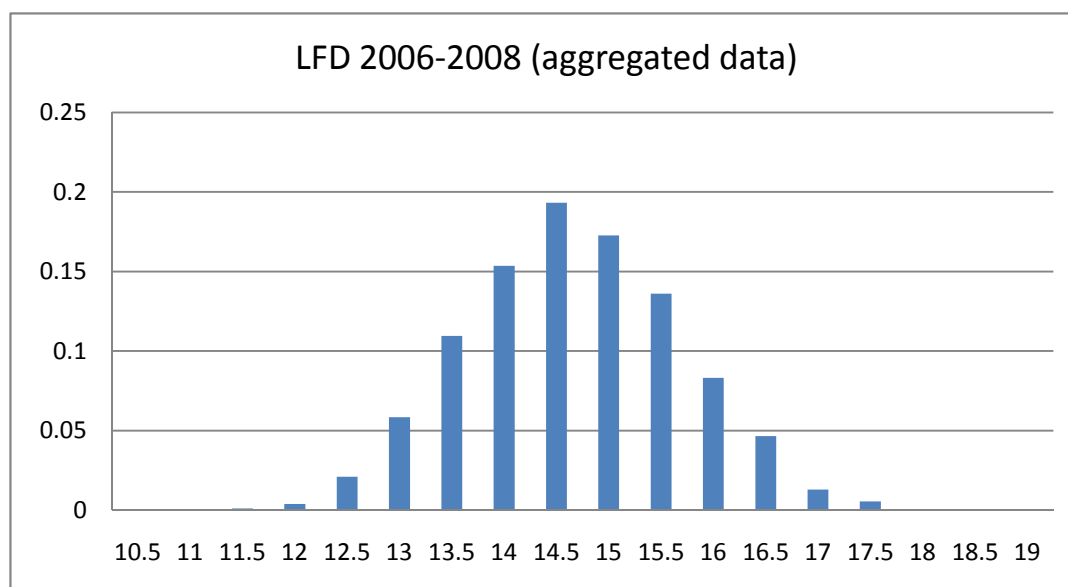
Selectivity

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
11	0.05	0.00	0.12
11.5	0.27	0.00	0.06
12	0.99	0.00	0.18
12.5	3.93	0.50	1.89
13	9.12	2.18	6.21
13.5	14.59	10.83	7.43
14	21.50	16.62	7.97
14.5	20.78	24.10	13.09
15	12.60	19.06	20.15
15.5	8.49	13.18	19.17
16	4.16	7.39	13.39
16.5	2.35	3.95	7.67
17	0.77	1.43	1.70
17.5	0.27	0.50	0.85
18	0.00	0.08	0.06
18.5	0.00	0.17	0.06

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Sheet P2a
Fishery by Operational Unit

Code: PIL1610Pat

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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	949	789	1102	1018	600	704
Minimum size						
Average size L_c						
Maximum size						
Fleet						

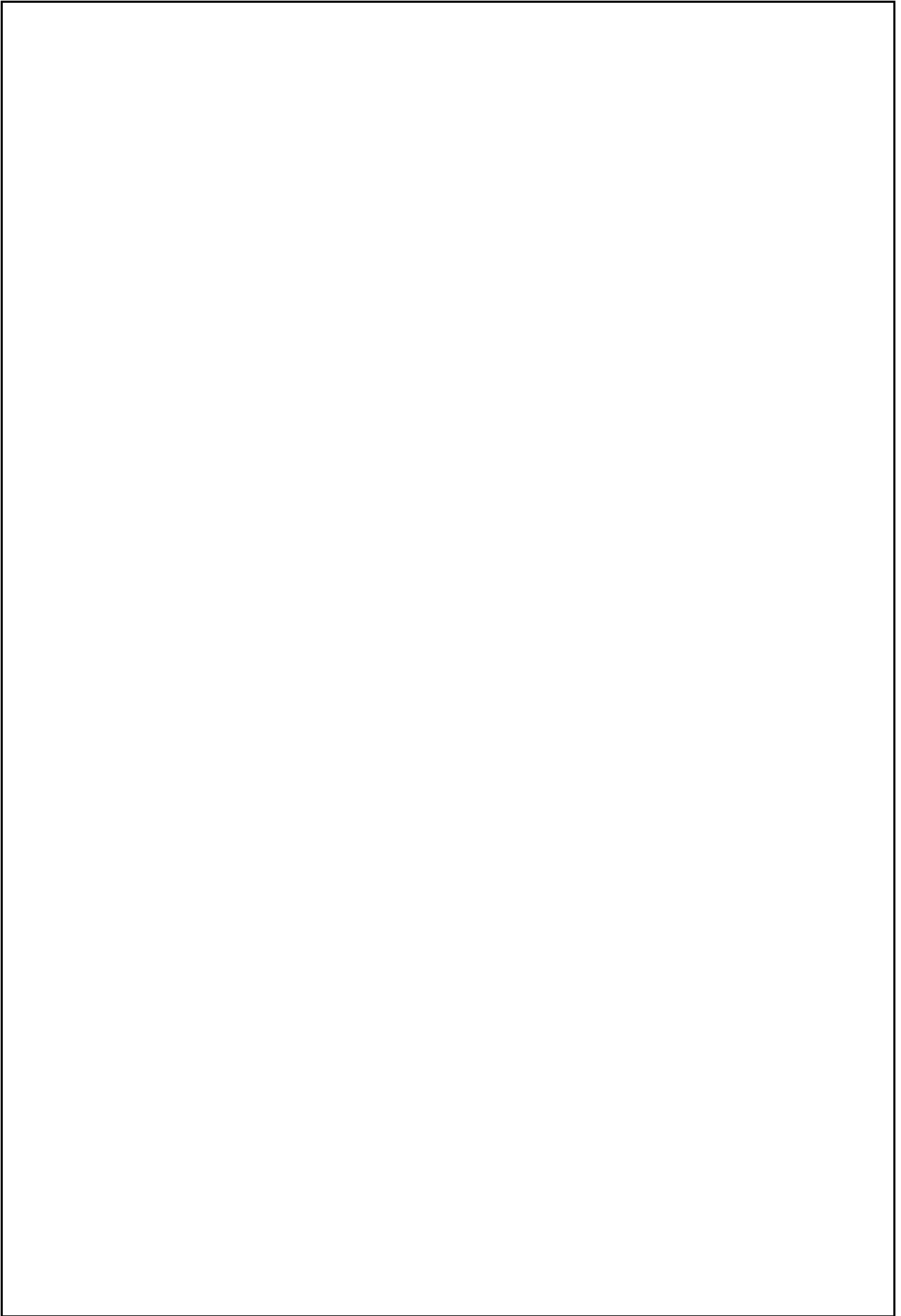
Year	2004	2005	2006	2007	2008	2009
Catch	938	680	906	693	543	451
Minimum size						
Average size L_c						
Maximum size						
Fleet						

Selectivity

Remarks

L ₂₅		
L ₅₀		
L ₇₅		
Selection factor		

Structure by size or age



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Sheet other

Code: PIL1610Pat

Other assessment methods

Acoustics

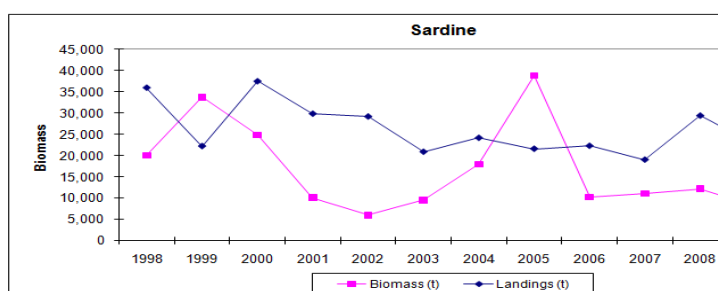
Vessel: R/V Dallaporta
 Date: June to September
 Transects design: perpendicular to bathymetry
 Inter-transect distance (nm): 5
 Area covered: 2500 nm²
 Time of day: Full time
 EDSU (nm): 1
 Bottom depth (min, m): 10
 Echo sounding depth (min, m): 3
 Echo sounding depth (max, m): 300
 Fishing gear: Pelagic 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

(figures in tons)

Vessel	Dallaporta
Survey	
Date	June to
Transects	perpendic
Inter-	5
Time of	Full time
EDSU	1
Bottom	10
Echo	3
Echo	300
Fishing	Pelagic
Geographi	G.S.A. 16
Target	Anchovy
Other	Mackerel,
Echo	Simrad
Frequency	38
Complem	120, 200
Pulse	1
Threshold	-80
Threshold	-70
Calibratio	1 per
File	*.raw,

YEAR	Acoustics	Landings (Sciacca port only)
1998	20000	1996
1999	33700	1233
2000	36370	2080
2001	10054	1656
2002	6000	1620
2003	9510	1159
2004	17960	1341
2005	21219	1199
2006	10220	1237
2007	11043	1057
2008	12152	1632
2009	8028	1249

Year	Total GSA16 landings
2006	2226
2007	2175
2008	2067
2009	1642



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Sheet D
Diagnosis

Code: PIL1610Pat

Reference points

Criterion	Current value	Units	Reference Point	Trend	Comments
B					
SSB					
F					
Y					
CPUE					
Exploitation	0.20			decreasing	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.

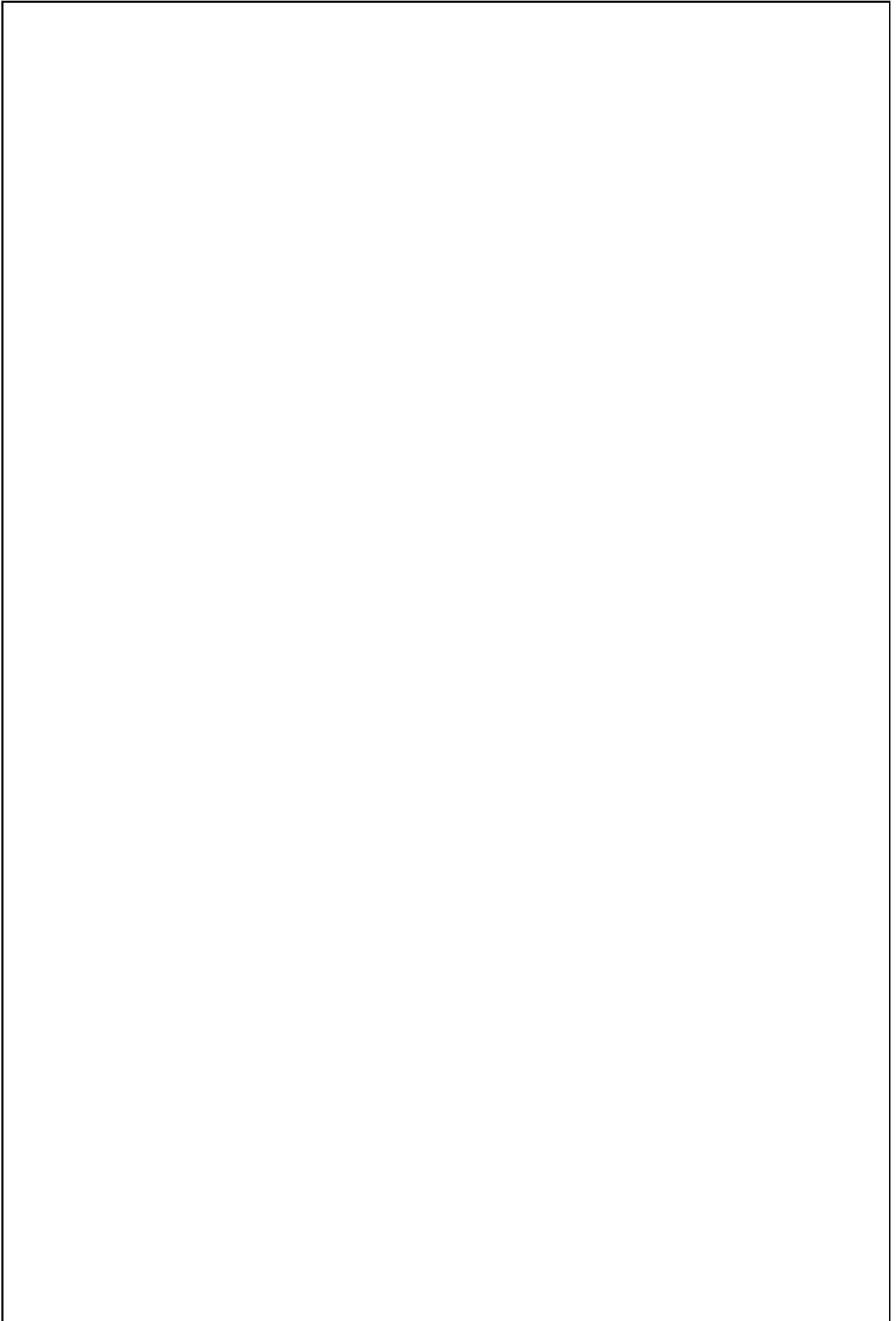
Stock Status* Use one (or both) of the following two systems for the stock assessment status description

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

Grafs for diagnostics are in the previous sheet ("Other").
The assessments on the assumption of acoustic surveys providing absolute estimates of biomass at sea (tonnes).



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Sheet Z

Objectives and recommendations

Code: PIL1610Pat

Management advice and recommendations*

Acoustic biomass evaluations show that sardine population experienced quite large inter-annual fluctuations over the period 1998-2009. Over the last four years (2006-2009) the population appears to be stable at a relatively low level.

Management advice and Recommendations:

Assuming acoustic evaluations as an unbiased estimate of the absolute biomass of the population, the current exploitation seems to be tolerable. Given the multispecies nature of this fishery, and in agreement with the recommendations concerning anchovy, the WG recommends that the fishing effort should not be allowed to increase.

As the impact of fry fishery on this population is not known, a proper quantification of the catches in the fry fishery is mandatory.

Abstract for SCSA reporting

Authors Patti B., Quinci E., Bonanno

Year 2010

Species Scientific name Sardina pilchardus - PIL

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 (GSA 16), accounting for about 2/3 of total landings in GSA 16, two operational units are presently active, purse seiners and pelagic pair trawlers. In both OUs anchovy represents the main target species due to the higher market price, so generally sardine catches are to be considered of secondary importance for local fishery.

Average sardine landings over the period 1997-2009 were about 1,400 metric tons, with a general decreasing trend. Sardine biomass, estimated by acoustic methods, ranged from a minimum of 6,000 tons in 2002 to a maximum of 39,000 tons in 2005.

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. Biological samples for fish biology information. Acoustic data for fish biomass evaluations. Total official landing for the last 3 years were also taken into account.

Stock Status*

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Exploitation rate

Moderate fishing mortality

Stock abundance

Intermediate abundance

Comments

Graphs for diagnostics are in the previous sheet ("Other").
The assessments are on the assumption of acoustic surveys providing absolute estimates of biomass at sea (tonnes).

Management advice and recommendations*

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