Status of Mediterranean resources in European Waters in 2012

Results for stocks in GSA 1-29 (Mediterranean and Black Sea)

By Max Cardinale* & Giacomo Chato Osio**

*Chairman of STECF-SGMED

** EC JRC, Ispra, Italy

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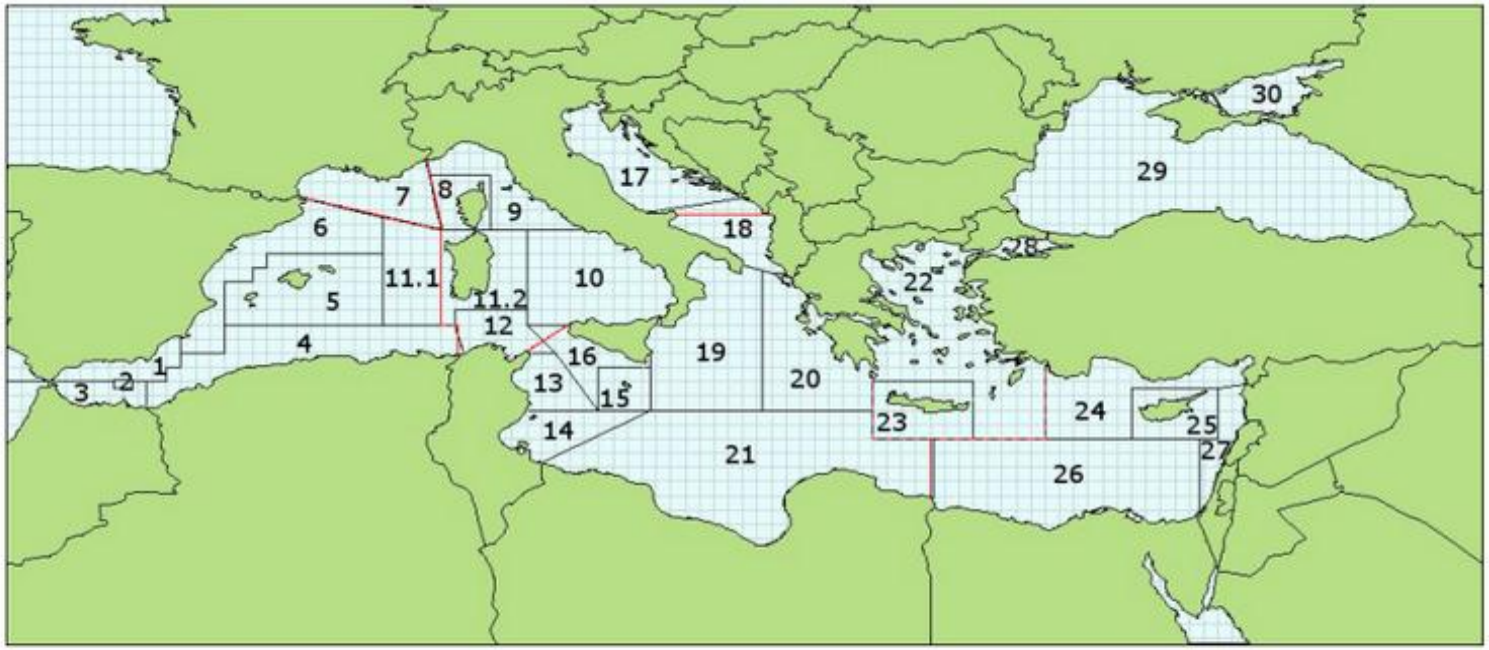
Guidelines for the evaluation of stock status

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 yields and the long-term sustainable exploitation of the stock
- F/F_{MSY} indicates how far each stock is from the MSY target

FAO GFCM sub-areas (GSA's)



— *FAO Statistical Divisions (red)* — *GFCM Geographical Sub-Areas (black)*

01 - Northern Alboran Sea	07 - Gulf of Lions	13 - Gulf of Hammamet	19 - Western Ionian Sea	25 - Cyprus Island
02 - Alboran Island	08 - Corsica Island	14 - Gulf of Gabes	20 - Eastern Ionian Sea	26 - South Levant
03 - Southern Alboran Sea	09 - Ligurian and North Tyrrhenian Sea	15 - Malta Island	21 - Southern Ionian Sea	27 - Levant
04 - Algeria	10 - South and Central Tyrrhenian Sea	16 - South of Sicily	22 - Aegean Sea	28 - Marmara Sea
05 - Balearic Island	11.1 - Sardinia (west) 11.2 - Sardinia (east)	17 - Northern Adriatic	23 - Crete Island	29 - Black Sea
06 - Northern Spain	12 - Northern Tunisia	18 - Southern Adriatic Sea	24 - North Levant	30 - Azov Sea

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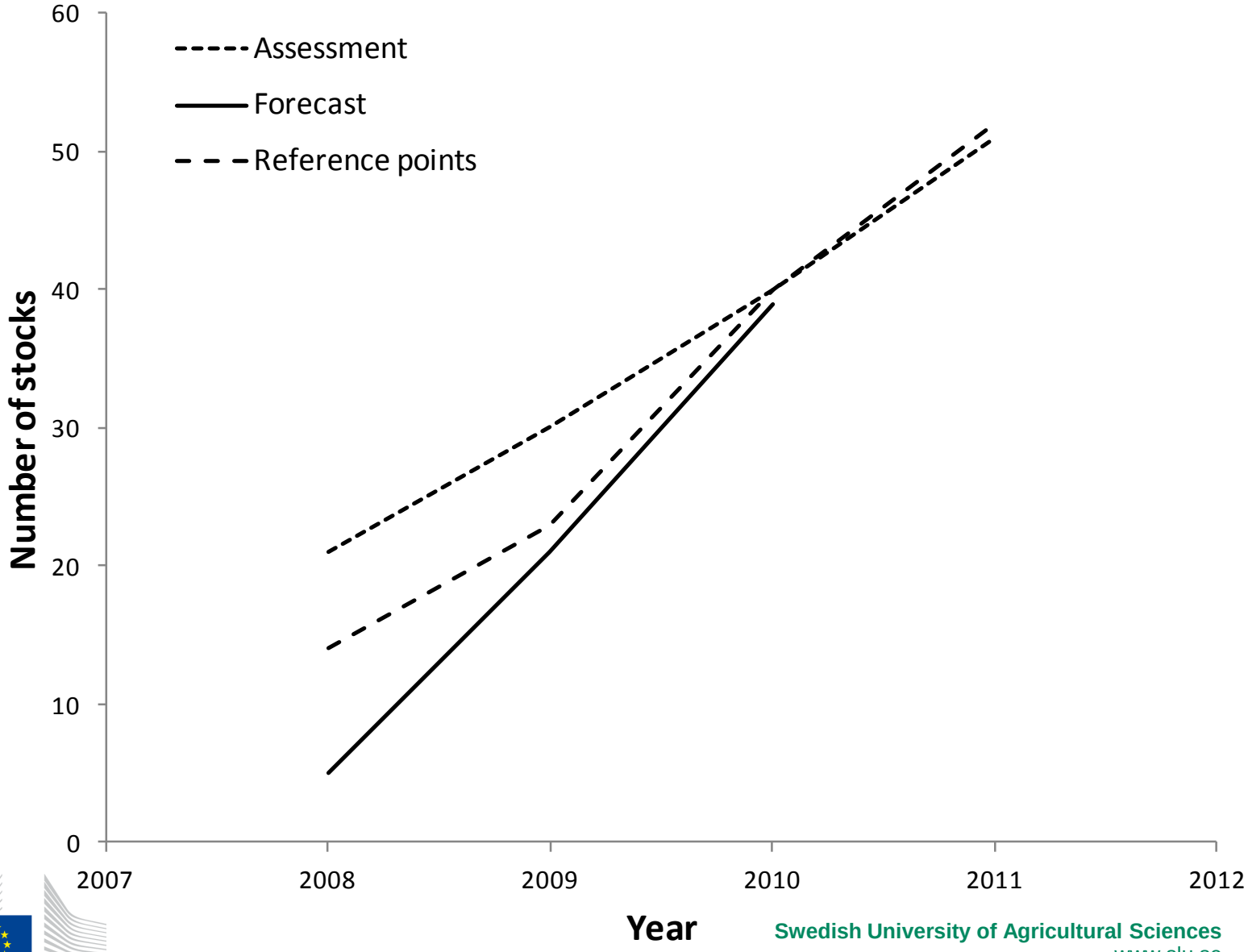
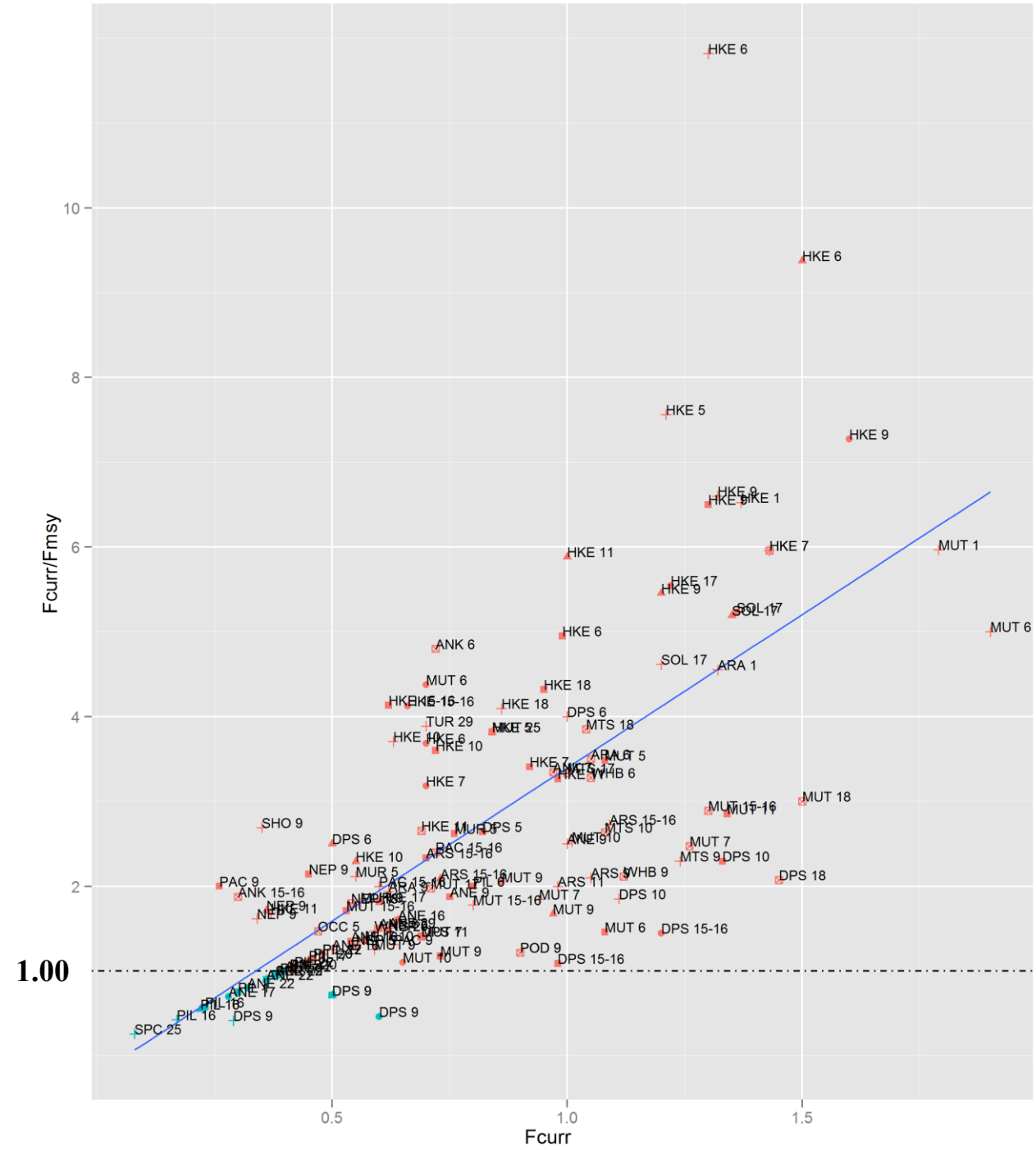
Historical trend of the assessed stocks



Stock status compared to MSY



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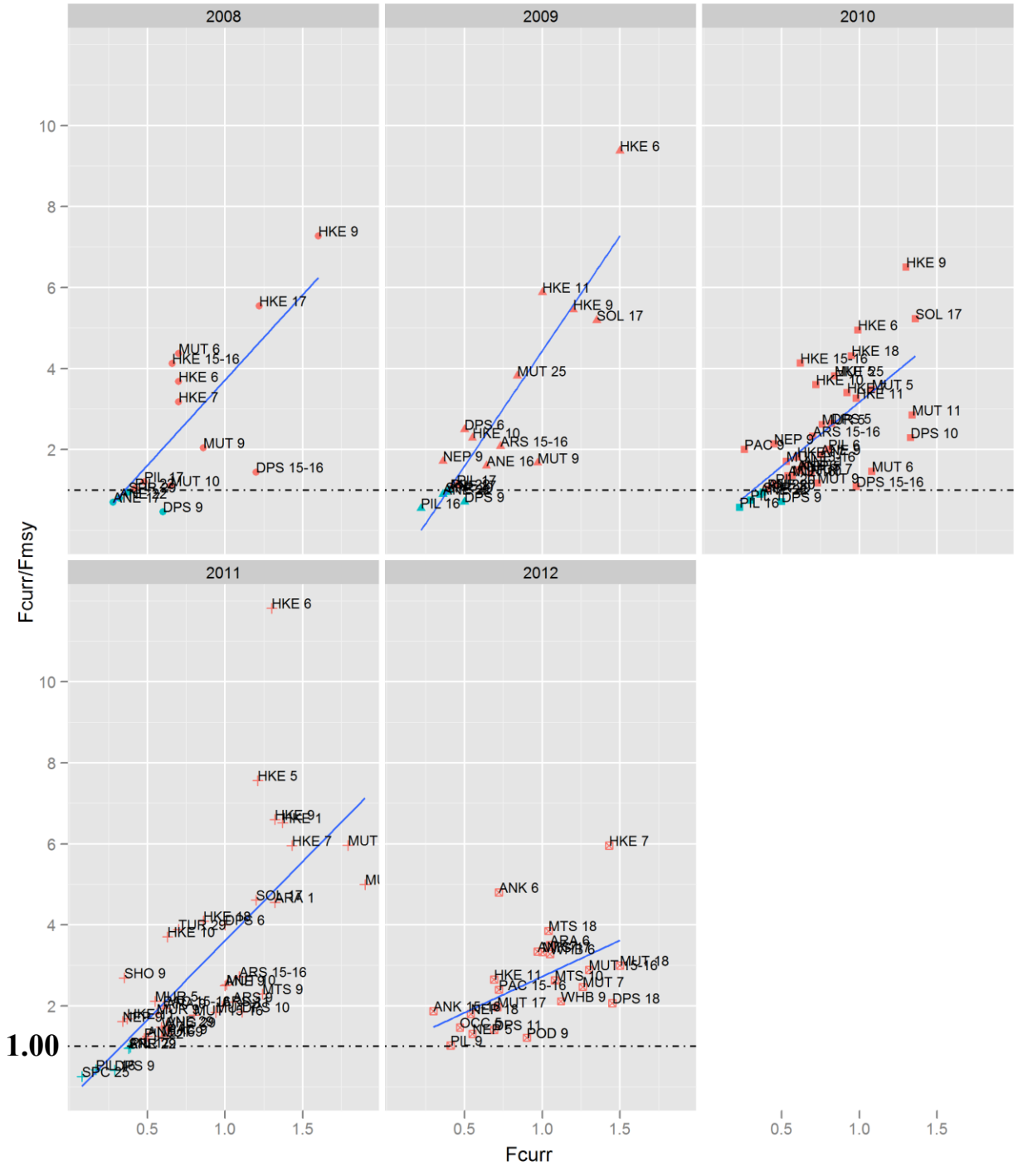
Stock status compared to MSY by year



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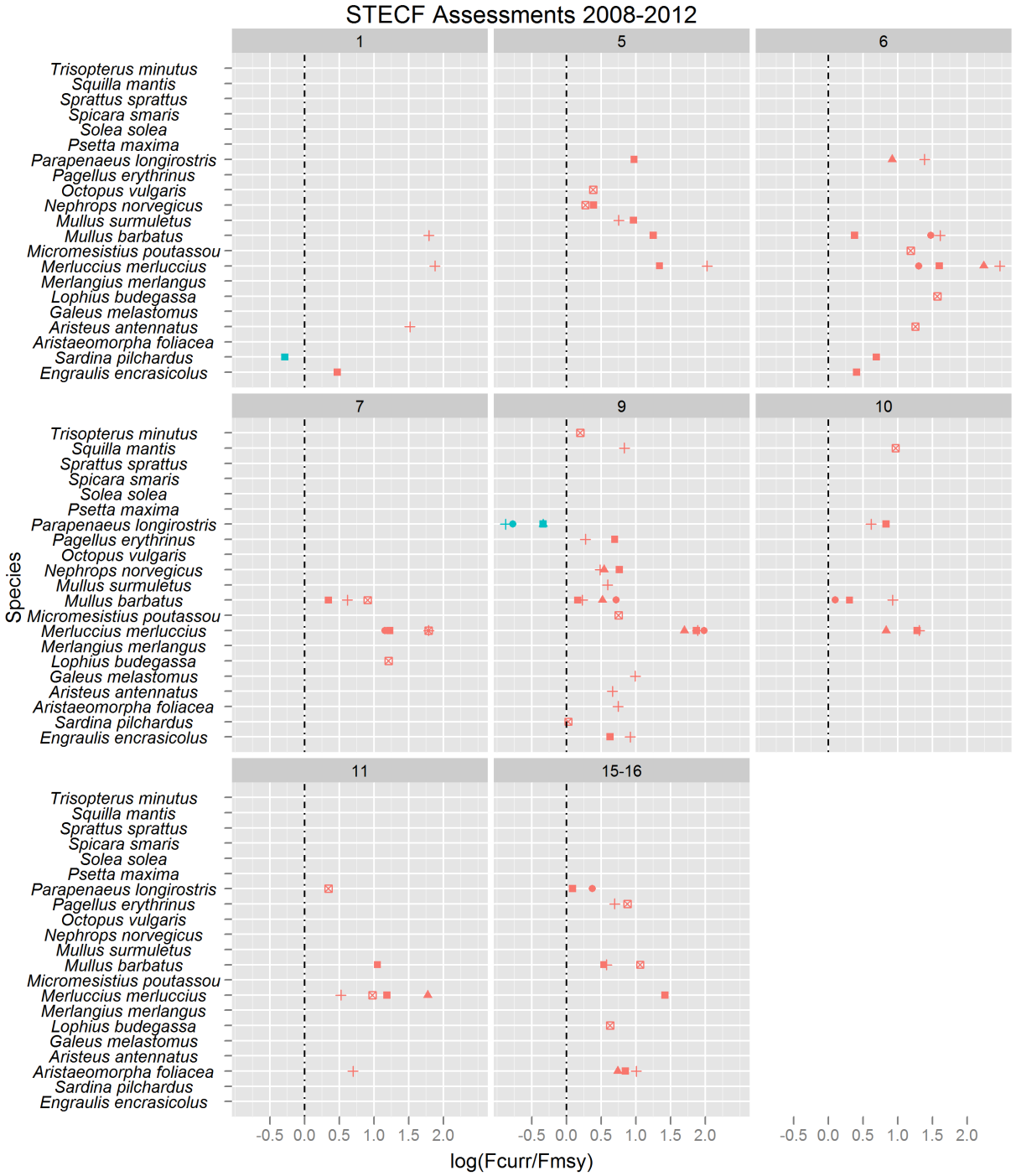
Stock status compared to MSY by GSA



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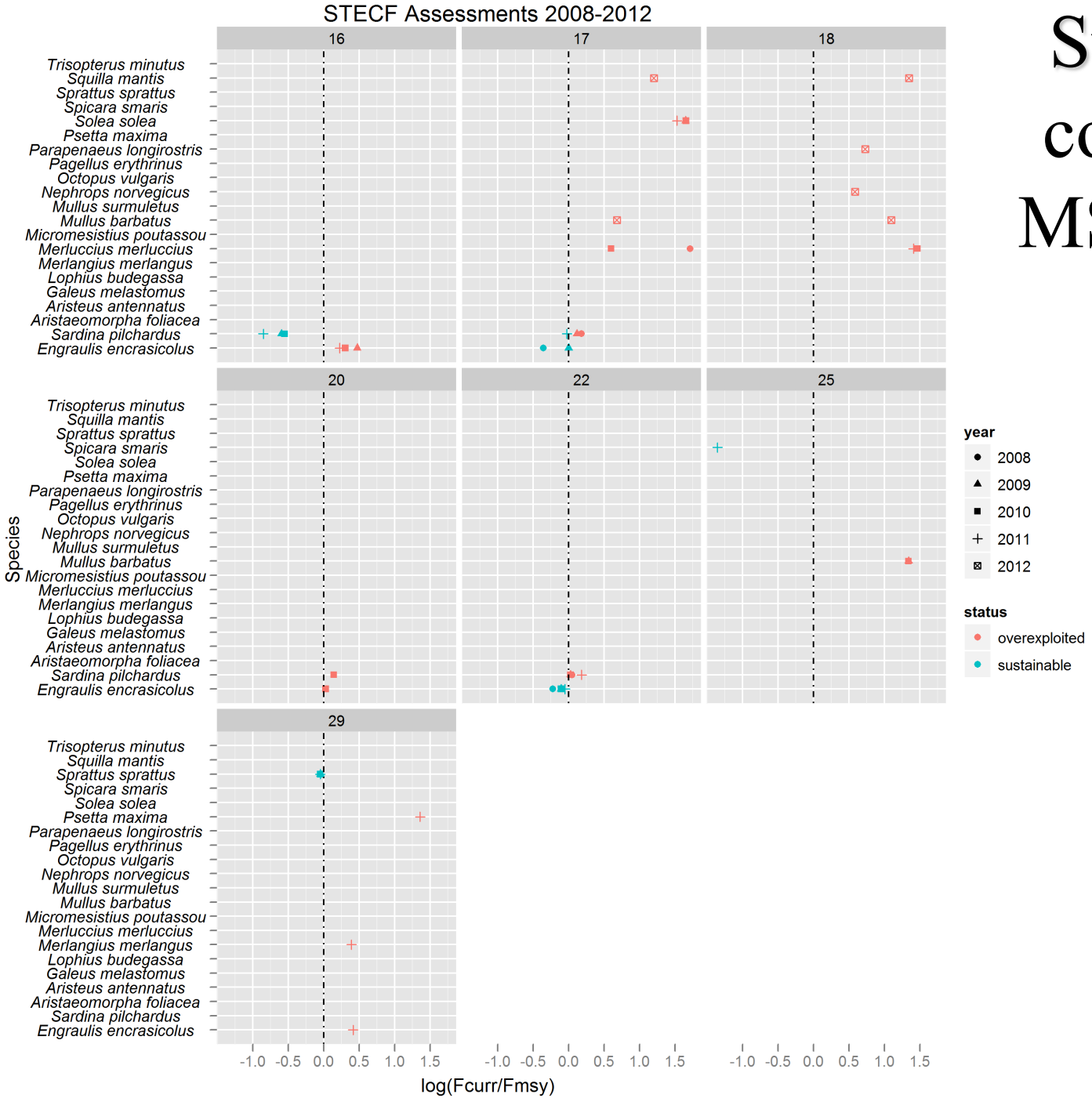
Stock status compared to MSY by GSA



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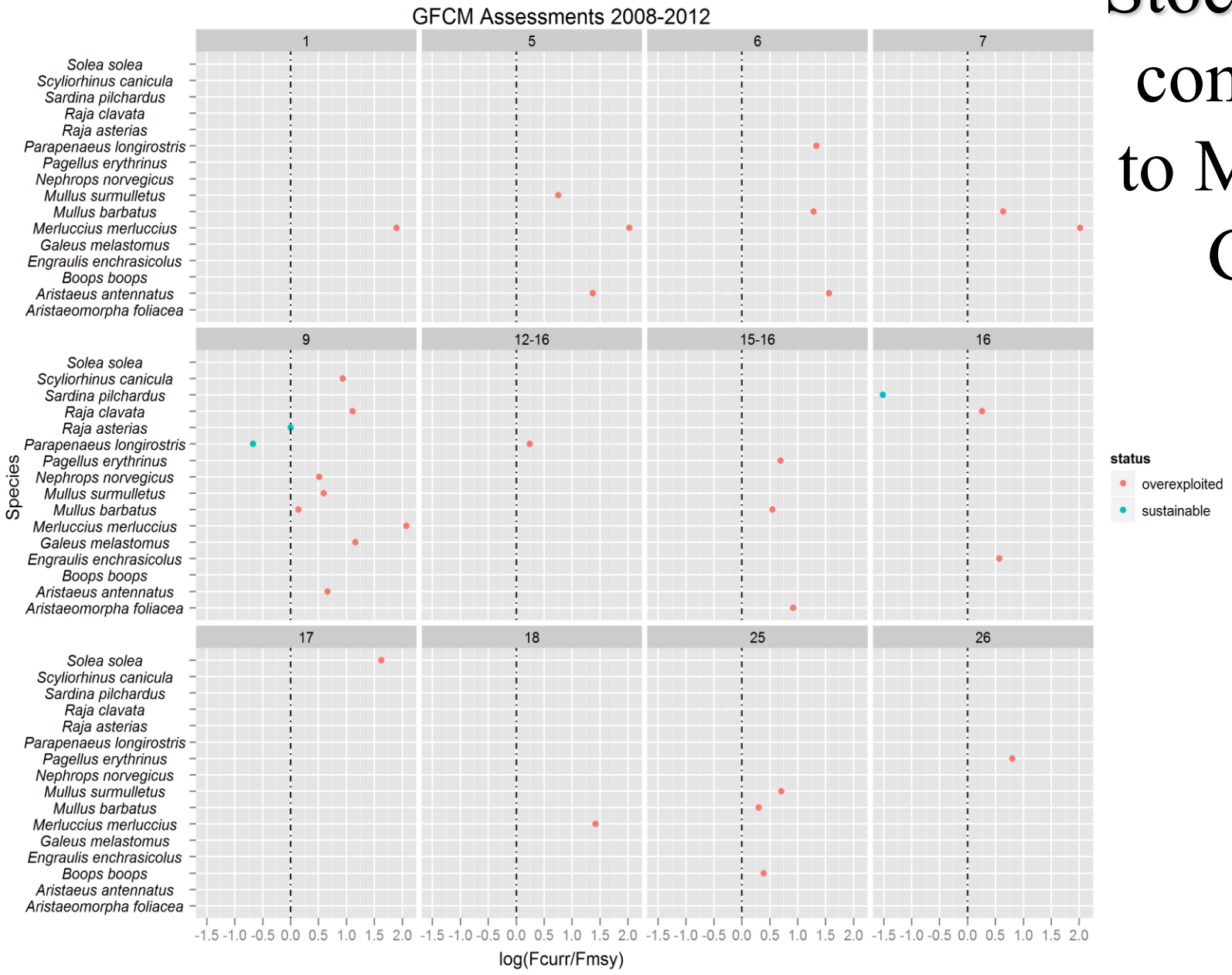
Stock status compared to MSY by GSA



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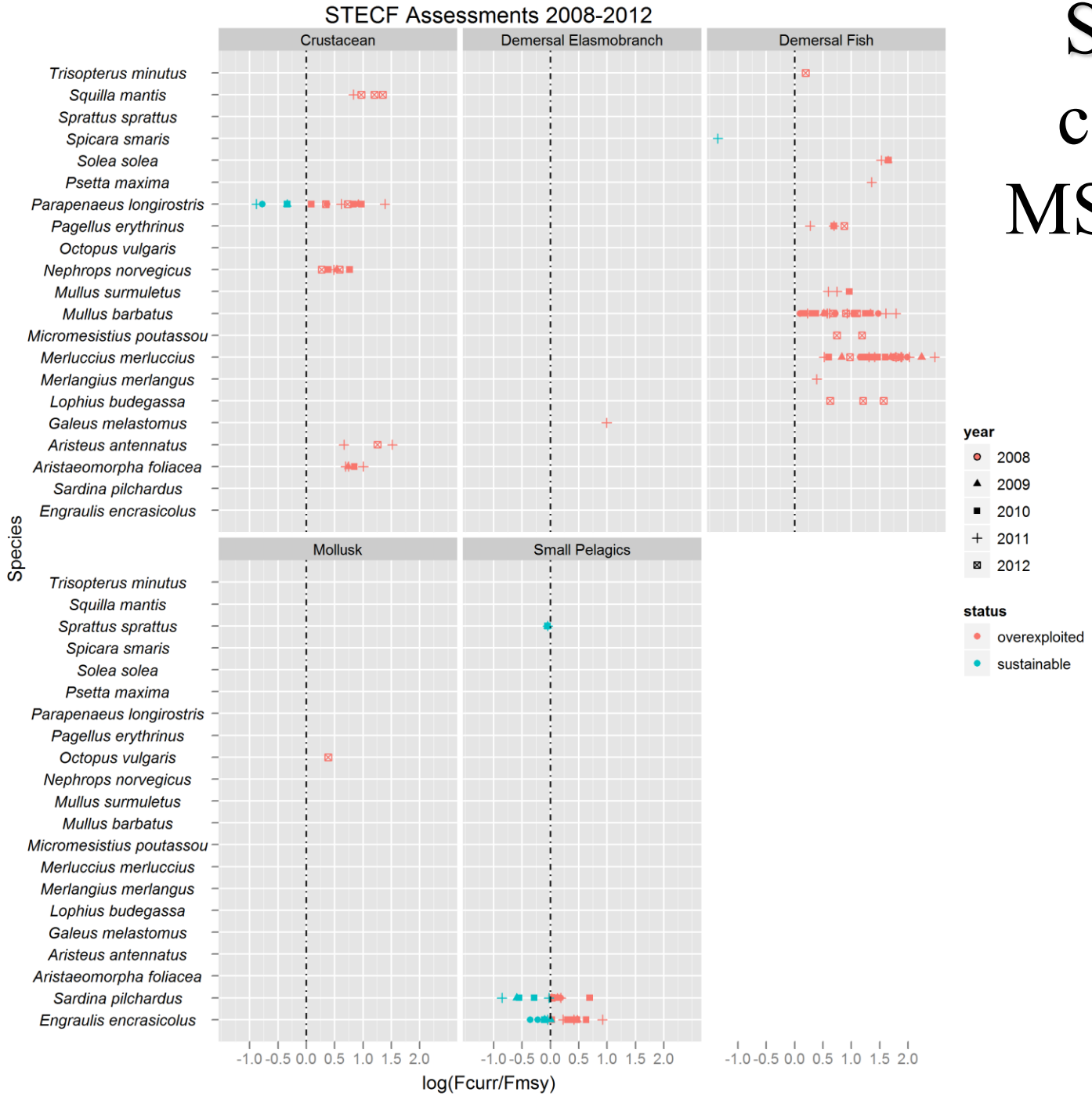
Stock status compared to MSY by groups



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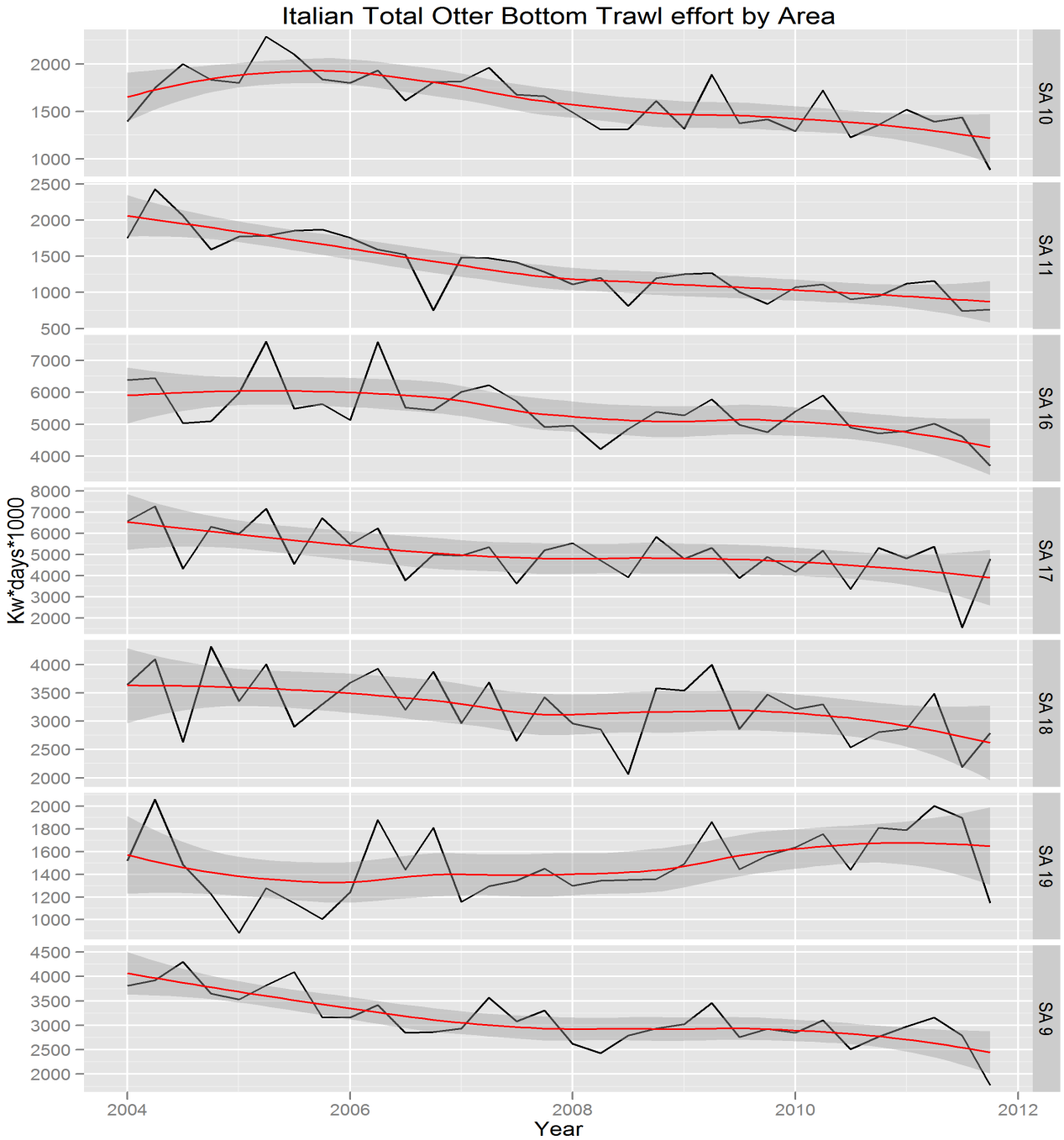
Effort trends by GSA and country



Unstandardized data from 2012 DCF datacall

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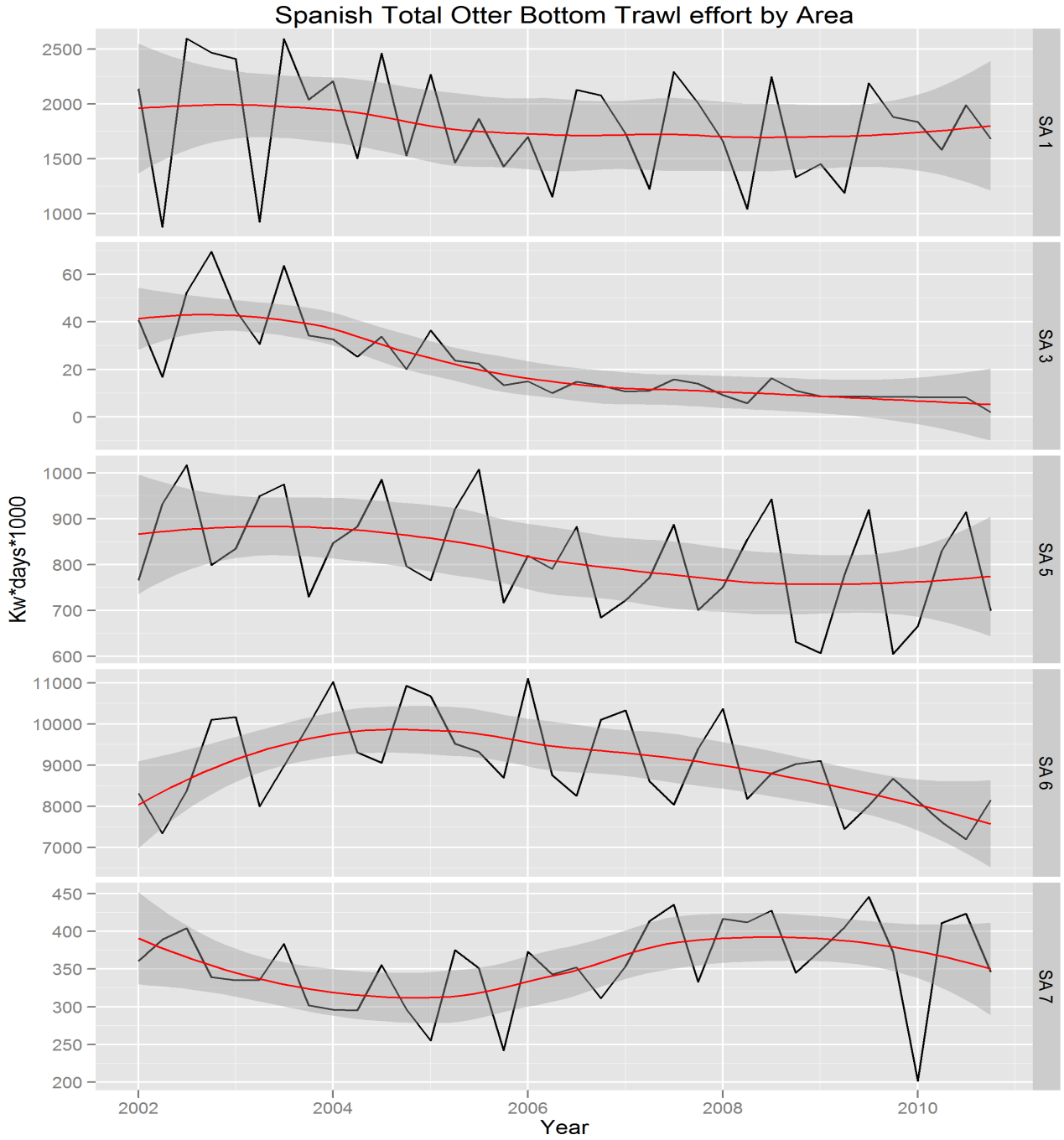
Effort trends by GSA and country



Unstandardized data from 2012 DCF datacall

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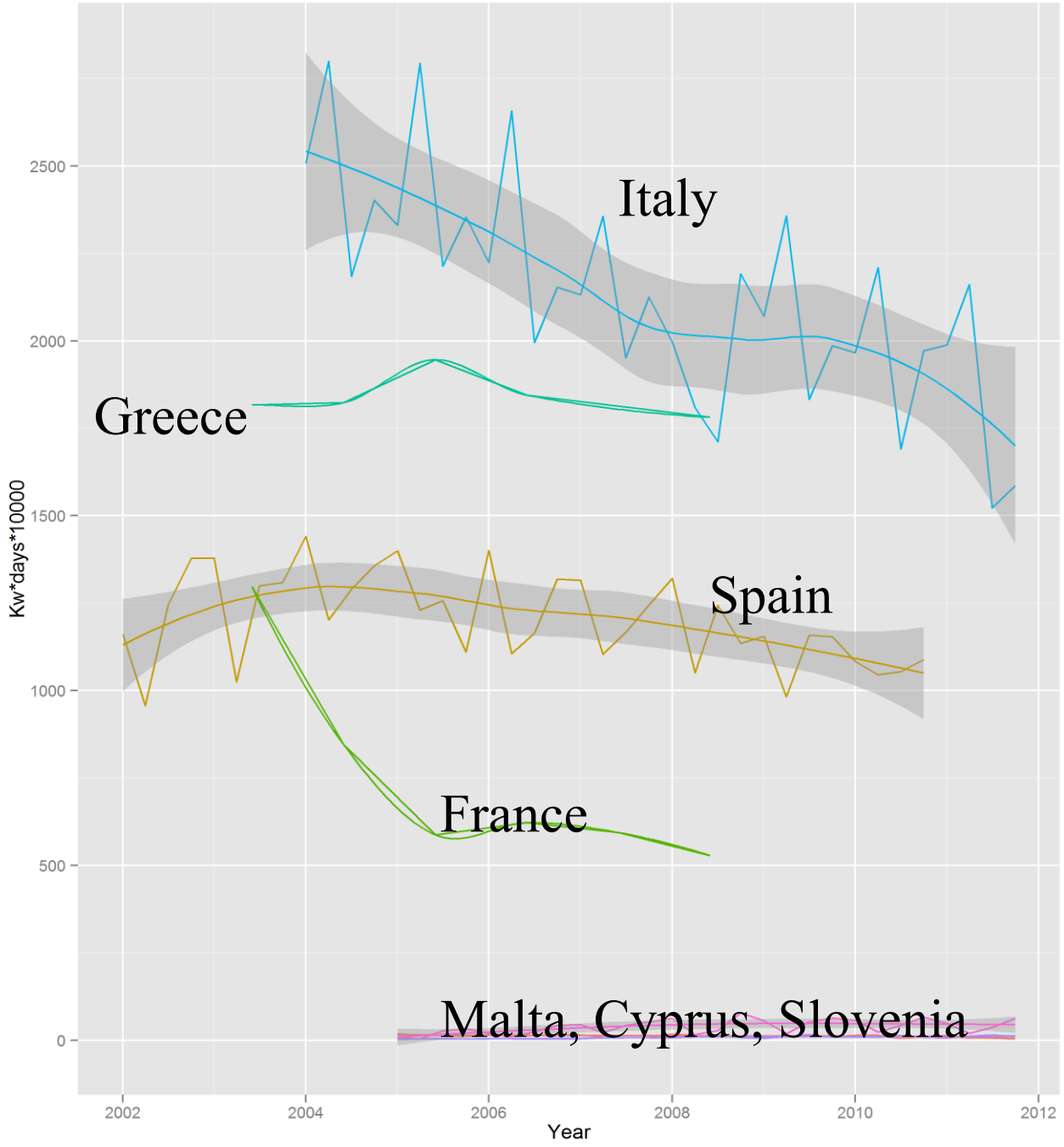
Effort trends OF otter trawlers



Unstandardized data from 2012 DCF datacall

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Stock status in the last assessment year compared to MSY

STECF

GSA	Common name	Species	2010-2011 Fcurr	2010-2011 Fmsy	% decrease in F	GSA	Common name	Species	2010-2011 Fcurr	2010-2011 Fmsy	% decrease in F
1	Blue and red shrimp	*Aristeus antentus*	1.32	0.29	78						
1	Hake	*Merluccius merluccius*	1.37	0.21	85	10	Hake	*Merluccius merluccius*	0.63	0.17	73
1	Red mullet	*Mullus barbatus*	1.79	0.30	83	10	Pink shrimp	*Parapeeus longirostris*	1.11	0.60	46
5	Hake	*Merluccius merluccius*	1.21	0.16	87	10	Red mullet	*Mullus barbatus*	1.01	0.40	60
5	Norway lobster	*Nephrops norvegicus*	0.55	0.42	24	10	Spottail mantis shrimp	*Squilla mantis*	1.08	0.41	62
5	Octopus	*Octopus vulgaris*	0.47	0.32	32	11	Giant red shrimp	*Aristaeomorpha foliacea*	0.98	0.49	50
5	Striped red mullet	*Mullus surmuletus*	0.55	0.26	53	11	Hake	*Merluccius merluccius*	0.69	0.26	62
6	Angler fish	*Lophius budegassa*	0.72	0.15	79	11	Pink shrimp	*Parapeeus longirostris*	0.69	0.49	29
6	Blue and red shrimp	*Aristeus antentus*	1.05	0.30	71	16	Anchovy	*Engraulis encrasicolus*	0.50	0.40	20
6	Blue whiting	*Micromesistius poutassou*	1.05	0.32	70	16	Sardine	*Sardina pilchardus*	0.17	0.40	-135
6	Hake	*Merluccius merluccius*	1.30	0.11	92	17	Common sole	*Solea solea*	1.20	0.26	78
6	Pink shrimp	*Parapeeus longirostris*	1.00	0.25	75	17	Red mullet	*Mullus barbatus*	0.71	0.36	49
6	Red mullet	*Mullus barbatus*	1.90	0.38	80	17	Sardine	*Sardi pilchardus*	0.39	0.40	-3
7	White anglerfish	*Lophius budegassa*	0.97	0.29	70	17	Spottail mantis shrimp	*Squilla mantis*	1.00	0.30	70
7	Hake	*Merluccius merluccius*	1.43	0.24	83	18	Hake	*Merluccius merluccius*	0.86	0.21	76
7	Red mullet	*Mullus barbatus*	1.26	0.51	60	18	Norway lobster	*Nephrops norvegicus*	0.54	0.30	44
9	Anchovy	*Engraulis encrasicolus*	1.00	0.40	60	18	Pink shrimp	*Parapeeus longirostris*	1.45	0.70	52
9	Blackmouth catshark	*Galeus melastomus*	0.35	0.13	63	18	Red mullet	*Mullus barbatus*	1.50	0.50	67
9	Blue and red shrimp	*Aristeus antentus*	0.62	0.32	48	18	Spottail mantis shrimp	*Squilla mantis*	1.04	0.27	74
9	Blue whiting	*Micromesistius poutassou*	1.12	0.53	53	22	Anchovy	*Engraulis encrasicolus*	0.38	0.40	-5
9	Common Pandora	*Pagellus erythrinus*	0.63	0.48	24	22	Sardine	*Sardina pilchardus*	0.48	0.40	17
9	Giant red shrimp	*Aristaeomorpha foliacea*	1.05	0.50	52	25	Picarel	*Spicara smaris*	0.08	0.31	-288
9	Hake	*Merluccius merluccius*	1.32	0.20	85	29	Anchovy	*Engraulis encrasicolus*	0.62	0.41	34
9	Norway lobster	*Nephrops norvegicus*	0.34	0.21	38	29	Sprat	*Sprattus sprattus*	0.38	0.40	-5
9	Pink shrimp	*Parapeeus longirostris*	0.29	0.70	-141	29	Turbot	*Psetta maxima*	0.70	0.18	74
9	Poor cod	*Trisopterus minutus*	0.90	0.74	18	29	Whiting	*Merlangius merlangus*	0.59	0.40	32
9	Red mullet	*Mullus barbatus*	0.59	0.47	20	15-16	Common Pandora	*Pagellus erythrinus*	0.72	0.30	58
9	Sardine	*Sardina pilchardus*	0.41	0.40	2	15-16	Giant red shrimp	*Aristaeomorpha foliacea*	1.09	0.40	63
9	Spottail mantis shrimp	*Squilla mantis*	1.24	0.54	56	15-16	Red mullet	*Mullus barbatus*	1.30	0.45	65
9	Striped red mullet	*Mullus surmuletus*	0.56	0.31	45	15-16	Black bellied anglerfish	*Lophius budegassa*	0.30	0.16	47

Around 90% of analysed Mediterranean stocks are estimated to be exploited unsustainably in 2010-2011

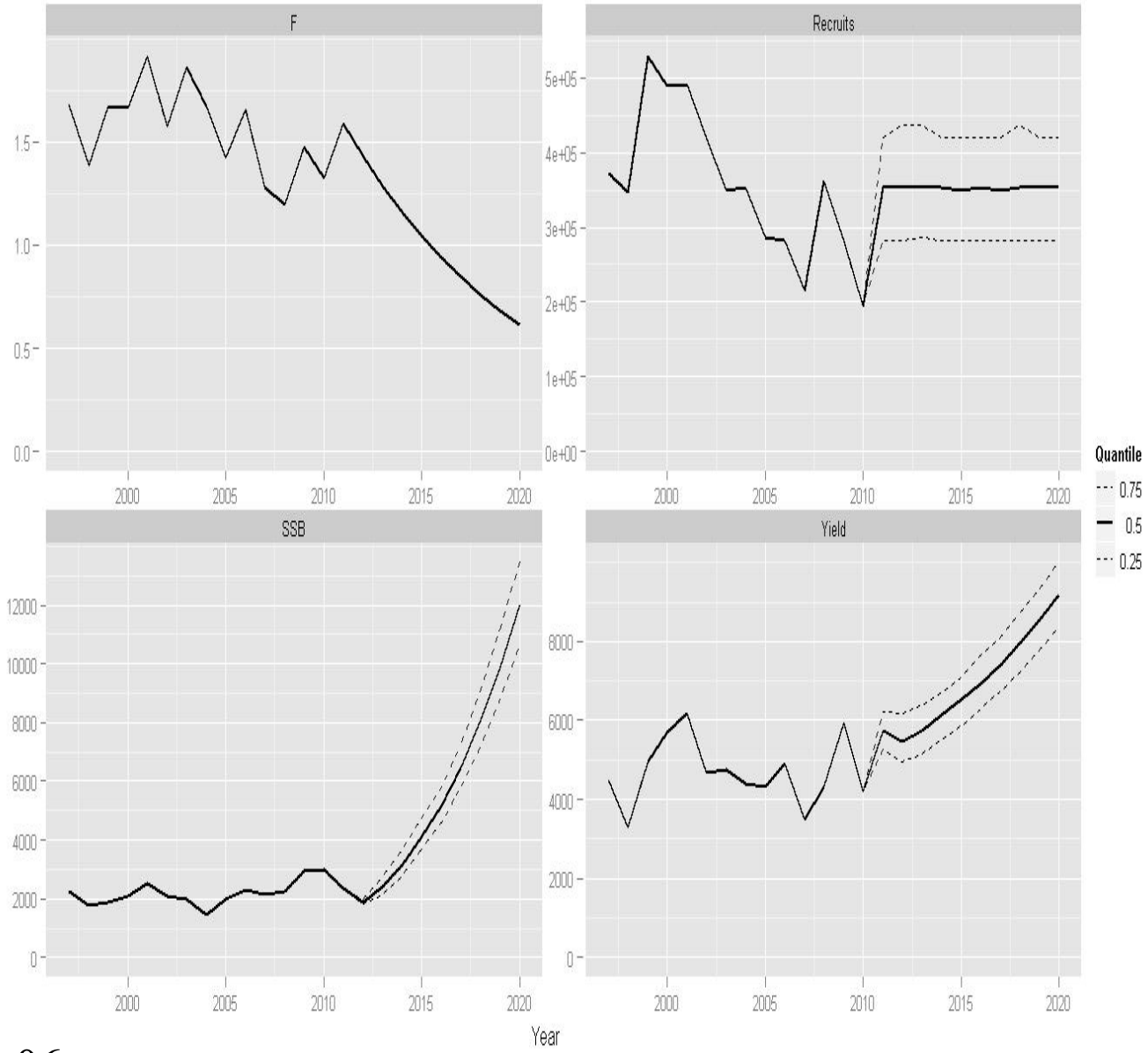
Stock status in the last assessment year compared to MSY

GFCM

GSA	Species	Year period	F_{MSY}	F_{curr}	F_{MSY}/F_{curr}	Status	% reduction in F
1	*Merluccius merluccius*	2002-2010	0.20	1.33	6.65	Overexploited	85
5	*Merluccius merluccius*	2001-2010	0.16	1.21	7.56	Overexploited	87
5	*Mullus surmulletus*	2001-2010	0.26	0.55	2.12	Overexploited	53
5	*Aristaeus antennatus*	1992-2010	0.15	0.59	3.93	Overexploited	75
6	*Mullus barbatus*	1995-2010	0.20	0.72	3.60	Overexploited	72
6	*Aristaeus antennatus*	1996-2010	0.28	1.33	4.75	Overexploited	79
6	*Parapenaeus longirostris*	2001-2010	0.30	1.14	3.80	Overexploited	74
7	*Merluccius merluccius*	1998-2010	0.19	1.43	7.53	Overexploited	87
7	*Mullus barbatus*	2004-2010	0.45	0.85	1.89	Overexploited	47
9	*Merluccius merluccius*	2005-2010	0.22	1.75	7.95	Overexploited	87
9	*Mullus barbatus*	1994-2010	0.47	0.54	1.15	Overexploited	13
9	*Mullus surmulletus*	2009-2010	0.35	0.64	1.81	Overexploited	45
9	*Galeus melastomus*	2009-2010	0.11	0.35	3.18	Overexploited	69
9	*Aristaeus antennatus*	2009-2010	0.32	0.62	1.94	Overexploited	48
9	*Nephrops norvegicus*	2006-2010	0.21	0.35	1.67	Overexploited	40
9	*Parapenaeus longirostris*	2006-2010	0.78	0.40	0.51	Sustainable	-95
9	*Raja asterias*	1994-2010	0.49	0.49	1.00	Sustainable	0
9	*Raja clavata*	1994-2010	0.08	0.23	3.03	Overexploited	67
9	*Scyliorhinus canicula*	1994-2010	0.13	0.33	2.54	Overexploited	61
16	*Raja clavata*	1994-2010	0.10	0.13	1.30	Overexploited	23
17	*Solea solea*	2005-2010	0.25	1.27	5.08	Overexploited	80
18	*Merluccius merluccius*	1994-2010	0.21	0.87	4.14	Overexploited	76
25	*Mullus barbatus*	2005-2010	0.33	0.45	1.35	Overexploited	26
25	*Mullus surmulletus*	2009-2010	0.23	0.46	2.02	Overexploited	51
25	*Boops boops*	2005-2010	0.25	0.37	1.48	Overexploited	32
26	*Pagellus erythrinus*	2006-2007	0.29	0.64	2.23	Overexploited	55
12-16	*Parapenaeus longirostris*	2007-2010	0.95	1.21	1.27	Overexploited	21
15-16	*Mullus barbatus*	1994-2010	0.45	0.78	1.73	Overexploited	42
15-16	*Pagellus erythrinus*	1994-2010	0.30	0.60	2.00	Overexploited	50
15-16	*Aristaeomorpha foliacea*	1994-2010	0.40	1.00	2.50	Overexploited	60

Around 93% of the analysed Mediterranean stocks are estimated to be exploited unsustainably in 2007-2010

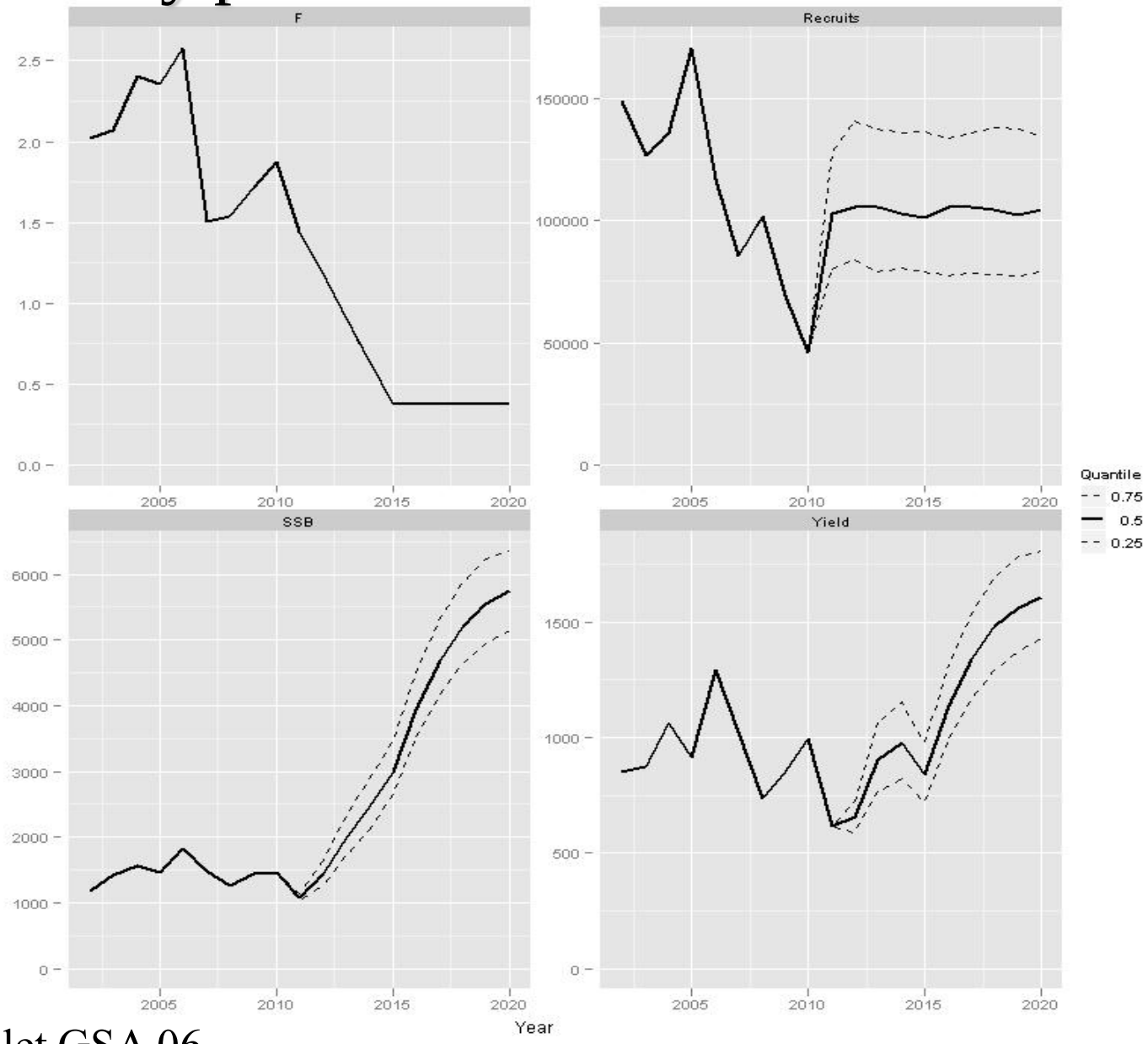
Recovery potential of Mediterranean stocks



Hake GSA 06

10% reduction of F per year, MSY in 2020

Recovery potential of Mediterranean stocks



Red Mullet GSA 06

10% reduction of F per year, MSY in 2015

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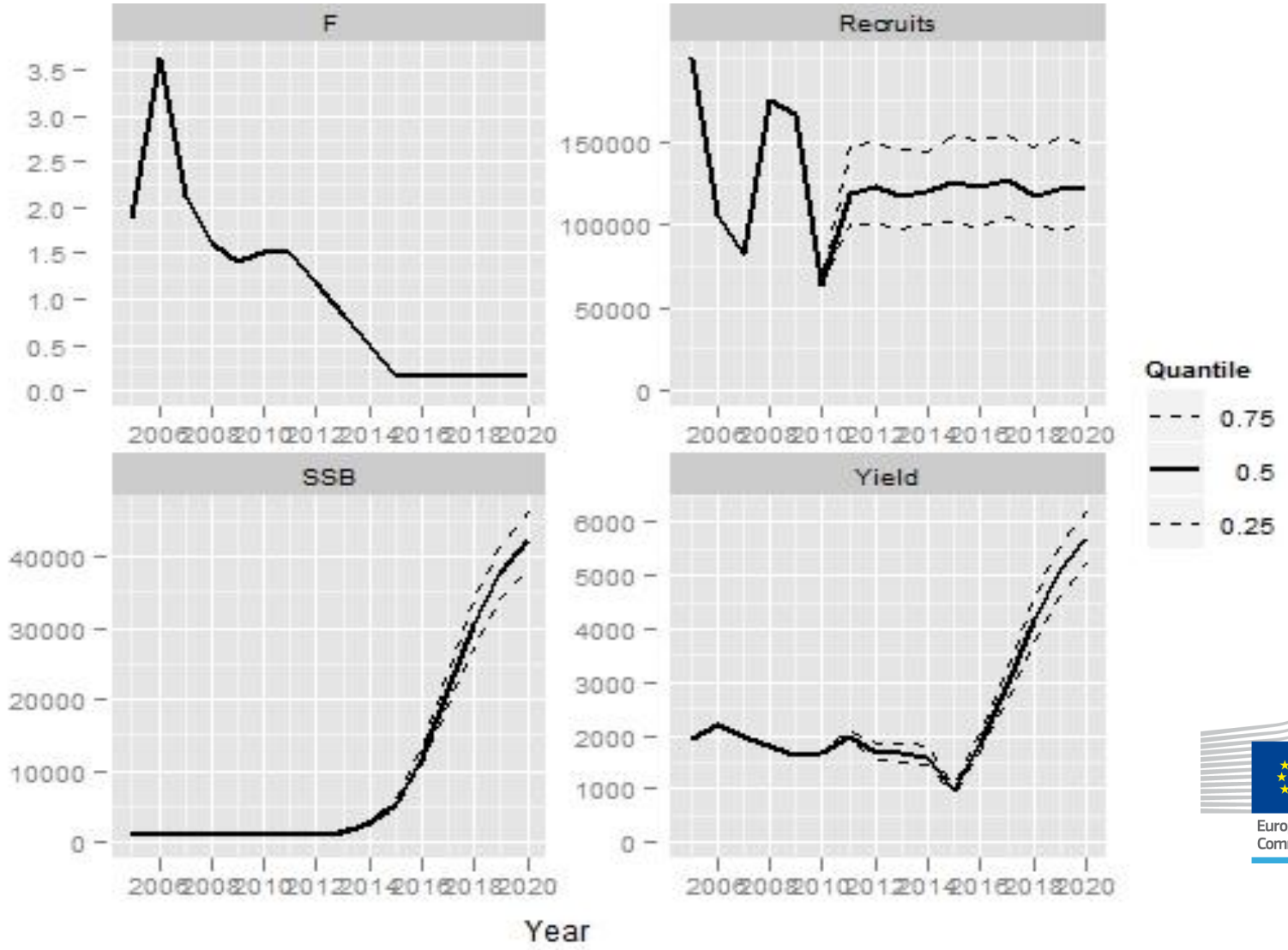
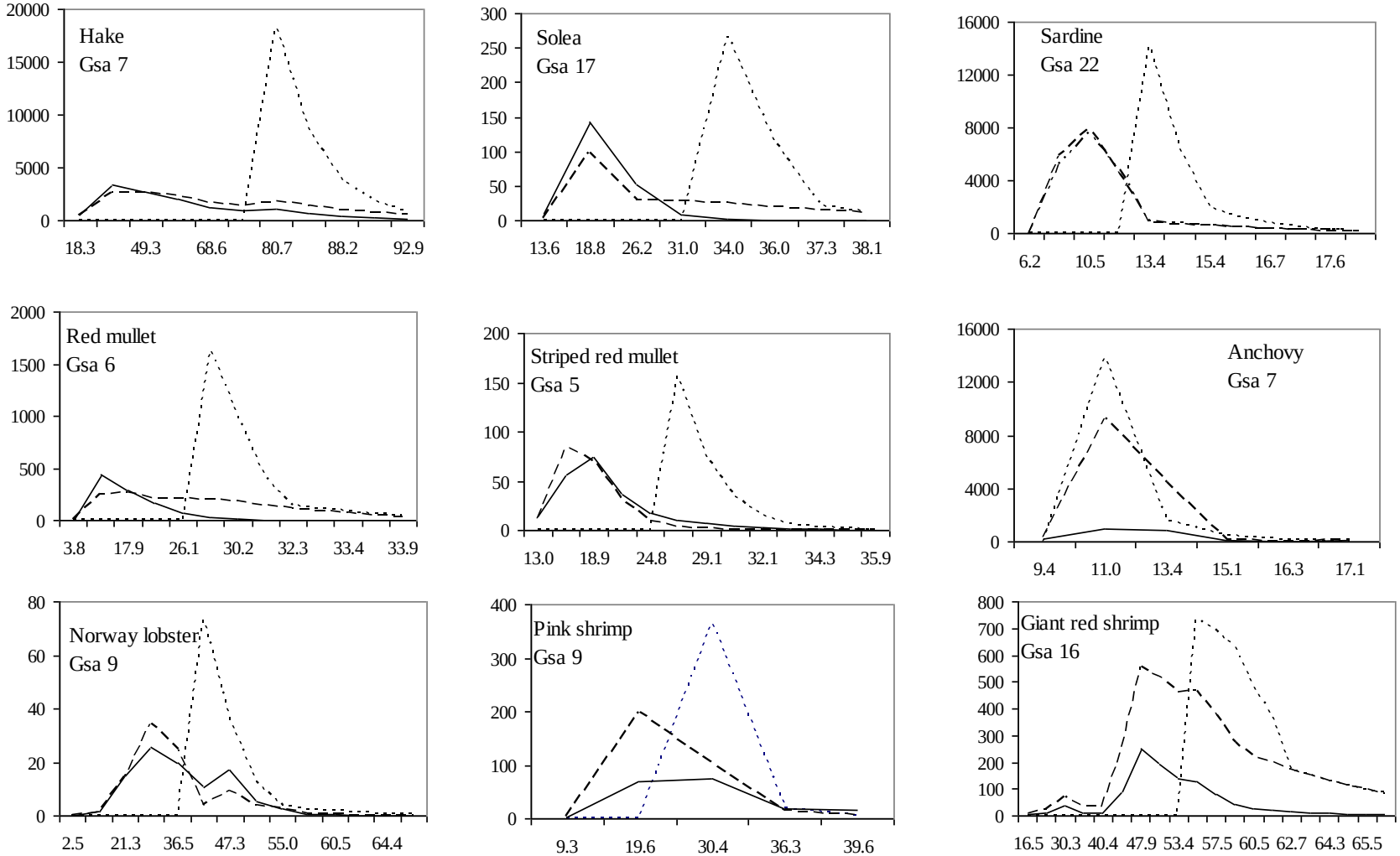
Recovery potential of Mediterranean stocks



Hake GSA 09
10% reduction of F per year, MSY in 2015

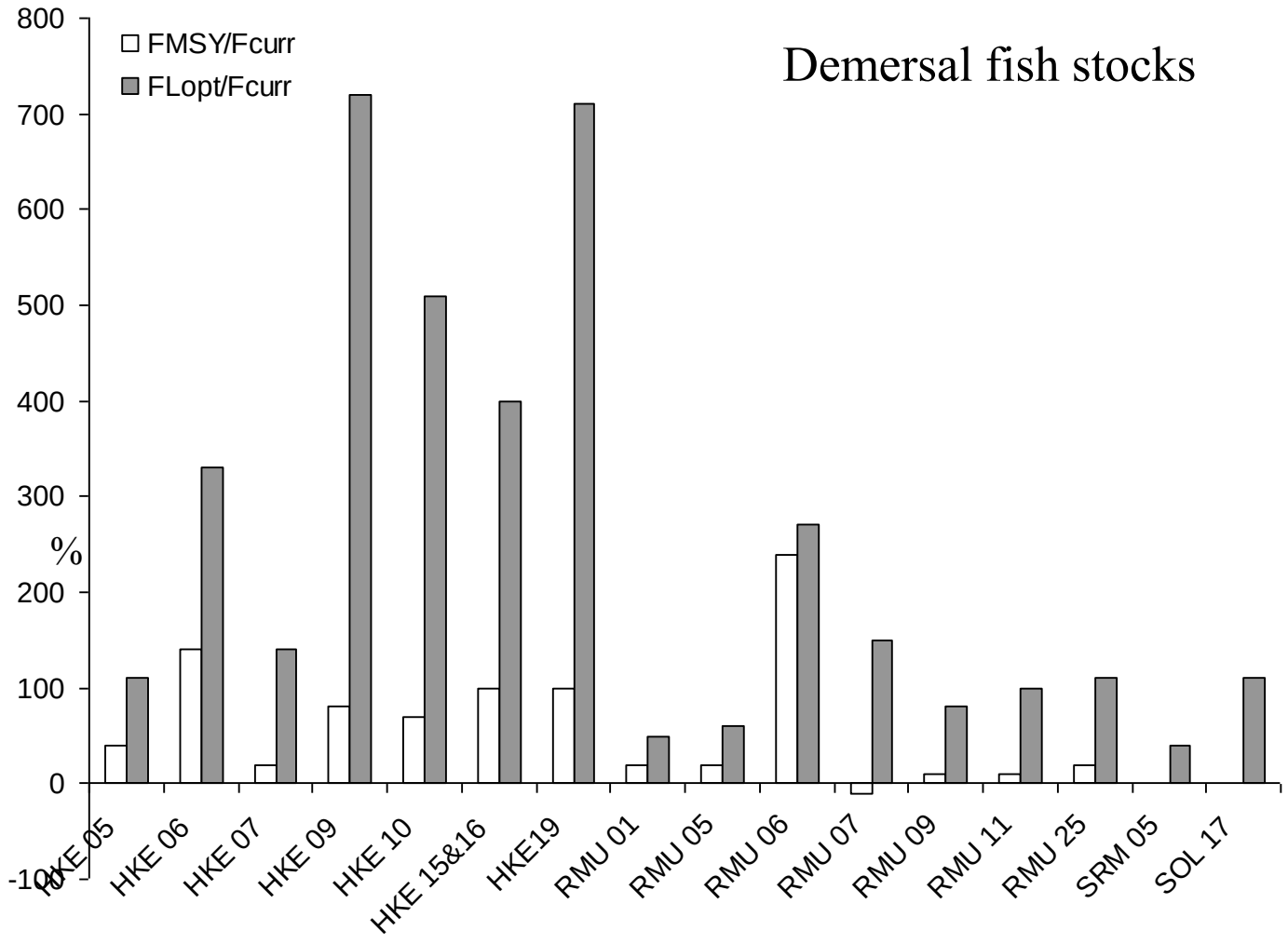
Current selectivity compared to the optimal one



F_{opt}
F_{MSY}
F_{curr}

Colloca, Cardinale et al. Fish and Fisheries, 2011

Changes in yield for different fishing selectivity regime



Colloca, Cardinale et al. Fish and Fisheries, 2011

Status of Mediterranean and Black Sea marine resources

State of the art

• State of knowledge on the Mediterranean and Black Sea stocks is improving rapidly

• Between 90% and 93% 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

•Observed reduction in nominal effort did not result in a decline in F

Status of Mediterranean and Black Sea marine resources

Immediate actions

• Reduce F for all demersal fisheries through reduction in effort or/and catches

• Implement a TAC system for small pelagics

• Modify gear selectivity to move towards MSY

• Several stocks are shared fisheries/stocks with non EU contries and thus a strong coordination and collaboration between GFCM-SAC and SGMED is crucial in the future

Status of Mediterranean and Black Sea marine resources

Way forward

- 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

- 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

- Effort reduction have been, so far, inefficient to limit F

- For small pelagics, TAC are considered by STECF the appropriate management measure

Assessment of Mediterranean marine resources

Major data inconsistencies

- The landings appear incompletely reported for some important part of the fleet (e.g. gillnetting and longlines)
- Landings are often reported differently to different fora (FAO, EU, etc.)
- Discard data are very scarce and thus rarely used in assessment
- Time series are short and the reconstruction of historical data would be crucial to estimate biomass baselines for management
- Collection of data, assessment and management should be at the stock unit level, which not necessarily match with the GSA classification