

SAC GFCM Sub-Committee on Stock Assessment

Date*

20	November	2009
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Code*

PIL0309Oma

Authors*

Omar KADA & My Hachem IDRISSI

Affiliation*

Institut National de Recherche Halieutique - Centre Régional de Nador (INRH-Maroc)
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- Species Scientific name*
- 1 *Sardina pilchardus* - *PIL*
Source: GFCM Priority Species
 - 2
Source: -
 - 3
Source: -

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: PIL0309Oma

Date*	20	Nov	2009	Authors*	Omar KADA & My Hachem IDRISSE
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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 from 2000 to 2008
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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

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Biology

	Somatic magnitude measured (LH, LC, etc)*			total length	Units*	cm
	Sex	Fem	Mal	Both	Unsexed	
Maximum size observed					23.5	Reproduction season
Size at first maturity					13.5	Reproduction areas
Recruitment size						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					0.2
	sex ratio (mal/fem)					

Comments

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

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Sheet P1

General information about the fishery

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Data source*	Size composition of landings from sampling, catch d	Year (s)*	average from 2000 to 2008
Data aggregation (by year, average figures between years, etc.)*		A pseudo cohort was created averaging data from 2000 to 2008	

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	147	Tons	13902	See sheet P2b			days
Total	147		13902				

Legal minimum size

Comments

Catch is the average landings of GSA03 during the years from 2000 to 2008.

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Sheet P2a
Fishery by Operational Unit

Code: PIL0309Oma

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Data source*	Size composition of landings from biological sam	OpUnit 1*	MAR 03 G 01 31 - PIL
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Time series

Year*	Average 2000-2008				
Catch	13902				
Minimum size	7				
Average size Lc	13.16				
Maximum size	23.5				
Fleet	147				

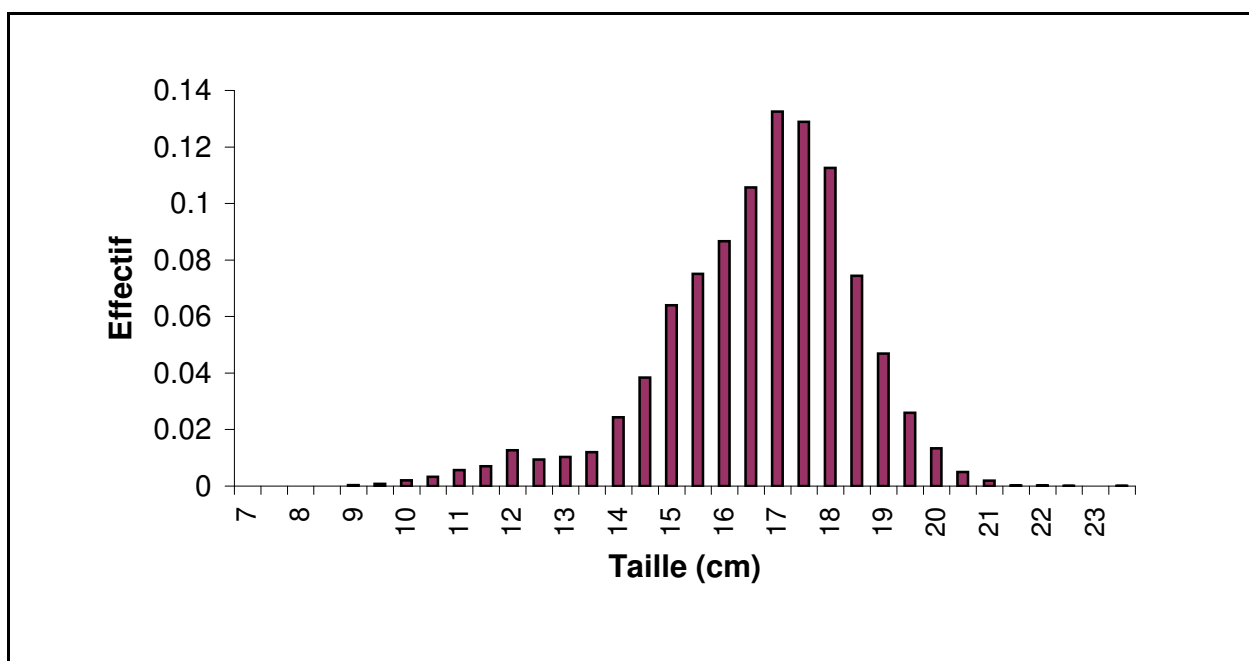
Year					
Catch					
Minimum size					
Average size Lc					
Maximum size					
Fleet					

Selectivity

Remarks

L25		O. KADA, 2002
L50	13.5	
L75		
Selection factor		

Structure by size or age



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Sheet P2b
Fishery by Operational Unit

Code: PIL0309Oma

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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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Sheet G
Indirect methods. Global model

Code: PIL0309Oma

Analysis #*

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Data source* Gear* 1

Model characteristic

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

Data

Year	2000	2001	2002	2003	2004	2005	2006
Catch	17218.162	12413.914	12537.363	11220.309	13673.826	17195.796	16653.705
Effort	364078	309968	471631	269756	282442	451549	324738
CPUE	0.069	0.075	0.034	0.038	0.055	0.043	0.066

Year	2007	2008					
Catch	15095.897	9111.421					
Effort	367980	362405					
CPUE	0.049	0.029					

Adjustment

RMS

Results

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

Comments

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Sheet A1
Indirect methods: VPA, LCA

Code: PIL0309Oma

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Sex* unsexed

Analysis # * **1**

Time series

Data	Size	Age
(mark with X)	x	

Model	Cohorts	Pseudocohorts
(mark with X)		x

Equation used	catch equation	Tunig method	
# of gears	1	Software	VIT (Lleonart and Salat, 1997)
F _{terminal}	0.4		

Population results (please state units)

	Sizes	Ages		Amount	Biomass
Minimum			Recruitment		1435.178
Average			Average population		21553
Maximum			Virgin population		
Critical	15.5	1.723	Turnover		
					SSB
					16380.819

Average mortality

	Total	Gear					
F ₁	0.508						
F ₂							
Z	0.708						

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

Comments

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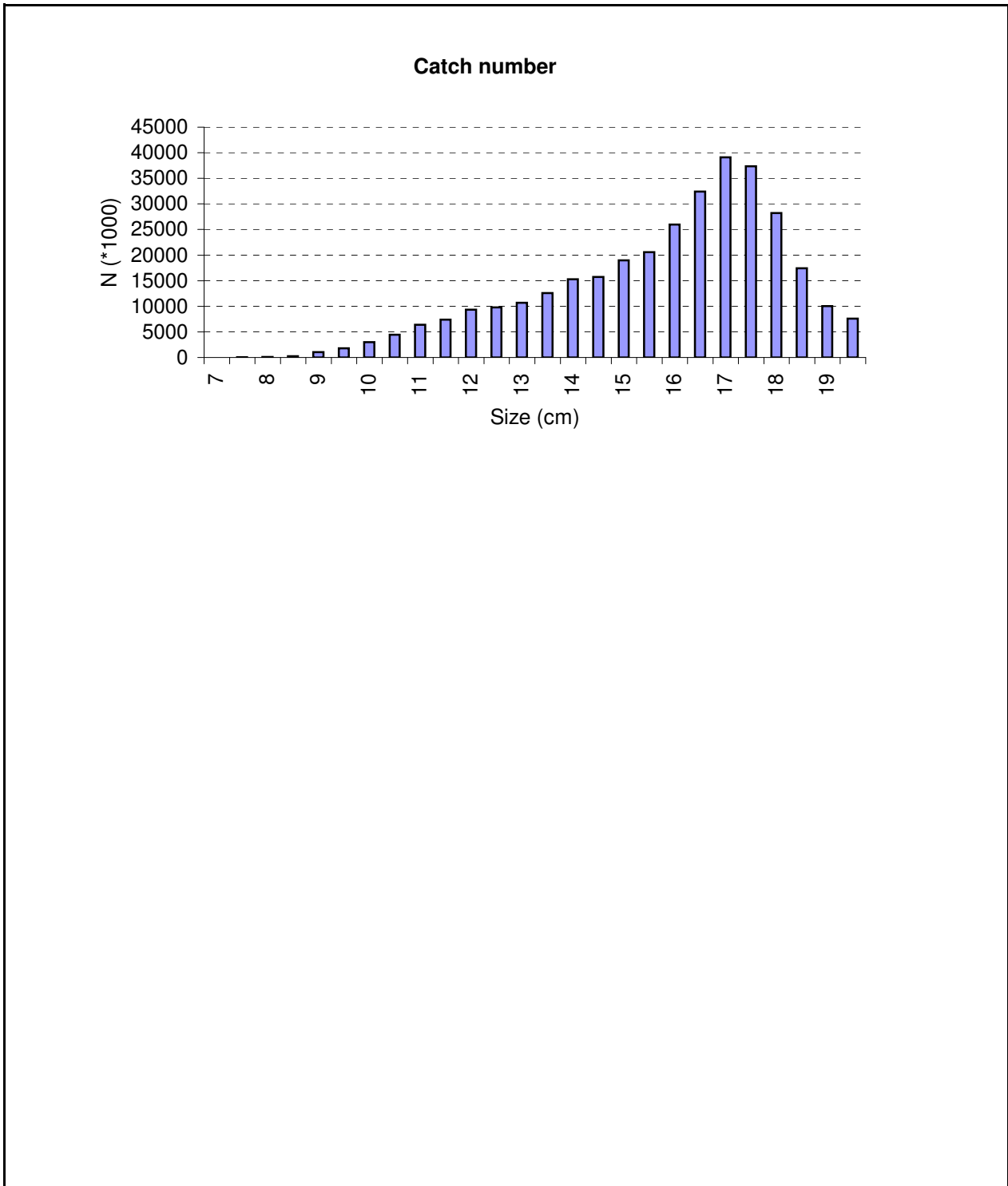
Sheet A2
Indirect methods: data

Code: PIL0309Oma

Sex*	unsexed	Gear*	purse seine	Analysis # *	1
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Data	Average data for years 2000-2008.
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Data



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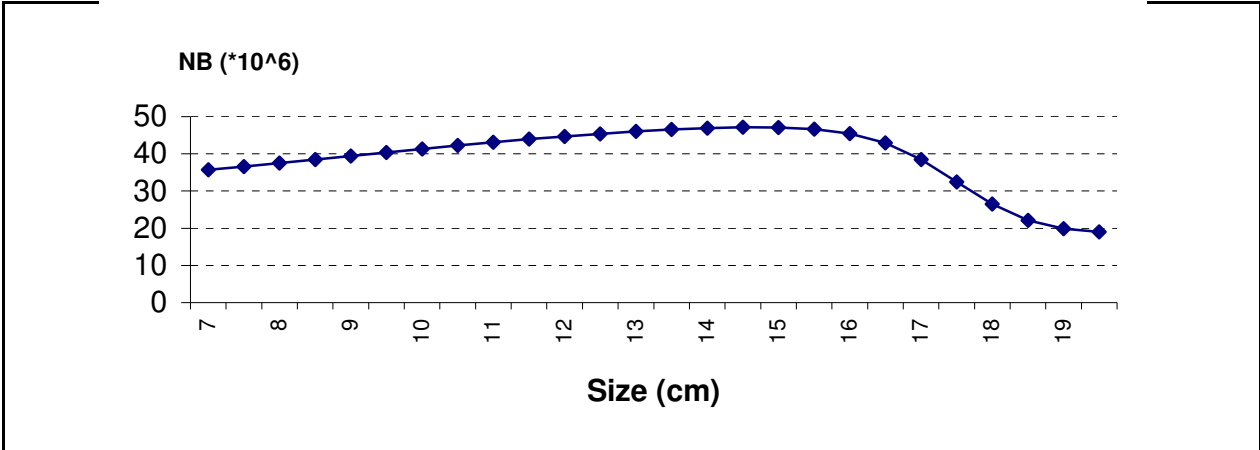
Sheet A3
Indirect methods: VPA results

Code: PIL0309Oma

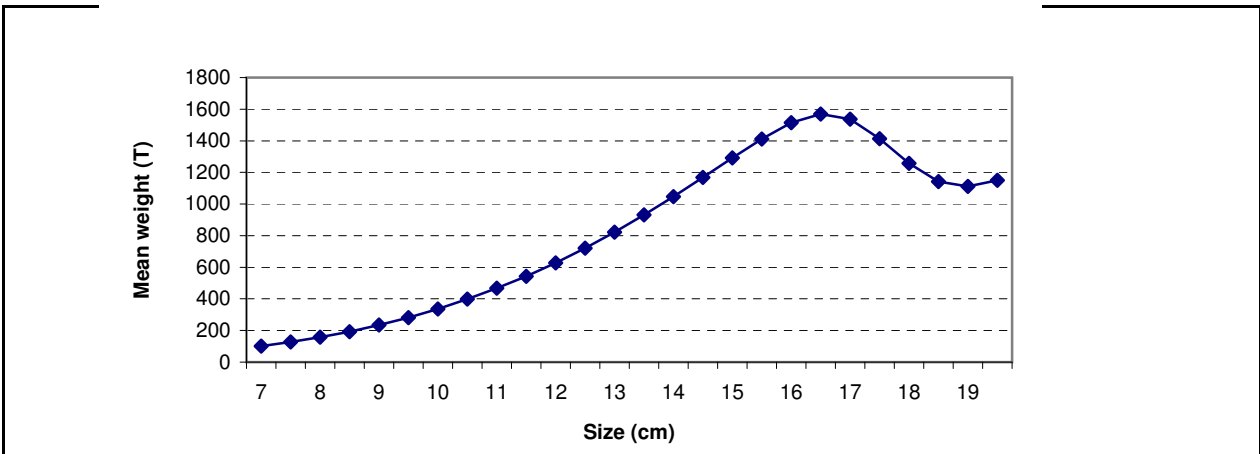
Page 1 /

Sex*		Gear*		Analysis #*	
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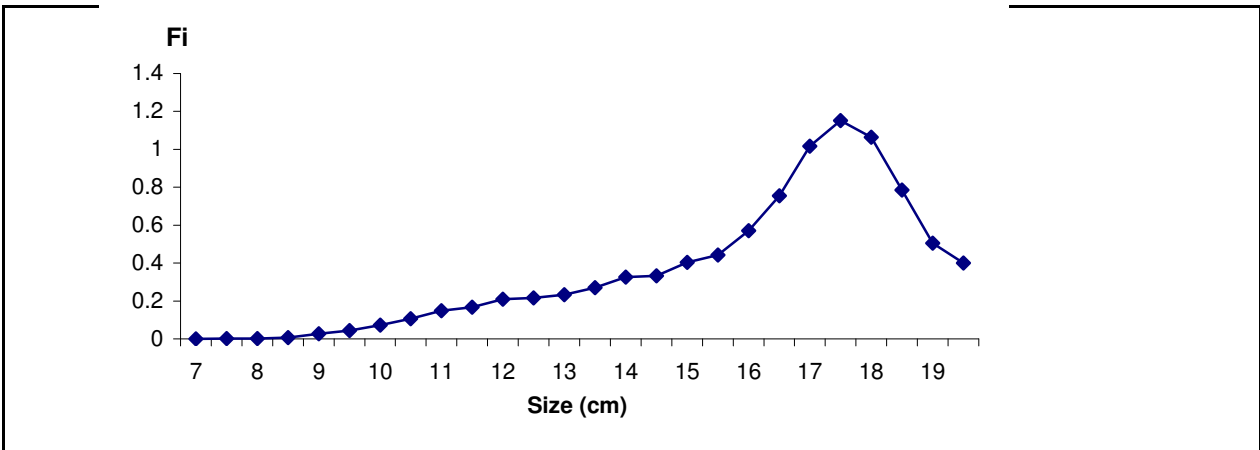
Population in figures



Population in biomass



Fishing mortality rates



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Sheet D
Diagnosis

Code: PIL0309Oma

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="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				

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Sheet Z

Objectives and recommendations

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Management advice and recommendations*

Not to increase the current level of the fishing effort.