

# SAC GFCM

## Sub-Committee on Stock Assessment

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Date\* 

17	October	2011
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Code\* 

ARA0911Man
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Authors\* 

Mannini A. (1), Abella A. (2), Colloca F. (3), Ligas A., (4) and Sbrana M. (4)
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Affiliation\* 

1 - Dip.Te.Ris. University of Genoa, 2 - ARPAT Livorno, 3 - DBA University of Roma, 4 - CIBM Livorno
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Species Scientific name\* 

1	<i>Aristeus antennatus</i> - ARA Source: GFCM Priority Species
2	Source: -
3	Source: -

Geographical area\* 

Ligurian and Tyrrhenian seas
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Geographical Sub-Area (GSA)\* 

09 - Ligurian and North Tirrenian Sea
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Combination of GSAs 

1	
2	
3	



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

Assessment form

Sheet #0

Basic data on the assessment

Code: ARA0911Man

Date*	17	Oct	2011	Authors*	Mannini A. (1), Abella A. (2), Colloca F. (3), Ligas A., (4) and Sbrana M. (4)
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Species Scientific name*	Aristeus antennatus - ARA	Species common name*	Blue and red shrimp
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### Data Source

GSA*	09 - Ligurian and North Tirrenian Sea	Period of time*	2006-2010
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### Description of the analysis

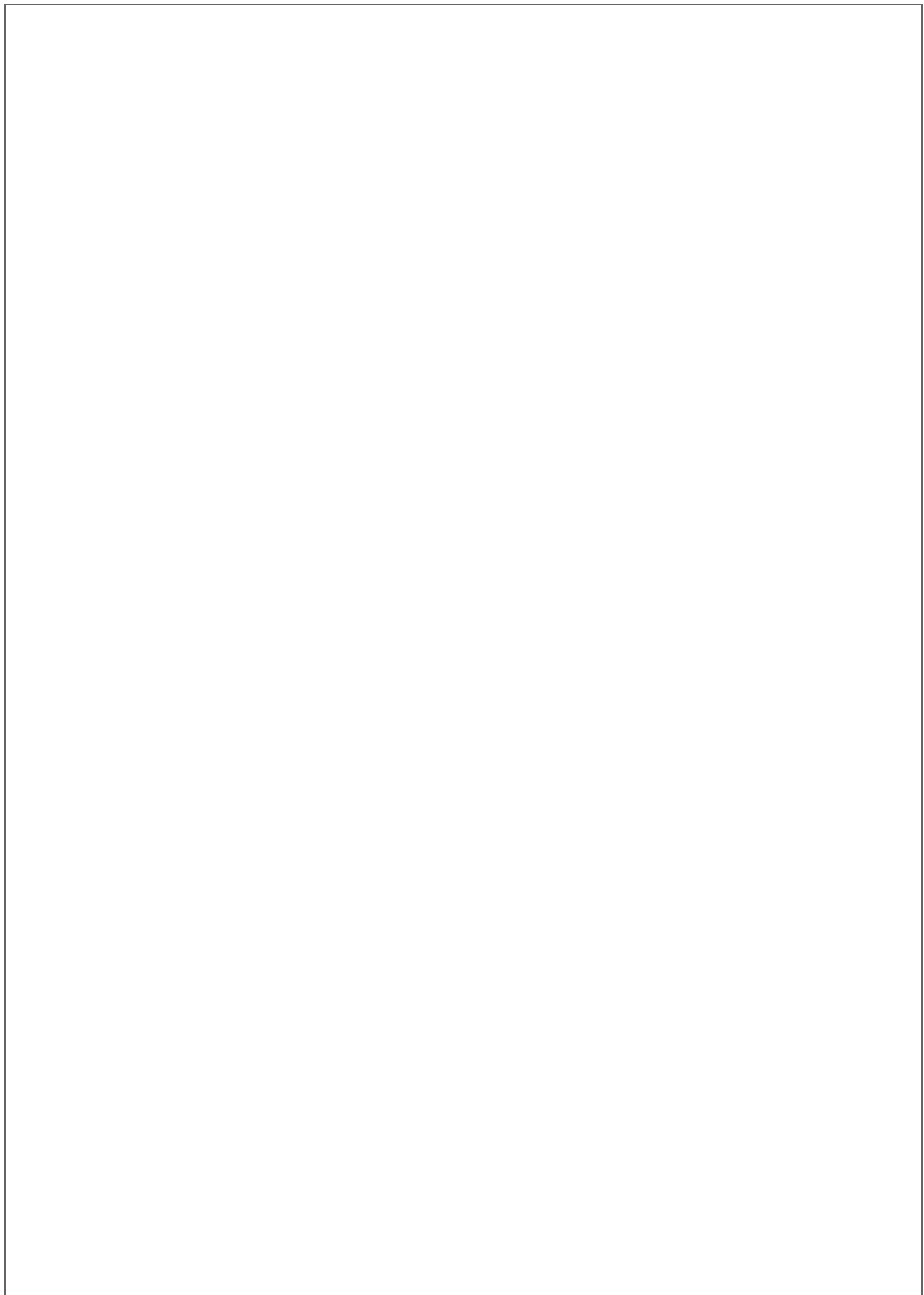
Type of data*	Commercial landings	Data source*	DCF
Method of assessment*	LCA	Software used*	VIT

### 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	---

### Comments, bibliography, etc.

In the GSA09 the blue and red shrimp (*Aristeus antennatus*) represent one of the most evaluable demersal resources of trawling fleet operating on the muddy bottoms of the upper and middle slope from 400 to 800m depth, where the stock is composed mainly of aggregations of large spawners female. The highest abundances have been found in the northern part of the GSA (Ligurian Sea).



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

Assessment form

Sheet B  
Biology of the species

Code: ARA0911Man

**Biology**

Somatic magnitude measured (LH, LC, etc)*				LC	Units*	mm
Sex	Fem	Mal	Both	Unsexed		
Maximum size observed	68	36			Reproduction season	May - August
Size at first maturity					Reproduction areas	Yes
Recruitment size					Nursery areas	

**Parameters used (state units and information sources)**

		Units	Sex			
			female	male	both	unsexed
Growth model	$L_{\infty}$	mm	76.9	4.6		
	K		0.21	0.213		
	t0		-0.019	-0.019		
	Data source	Trawl surveys and commercial landings				
Length weight relationship	a		0.0029	0.005		
	b		2.429	2.286		

M	Vector				
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sex ratio (mal/fem)	0.12
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**Comments**

A VPA was performed using a Length Cohort Analysis (LCA) applying the routine included in the VIT package (Leonart and Salat, 1994) for each year separately. A natural mortality vector computed by Prodbiom was used:  
 Female - from age0 to age 10 (0.75,0.49,0.40,0.36,0.33,0.32,0.30,0.29,0.29,0.28)  
 Male - from age0 to age 10 (0.76,0.50,0.41,0.36,0.34,0.32,0.31,0.30,0.29,0.28).  
 Concerning proportion of mature the following series was used for both sex:  
 from age 0 to age 10 (0.4,0.8,1,1,1,1,1,1,1,1)

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

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

Assessment form

Sheet P1

General information about the fishery

Code: ARA0911Man

<b>Data source*</b>	DCF Commercial landings	<b>Year (s)*</b>	2006-2010
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<b>Data aggregation (by year, average figures between years, etc.)*</b>	Average figures between years
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### Fleet and catches (please state units)

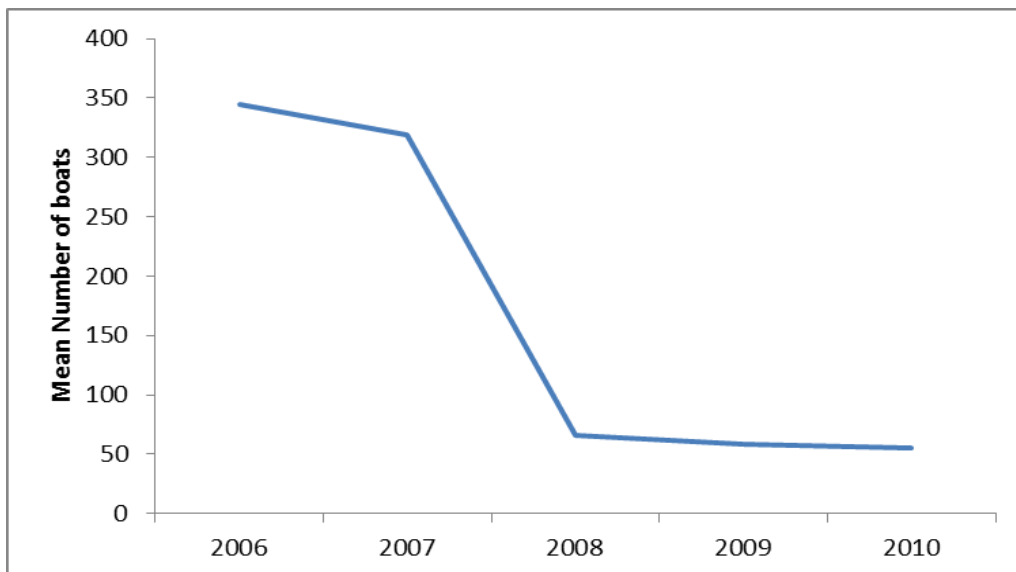
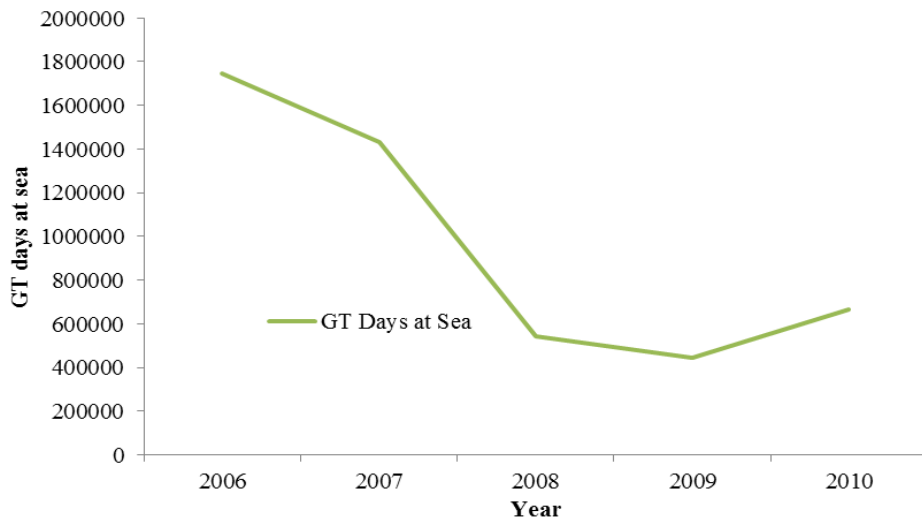
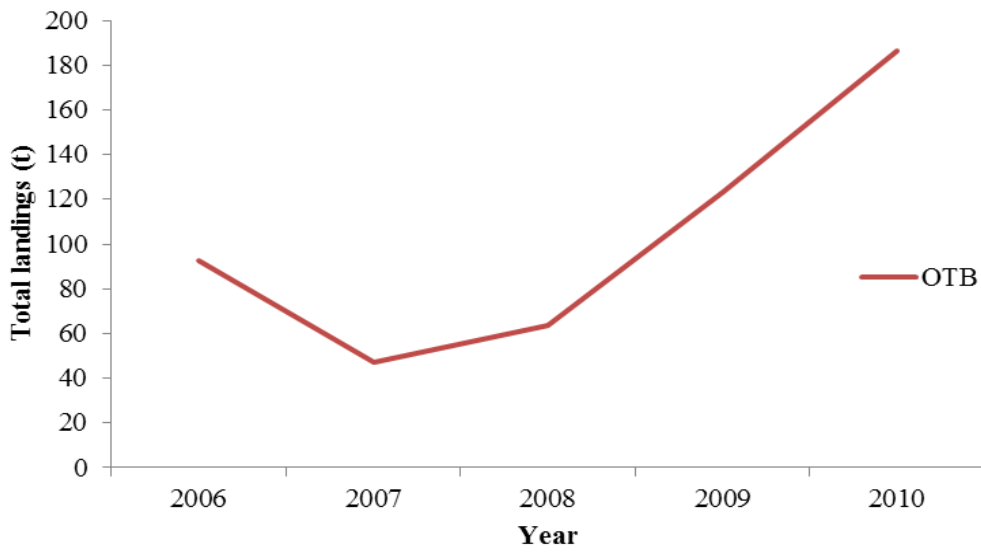
	Country	GSA	Fleet Segment	Fishing Gear Class	Group of Target Species	Species
Operational Unit 1*	ITA	09	E - Trawl (12-24 metres)	03 - Trawls	34 - Demersal slope species	ARA
Operational Unit 2						
Operational Unit 3						
Operational Unit 4						
Operational Unit 5						

Operational Units*	Fleet (n° of boats)*	Kilos or Tons	Catch (species assessed)	Other species caught	Discards (species assessed)	Discards (other species caught)	Effort units
ITA 09 E 03 34 - ARA	169	Tons	103				
<b>Total</b>	<b>169</b>		<b>103</b>				

<b>Legal minimum size</b>	
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### Comments

Comments







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

Assessment form

Sheet P2a  
Fishery by Operational Unit

Code: ARA0911Man

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Data source*	DCF Commercial landings	OpUnit 1*	ITA 09 E 03 34 - ARA
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**Time series**

Year*	2006	2007	2008	2009	2010	
Catch	3010210	1223584	4245263	5450576	8971235	
Minimum size	20	26	18	16	16	
Average size Lc	42	48	30	37	36	
Maximum size	68	62	66	66	60	
Fleet	OTB	OTB	OTB	OTB	OTB	

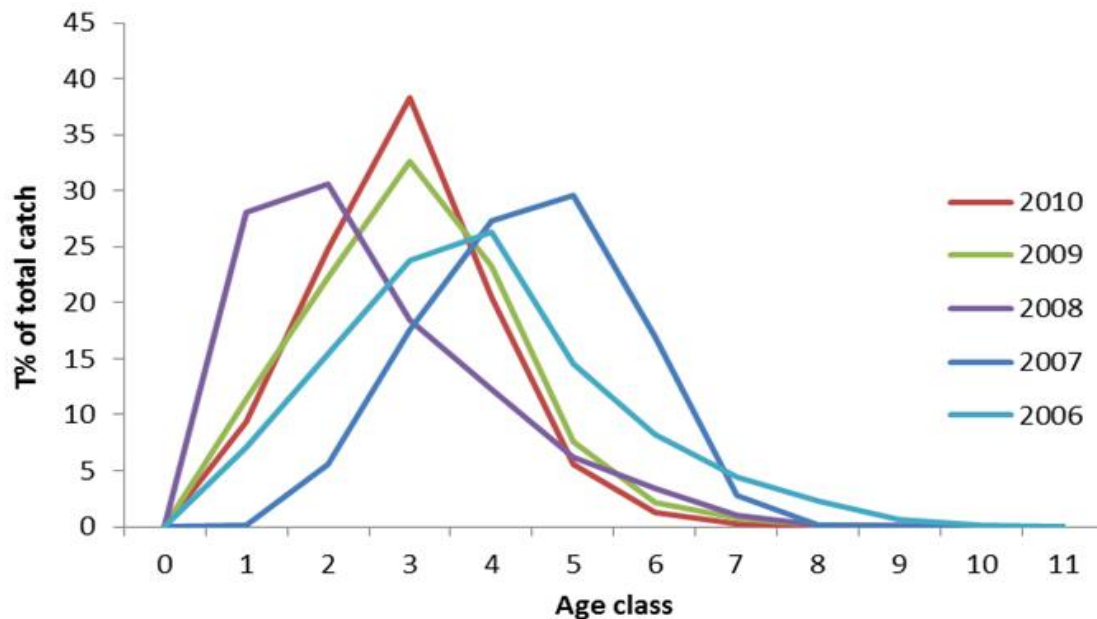
Year						
Catch						
Minimum size						
Average size Lc						
Maximum size						
Fleet						

**Selectivity**

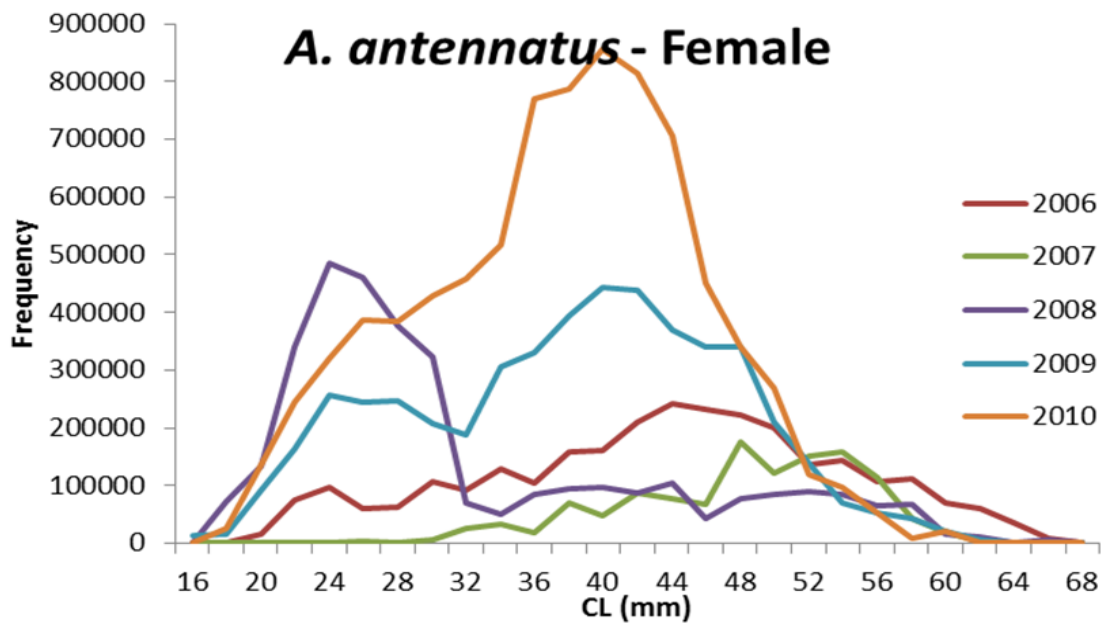
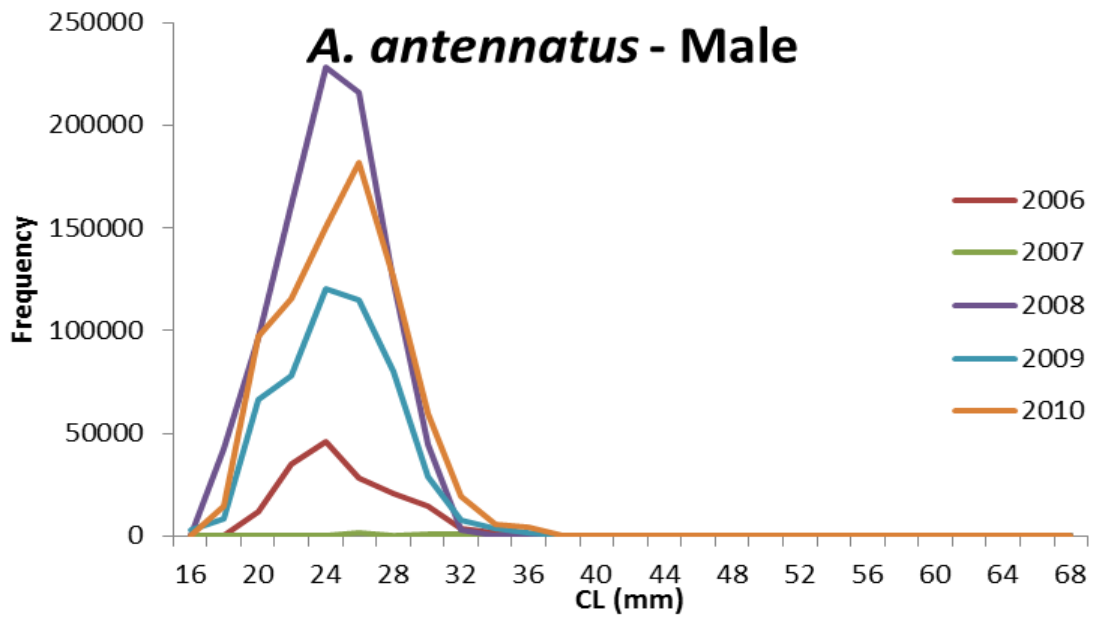
**Remarks**

L25		
L50		
L75		
Selection factor		

**Structure by size or age**



Structure by size or age



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

Assessment form

Sheet P2b  
Fishery by Operational Unit

Code: ARA0911Man

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Data source*	EC Regulation 1967/2006 and National Law promoted	OpUnit 1*	ITA 09 E 03 34 - ARA
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### Regulations in force and degree of observance of regulations

EC regulation 1967/2006 don't provide for a minimum length size for this species. Italian national law provided in the last years a fishing ban of a month which, for the Ligurian fleet, is enforced after the summer fishing season

### Accompanying species



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

Assessment form

Sheet A1  
Indirect methods: VPA, LCA

Sex*	Combined
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Code: ARA0911Man

Page 1 /

Analysis # *	
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**Time series**

Data	Size	Age
(mark with X)	X	

Model	Cohorts	Pseudocohorts
(mark with X)		X

Equation used		Tunig method	
# of gears	1	Software	VIT
F <sub>terminal</sub>	0.5		

**Population results (please state units)**

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

**Average mortality**

	Total	Gear					
F <sub>1</sub>							
F <sub>2</sub>							
Z							

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

**Comments**

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

Assessment form

Sheet A2  
Indirect methods: data

Code: ARA0911Man

Sex*	M+F	Gear*	OTB	Analysis # *	LCA
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Data source	2006-2010
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**Data**

Carapace Length (cm)	FEMALE					MALE				
	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
1.6	0	0	0	12466	1416	0	0	0	3110	353
1.8	0	0	73347	15102	24951	0	0	42421	8735	14430
2.0	16269	0	134723	92690	135276	11691	0	96815	66609	97213
2.2	74147	0	340130	163896	243793	35214	0	161536	77838	115783
2.4	97510	0	485895	256443	321298	45759	0	228015	120341	150775
2.6	60918	3889	460740	245097	386918	28590	1825	216234	115029	181588
2.8	62646	0	378080	246036	385020	20478	0	123586	80423	125854
3.0	107121	5019	322643	207197	428727	14831	695	44670	28687	59358
3.2	92632	26795	69074	186837	458604	3905	1130	2912	7876	19333
3.4	129413	32286	50646	306452	517768	1509	376	591	3574	6038
3.6	105032	18280	84944	331239	769698	557	97	451	1758	4084
3.8	159557	69544	94952	394630	788296	0	0	0	0	0
4.0	161888	48095	98077	443962	855315	0	0	0	0	0
4.2	209704	87216	86685	439080	814620	0	0	0	0	0
4.4	243044	76221	105418	370450	706967	0	0	0	0	0
4.6	232834	67173	42425	341305	449616	0	0	0	0	0
4.8	222169	176144	78237	340458	340090	0	0	0	0	0
5.0	199426	122690	85396	210509	268221	0	0	0	0	0
5.2	136315	150144	88703	138560	118985	0	0	0	0	0
5.4	143841	159333	83924	70881	97977	0	0	0	0	0
5.6	106247	114161	64828	53756	52479	0	0	0	0	0
5.8	111806	41797	66663	41902	9361	0	0	0	0	0
6.0	70799	18170	17078	20376	21030	0	0	0	0	0
6.2	60106	2504	10283	6726	0	0	0	0	0	0
6.4	35547	0	0	273	0	0	0	0	0	0
6.6	7425	0	5141	273	0	0	0	0	0	0
6.8	1280	0	0	0	0	0	0	0	0	0

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Assessment form

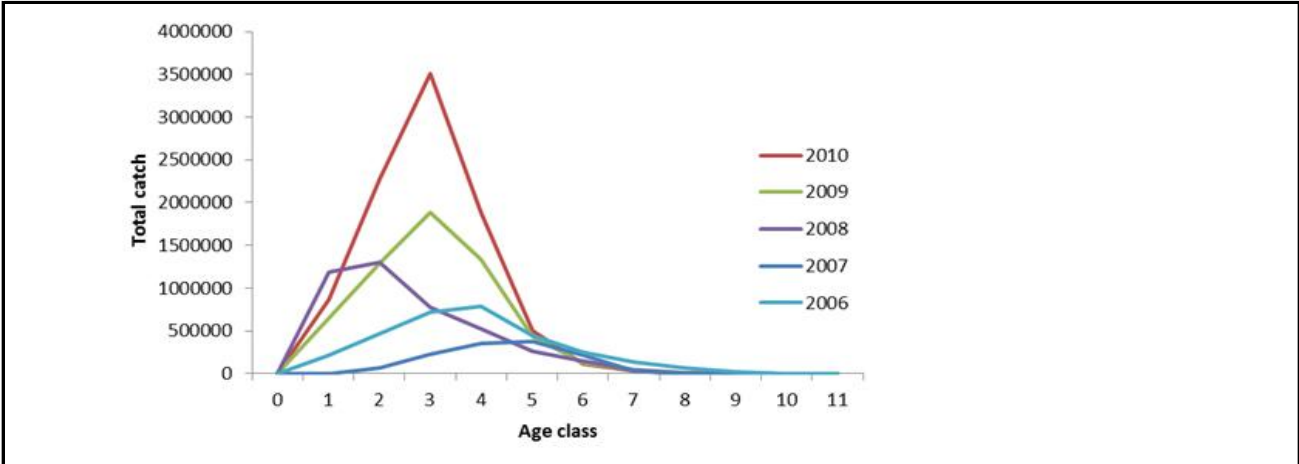
Sheet A3  
Indirect methods: VPA results

Code: ARA0911Man

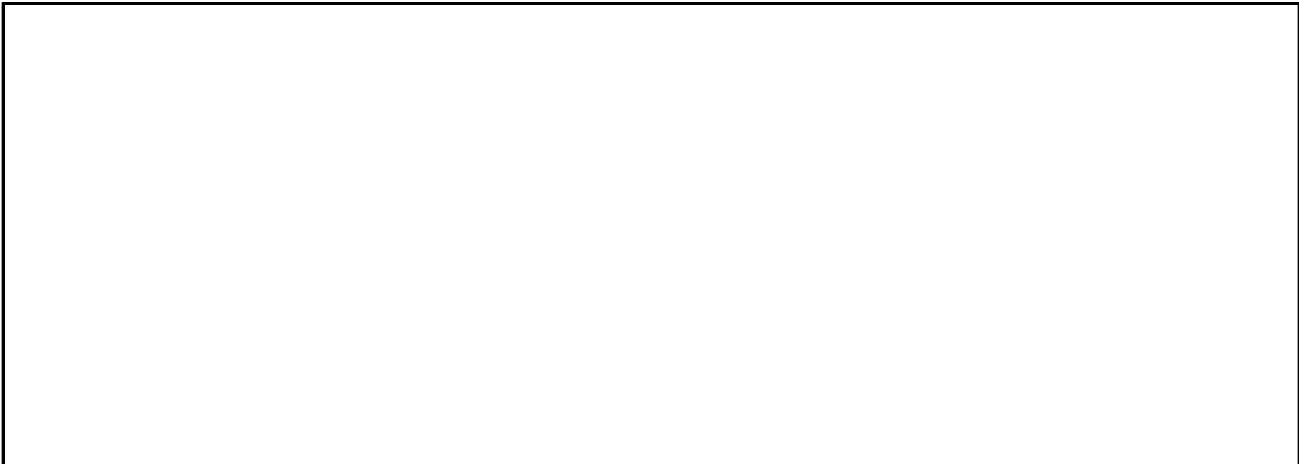
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Sex*	M+F	Gear*	OTB	Analysis #*	LCA
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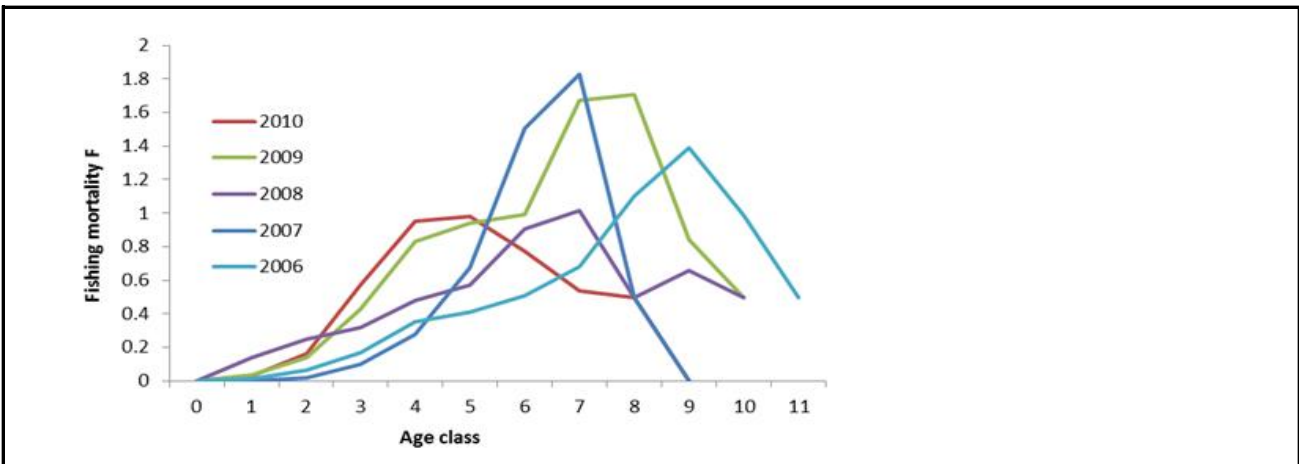
Population in figures



Population in biomass



Fishing mortality rates





<b>SAC GFCM - Sub-Committee on Stock Assessment (SCSA)</b>	
Assessment form	Sheet Y Indirect methods: Y/R

Sex	M+F
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Code: ARA0911Man

Analysis #	LCA
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# of gears	1	Software	VIT
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**Parameters used**

Vector F	
Vector M	
Vector N	

**Model characteristics**

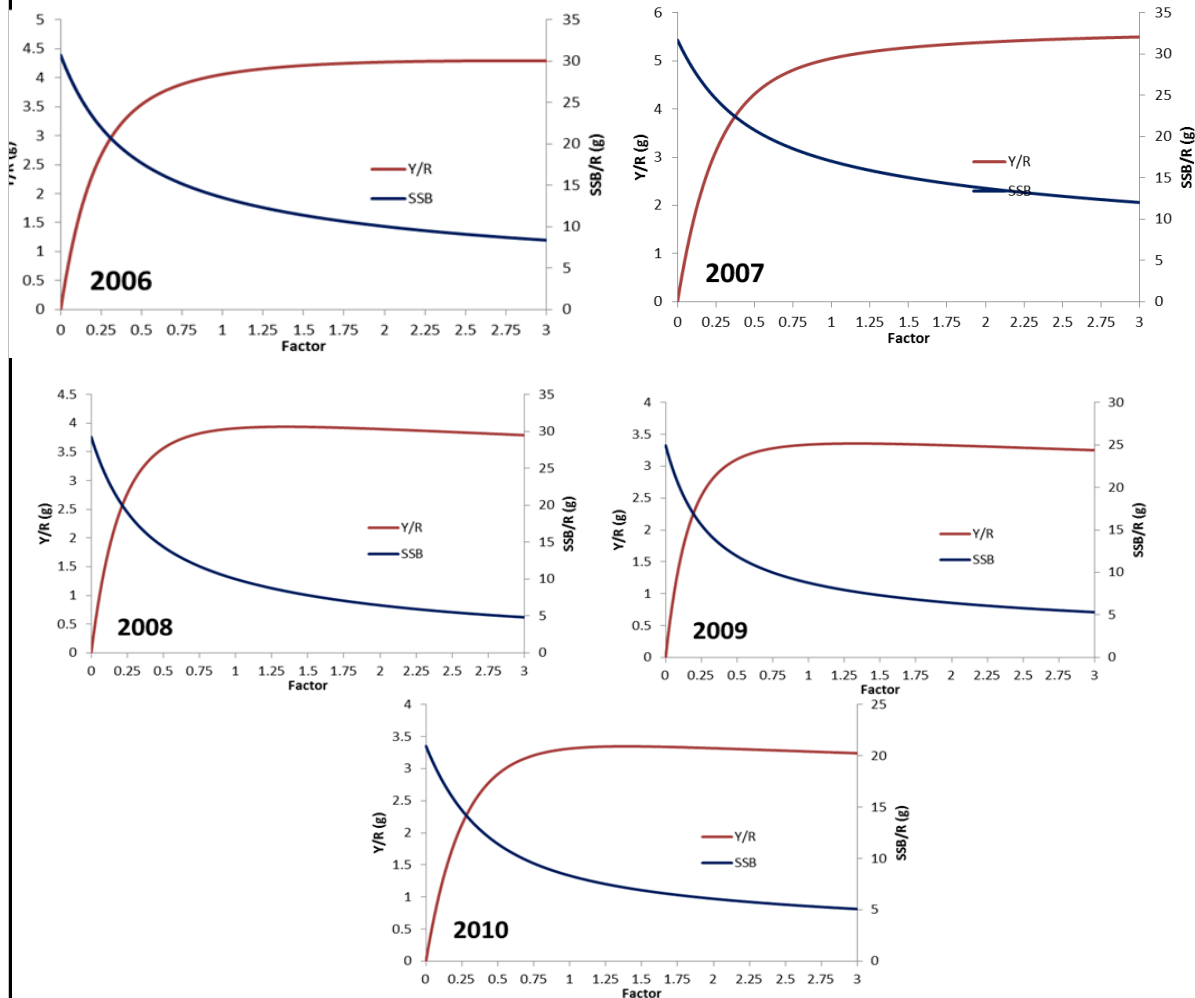
**Results**

	Total	Gear			
Current YR					
Maximum Y/R					
Y/R 0.1					
F <sub>max</sub>					
F <sub>0.1</sub>					
Current B/R					
Maximum B/R					
B/R 0.1					

**Comments**

Comments

		Factor	Absolute F	Y/R	B/R	SSB
2006	Virgin	0.00	0.00	0.00	41.03	40.42
	$F_{0.1}$	0.58	<b>0.32</b>	4.15	24.19	23.59
	$F_c$	1.01	0.57	4.65	19.84	19.24
	$F_{max}$	2.88	1.62	5.02	12.67	12.08
2007	Virgin	0.00	0.00	0.00	34.93	34.31
	$F_{0.1}$	0.56	<b>0.34</b>	4.43	23.17	22.56
	$F_c$	1.01	0.62	4.91	20.08	19.47
	$F_{max}$	3.00	1.84	5.23	15.03	14.41
2008	Virgin	0.00	0.00	0.00	36.94	36.40
	$F_{0.1}$	0.52	<b>0.28</b>	3.98	18.47	17.96
	$F_c$	1.01	0.54	4.36	13.03	12.53
	$F_{max}$	1.47	0.79	4.39	11.27	10.78
2009	Virgin	0.00	0.00	0.00	37.07	36.48
	$F_{0.1}$	0.37	<b>0.30</b>	4.14	20.17	19.58
	$F_c$	1.01	0.82	4.72	12.97	12.40
	$F_{max}$	1.31	1.06	4.74	11.75	11.17
2010	Virgin	0.00	0.00	0.00	29.80	29.21
	$F_{0.1}$	0.60	<b>0.34</b>	4.33	15.10	14.52
	$F_c$	1.01	0.57	4.67	11.94	11.36
	$F_{max}$	1.41	0.80	4.71	10.45	9.88
<b>Mean</b>		$F_{0.1}$	<b>0.32</b>			
		$F_c$	<b>0.62</b>			
		$F_{max}$	<b>1.22</b>			



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

Assessment form

Sheet D  
Diagnosis

Code: ARA0911Man

**Indicators and reference points**

Criterion	Current value	Units	Reference Point	Trend	Comments
B					
SSB					
F	0.62		0.32		Average value between 2006-2010
Y					
CPUE					

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

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

<b>Bidimensional</b>	<b>Exploitation rate</b>		<b>Stock abundance</b>	
	<input type="radio"/>	No or low fishing	<input type="radio"/>	Virgin or high abundance
	<input type="radio"/>	Moderate fishing	<input type="radio"/>	Intermediate abundance
	<input type="radio"/>	High fishing mortality	<input type="radio"/>	Low abundance
	<input checked="" type="radio"/>	Uncertain / Not assessed	<input type="radio"/>	Depleted
			<input checked="" type="radio"/>	Uncertain / Not assessed

Comments

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

Assessment form

Sheet Z

Objectives and recommendations

Code: ARA0911Man

**Management advice and recommendations\***

According to the fact that average F all ages estimates using LCA approach resulted over the average F0.1 values the stock would not appear to be able to sustain the current level of fishing effort and was considered in overfishing.

**Advice for scientific research\***

## Abstract for SCSA reporting

**Authors**

Mannini A. (1), Abella A. (2), Colloca F. (3), Ligas A., (4) and Sbrana M. (4)

**Year**

2011

**Species Scientific name**

Aristeus antennatus - ARA

Source: GFCM Priority Species

Source: -

Source: -

**Geographical Sub-Area**

09 - Ligurian and North Tirrenian Sea

**Fisheries (brief description of the fishery)\***

**Source of management advice\***

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

**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**

Uncertain / Not assessed

Uncertain / Not assessed

**Comments**



**Management advice and recommendations\***

According to the fact that previous 3 full years experience being in an apartment resulted over the average 11 years, the stock would not appear to be able to sustain the current level of dividend offer and the

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**Advice for scientific research\***

