

Status of Mediterranean resources in European Waters in 2011



Results for Mediterranean stocks in GSA 1-25



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SWEDISH BOARD
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Guidelines for the evaluation of stock status



Terminology



- **Spawning stock biomass (SSB)** is the biomass of the adult or reproducing fish

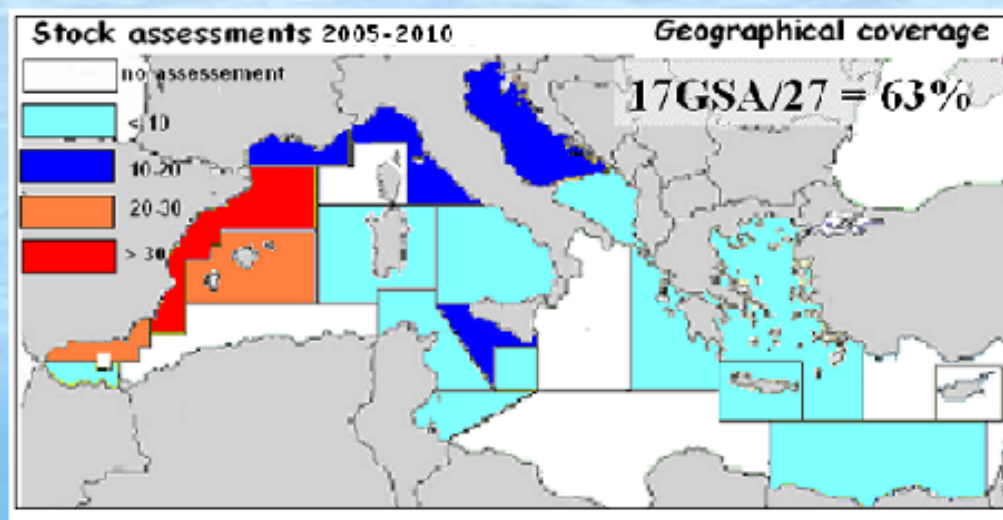
- **Fishing mortality (F)** is the proportion of fish in the stock that are taken by the fisheries



- F_{msy} is the F associated to high long term yield and the long-term sustainable exploitation of the stock

Stock assessment

Demersal and small pelagic stocks

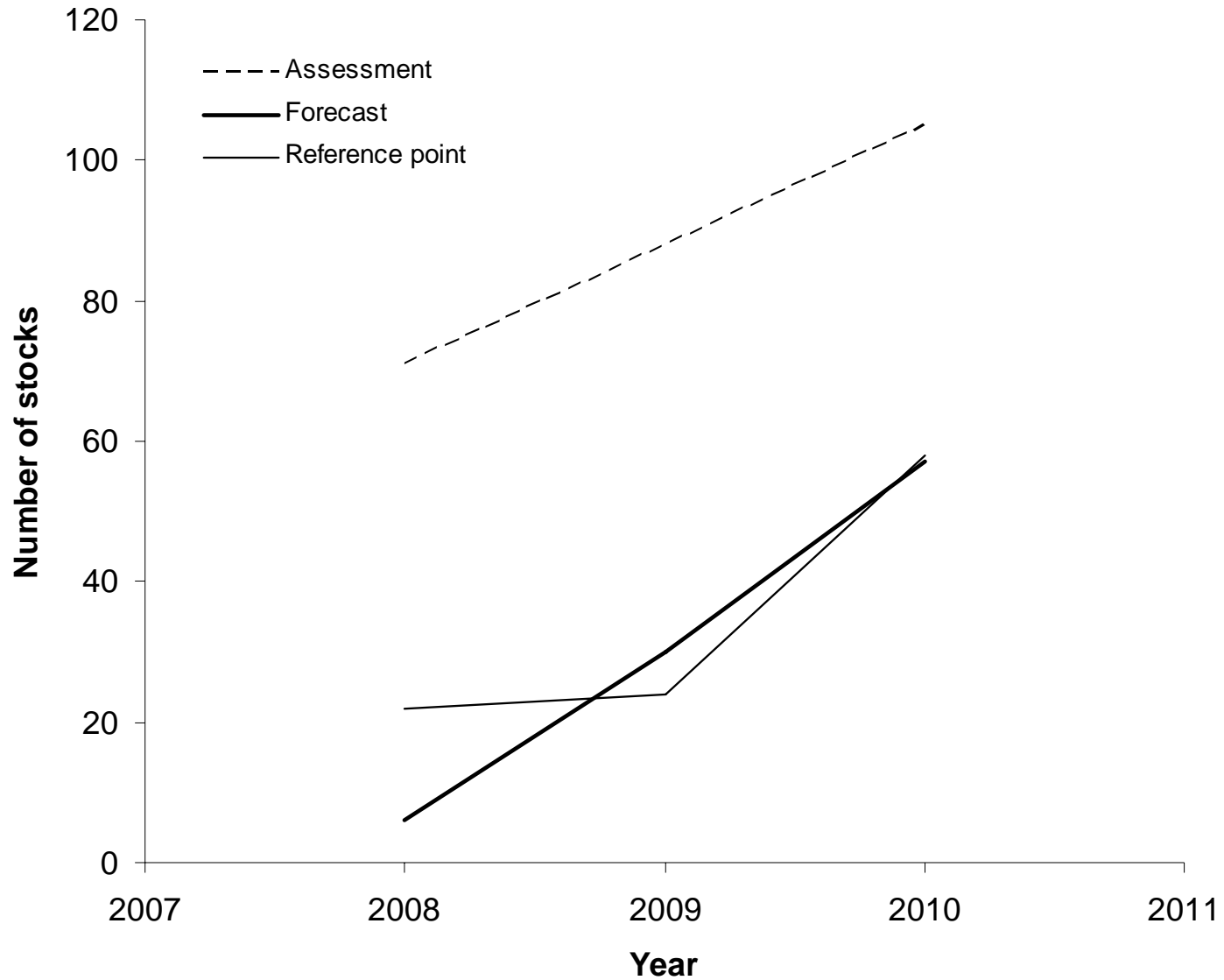


	24 DEMERSAL STOCKS	11 SMALL PELAGIC STOCKS
Overexploited	22 (91.66%)	2 (18.18%)
Fully exploited	2 (8.33%)	9 (81.80%)

SAC management advices and comments : doc GFCM/XXXV/2011/4



State of the art



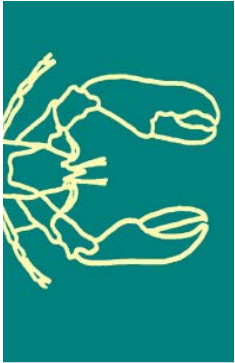


Stock status in the last assessment year compared to MSY

Species or groups	F_{curr}/F_{MSY}
FISHDEM	3.04
Hake	3.99
Red mullet	1.96
Others	2.82
CRUDEM	1.92
Pink shrimp	1.99
Others	1.81
FISHPEL	1.75
Anchovy	1.66
Sardine	1.87

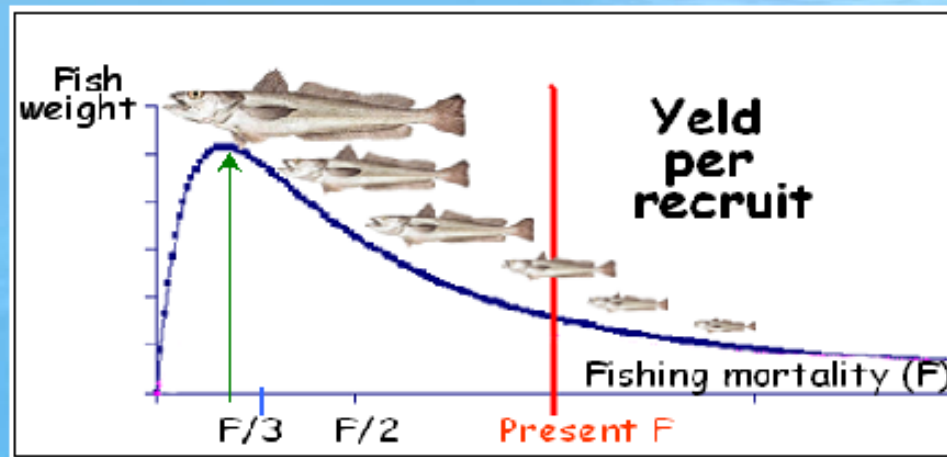
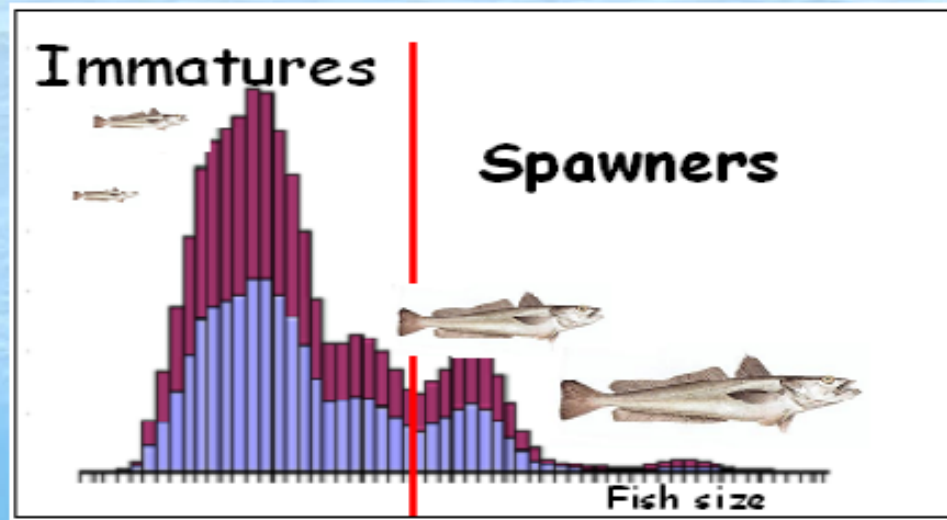


Around 87% of Mediterranean stocks are estimates to be overexploited in 2009-2010



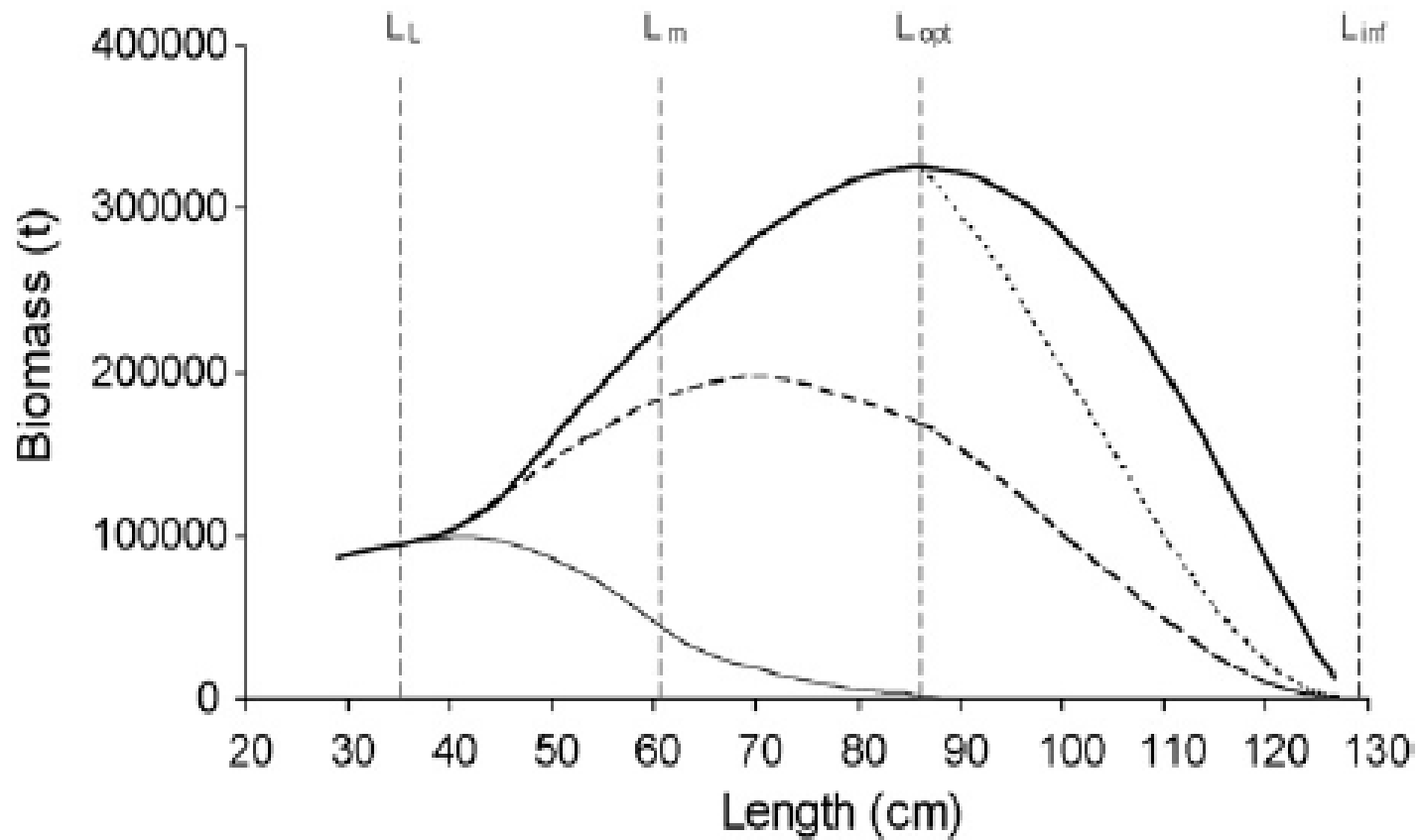
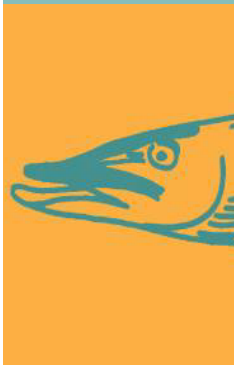
Status in the Mediterranean fisheries

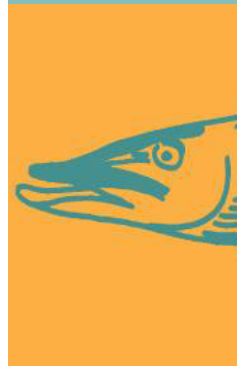
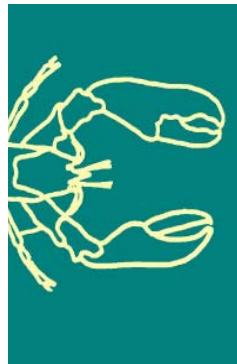
Most of the demersal fisheries are based on juvenile fish





Optimization of size selective harvesting

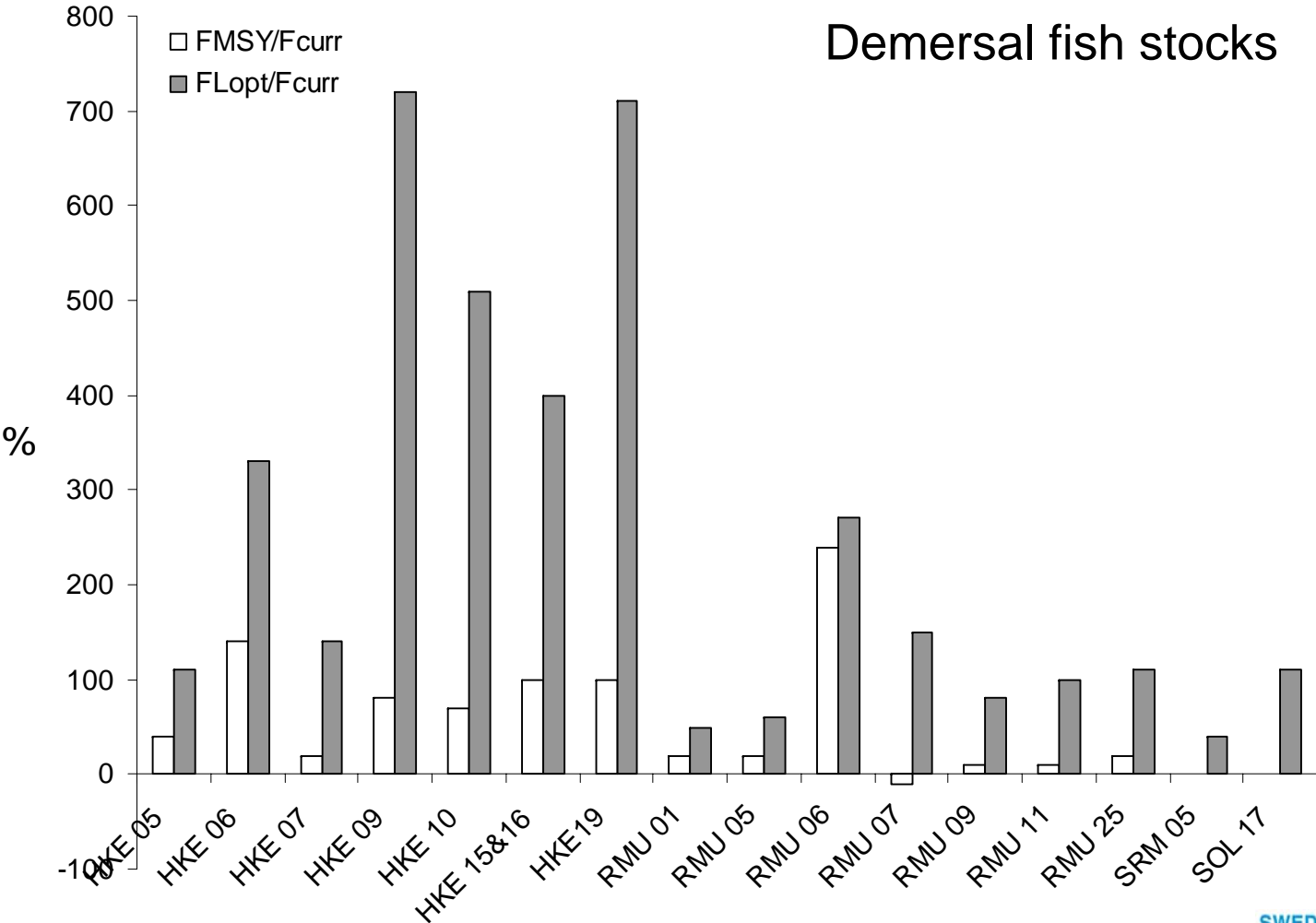




Species	GSA	mean F_{cur}	F_{MSY}	F_{Lopt}	Critical length (cm)		
					L_{curr}	L_{F01}	L_{opt}
European hake	5	0.91	0.25	0.54	21.3	31.3	50
	6	1.30	0.16	0.32	22.7	53.6	63.3
	7	0.41	0.26	0.19	35.6	49.3	80.7
	9	0.46	0.22	0.38	27.6	27.6	71
	10	0.54	0.24	0.48	37	44.7	57.3
	15-16	0.30	0.16	0.24	26.2	40.5	59
	19	0.59	0.15	0.23	19.9	59.2	80.8
Red mullet	1	1.11	0.26	0.45	16.3	16.3	21.7
	5	1.11	0.40	0.69	16.3	16.3	21.7
	6	1.00	0.16	0.25	11.1	26.1	28.5
	7	0.38	0.53	0.71	11.3	11.3	24.1
	9	0.79	0.49	1.04	14	14	20.8
	11	0.49	0.22	0.38	12.6	18.2	24.3
	25	0.46	0.22	0.17	12.5	14.9	23.4
Striped red mullet	5	0.46	0.73	1.35	13	13	27.1
Common sole	17	1.29	0.26	0.39	18.8	18.8	34
Norway lobster	9	0.32	0.21	0.34	29.6	29.6	42.4
	17	0.46	0.15	0.35	24.7	35.2	45
Deep water rose shrimp	3	0.55	0.58	1.09	15.2	15.2	34.3
	6	0.42	0.58	1.16	23.5	23.5	23.5
	9	0.18	0.70	1.05	19.6	19.6	33.8
	16	1.59	0.35	0.48	20.5	26.9	33.4
Giant red shrimp	16	0.76	0.34	0.32	44.5	48	55.6
Blue and red shrimp	6	1.36	0.30	0.53	25.6	41.9	53
Anchovy	1	1.48	0.36	0.91	11.8	11.8	11.8
	6	1.04	0.22	0.44	12.9	12.9	14.7
	7	0.13	0.62	1.29	9.4	9.4	9.4
	17	0.17	0.44	1.14	10.3	10.3	10.3
	22	0.29	0.53	1.32	15.1	10.5	13.2
Sardine	1	0.38	0.22	0.41	13.3	13.3	16.7
	6	0.73	0.22	0.41	14.6	14.6	16.7
	17	0.62	0.35	0.88	12.3	12.3	12.3
	22	0.43	0.49	0.41	8.6	8.6	13.4



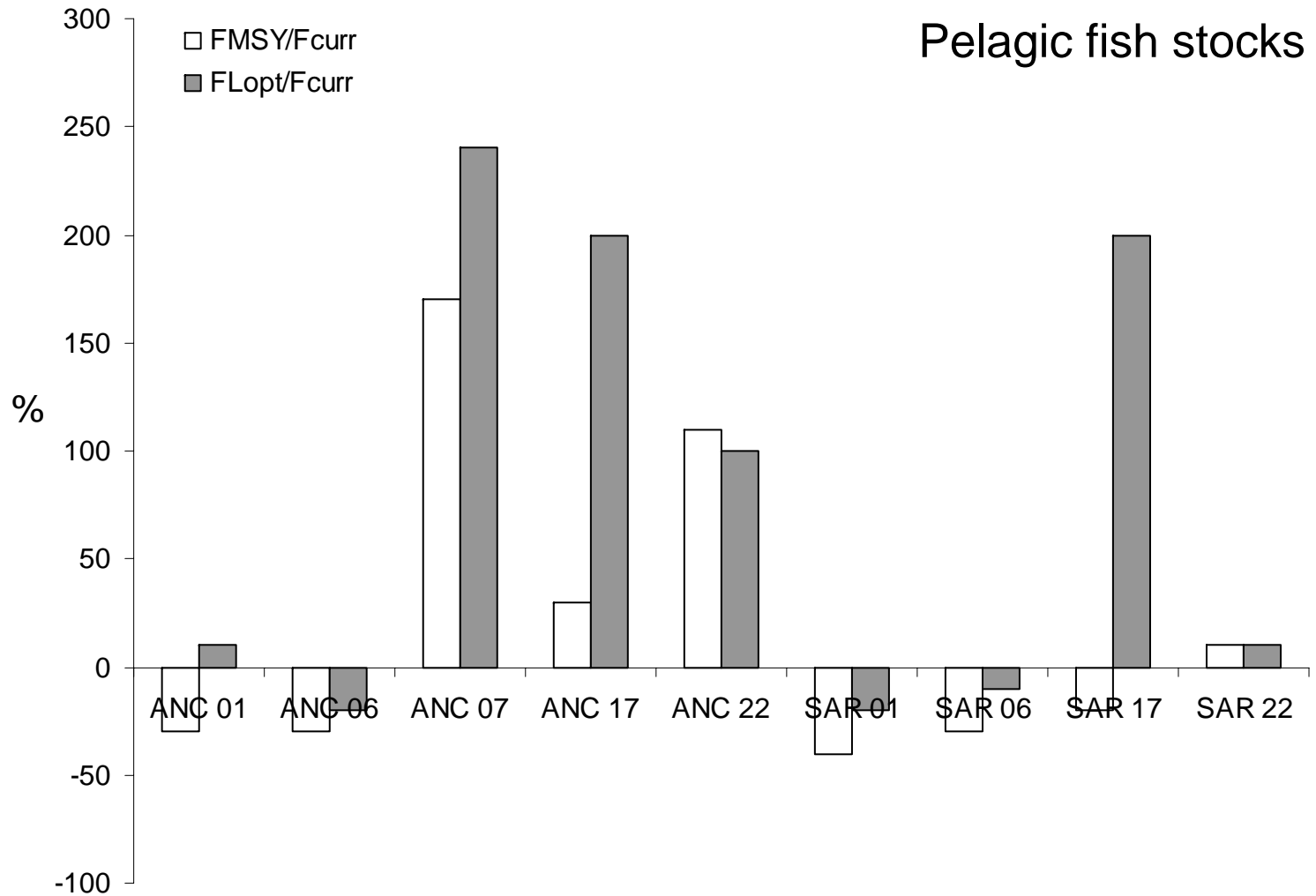
Changes in yield for different fishing regime



Colloca et al. Fish and Fisheries, conditionally accepted

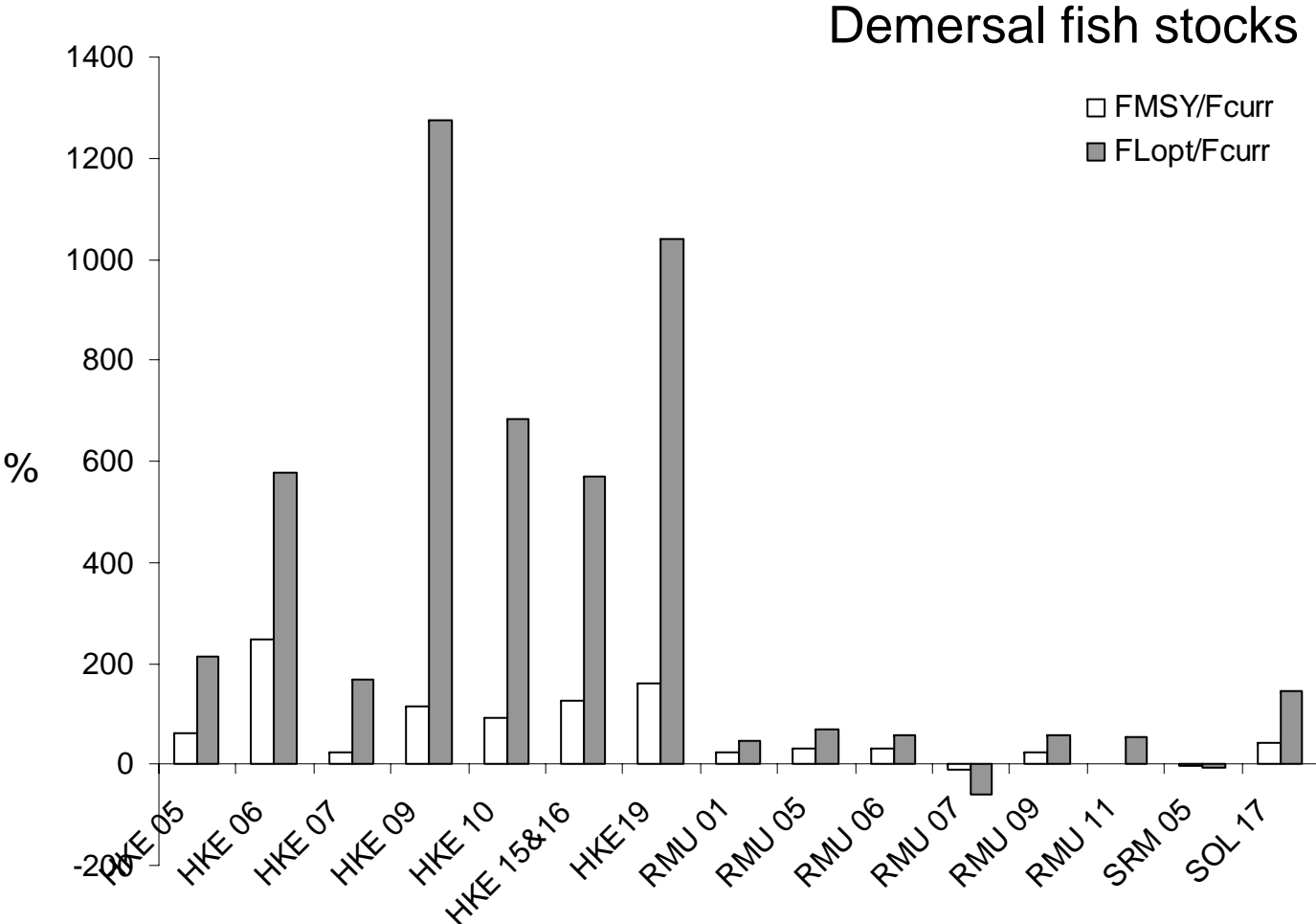


Changes in yield for different fishing regime





Changes in income for different fishing regime

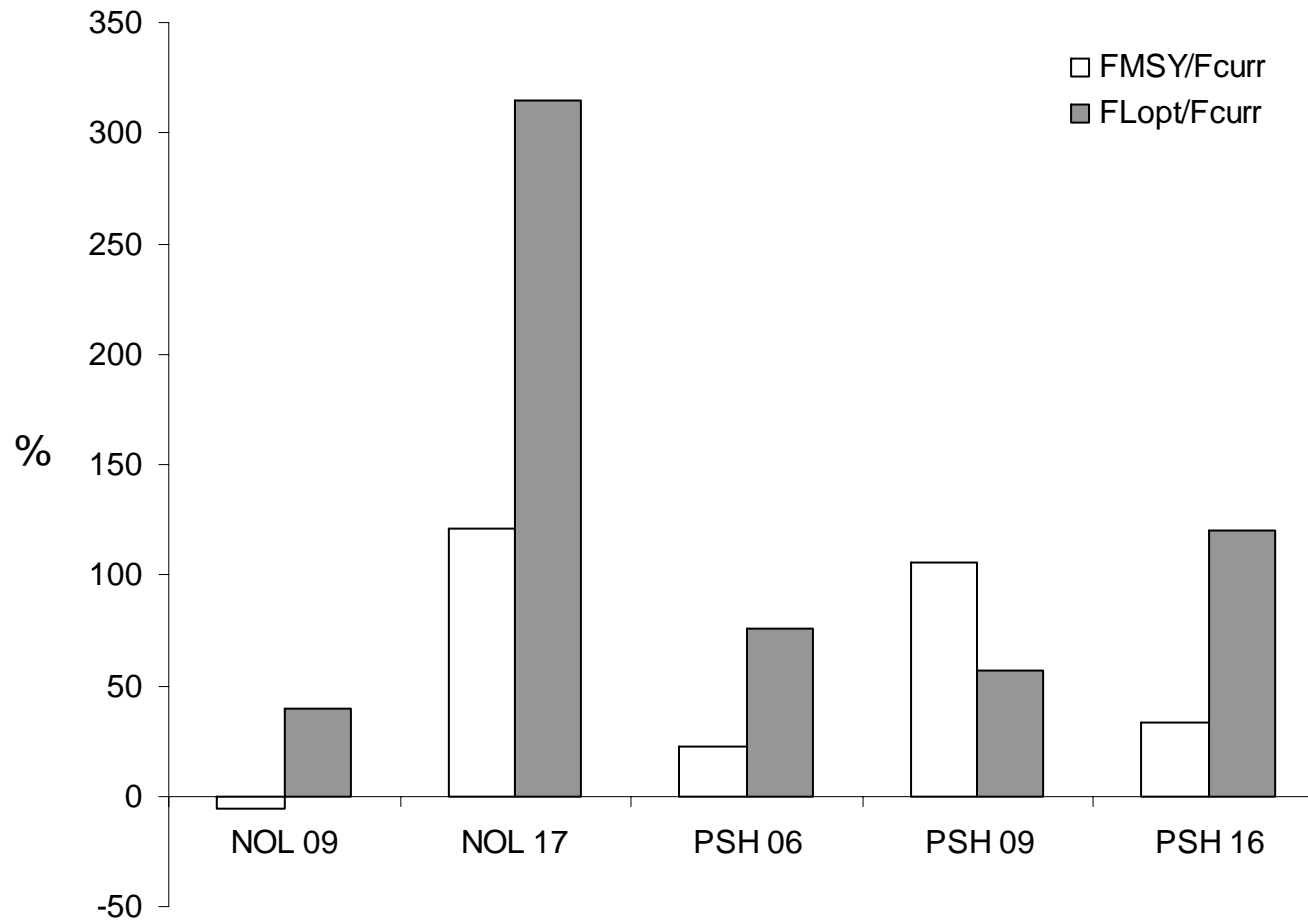


Colloca et al. Fish and Fisheries, conditionally accepted

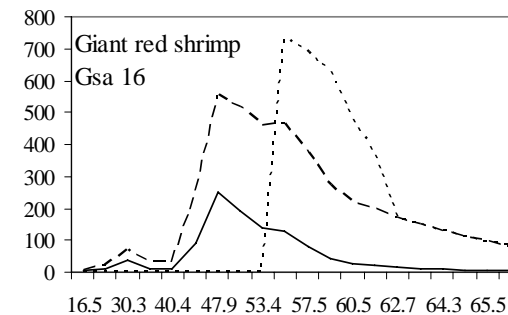
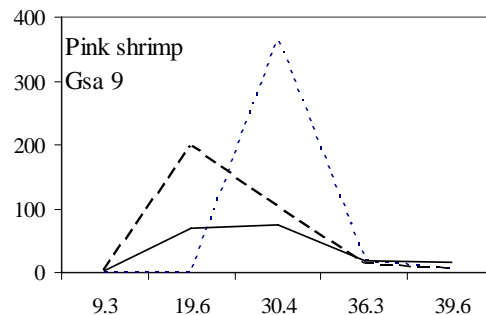
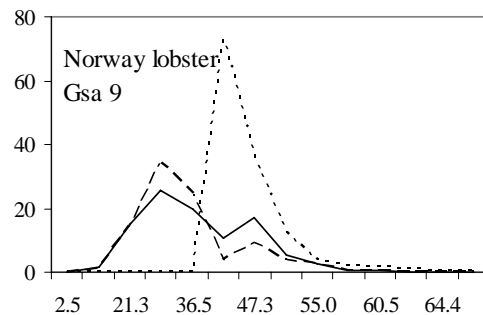
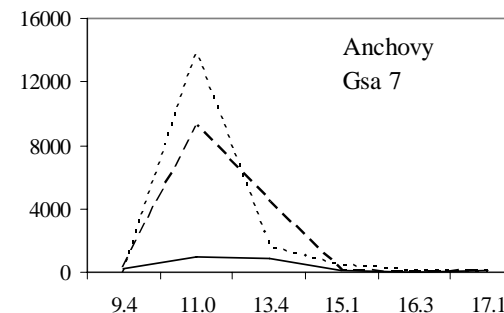
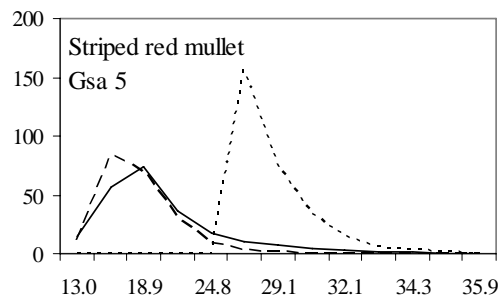
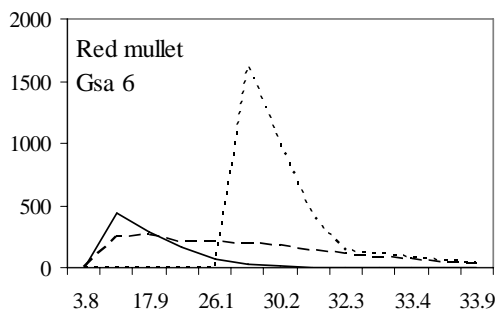
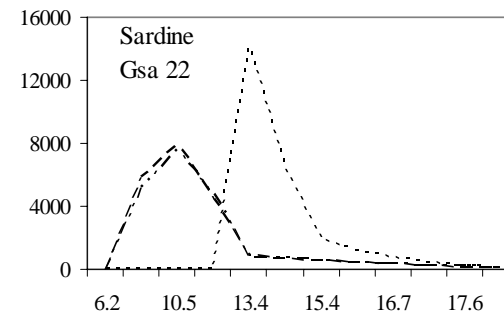
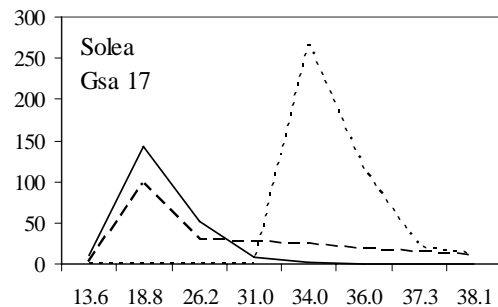
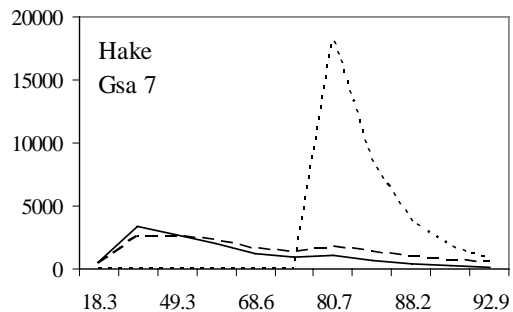


Changes in income for different fishing regime

Pelagic fish stocks



Changes in selectivity for different fishing regime



- - - - F_{opt}
 - - - - F_{MSY}
 ——— F_{curr}



Conclusions

Status of Mediterranean marine resources



- State of knowledge on the Mediterranean stocks is improving
- About 90% of the stocks analysed is overexploited compared to F_{MSY}



- Current size at capture is much smaller than both L_{50} and L_{opt}
- Reducing F will not reach MSY without changes in selectivity



- Current yields, stock biomass and economic revenues could be 43-164%, 190-496% and 52-203% higher than in the current situation if an F_{MSY} or a F_{opt} fishing strategy would be applied



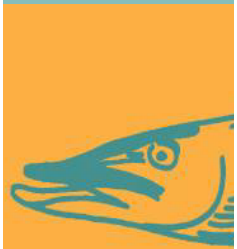
Way forward

Status of Mediterranean marine resources

- Changes in selectivity would increase the revenue of the fleet compared to both F_{curr} and F_{MSY} while assuring sustainable high long term yield
- It will imply that individuals has spawned several times compared to the current management strategy thus minimising genetic risk to the stock
- Have beneficial effects on the ecosystem structure and functioning

But.....

- The L_{opt} strategy can be easily implemented through the use of size selective gear as long line, pots and gillnets or larger mesh size for target fisheries while it would be more complex for multi-species fisheries
- Size selective harvesting can achieve several of the objectives of EAFM and it would represent the natural step forward after the implementation of the MSY framework





Conclusions

Way forward

- Reduce F for all fisheries
- Change gear selectivity
- Initiate the assessment of coastal species (e.g. sea bass, sea bream, etc) as the status of most of these species is unknown
- Several stocks are shared fisheries/stocks with non EU countries and thus a strong coordination and collaboration between GFCM-SAC and SGMED is crucial in the future





Assesment of Mediterranean marine resources

Major data inconsistencies:



Landings & discard



The landings appear incompletely reported by some important part of the fleet (e.g. gillnetting and longline)

Landings are differently reported to different fora (FAO, EU, etc.)

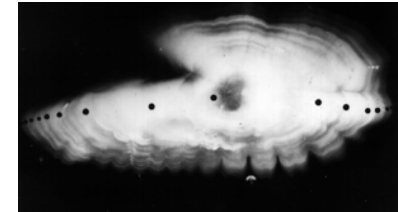


Discard data are very scarce



Major data issue

Data standardisation

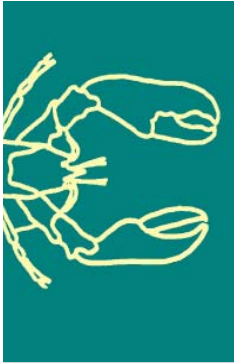


✓ Stock definition and collection of data at stock (and not at GSA) level



✓ Standardisation of survey data for stock assessment (e.g. unbalanced survey design, age slicing, etc)





Other data needs



Shortness of the time series used in the assessment



Difficulties in estimating baselines for management

