

SAC GFCM

Sub-Committee on Stock Assessment

Date*

25	October	2011
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Code*

PAC9911F.F

Authors*

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Species Scientific name*

1	<i>Pagellus erythrinus</i> - PAC
	Source: GFCM Priority Species

2
Source: -

3
Source: -

Geographical area*	
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Geographical Sub-Area (GSA)*	99 - Combination of GSAs
Combination of GSAs	1 15 - Malta Island
	2 16 - South of Sicily
	3

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Assessment form

Sheet #0

Basic data on the assessment

Code: PAC9911F.F

Date*	25	Oct	2011	Authors*	F.Fiorentino ¹ , L. Knittweis ² , V. Gancitano ¹ , R. Mifsud ² , F. Gravino ² , M. Gristina ¹
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Species Scientific name*	Pagellus erythrinus - PAC	Species common name*	Common Pandora
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Data Source

GSA*	15 - Malta Island, 16 - South of Sicily	Period of time*	2006-2010
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Description of the analysis

Type of data*	Commercial catch LFDs data	Data source*	EU Data Collection Framework (DCF) in GSAs 15 & 16
Method of assessment*	LCA, Y/R analysis	Software used*	Vit4Win, Yield Package, LFDA

Sheets filled out

B	P1	P2a	P2b	G	A1	A2	A3	Y	Other	D	Z	C
1	1	4	4	---	1	1	1	1	1	1	1	---

Comments, bibliography, etc.

Andaloro F., Giarritta P.S. (1985). Contribution to the knowledge of the age, growth and feeding of pandora, *Pagellus erythrinus* (L., 1758) in the Sicilian Channel. *FAO Fish. Rep.*, 336: 85-87.

Bauchot M., Hureau J.C. (1986). Sparidae. In: Whitehead P.J.P., Bauchot M.L., Hureau J.C., Nielsen J., Tortonese E. (eds.), *Fishes of the north-eastern Atlantic and the Mediterranean*. P. 883-907. Paris: UNESCO.

Cannizzaro, L., Garofalo, G. and Scalisi M. (1994). *Nasello, Luvaro e Scorfano di fondale nel Canale di Sicilia - Distribuzione spazio-temporale*. NTR-ITPP 44, 4 pp.

Coelho R., Bentes L., Correia C., Gonclaves J.M.S., Lino P.G., Menteiro P., Ribeiro J., Erzini K. (2010). Life history of the common Pandora *Pagellus erythrinus* (Linnaeus, 1758) (Actinopterygii: Sparidae) from southern Portugal. *Brazilian Journal of Oceanography* 58(3): 233-245.

Fiorentino F., Mazzola S., Garofalo G., Patti B., Gristina M., Bonanno A., Massi D., Basilone G., Cuttitta A., Giusto G.B., Gancitano S., Sinacori G., Rizzo P., Levi D., Ragonese S. (2005) - Lo stato delle risorse demersali e dei piccoli pelagici e le prospettive di pesca "sostenibile" nello Stretto di Sicilia. *Convenzione con Assessorato Regione Siciliana Cooperazione, Commercio, Artigianato e Pesca, Mazara del Vallo, Italia.*, 136 pp.

Comments, bibliography, etc.

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Sheet B
Biology of the species

Code: PAC9911F.F

Biology

Somatic magnitude measured (LH, LC, etc)*				TL	Units*	cm
Sex	Fem	Mal	Both	Unsexed	Ref: Fiorentino et al. 2005	
Maximum size observed			41		Reproduction season	May-August peak
Size at first maturity	16				Reproduction areas	Sicily southern coast
Recruitment size					Nursery areas	

Parameters used (state units and information sources)

		Units	Sex			
			female	male	both	unsexed
Growth model	L ∞				40	
	K				0.176	
	t0				-1	
	Data source	STECF-EWG 11-12				
Length weight relationship	a				0.022	
	b				2.83	
	M				0.29	
	sex ratio (mal/fem)					

Comments

Pagellus erythrinus is a widely distributed species in the Sparidae family, which is found in the north-eastern and central-eastern Atlantic Ocean, from Norway (Bauchot and Hureau, 1986) to Guinea-Bissau (Sanches, 1991 in Coelho et al. 2010) and the Mediterranean Sea (Spedicato et al., 2002). In the Mediterranean it occurs on continental shelf bottoms throughout all Mediterranean basins, including the Black Sea. Although aspects of Common Pandora population biology and fisheries have been the subject of several studies (e.g. Santos et al. 1995, Pajuelo and Lorenzo 1998, Hossucu 2003, Klaoudatos 2004, Metin et al. 2011), no detailed information on stock structure is available from the Central Mediterranean. Cannizzaro et al., (1994) identified nursery areas on the GSA 16 and 15, with the exclusion of the MFMZ.

Andaloro & Giarritta (1985) described firstly the growth of the species in the area on the basis of trawling catches. Orsi Relini & Romeo (1985) reported difference in growth patterns between specimens caught by trawling and those caught by long lines. Gancitano et al., (2010a) studied the existence of differences in growth curves of P. erythrinus in GSA 16 based on data from commercial trawling and artisanal fisheries (trammel net and long lines). In this study a total of 2647 otoliths (945trawling; 563artisanal from females and 758trawling; 381artisanal from males) were sampled and age was estimated by reading whole sagitta under transmitted light. Since this species is a protogynous hermaphroditic species, the von Bertalanffy growth curves (VBGF) were estimated by combined sex and keeping the metiers separate using the “Length at Age” routine as implemented in Fisat II. The results showed that differences in VBGF parameters by metier were significant (p<0.05; F=54.94).

Comments

P. erythrinus is a protogynous hermaphroditic species, where large fish change sex from females to males. Several authors have reported that the sex ratio of *P. erythrinus* in the Mediterranean is skewed in favour of females due to a lack of large individuals (Pajuelo and Lorenzo 1998; Vassilopoulou et al. 1986; Hashem and Gassim, 1981; Unsal, 1984; Mytilineou, 1989; Ozaydin 1997 in Hossucu 2003; Hoşsucu and Cakir, 2003), a situation which has important management implications.

The length at 50% maturity has been reported at 120-130 mm for females and 160 – 170 mm for males by Ragonese et al., (2004). Fiorentino et al., (2005) estimated the maturity oogive for females in GSA 16, and estimated an Lm of 160 mm.

With regards the timing of the reproductive season, Giudicelli (1982, in Fiorentino et al., 2005) reported that the reproductive peak for *P. erythrinus* in the Gulf of Tunis is between May and August. Similarly Ragonese et al., (2004) reported the spawning season for *P. erythrinus* off the Sicilian southern coasts to occur in spring-summer.

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Assessment form

Sheet P1

General information about the fishery

Code: PAC9911F.F

Data source*	EU Data Collection Framework (DCF) Data collected in GSAs 15 & 16	Year (s)*	2006-2010
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Data aggregation (by year, average figures between years, etc.)*	By year
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Fleet and catches (please state units)

	Country	GSA	Fleet Segment	Fishing Gear Class	Group of Target Species	Species
Operational Unit 1*	MLT	99	E - Trawl (12-24 metres)	03 - Trawls	33 - Demersal shelf species	PAC
Operational Unit 2	MLT	99	I - Long line (12-24 metres)	09 - Hooks and Lines	33 - Demersal shelf species	PAC
Operational Unit 3	ITA	99	F - Trawl (>24 metres)	03 - Trawls	33 - Demersal shelf species	PAC
Operational Unit 4	ITA	99	E - Trawl (12-24 metres)	03 - Trawls	33 - Demersal shelf species	PAC
Operational Unit 5	ITA	99	C - Minor gear with engine (6-12 metres)	20 - Miscellaneous Gear	33 - Demersal shelf species	PAC

Operational Units*	Fleet (n° of boats)*	Kilos or Tons	Catch (species assessed)	Other species caught	Discards (species assessed)	Discards (other species caught)	Effort units
MLT 99 E 03 33 - PAC	12	Tons					
MLT 99 I 09 33 - PAC	8	Tons					
ITA 99 F 03 33 - PAC	146	Tons	216				
ITA 99 E 03 33 - PAC	260	Tons	58				
ITA 99 C 20 33 - PAC	490	Tons	25				
Total	916		299				

NB - there is insufficient space to report all operational units

Legal minimum size	15 cm (EC 1967/2006)
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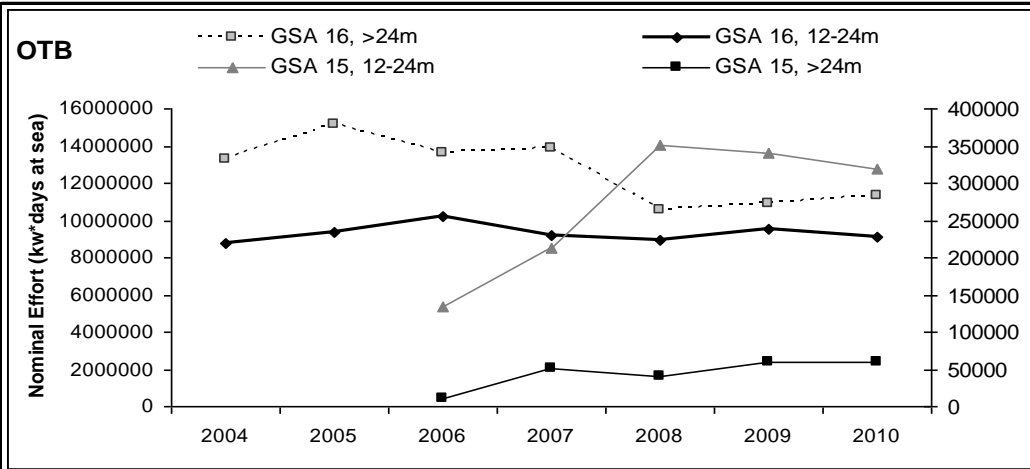
Comments

	GEAR	2006	2007	2008	2009	2010	Total
ITA	GNS					0.27	0.27
	GTR	135.1	16.1	19.32	32.25	15.49	67.06
	LLS			21.39	29.53	9.27	60.19
	OTB	777.26	465.35	361.5	223.3	273.9	858.7
	ITA Total	912.32	481.4	402.2	285	299	986.2
MLT	FPO	0	0.02	0.02	0.01		0.04
	GNS	0			0.04		0.04
	GTR	1.55	0.94	1.01	0.94	2.38	6.83
	LHP	0.02			0.06		0.08
	LLS	2.64	2.47	4.36	1.18	10.63	21.27
	OTB	0.98	2.89	3.93	8.52	7.11	23.42
	MLT Total	5.19	6.31	9.32	10.74	20.11	51.68
	Grand Total	917.51	487.7	411.5	295.8	319.1	1038

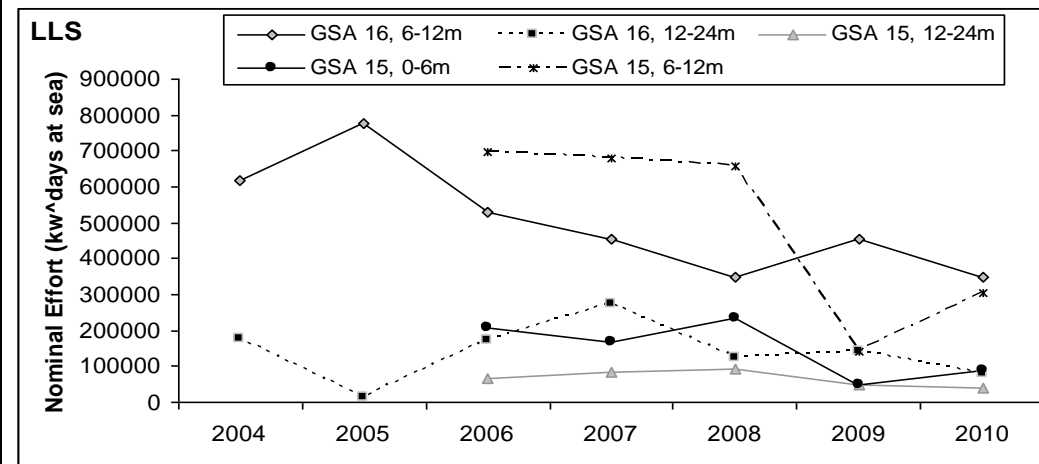
Annual *P. erythrinus* landings (t) by fishing technique in GSAs 15&16

Note: The trawl 12_24 and >24 are considered as unique gear

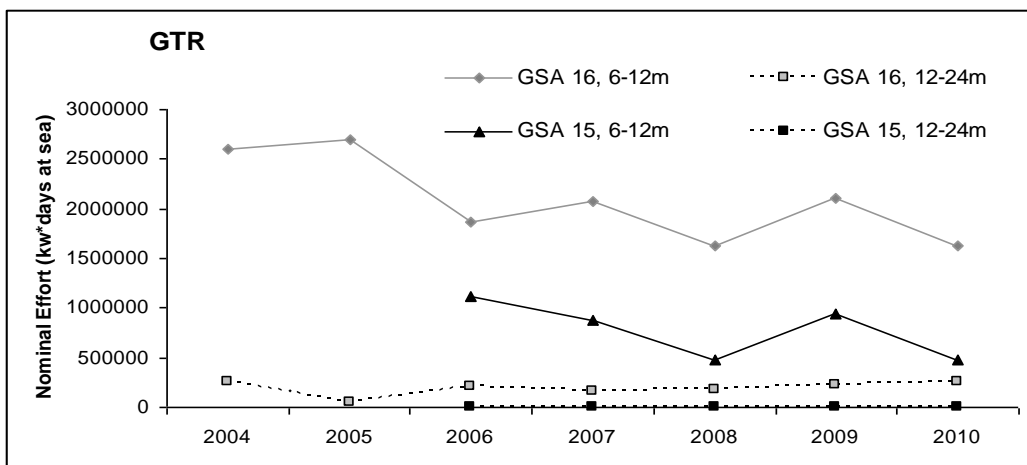
Comments



Nominal effort (kW*days at sea) trends of trawlers (OTB) by segments in GSA 15 (left) & 16 (right) 2004-2010



Nominal effort (kW*days at sea) trends of artisanal fisheries (LLS – set lonlines) segments in GSA 15 & 16, 2004-2010



Nominal effort (kW*days at sea) trends of artisanal fisheries (GTR- trammel nets) segments in GSA 15 & 16, 2004-2010.



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Sheet P2a
Fishery by Operational Unit

Code: PAC9911F.F

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Data source*	EU Data Collection Framework (DCF)	OpUnit 1*	MLT 99 E 03 33 - PAC
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Time series

Year*	2006	2007	2008	2009	2010	
Catch	0.9	1.81	3.3	5.5	5.6	
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Year						
Catch						
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Selectivity

Remarks

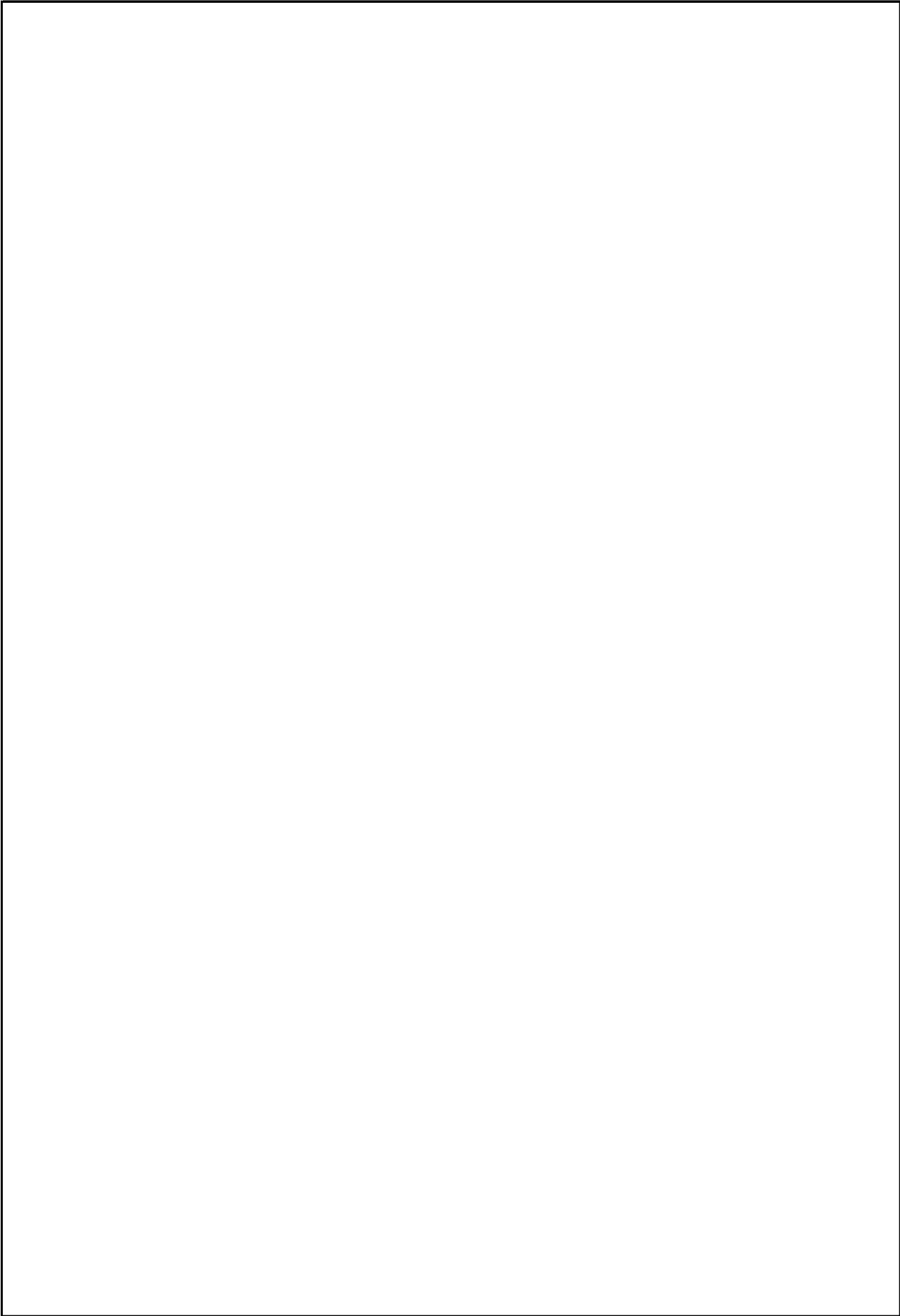
L25		
L50		
L75		
Selection factor		
		

Structure by size or age

N.B. The above refers to the 12-24m OTB segment only. Total landings of PAC by OTB in GSA 15 are given below

2006	2007	2008	2009	2010
0.98	2.89	3.93	8.52	7.11

Structure by size or age

A large, empty rectangular box with a thin black border, occupying most of the page. It is intended for a drawing or diagram related to the section header 'Structure by size or age'.

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Assessment form

Sheet P2a
Fishery by Operational Unit

Code: PAC9911F.F

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Data source*	EU Data Collection Framework (DCF)	OpUnit 2*	MLT 99.I 09.33 - PAC
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Time series

Year*	2006	2007	2008	2009	2010	
Catch	0.12	0.02	1.06	0.5	0.07	
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Year						
Catch						
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Selectivity

Remarks

L25		
L50		
L75		
Selection factor		

Structure by size or age

N.B. The above refers to the 12-24m LLS segment only. Total landings of PAC by LLS in GSA 15 are given below

2006	2007	2008	2009	2010
2.64	2.47	4.36	1.18	10.63

The largest fraction of vessels using set bottom longlines targeting PAC fall into the 6-12m category in Malta (this operational unit is missing from sheet P1).

The large increase in total PAC landings by set bottom longlines in Malta in 2010 is due to the implementation of a new catch assessment scheme for artisanal vessels by the Maltese Authorities.



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Sheet P2a
Fishery by Operational Unit

Code: PAC9911F.F

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Data source*	EU Data Collection Framework (DCF)	OpUnit 3*	ITA 99 F 03 33 - PAC
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Time series

Year*	2008	2009	2010			
Catch	362	223	274			
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Year						
Catch						
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Selectivity

Remarks

L25		
L50		
L75		
Selection factor		

Structure by size or age

LFDs from italian trawler 12_24 were together with trawler >24

Trawlers, GSA 16, 12-24&>24m

Classe	N. es. (2006)	N. es. (2007)	N. es. (2008)	N. es. (2009)	N. es. (2010)
13					211
14	0	15409	6894	2073	1519
15	0	118446	57178	113021	14558
16	33903	412955	229331	168550	51198
17	330210	506704	410490	177588	59689
18	588391	492628	435879	186744	49266
19	542817	516951	407982	233016	43664
20	292236	372569	410576	125588	36478
21	182843	274627	277289	123816	36461
22	345435	324442	278175	141347	43420
23	165223	268304	141523	149824	33635
24	222479	231231	127392	81634	25045
25	140172	151037	57418	35857	16587

26	67372	83284	41893	35761	7395
27	54845	44268	31519	24026	12999
28	33251	13728	10248	11149	3688
29	16059	10854	6584	12503	2518
30	7688	0	1511	0	534
31	0	0	3527	2170	534

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Sheet P2a
Fishery by Operational Unit

Code: PAC9911F.F

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Data source*	EU Data Collection Framework	OpUnit 4*	ITA 99 C 20 33 - PAC
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Time series

Year*	2008	2009	2010			
Catch	41	62	25			
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Year						
Catch						
Minimum size						
Average size Lc						
Maximum size						
Fleet						

Selectivity

Remarks

L25		
L50		
L75		
Selection factor		

Structure by size or age

Artisanal, GSA 16, '06-12m

Classe	N. es. (2006)	N. es. (2007)	N. es. (2008)	N. es. (2009)	N. es. (2010)
13	0	2406	0	0	4479
14	0	5964	1034	0	9395
15	0	7738	0	0	4479
16	0	7758	0	0	4479
17	0	9681	682	0	6719
18	18385	2282	2387	0	436
19	48544	2621	1476	11614	6719
20	21916	4029	3932	3058	5788
21	15560	4626	6682	5527	2240
22	42188	5508	5530	16126	3985
23	9447	7095	6716	3951	3985
24	13311	11423	11240	5863	7155
25	11917	12378	13619	25350	8465
26	10715	1984	16238	17768	1745
27	4618	5213	6871	26062	3985
28	8401	5418	3937	19527	873

29	0	4413	4732	6554	436
30	13047	3288	2757	5206	436
31	0	2486	2590	4742	0
32	1172	1408	1256	3247	0
33	1172	1141	1332	10541	0
34	2173	0	2086	0	0
35	6691	1238	4670	1164	0
36	0	0	930	1164	436
37	0	0	1861	0	
38	0	0	413	1164	
39	0	0	930		
40	0	0	1861		
41	0	0	930		

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Sheet P2b
Fishery by Operational Unit

Code: PAC9911F.F

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Data source* EC 1967/2006; EU DCF

OpUnit 1* MLT 99 E 03 33 - PAC

Regulations in force and degree of observance of regulations

At present there are no formal management objectives for common Pandora in the Strait of Sicily fisheries. As in other areas of the Mediterranean, the stock management is based on control of fishing capacity (licenses), fishing effort (fishing activity), technical measures (mesh size and area/season closures).

Maltese fishing licenses have been fixed at a total of 16 trawlers since 2000. Eight new licences were however issued in 2008, a move made possible under EU law by the reduction of the capacities of other Maltese fishing fleets.

In terms of technical measures, the new regulation EC 1967 of 21 December 2006 fixed a minimum mesh size of 40 mm for bottom trawling of EU fishing vessels (Italian and Maltese trawlers). Mesh size had to be modified to square 40 mm or diamond 50 mm in July 2008, and derogations were only possible up to 2010.

Accompanying species

Trawling is carried out on the continental shelf of the Central Mediterranean throughout the year, and catches include common Pandora (*Pagellus erythrinus*), pink shrimp (*Parapenaeus longirostris*), Norway lobster (*Nephrops norvegicus*), giant red shrimp (*Aristaeomorpha foliacea*), violet shrimp hake (*Merluccius merluccius*), violet shrimp (*Aristeus antennatus*), scorpionfish (*Helicolenus dactylopterus*), grater forkbeard (*Phycys blennioides*), red Pandora (*Pagellus bogaraveo*) and monkfish (*Lophius piscatorius*).

The Maltese Islands are surrounded by a 25 nautical miles (nm) fisheries management zone, where fishing effort and capacity are being managed by limiting vessel sizes, as well as total vessel engine powers (EC 813/04; EC 1967/06). Trawling is allowed within this designated conservation area, however only by vessels not exceeding an overall length of 24m and only within designated areas. Such vessels fishing in the management zone hold a special fishing permit in accordance with Article 7 of Regulation (EC) No 1627/94, and are included in a list containing their external marking and vessel's Community fleet register number (CFR) to be provided to the Commission annually by the Member States concerned. Moreover, the overall capacity of the trawlers allowed to fish in the 25nm zone can not exceed 4 800 kW, and the total fishing effort of all vessels is not allowed to exceed an overall engine power and tonnage of 83 000 kW and 4 035 GT respectively. The fishing capacity of any single vessel with a license to operate at less than 200m depth can not exceed 185 kW. In addition, the use of all trawl nets within 1.5nm of the coast is prohibited according to EC regulation 1967 / 2006, although again a transitional derogation is at present in place until 2010.

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Sheet P2b
Fishery by Operational Unit

Code: PAC9911F.F

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Data source* EC 1967/2006; EU DCF

OpUnit 2* MLT 99 I 09 33 - PAC

Regulations in force and degree of observance of regulations

At present there are no formal management objectives for common Pandora in the Strait of Sicily fisheries. As in other areas of the Mediterranean, the stock management is based on control of fishing capacity (licenses), fishing effort (fishing activity), technical measures (mesh size and area/season closures).

Accompanying species

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Assessment form

Sheet P2b
Fishery by Operational Unit

Code: PAC9911F.F

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Data source* EC 1967/2006; EU DCF

OpUnit 3*

ITA 99 F 03 33 - PAC

Regulations in force and degree of observance of regulations

At present there are no formal management objectives for Common Pandora in the Strait of Sicily fisheries. As in other areas of the Mediterranean, the stock management is based on control of fishing capacity (licenses), fishing effort (fishing activity), technical measures (mesh size and area/season closures).

The adoption of the trawling ban of 30-45 days per year by the Sicilian Government since late eighties have should contributed to reduce the fishing effort on demersal resources off the Sicilian coast. However this measure for many years had low efficacy in Sicily because the period of stopping trawling was not chosen to reduce fishing mortality on juveniles (late summer-early autumn). Since 2008 the seasonal trawling ban for Sicilian trawlers was done in September–October contributing to improve the stock status of common pandora. In order to limit the over-capacity of fishing fleet, no new fishing licenses have been assigned in Italy since 1989, and a progressive reduction of the trawl fleet capacity is occurring.

In terms of technical measures, the new regulation EC 1967 of 21 December 2006 fixed a minimum mesh size of 40 mm for bottom trawling of EU fishing vessels (Italian and Maltese trawlers). Mesh size had to be modified to square 40 mm or diamond 50 mm in July 2008, and derogations were only possible up to 2010.

Accompanying species

Trawling is carried out on the continental shelf of the Central Mediterranean throughout the year, and catches include common Pandora (*Pagellus erythrinus*), pink shrimp (*Parapenaeus longirostris*), Norway lobster (*Nephrops norvegicus*), giant red shrimp (*Aristaeomorpha foliacea*), violet shrimp hake (*Merluccius merluccius*), violet shrimp (*Aristeus antennatus*), scorpionfish (*Helicolenus dactylopterus*), grater forkbeard (*Phycys blennioides*), red Pandora (*Pagellus bogaraveo*) and monkfish (*Lophius piscatorius*).

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Sheet P2b
Fishery by Operational Unit

Code: PAC9911F.F

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Data source* EC 1967/2006; EU DCF

OpUnit 4*

ITA 99 C 20 33 - PAC

Regulations in force and degree of observance of regulations

At present there are no formal management objectives for Common Pandora in the Strait of Sicily fisheries. As in other areas of the Mediterranean, the stock management is based on control of fishing capacity (licenses), fishing effort (fishing activity), technical measures (mesh size and area/season closures).

The adoption of the trawling ban of 30-45 days per year by the Sicilian Government since late eighties have should contributed to reduce the fishing effort on demersal resources off the Sicilian coast. However this measure for many years had low efficacy in Sicily because the period of stopping trawling was not chosen to reduce fishing mortality on juveniles (late summer-early autumn). Since 2008 the seasonal trawling ban for Sicilian trawlers was done in September–October contributing to improve the stock status of common pandora. In order to limit the over-capacity of fishing fleet, no new fishing licenses have been assigned in Italy since 1989, and a progressive reduction of the trawl fleet capacity is occurring.

In terms of technical measures, the new regulation EC 1967 of 21 December 2006 fixed a minimum mesh size of 40 mm for bottom trawling of EU fishing vessels (Italian and Maltese trawlers). Mesh size had to be modified to square 40 mm or diamond 50 mm in July 2008, and derogations were only possible up to 2010.

Accompanying species

Trawling is carried out on the continental shelf of the Central Mediterranean throughout the year, and catches include common Pandora (*Pagellus erythrinus*), pink shrimp (*Parapenaeus longirostris*), Norway lobster (*Nephrops norvegicus*), giant red shrimp (*Aristaeomorpha foliacea*), violet shrimp hake (*Merluccius merluccius*), violet shrimp (*Aristeus antennatus*), scorpionfish (*Helicolenus dactylopterus*), grater forkbeard (*Phycys blennioides*), red Pandora (*Pagellus bogaraveo*) and monkfish (*Lophius piscatorius*).

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Assessment form

Sheet A1
Indirect methods: VPA, LCA

Sex* F & M

Code: PAC9911F.F

Page 1 / 1

Time series

Analysis # * LCA

Data	Size	Age
(mark with X)	x	

Model	Cohorts	Pseudocohorts
(mark with X)		x

Equation used	VPA	Tuning method	
# of gears	2	Software	Vit4Win
F _{terminal}	0.5		

Population results (please state units)

	Sizes	Ages		Amount	Biomass
Minimum	11.9	1	Recruitment	3.9-15.2	252-912
Average	20.8-22.0	3.3-3.7	Average population		1046-1307
Maximum	36.6-34.2	13-10	Virgin population		
Critical	16.4	2	Turnover		
	cm	years		millions	tons

Average mortality

	Total	Gear			
		trawl	Artisanal		
F ₁	0.5	0.39	0.11		
F ₂					
Z					

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

Comments

The estimates of absolute recruitment in millions of individuals (age class 1) from VIT analysis in 2006-2010 were 15.2 in 2006, 8.1 in 2007, 7.1 in 2008, 5.1 in 2009, and 3.9 in 2010. Considering that the estimate of 2009 was considered not reliable, the strength of recruits remained quite stable along the time series.

According to VIT analysis, absolute estimations of SSB (combined sex) in the 2006-2010 was 1070 t in 2006, 1307 t in 2007, 1046 t in 2008, 905t in 2009 and 1072 t in 2010. Estimate of 2009 was considered not reliable.

F1 refers to median total F (ages 2-7) range in 2006-2010 for combined sexes.

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Assessment form

Sheet A2
Indirect methods: data

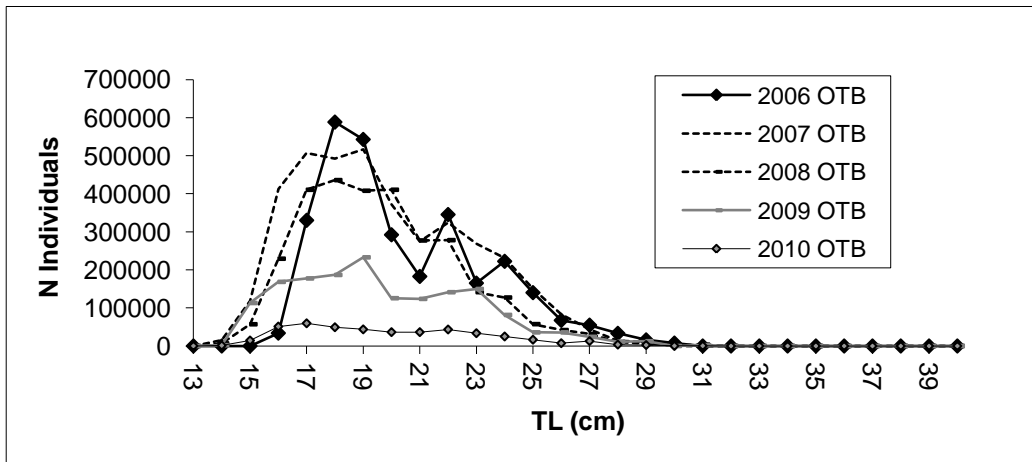
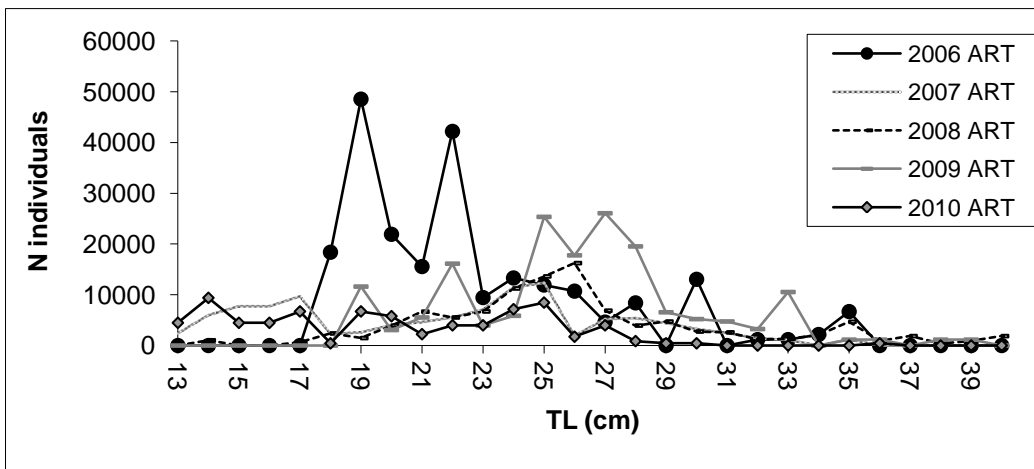
Code: PAC9911F.F

Sex*	F&M	Gear*	OTB, GTR, LLS	Analysis # *	LCA VIT
------	-----	-------	---------------	--------------	---------

Data source	LFD
-------------	-----

Data

LFD of commercial *P. erythrinus* landings data from GSA 16 by gear used as input data for age slicing and subsequently VIT analysis; ART = artisanal (trammel nets & longlines) / OTB=trawlers. Only total landings data was available for GSA 15



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Assessment form

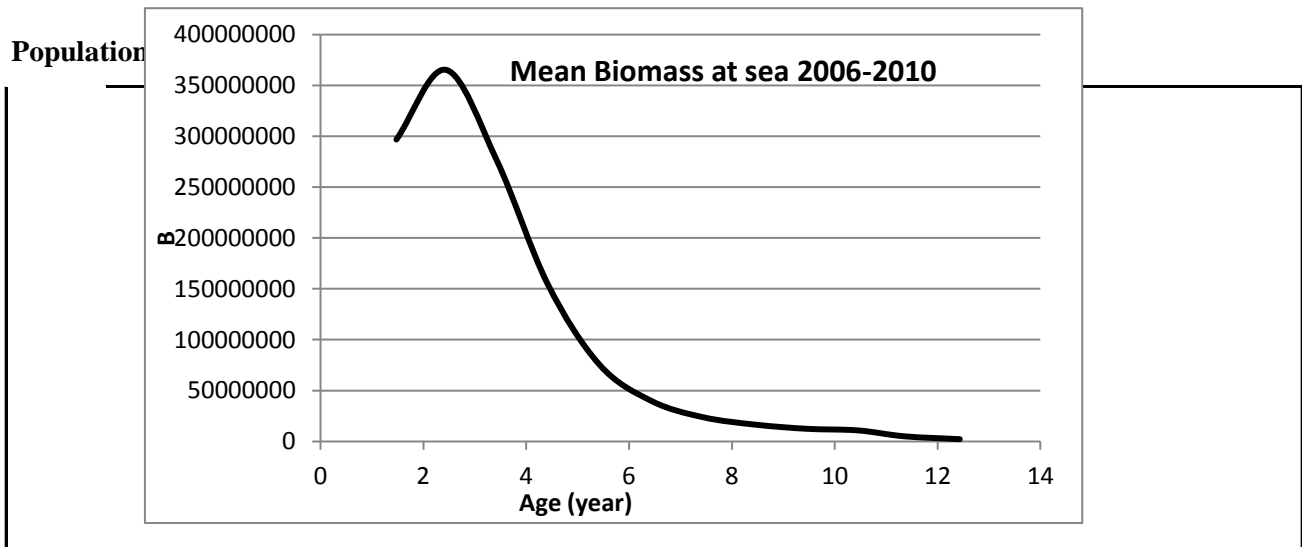
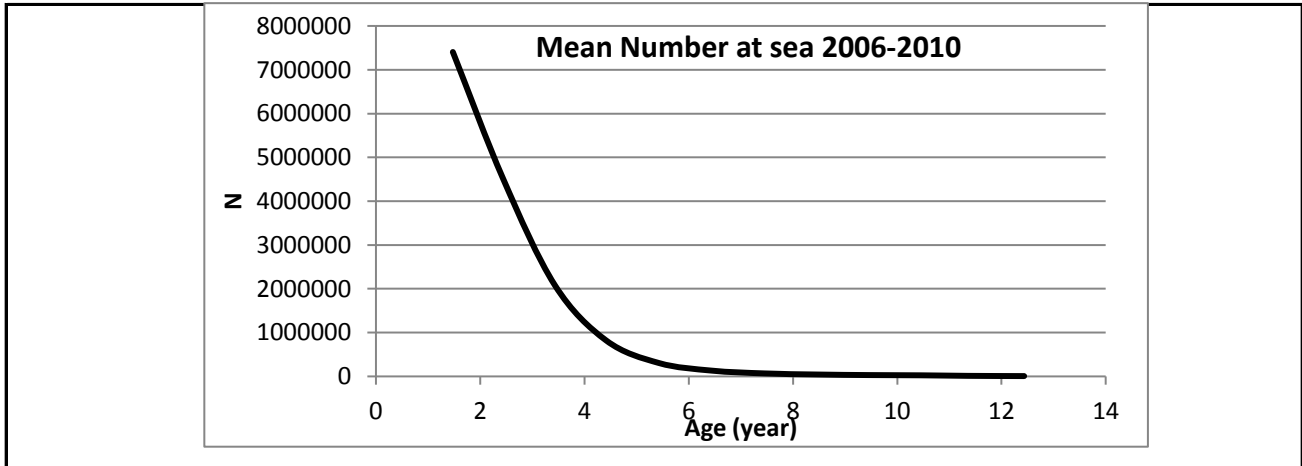
Sheet A3
Indirect methods: VPA results

Code: PAC9911F.F

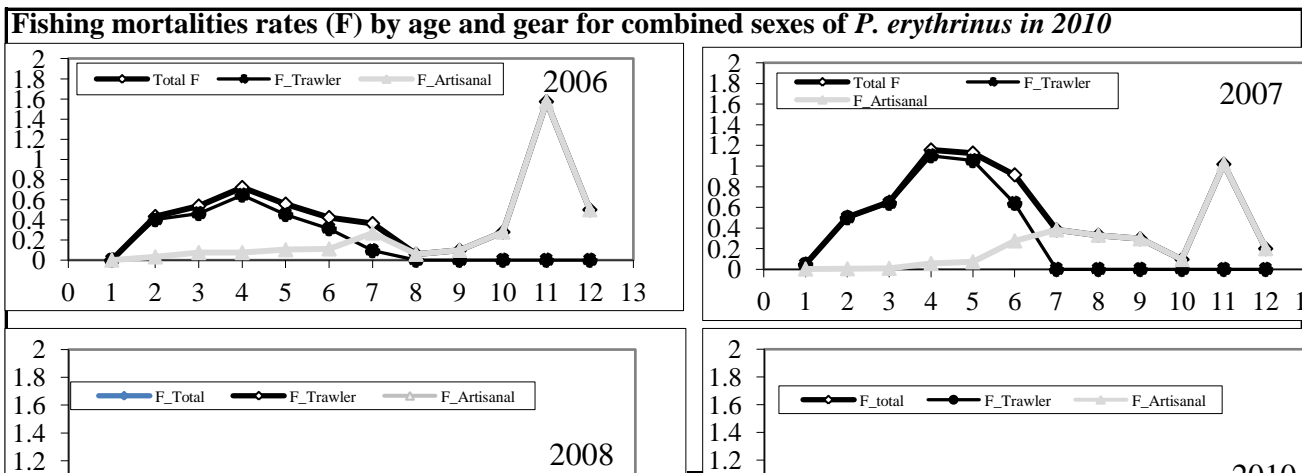
Page 1 / 1

Sex*	F & M	Gear*	Trammel nets, longlines, trawlers	Analysis #*	LCA
------	-------	-------	-----------------------------------	-------------	-----

Population in figures



Fishing mortality rates



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Assessment form	Sheet Y Indirect methods: Y/R

Sex	M&F
-----	-----

Code: PAC9911F.F	Analysis #	Y/R
------------------	------------	-----

# of gears	n/a	Software	Vit4Win
------------	-----	----------	---------

Parameters used

Vector F	
Vector M	
Vector N	

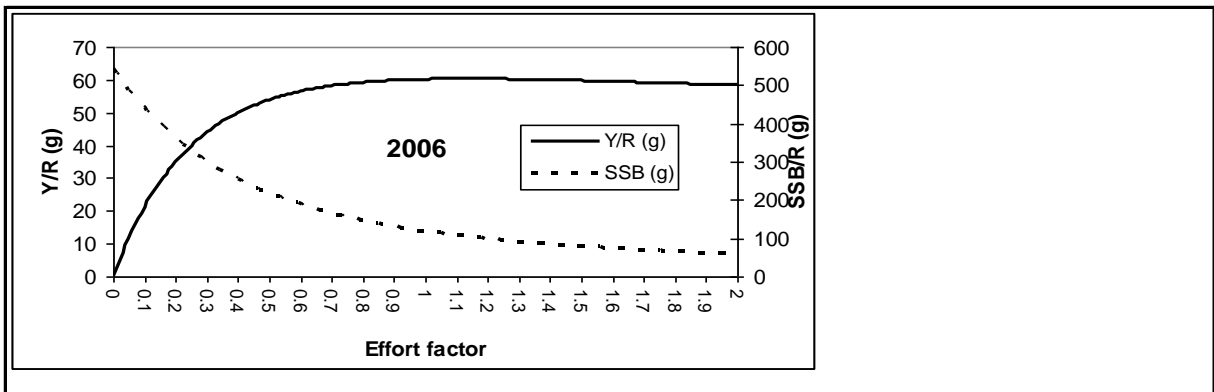
Model characteristics

Results given below refer to 2010 estimation of yield (g), biomass (g) and SSB (g) per recruit varying fishing mortality by a multiplicative factor as implemented in the Vit4Win package.

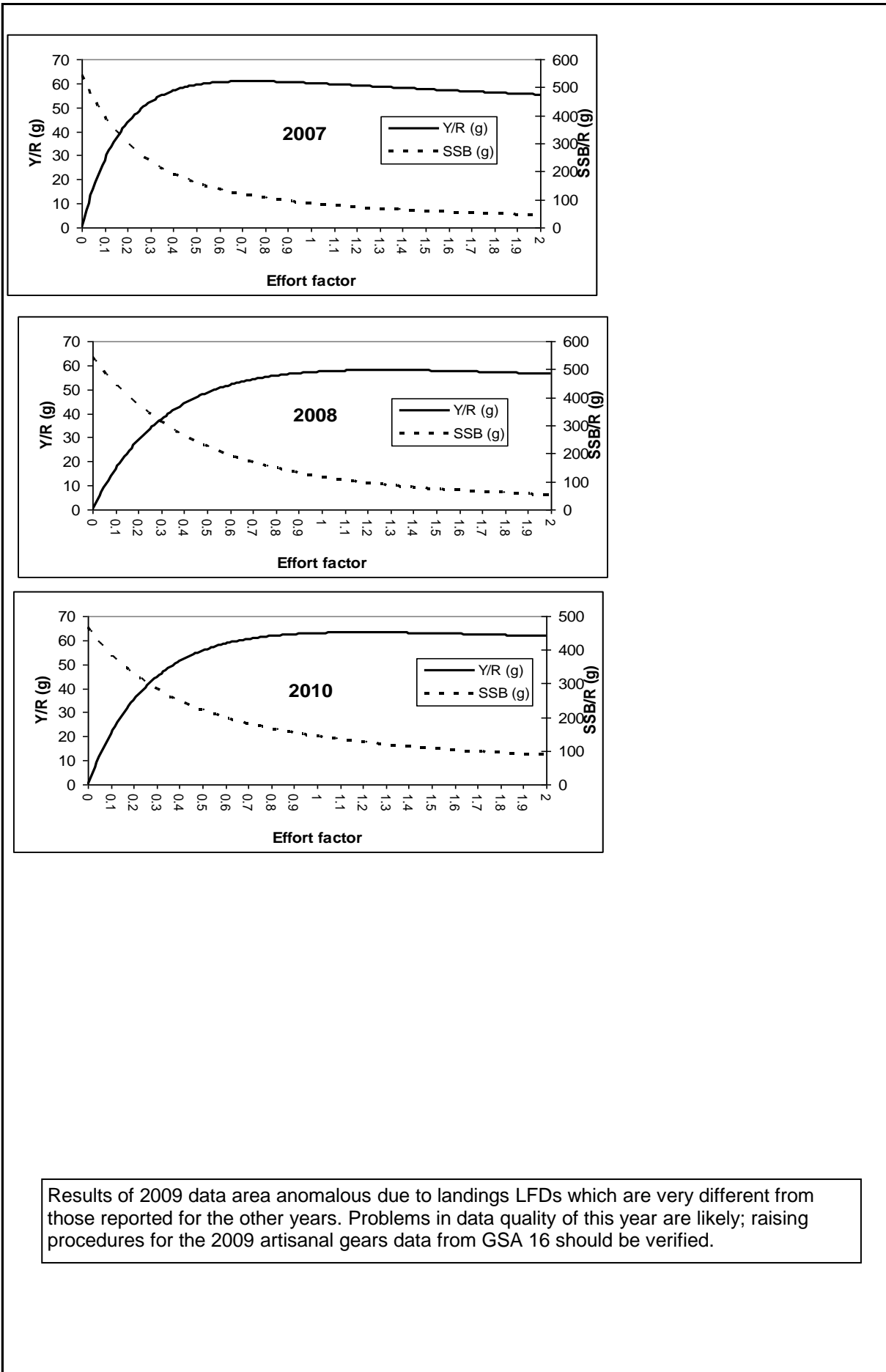
Results

	Total	Gear			
Current YR	62.94				
Maximum Y/R	63.21				
Y/R 0.1	58.55				
F _{max}					
F _{0.1}	0.36				
Current B/R	177.64				
Maximum B/R	160.71				
B/R 0.1	233.61				

Comments

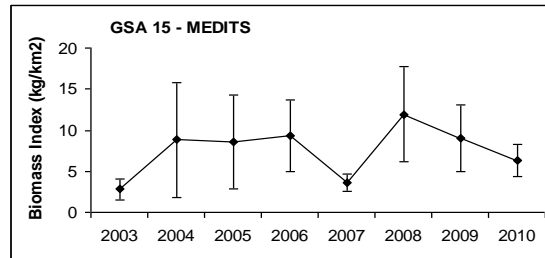
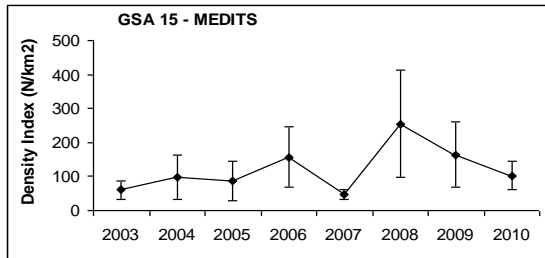


Comments

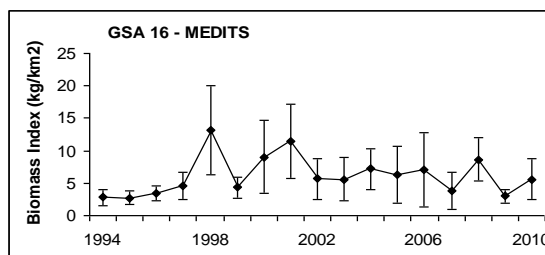
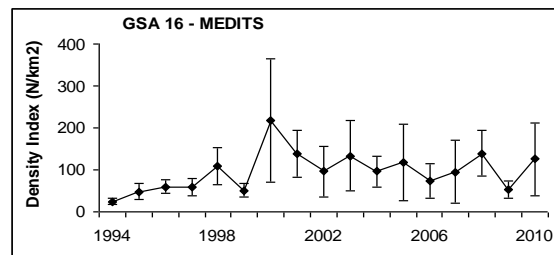


Other assessment methods

Fishery independent information regarding the state of the common Pandora was derived from the international survey MEDITS. Figures below show the estimated trend in *P. erythrinus* MEDITS abundance and biomass at depths of 10-200m in GSA 15, and the estimated trend in MEDITS abundance and biomass on the shelf of GSA 16.



MEDITS abundance and biomass indices of common Pandora in GSA 15.



MEDITS abundance and biomass indices of common Pandora in GSA 16.

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

Assessment form

Sheet D
Diagnosis

Code: PAC9911F.F

Indicators and reference points

Criterion	Current value	Units	Reference Point	Trend	Comments
B	177.64	g	233.61		Biomass and yield values are per recruit
SSB	143.12	g	198.95		
F	0.6		0.3		(VIT analysis, F0.1 based on 2006-2010 results, Fc = 2010)
Y	62.94	g	58.55		
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 checked="" 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"/>	Moderate fishing	<input checked="" type="radio"/>	Intermediate abundance
	<input type="radio"/>	High fishing mortality	<input type="radio"/>	Low abundance
	<input type="radio"/>	Uncertain / Not assessed	<input type="radio"/>	Depleted
			<input type="radio"/>	Uncertain / Not assessed

Comments

On the basis of the VIT analyses a provisional reference point was given, corresponding to $F_{0.1} = 0.30$. Due to the shape of the YpR curve, no reliable value of F_{max} was estimated. Since the current fishing mortality is higher than $F_{0.1}$, the stock of common Pandora in the Northern sector of the Strait of Sicily is assessed in overfishing. Considering the fishing mortality in 2010 ($F_c = 0.60$), to reach the proposed TRP a reduction of F_c of about 50% is advisable.

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Assessment form

Sheet Z

Objectives and recommendations

Code: PAC9911F.F

Management advice and recommendations*

Considering the Sicilian fleet operating in GSAs 15-16, for which both commercial data were available at STECF EWG 11-12, a reduction of about 50% of the fishing mortality needs to reach the technical target Reference points F0.1 is recommended. In addition a protection of key nursery areas in the Strait of Sicily is also recommended in order to improve the status of this fishery. However the stock does not shown sign of decrease of SSB and recruitment indices from trawl surveys.

The working group was informed that the Italian government has adopted a management plan in which a reduction of trawler capacity of 25% of that existing in 2008 is planned within 2013. It is recommended to continuously reduce current F through consistent effort reductions, and an improvement in current exploitation patterns.

Advice for scientific research*

Abstract for SCSA reporting

Authors F.Fiorentino¹, L. Knittweis², V. Gancitano¹, R. Mifsud², F. Gravino², M. Gristina¹ **Year** 2011

Species Scientific name Pagellus erythrinus - PAC
Source: GFCM Priority Species

Source: -

Source: -

Geographical Sub-Area 15 - Malta Island, 16 - South of Sicily

Fisheries (brief description of the fishery)*

Common Pandora is an important demersal fishery resource through the Mediterranean, including in the Strait of Sicily (Gancitano et al. 2010b). Trawling is carried out on the continental shelf of the Central Mediterranean throughout the year, and catches include common Pandora (Pagellus erythrinus), pink shrimp (Parapenaeus longirostris), Norway lobster (Nephrops norvegicus), giant red shrimp (Aristaeomorpha foliacea), violet shrimp hake (Merluccius merluccius), violet shrimp (Aristeus antennatus), scorpionfish (Helicolenus dactylopterus), grater forkbeard (Phycys blennioides), red Pandora (Pagellus bogaraveo) and monkfish (Lophius piscatorius). In addition to trawling, common Pandora is targeted by several artisanal gears, including set gillnets, trammel nets, pots and traps and set longlines.

In 2010 a total of 319 tonnes of common Pandora were landed in GSAs 15 & 16, with the greatest contribution coming from Sicilian trawlers (274 tonnes). Maltese vessels were responsible for 6.3% of total landings.

Source of management advice*

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

Five complete years (2006, 2007, 2008, 2009 and 2010) of length frequency distributions from GSA 16 commercial landings data (fished in GSA 15 as well as GSA 16) were available, so an approach under steady state (pseudocohort) assumptions was used. Cohort (VPA equation) and Y/R analysis as implemented in the package VIT4win were thus used. Age structure of landings were derived from the DCF data call for GSA 16. Total landing included the yield of both the Italian and Maltese fleet.

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

High fishing mortality

Stock abundance

Intermediate abundance

Comments

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Advice for scientific research*

