SAC GFCM
Sub-Committee on Stock Assessment

Date* | 20 | October | 2010 | **Code*** | SOO2610Sah

Authors*

Sahar Mehanna

Affiliation*

National Institute of Oceanography and Fisheries

Species Scientific name*

1 *Solea solea - SOO*
Source: -

2
Source: -

3
Source: -

Geographical area*

Mediterranean, Egypt

Geographical Sub-Area (GSA)*

26 - South Levant

Combination of GSAs 1
2
3

Code: SOO2610Sah

Date*	20	Oct	2010	Authors*	Sahar Mehanna

Species Scientific name*	Solea solea - SOO	Species common name*	Common sole, Mousa

Data Source

GSA*	26 - South Levant	Period of time*	2006-2007

Description of the analysis

Type of data*	Length frequency data	Data source*	Biological samples from Commercial catch
Method of assessment*	LCA and Y/R	Software used*	VIT

Sheets filled out

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

Comments, bibliography, etc.

Comments, bibliography, etc.

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Biology

Somatic magnitude measured (LH, LC, etc)*			TL		Units*	cm

Sex	Fem	Mal	Both	Unsexed		
Maximum size observed			40.5		Reproduction season	
Size at first maturity			19.9		Reproduction areas	
Recruitment size					Nursery areas	

Parameters used (state units and information sources)

		Units	Sex			
			female	male	both	unsexed
Growth model	L∞	cm			44.36	
	K	per year			0.33	
	t0	year			-0.45	
	Data source	Otolith readings				
Length weight relationship	a				0.0148	
	b				2.861	

M				0.63	

sex ratio (mal/fem)	

Comments

Comments

Code: SOO2610Sah

Data source*	commercial catch	Year (s)*	2

Data aggregation (by year, average figures between years, etc.)*	by year

Fleet and catches (please state units)

	Country	GSA	Fleet Segment	Fishing Gear Class	Group of Target Species	Species
Operational Unit 1*	EGY	26	E - Trawl (12-24 metres)	03 - Trawls	33 - Demersal shelf species	SOO
Operational Unit 2						
Operational Unit 3						
Operational Unit 4						
Operational Unit 5						

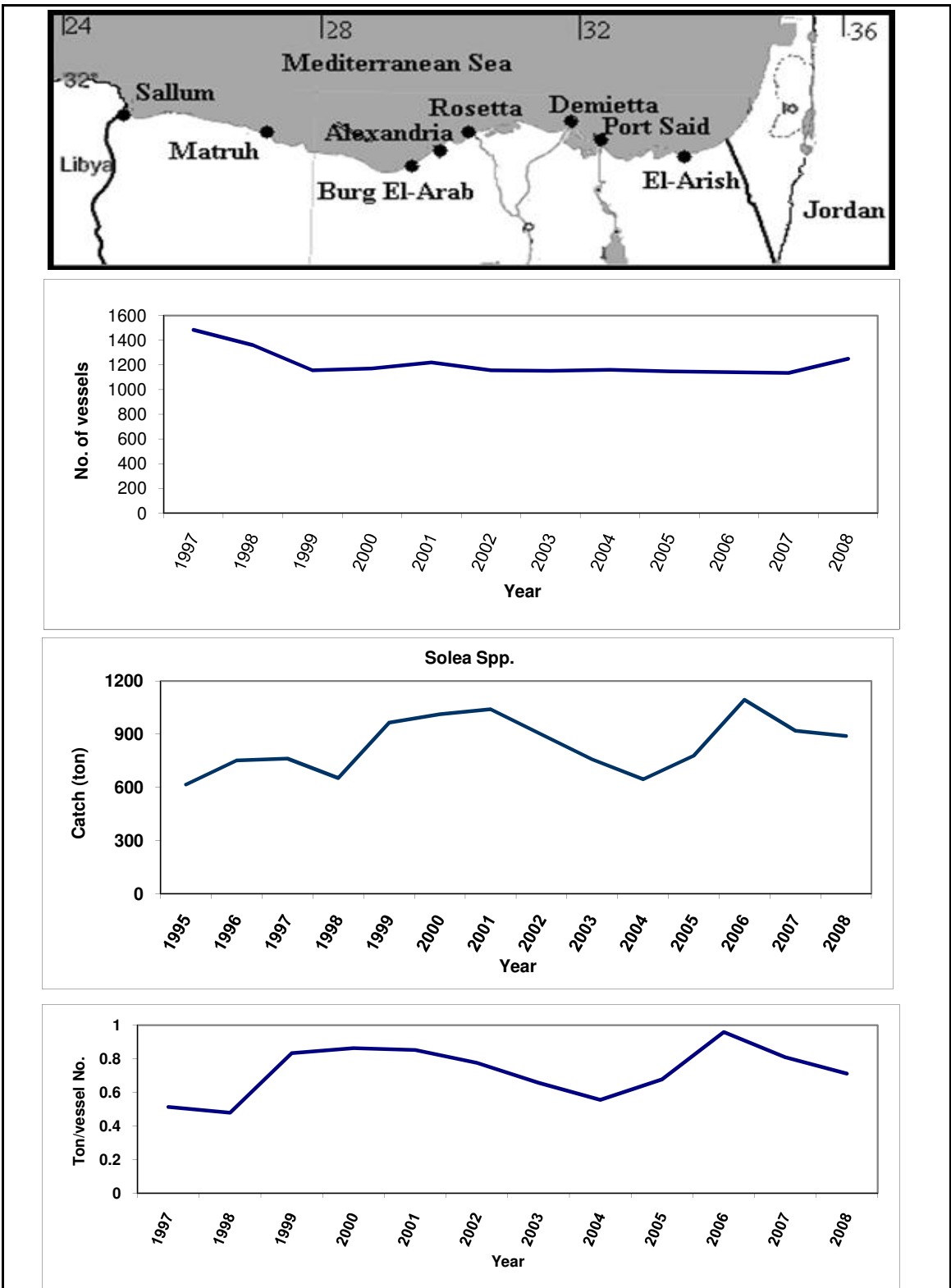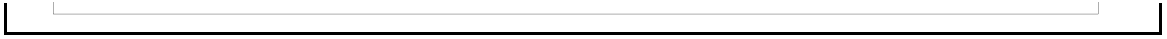| Operational Units*	Fleet (n° of boats)*	Kilos or Tons	Catch (species assessed)	Other species caught	Discards (species assessed)	Discards (other species caught)	Effort units
EGY 26 E 03 33 - SOO	1138	Tons	1006	28810		1700	vessel No.
Total	1138		1006	28810		1700	

Legal minimum size	

Comments

The given values are the mean values of the two years used (2006-2007)
The discard means the undersized species, species of lesser commercial important, unidentified species and species which rarely appeard.

Comments

Solea Spp.

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Assessment form	Sheet P2a
	Fishery by Operational Unit

Code: SOO2610Sah

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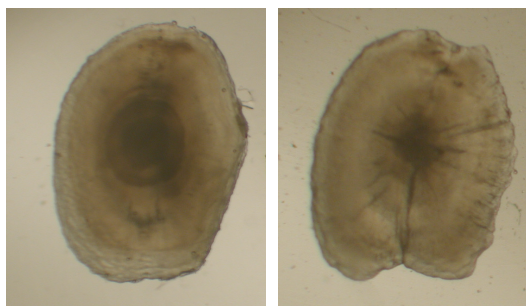
Data source*	commercial catch		OpUnit 1*	EGY 26 E 03 33 - SOO

Time series

Year*	2000	2001	2002	2003	2004	2005
Catch	1012	1041	898	758	645	778
Minimum size						
Average size Lc						
Maximum size						
Fleet	1171	1220	1157	1152	1161	1147

Year	2006	2007	2008			
Catch	1094	919	890			
Minimum size	13.5	12	9			
Average size Lc						
Maximum size	40	38	37			
Fleet	1141	1135	1251			

Selectivity   Remarks

L25	
L50	
L75	
Selection factor	

Structure by size or age
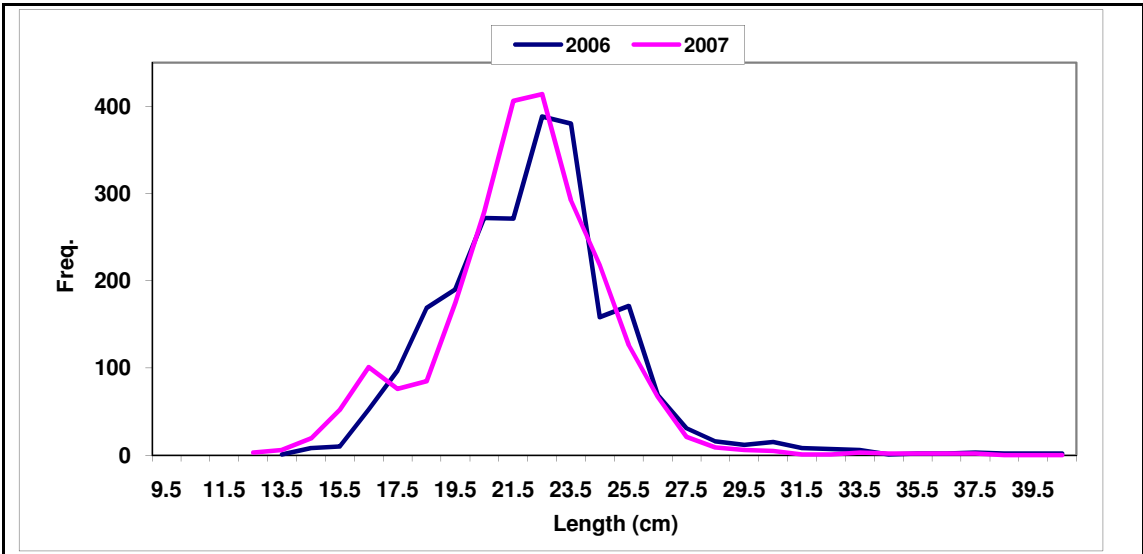
Structure by size or age

The mean number of two years 2006-2007

This sheet will be activated once the Operational Unit information (P1 section) will be successfully filled in
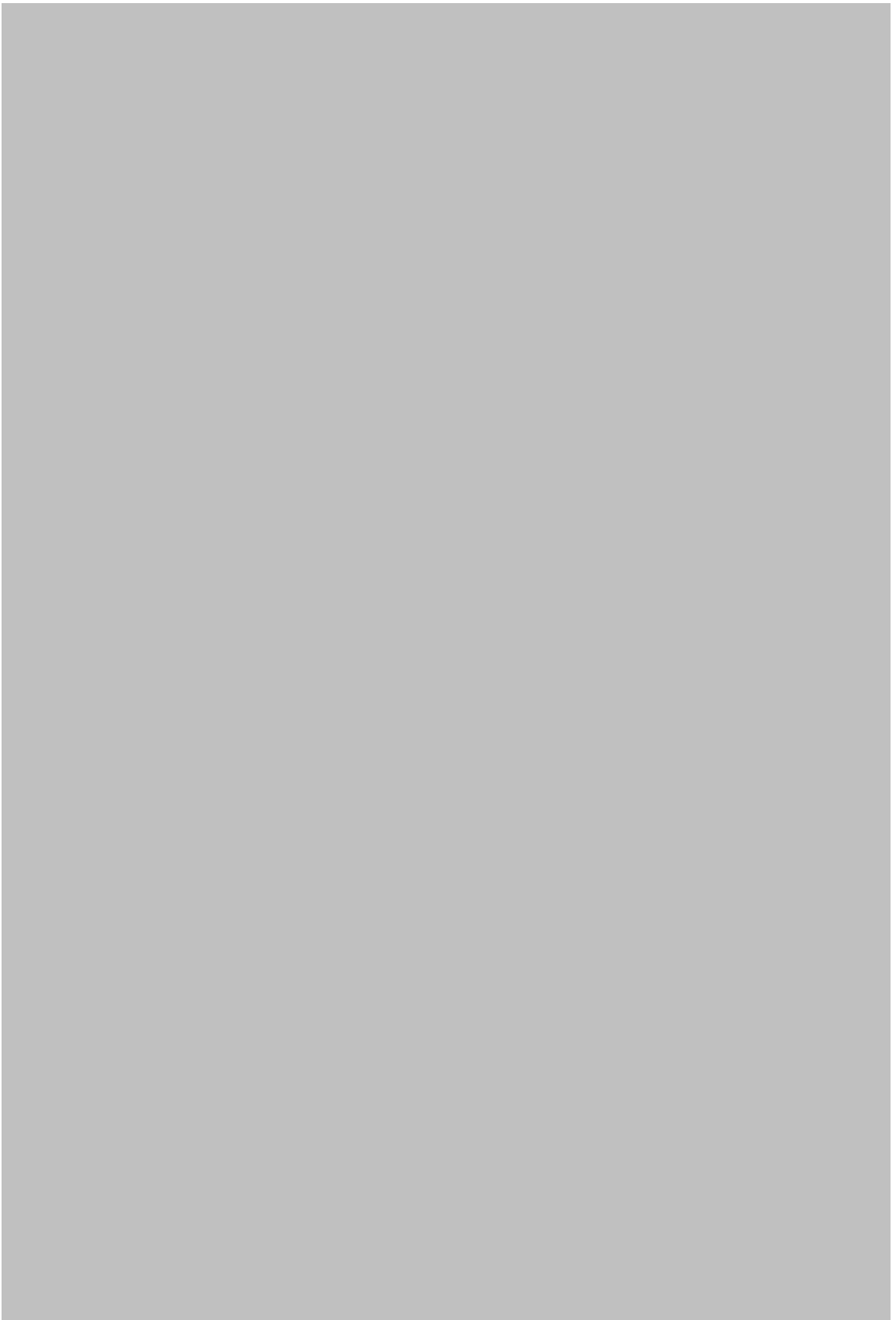
Code: SOO2610Sah

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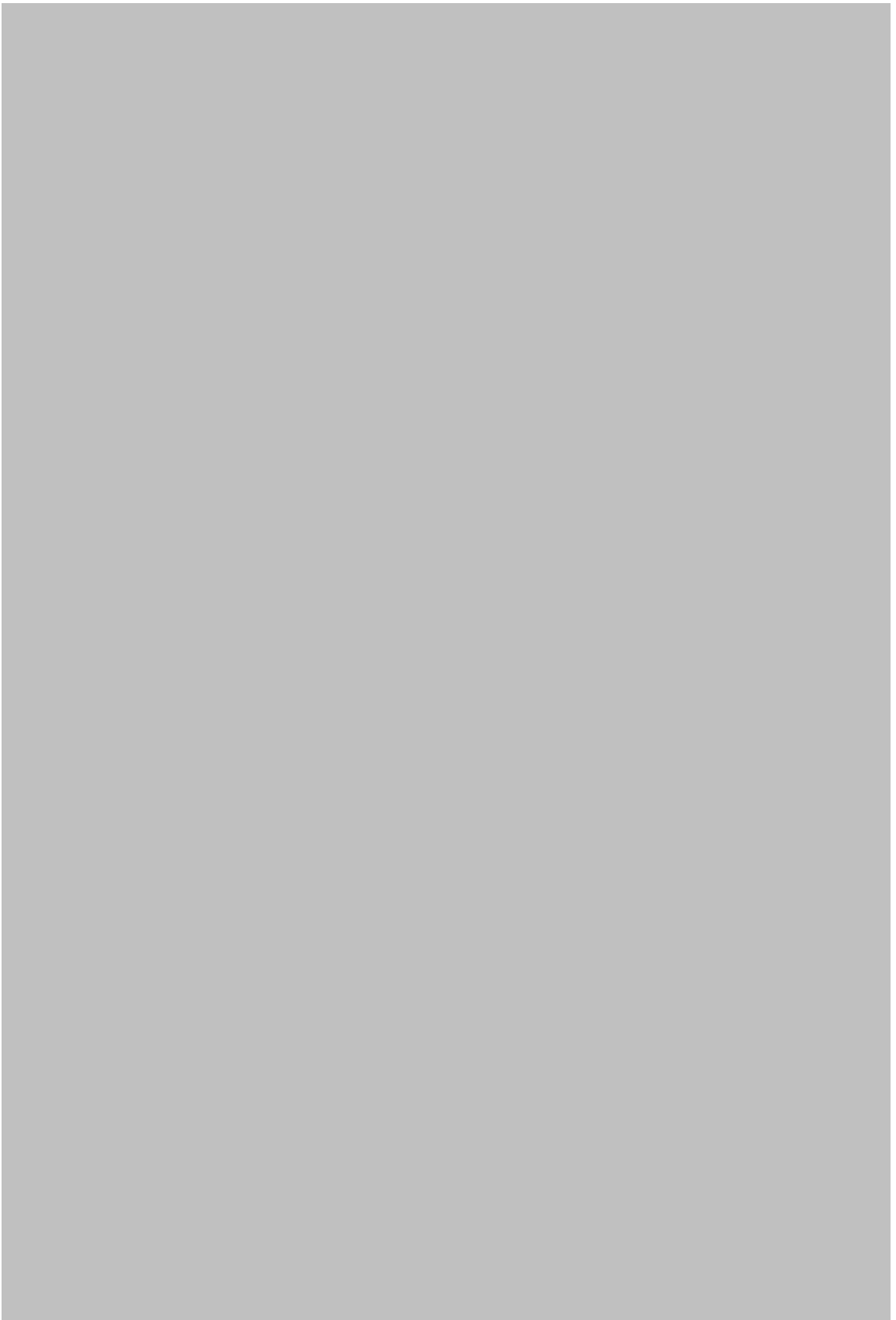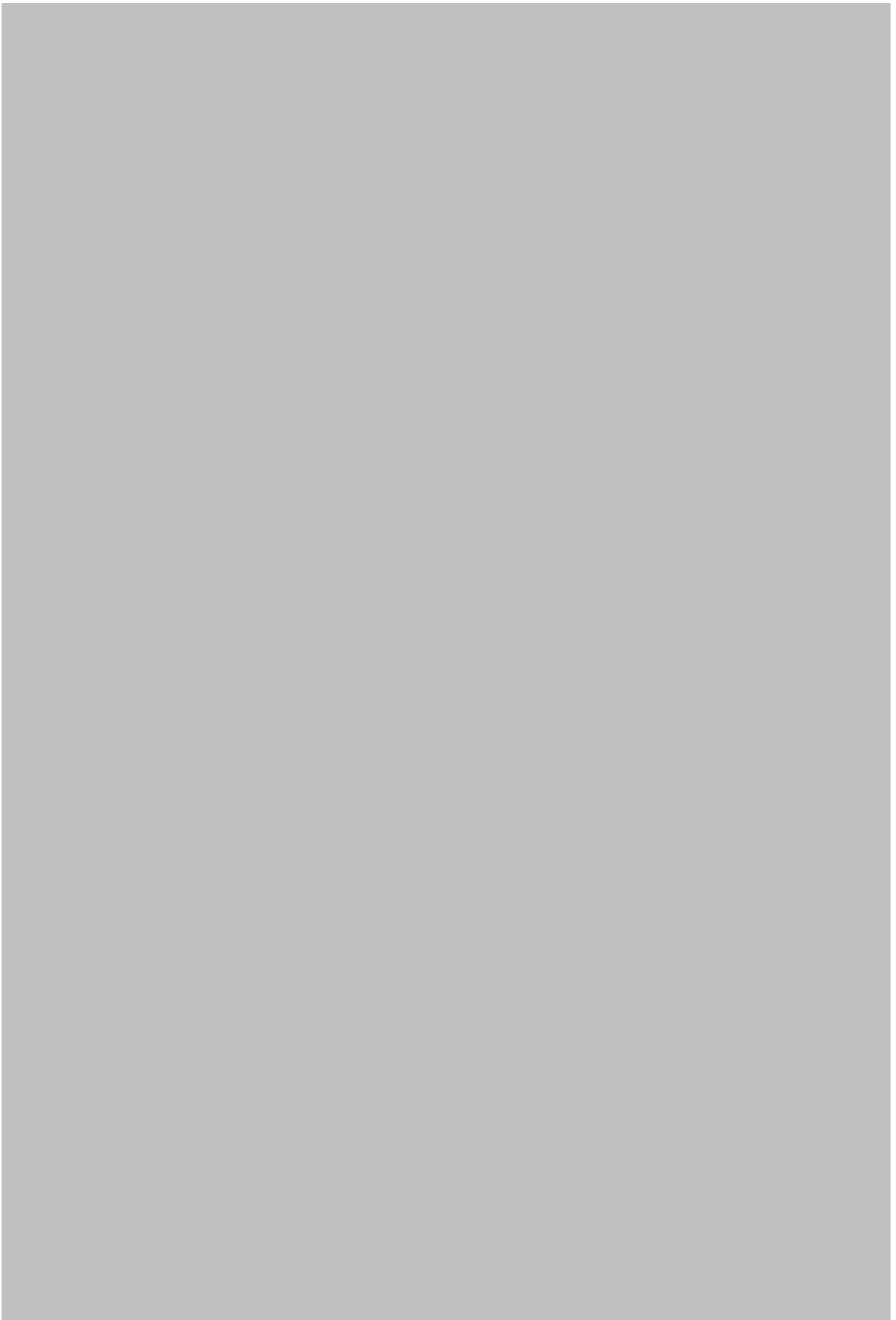## SAC GFCM - Sub-Committee on Stock Assessment (SCSA)

Assessment form

Sheet P2b
Fishery by Operational Unit
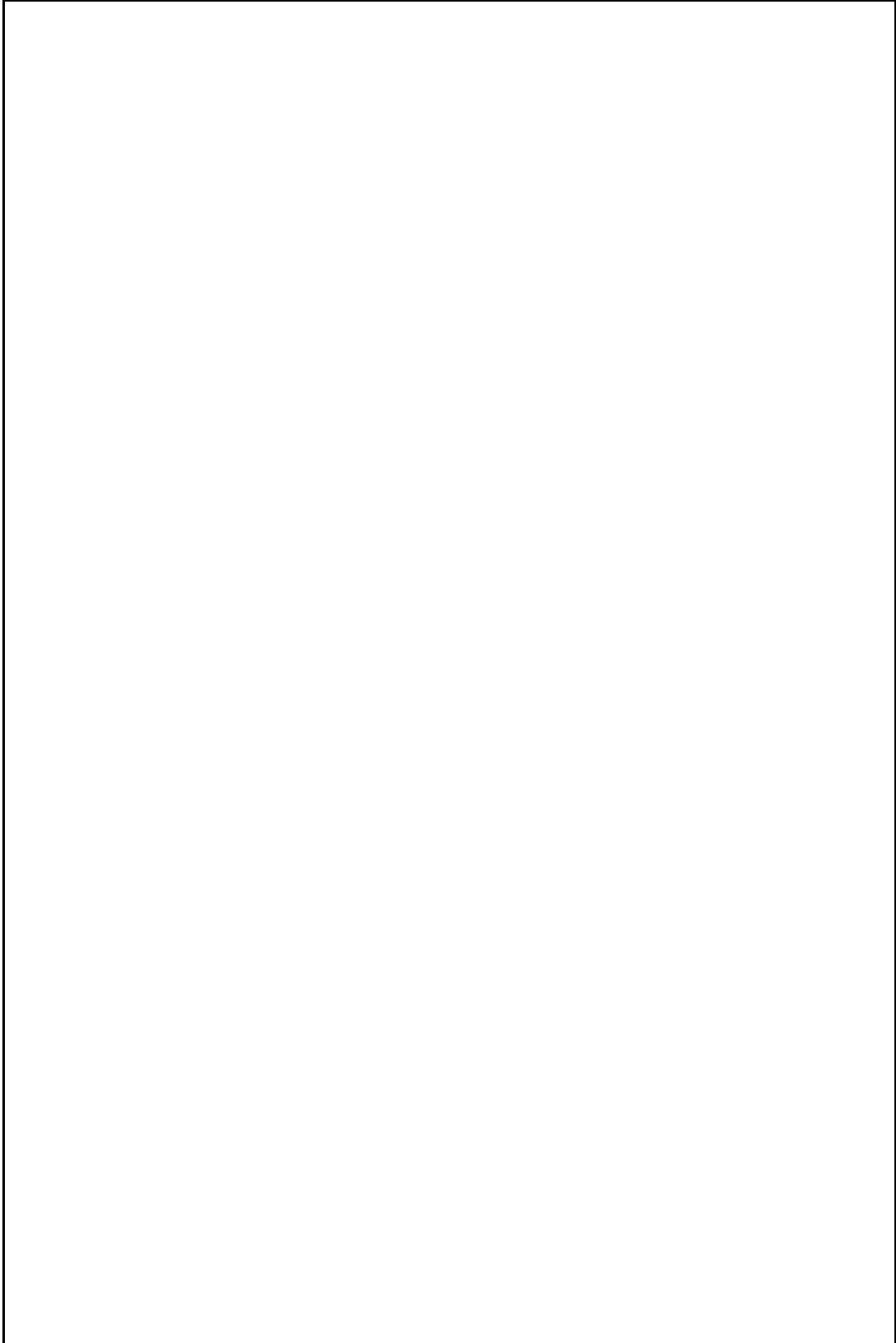
Code: SOO2610Sah
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Data source*	commercial catch and personal observation	OpUnit 1*	EGY 26 E 03 33 - SOO

Regulations in force and degree of observance of regulations

Closed season for 45 days (from 1st May- mid of June) since 2006 (not fully observed)
No new licenses are given since 1996 (not fully observed)
prevention any improvements on fishing vessels like increasing hp (not fully observed)
Mesh size regulation (not fully observed)

Accompanying species

Mullus barbatus, M. surmmuletus, Pagellus erythrinus, P. acarne, Sparus aurata, Sepia officinalis, hake, triglid, shrimp

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Sex*	both

Analysis # *	**VPA**

Time series

Data	Size	Age
(mark with X)	X	

Model	Cohorts	Pseudocohorts
(mark with X)		X

Equation used	standard VPA	Tunig method	
# of gears	1	Software	VIT
$F_{terminal}$	0.7		

Population results (please state units)

	Sizes	Ages		Amount	Biomass
Minimum	12		Recruitment		
Average	21.48		Average population		
Maximum	40.5		Virgin population		
Critical			Turnover		

Average mortality

	Total	Gear					
F_1							
F_2							
Z							

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

Comments

Sex*

Time series

Analysis # *

Data	Size	Age
(mark with X)		

Model	Cohorts	Pseudocohorts
(mark with X)		

Equation used		Tunig method	
# of gears		Software	
$F_{terminal}$			

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

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

This sheet will be activated once the previous page will be successfully completed

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Sex*	both	Gear*	bottom trawl		Analysis # *	VPA

Data source	Length frequency

Data

The data used in stock assessment of *Solea solea* in GSA 26 is based on monthly biological samples from the commercial catch from landing sites and local markets during two years 2006-2007.

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Sex*	both	Gear*	bottom trawl		Analysis #*		VPA

Population in figures

Population in biomass

Fishing mortality rates

SCSA Assessment Forms

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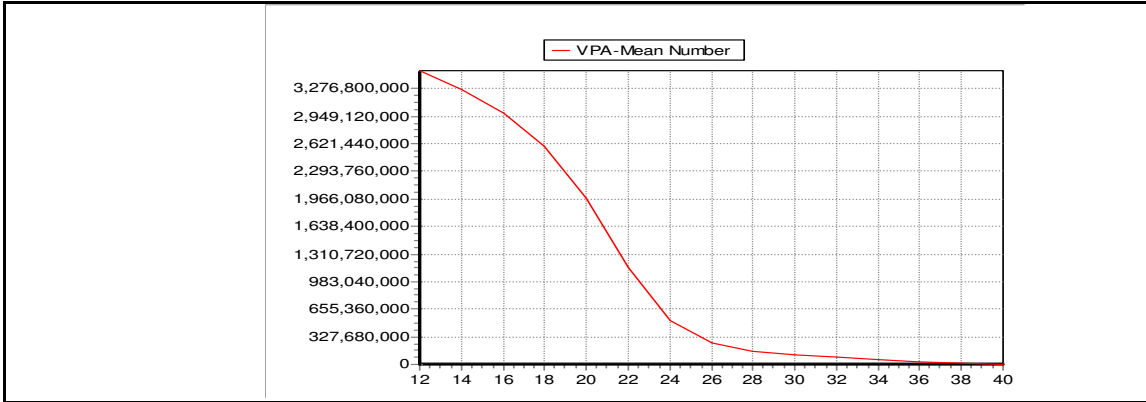
Assessment form

Sheet A3
Indirect methods: VPA results
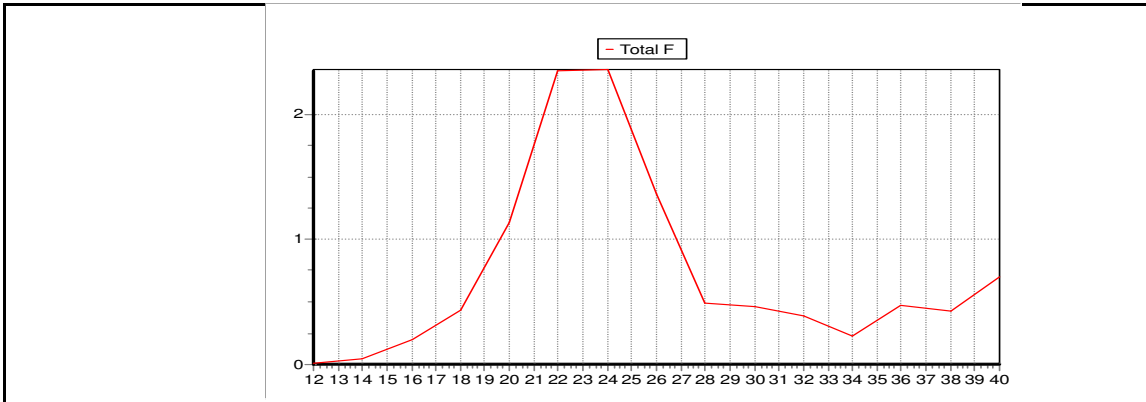
Code: SOO2610Sah
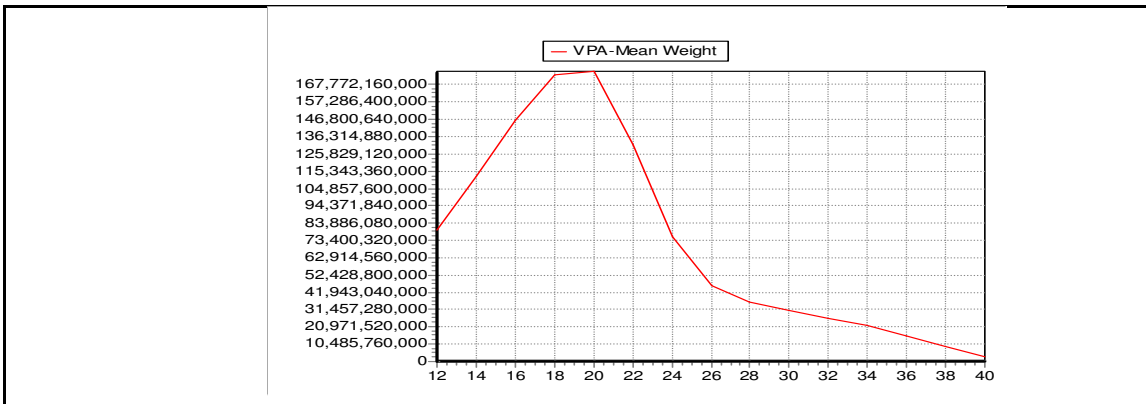Page 2 / 1

Sex*		Gear*		Analysis #*	

Population in figures

Population in biomass

Fishing mortality rates

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Code: SOO2610Sah

Sex	both

Analysis #	1

# of gears	1	Software	VIT

Parameters used

Vector F	
Vector M	constant
Vector N	

Model characteristics

Results

	Total	Gear			
Current YR	48.11				
Maximum Y/R	48.38				
Y/R 0.1	44.79				
F_{max}	0.81				
$F_{0.1}$	0.41				
Current B/R	56.52				
Maximum B/R	238				
B/R 0.1	81.24				

Comments

Comments

Other assessment methods

Other assessment methods

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Code: SOO2610Sah

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

	Exploitation rate		**Stock abundance**		
Bidimensional	☐ No or low fishing		☐ Virgin or high abundance	☐ Depleted	
	☐ Moderate fishing		☐ Intermediate abundance	☐ Uncertain / Not assessed	
	⊙ High fishing mortality		☐ Low abundance		
	☐ Uncertain / Not assessed				

Comments

Code: SOO2610Sah

Management advice and recommendations*

To reduce fishing mortality by about 40-60%.
To regulate mesh sizes and improve the trawl selectivity.
To identify and protect nursery grounds.

Advice for scientific research*

With possible support of regional projects
The necessity to work in order to provide a common management information system for the Mediterranean countries.
The necessity to standardize the stock assessment methods to facilitate the comparison between species in different areas.
It is necessary to make an accurate data base about our fisheries involving good records for fishery statistics.

Abstract for SCSA reporting

Authors Sahar Mehanna   **Year**   **2010**

Species Scientific name   Solea solea - SOO

Source: -

Source: -

Source: -

Geographical Sub-Area   26 - South Levant

Fisheries (brief description of the fishery)*

The Egyptian Mediterranean coast (GFCM-GSA 26) is about 1100 km extending from El-Salloum in the West to El-Arish in the East. The mean annual fish production from this area was about 55 thousand ton (1990-2008). The main fishing gears operated in this region are trawling, purse - seining and lining especially long and hand lining.

The number of licensed trawl vessels ranged between 1100 and 1500 during the period from 1990 to 2007.

The mean annual landing of trawl fishery is around 18 thousand tons accounting for approximately 33% of total catches in Egyptian Mediterranean.

The most dominant fish species in the catch are red mullet; bream; soles; European hake; the picarels; lizardfishes; elasmobranches. Invertebrates are represented by shrimp, cuttlefish, squid, crab and bivalves.

Family Soleidae, contributes about 4% of the total trawl catch in the Egyptian Mediterranean with a mean annual catch of 800 ton composed mainly of common sole (S. solea) and Egyptian sole S. aegyptiaca.

Source of management advice*

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

Monthly samples were collected from the commercial catch of trawl fishery during three years (2006-2008). The samples were collected from Port Said, Demmietta and Alexandria landing sites along the Egyptian Mediterranean coast, where the majority of Sole catch is landed.
Age and growth of the Solea solea was done based on otolith's readings
The growth parameters (L8 , k and t0) were estimated following the Von Bertalanffy growth curve
The length at first sexual maturity (Lm) was estimated by fitting the maturation curve between the observed points of mid-class interval and the percentage maturity of fish corresponding to each length interval.
The yield per recruit (Y/R) analysis was performed using VIT software
The total mortality coefficient (Z) was estimated using the converted catch curve
The natural mortality coefficient was estimated using the method of Djabali et al. (1993).

Stock Status*

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;

Exploitation rate   **Stock abundance**

High fishing mortality

Comments

Management advice and recommendations*

To reduce fishing mortality by about 40-60%.
To regulate mesh sizes and improve the trawl selectivity.
To identify and protect nursery grounds.

Advice for scientific research*

With possible support of regional projects
The necessity to work in order to provide a common management information system for the Mediterranean countries.
The necessity to standardize the stock assessment methods to facilitate the comparison between species in different areas.
It is necessary to make an accurate data base about our fisheries involving good records for fishery statistics.