

SAC GFCM Sub-Committee on Stock Assessment

Date*	20	October	2011	Code*	PIL0311Oma
Authors*	Omar KADA & My Hachem IDRISSI				
Affiliation*	Institut National de Recherche Halieutique - Centre Régional de Nador (INRH-Maroc)				
Species Scientific name*	<p>1 Source: GFCM Priority Species</p> <p>2 Source: -</p> <p>3 Source: -</p>				
Geographical area*	Alboran sea				
Geographical Sub-Area (GSA)*	03 - Southern Alboran Sea				
Combination of GSAs	1				
	2				
	3				

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Assessment form

Sheet #0

Basic data on the assessment

Code: PIL0311Oma

Date*	20	Oct	2011	Authors*	Omar KADA & My Hachem IDRISSEI
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Species Scientific name*	Sardina pilchardus - PIL	Species common name*	European pilchard
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Data Source

GSA*	03 - Southern Alboran Sea	Period of time*	years 2007 to 2010
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Description of the analysis

Type of data*	Size composition of commercial catches and official landings.	Data source*	INRH, National Office of Fisheries, Ministry of Fisheries
Method of assessment*	Pseudocohort analysis and yield per recruit analysis	Software used*	VIT (Leonart and Salat, 1997)

Sheets filled out

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

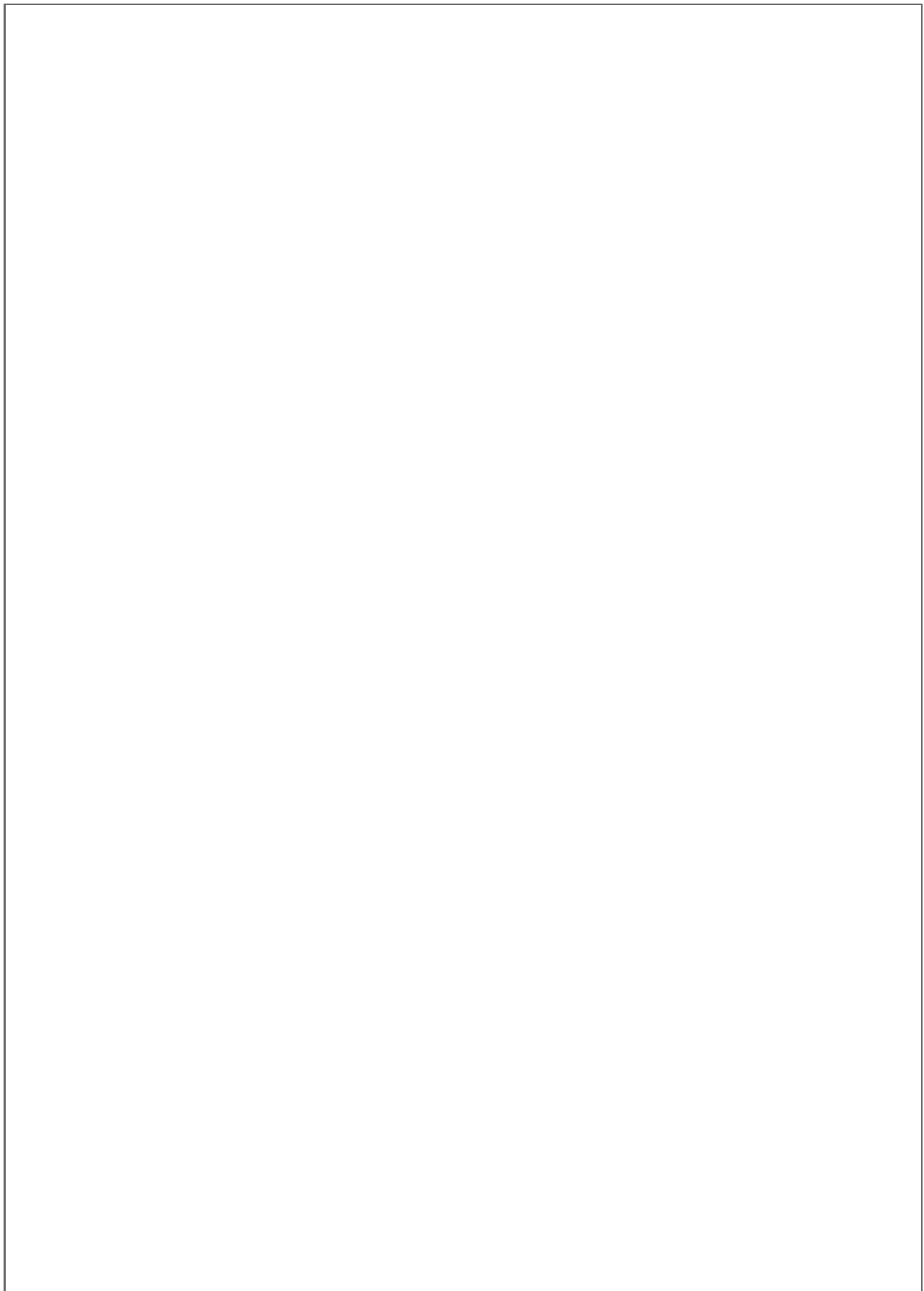
Comments, bibliography, etc.

Cadima E.L., 2001. Manuel d'évaluation des ressources halieutiques. FAO document technique. N° 393, FAO. 162p.

Leonard J. et J. Salat, 2000. VIT for windows (version 1.2): software for fisheries analysis. Inf. tech. Sci. Mar.

N. EL Ouamari et N. Abid, 2003. Etat d'exploitation du stock de la sardine en Méditerranée marocaine, SCES, Tanger, 2003.

O. Kada et N. EL Ouamari, 2005. Etat d'exploitation du stock de la sardine en Méditerranée marocaine, SCES, Rome, 2005.



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Sheet B
Biology of the species

Code: PIL0311Oma

Biology

Somatic magnitude measured (LH, LC, etc)*	total length	Units*	cm
Sex	Fem	Mal	Both
Maximum size observed			22.5
Size at first maturity			13.3
Recruitment size			
	Reproduction season		
	Reproduction areas		Continental shelf
	Nursery areas		Continental

Parameters used (state units and information sources)

		Units	Sex			
			female	male	both	unsexed
Growth model	L_{∞}	cm				21.3
	K	cm/an				0.56
	t0	an				-0.67
	Data source	INRH Nador				
Length weight relationship	a					0.0066
	b					3.0582
	M					0.5
	sex ratio (mal/fem)					

Comments

Data of growth and reproduction of the sardine "Sardina pilchardus" are resulting from biological study on this specie

A large, empty rectangular box with a thin black border, intended for handwritten or typed comments.

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Sheet P1

General information about the fishery

Code: PIL0311Oma

Data source*	Size composition of landings from sampling, catch d	Year (s)*	average from 2007 to 2010
Data aggregation (by year, average figures between years, etc.)*	A pseudo cohort was created averaging data from 2007 to 2010		

Fleet and catches (please state units)

	Country	GSA	Fleet Segment	Fishing Gear Class	Group of Target Species	Species
Operational Unit 1*	MAR	03	G - Purse Seine (6-12 metres)	01 - Surrounding Nets	31 - Small gregarious pelagic	PIL
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
MAR 03 G 01 31 - PIL	144	Tons	11102	See sheet P2b			days
Total	144		11102				

Legal minimum size	50 ind/kg (moule)
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Comments

Catch is the landings of GSA03 during the year 2010 by seiners.

Comments

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Sheet P2a
Fishery by Operational Unit

Code: PIL0311Oma

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Data source*	Size composition of landings from biological sampl	OpUnit 1*	MAR.03.G.01.31 - PIL
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Time series

Year*	2007	2008	2009	2010		
Catch	13574	9111	15076	11102		
Minimum size	8	9	10	8		
Average size Lc	16.53	16.66	15.37	16.03		
Maximum size	22	23.5	22.5	21		
Fleet	147	137	141	144		

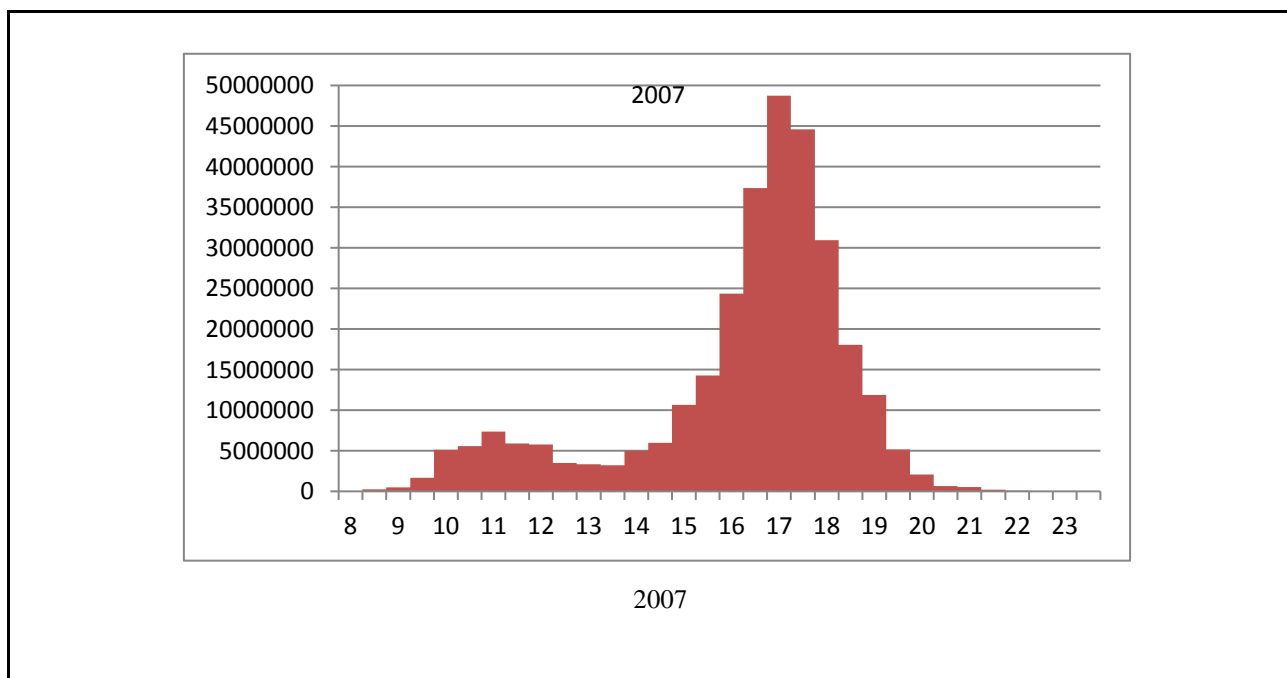
Year						
Catch						
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Selectivity

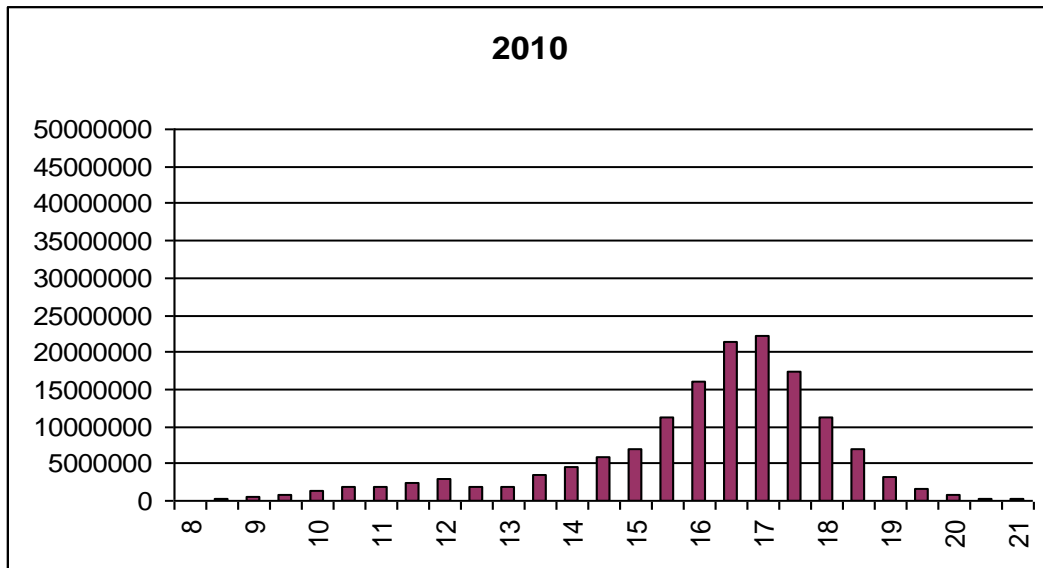
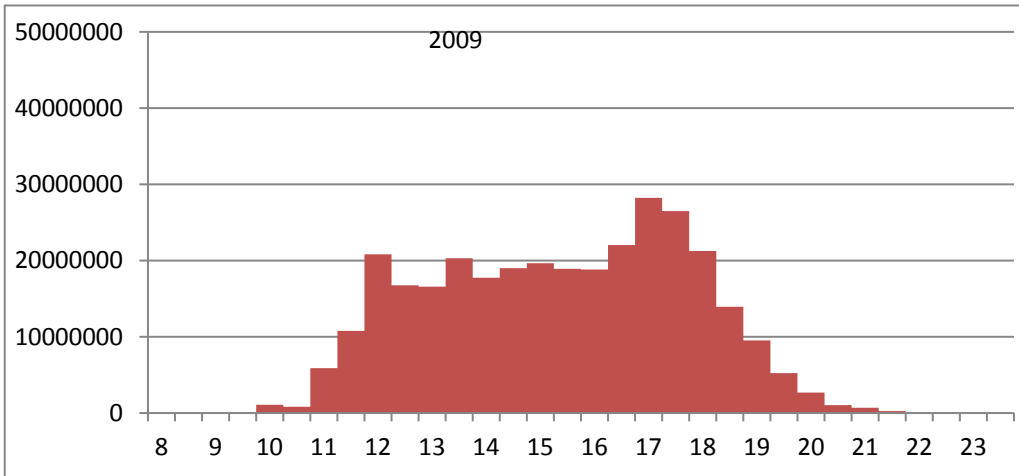
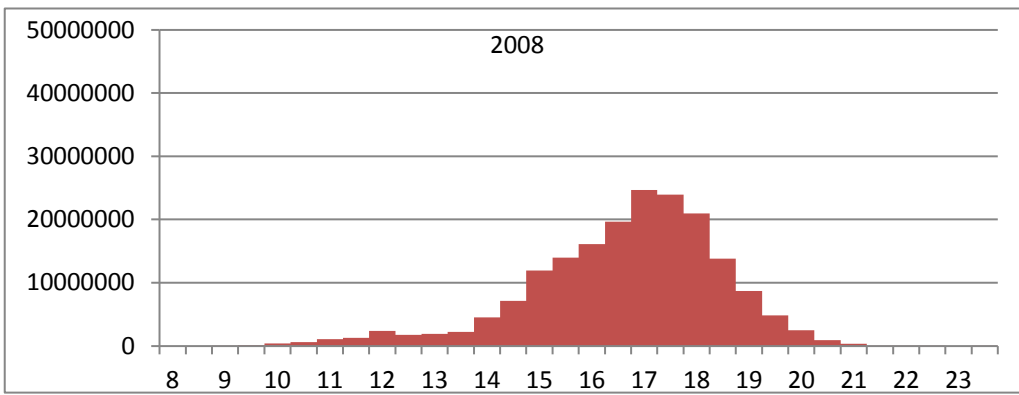
Remarks

L25		O. KADA, 2002
L50	13.3	
L75		
Selection factor		

Structure by size or age



Structure by size or age



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Sheet P2b
Fishery by Operational Unit

Code: PIL0311Oma

Page 1 /

Data source*

OpUnit 1*

MAR 03 G 01 31 - PIL

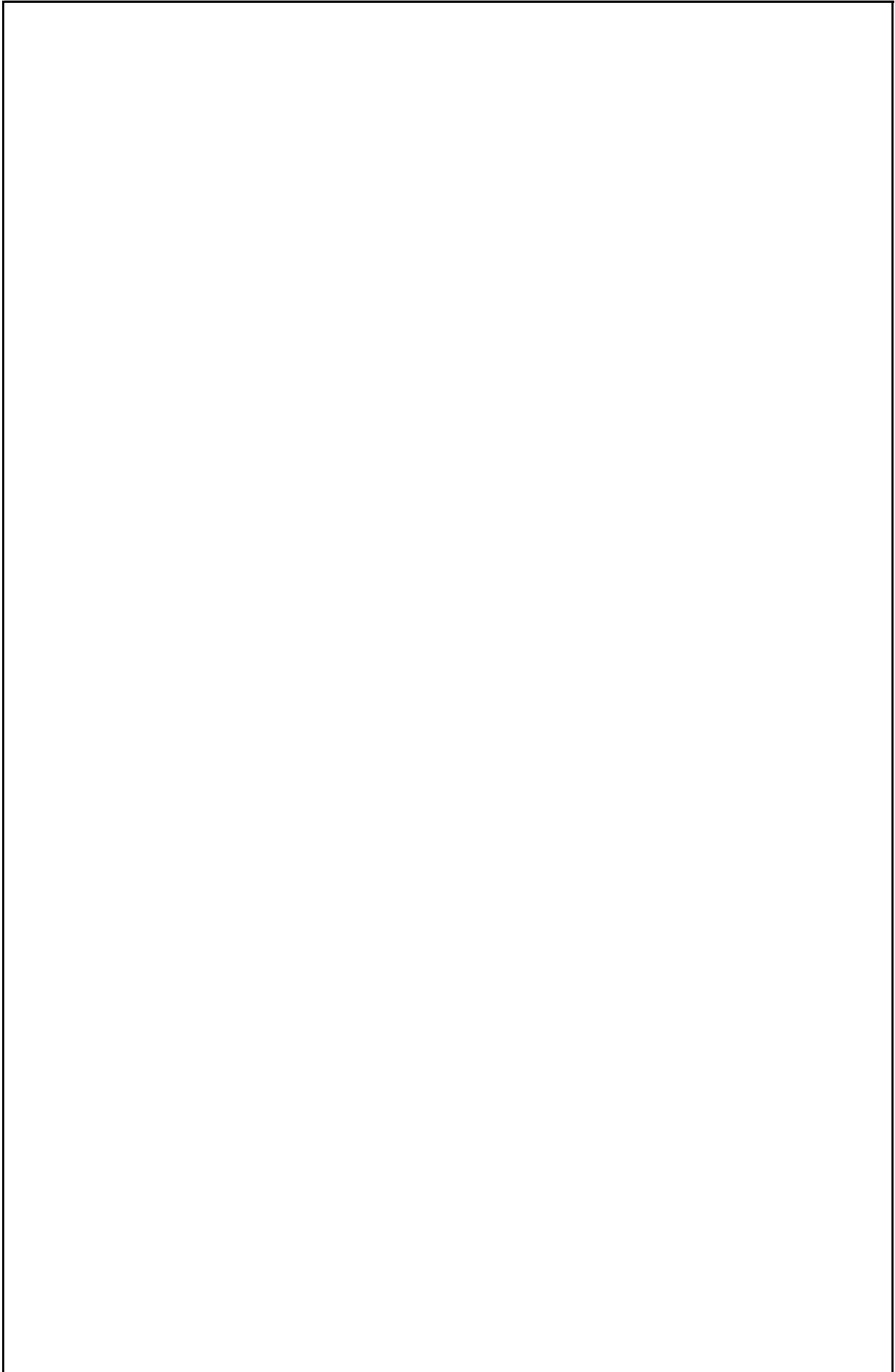
Regulations in force and degree of observance of regulations

- Fishing license: fully observed
- Length of purse seine (200m): fully observed
- Mesh size (11 mm stretched): fully observed
- Moule (50 individuals): fully observed

Accompanying species

The accompanying species of the sardine are :

- Chinchard "*Trachurus trachurus*"
- Bogue "*Boops boops*"
- Anchois "*Engraulis encrasicolus*"



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Assessment form

Sheet G
Indirect methods. Global model

Code: PIL0311Oma

Analysis #*

Page 1 /

Data source* <input style="width: 90%;" type="text"/>	Gear*	1
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Model characteristic

Type of model*	Pseudo cohort analysis "LCA"	Fitting criterion	
Software	VIT	Bibliographical source	

Data

Year	2007	2008	2009	2010			
Catch	13574.112	9111.421	15075.8855	11102.126			
Effort	589958	362405	335355	728277			
CPUE	0.023	0.029	0.053	0.015			

Year							
Catch							
Effort							
CPUE							

Adjustment

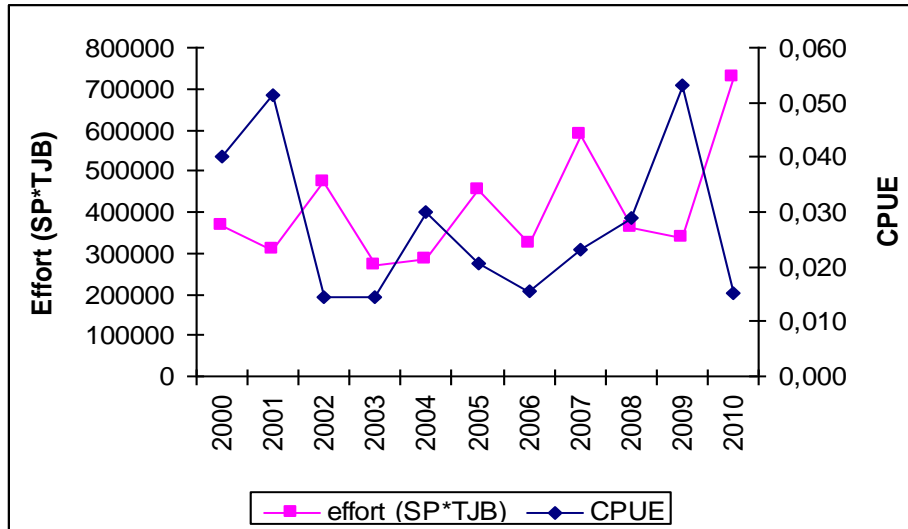
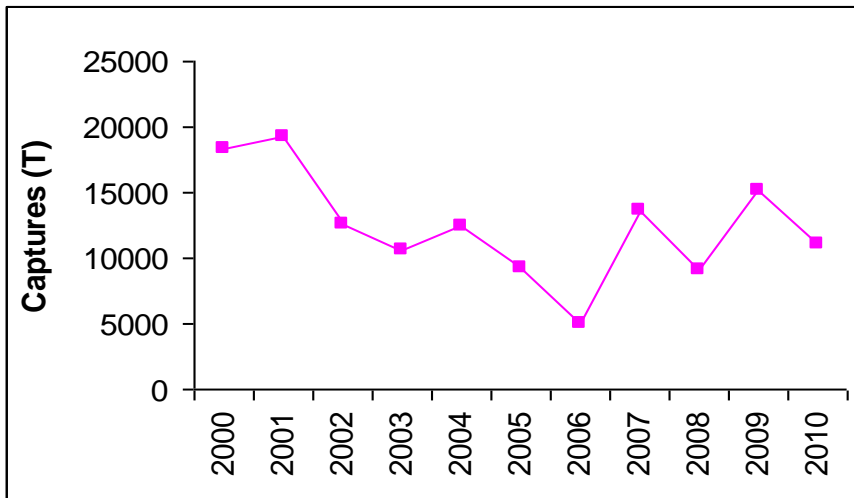
RMS

Results

Carryng capacity		a	
Growth rate		b	
Catchability			
MSY			
EMSY		TACMSY	
E0.1		TAC0.1	
Ecurrent			

Comments

Comments



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Assessment form

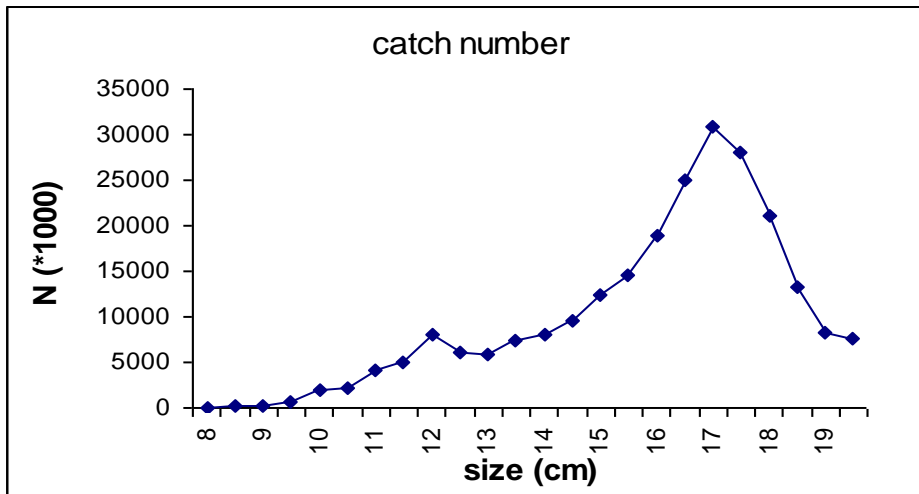
Sheet A2
Indirect methods: data

Code: PIL03110ma

Sex*	unsexed	Gear*	purse seine	Analysis # *	1
------	---------	-------	-------------	--------------	---

Data	A pseudocohort created using data for year 2007.
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Data



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Assessment form

Sheet A3
Indirect methods: VPA results

Code: PIL03110ma

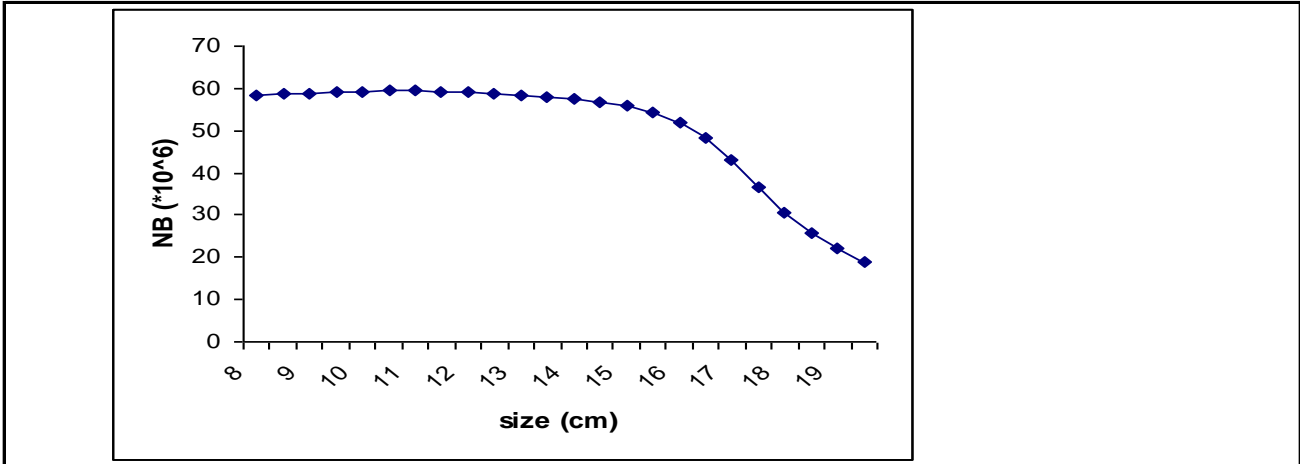
Page 1 /

Sex*

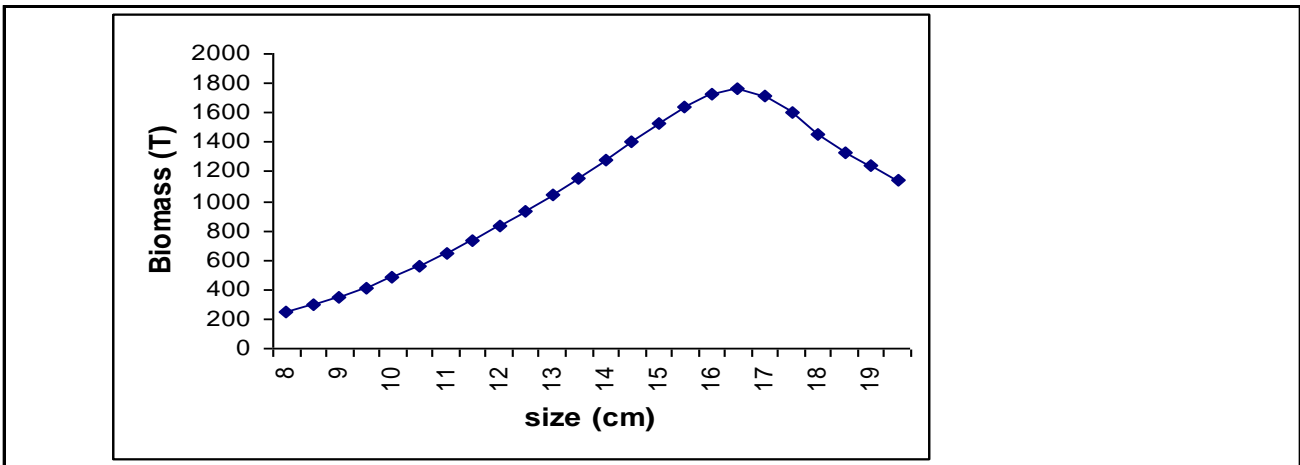
Gear*

Analysis #*

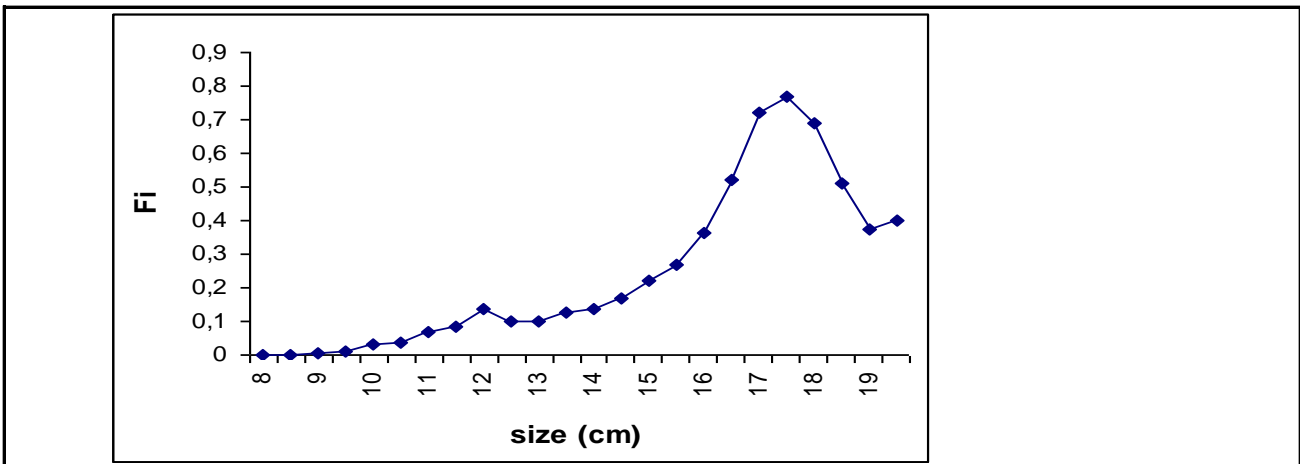
Population in figures



Population in biomass



Fishing mortality rates





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Assessment form	Sheet Y Indirect methods: Y/R

Sex <input style="width: 50px;" type="text"/>	Code: PIL0311Oma
	Analysis # <input style="width: 50px;" type="text"/>

# of gears	<input style="width: 95%;" type="text"/>	Software	<input style="width: 95%;" type="text"/>
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Parameters used

Vector F	<input style="width: 80%;" type="text"/>
Vector M	<input style="width: 80%;" type="text"/>
Vector N	<input style="width: 80%;" type="text"/>
<input style="width: 80%;" type="text"/>	<input style="width: 80%;" type="text"/>
<input style="width: 80%;" type="text"/>	<input style="width: 80%;" type="text"/>

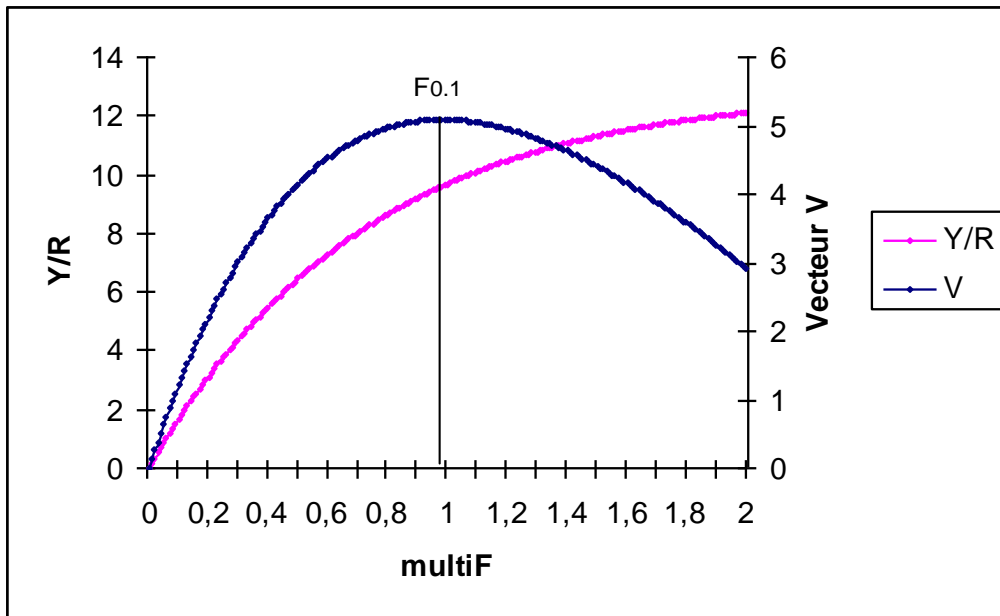
Model characteristics

Results

	Total	Gear			
Current YR	9.686				
Maximum Y/R	12.107				
Y/R 0.1	9.641				
F _{max}	-				
F _{0.1}	0.99				
Current B/R	29.401				
Maximum B/R	45.981				
B/R 0.1	29.506				

Comments

Comments



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Assessment form

Sheet D
Diagnosis

Code: PIL0311Oma

Indicators and reference points

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

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 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"/>	Depleted
	<input type="radio"/>	Moderate fishing	<input type="radio"/>	Intermediate abundance	<input type="radio"/>	Uncertain / Not assessed
	<input type="radio"/>	High fishing mortality	<input type="radio"/>	Low abundance		
	<input type="radio"/>	Uncertain / Not assessed				

Comments

The results showed that the fishing effort is exercised mainly on adult individuals (between 16.5 and 19.5 cm).

The analysis of the yield per recruit indicate a state of full exploitation for stock sardine in the moroccan mediteranean sea.

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Sheet Z

Objectives and recommendations

Code: PIL0311Oma

Management advice and recommendations*

Not increase the current level of fishing effort.

Advice for scientific research*

Abstract for SCSA reporting

Authors Omar KADA & My Hachem IDRISSEI **Year** 2011

Species Scientific name Sardina pilchardus - PIL
Source: GFCM Priority Species

Source: -

Source: -

Geographical Sub-Area 03 - Southern Alboran Sea

Fisheries (brief description of the fishery)*

On the scale of moroccan mediterranean sea and in term of importance of landings small pelagics, sardine is ranked first in an annual production of 14000 tons. Fishing of sardine is practiced mainly by approximately 140 purse seiners in seven ports.

Source of management advice*

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

The evaluation of the state of the stock was based on the Length Cohort Analysis (LCA) using the VIT software. Data collected from 2007 to 2009 were used.

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

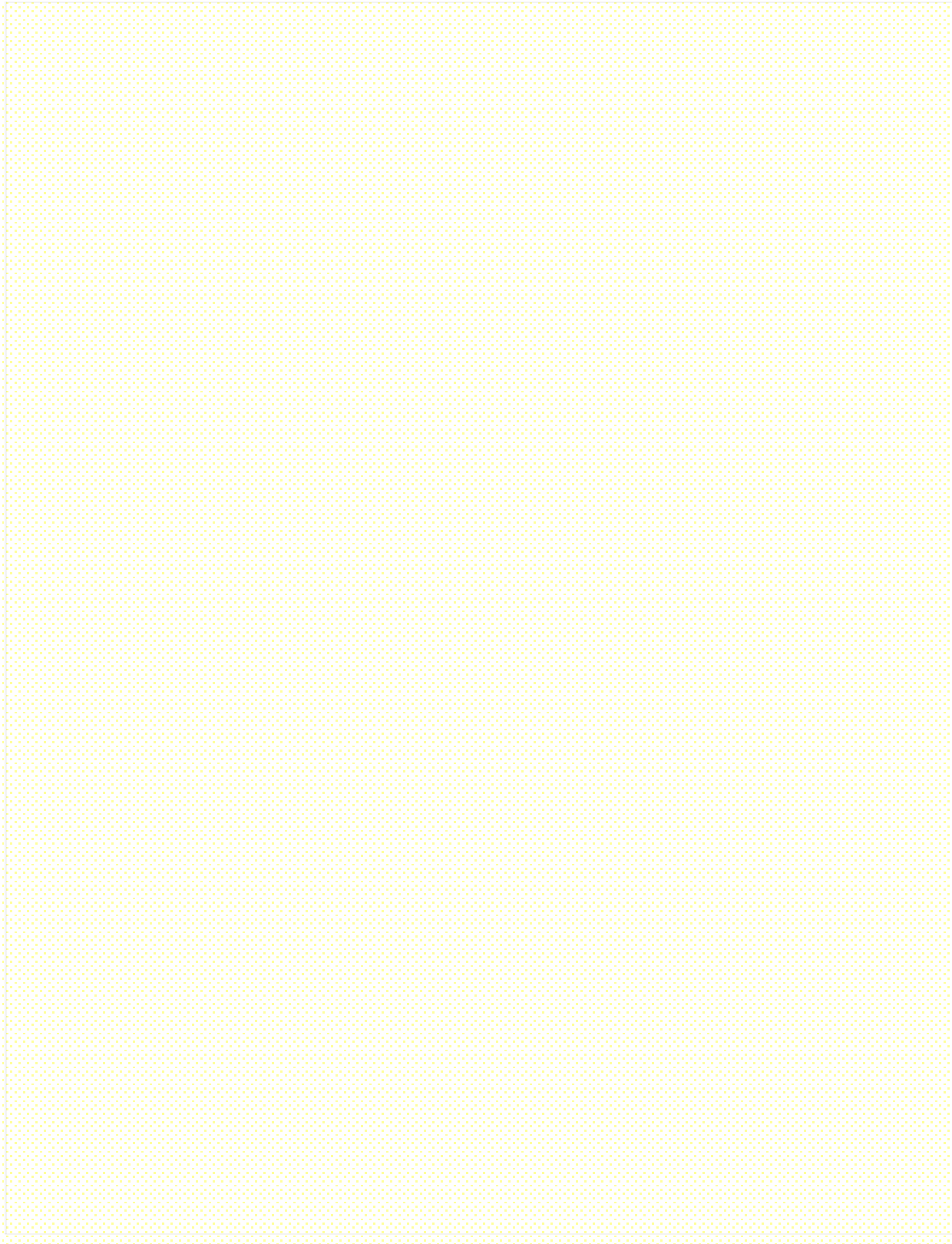
Stock abundance

Comments

Management advice and recommendations*

Area for management advice and recommendations.

Advice for scientific research*



GFCM Task 1 reporting

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Assessment of European pilchard (*Sardina pilchardus* - PIL) from 03 - Southern Alboran Sea. Omar KADA & My Hachem IDRISSE

Description of fishery: On the scale of moroccan mediterranean sea and in term of importance of landings small pelagics, sardine is ranked first in an annual production of 14000 tons. Fishing of sardine is practiced mainly by approximately 140 purse seiners in seven ports.

Source of management advice: The evaluation of the state of the stock was based on the Length Cohort Analysis (LCA) using the VIT software. Data collected from 2007 to 2009 were used.

Exploitation rate:

Stock abundance:

Comments: The results showed that the fishing effort is exercised mainly on adult individuals (between 16.5 and 19.5 cm).

The analysis of the yield per recruit indicate a state of full exploitation for stock sardine in the moroccan mediteranean sea.

Management advice and recommendation: Not increase the current level of fishing effort.

Advice for scientific research:

