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# Sampling Frame for Mediterranean and Black Sea CFP Monitoring indicators

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#### **Sampling Frame for Mediterranean and Black Sea CFP Monitoring indicators**

##### **Abstract**

The objective of this work was to define a sampling frame for the CFP Monitoring indicators in the Mediterranean and Black Sea.

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# **Sampling frame for Mediterranean and Black Sea CFP monitoring indicators**

Mannini Alessandro, Osio Giacomo Chato, Jardim Ernesto, Mosqueira Iago, Scott Finley,  
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## **1 Abstract**

The Mediterranean and Black Sea list of stocks to be used for computing the indicators was based on a ranking system approach for which the species having a rank in the first ten positions either in total live weight or total economic values were chosen.

Landings and economic values for the Mediterranean and Black Sea (FAO area 37) provided by "2016\_STECF 16-11 - EU Fleet Economic and Transversal data tables" were used.

The reference years were 2012 and 2014 (the last three years available for all the GSAs) and, as geographic strata, the Geographical Sub Areas (GSAs) belonging to EU countries and for which data were available were considered.

In the top ranking 10 stocks based on both in terms of live weight and economic value by GSA applied to AER Landings, many combined/nei groups categories were selected.

Based on local expert knowledge it was possible split some mixed categories at species level while, it was decided to drop from the list both the misreporting species and the mixed categories for which it wasn't possible defined clearly the species composition.

Eventually 230 stocks were selected.

## 2 Introduction

The objective of this work was to define a sampling frame for the CFP Monitoring indicators in the Mediterranean and Black Sea.

The Mediterranean and Black Sea list of stocks to be used for computing the indicators was based on a ranking system approach for which the species having a rank in the first ten positions either in total live weight or total economic values were chosen.

Landings and economic values for the Mediterranean and Black Sea (FAO area 37) provided by "2016\_STECF 16-11 - EU Fleet Economic and Transversal data tables" downloadable from <https://stecf.jrc.ec.europa.eu/data-reports> (Electronic data annex tables of STECF report) were used.

The reference years were 2012 and 2014 (the last three years available for all the GSAs) and, as geographic strata, the Geographical Sub Areas (GSAs) belonging to EU countries and for which data were available were considered (Table1) ([http://www.fao.org/fileadmin/user\\_upload/faoweb/GFCM/Fisheries/GFCM-GSAs\\_table.pdf](http://www.fao.org/fileadmin/user_upload/faoweb/GFCM/Fisheries/GFCM-GSAs_table.pdf)).

The assignment of the ranking was based on the species average value both in terms of live weight and economic value computed for the reference years. Undefined species at least at Family taxonomic level (for example generic faunistic categories (e.g. finfishes nei)) weren't take into account in the species ranking system.

Undefined species were identified using as reference the ASFIS 2016 database (<http://www.fao.org/fishery/collection/asfis/en>).

**Table 1.** FAO Major Fishing Area 37 - MEDITERRANEAN AND BLACK SEA. Geographical SubAreas (GSAs) (in bold selected areas).

FAO Subarea (37)	FAO Statistical divisions	GFCM_Subregions	GSA	Name
Western	1.1 Balearic	Western Mediterranean Sea	<b>1</b>	<b>Northern Alboran Sea</b>
			<b>2</b>	<b>Alboran Island</b>
			3	Southern Alboran Sea
			4	Algeria
			<b>5</b>	<b>Balearic Islands</b>
			<b>6</b>	<b>Northern Spain</b>
	1.2 Gulf of Lion		<b>11.1</b>	<b>Western Sardinia</b>
			<b>7</b>	<b>Gulf of Lion</b>
	1.3 Sardinia		<b>8</b>	<b>Corsica</b>
			<b>9</b>	<b>Ligurian Sea and Northern Tyrrhenian Sea</b>
			<b>10</b>	<b>Southern and Central Tyrrhenian Sea</b>
			<b>11.2</b>	<b>Eastern Sardinia</b>
		Ionian Sea	12	Northern Tunisia

FAO Subarea (37)	FAO Statistical divisions	GFCM_Subregions	GSA	Name
Central	2.1 Adriatic	Adriatic Sea	<b>17</b>	<b>Northern Adriatic Sea</b>
			<b>18</b>	<b>Southern Adriatic Sea</b>
	2.2 Ionian	Ionian Sea	13	Gulf of Hammamet
			14	Gulf of Gabes
			<b>15</b>	<b>Malta</b>
			<b>16</b>	<b>Southern Sicily</b>
			<b>19</b>	<b>Western Ionian Sea</b>
			<b>20</b>	<b>Eastern Ionian Sea</b>
			21	Southern Ionian Sea
			Eastern	3.1 Aegean
<b>23</b>	<b>Crete</b>			
24	Northern Levant Sea			
<b>25</b>	<b>Cyprus</b>			
26	Southern Levant Sea			
27	Eastern Levant Sea			
Black Sea	4.1 Marmara Sea	Black Sea		28
	4.2 Black Sea		<b>29</b>	<b>Black Sea</b>
	4.3 Azov Sea		30	Azov Sea

### 3 Sampling frame for the CFP indicators in the Mediterranean and Black Sea

#### 3.1 First ranking

The number of species code by GSA ranged between a minimum of 10 (GSA 29) to a maximum of 16 (GSA 5) (Table 2) for a total of 236 stocks selected (Table 3).

**Table 2** FAO Major Fishing Area 37 - MEDITERRANEAN AND BLACK SEA. Number of species by GSAs selected by the ranking system.

GSA	N° Species	GSA	N° Species
1	15	16	13
5	16	17	11
6	13	18	13
7	14	19	14
8	14	20	11
9	13	22	14
10	14	23	13
11	13	25	13
15	12	29	10

**Table 3** FAO Major Fishing Area 37 - MEDITERRANEAN AND BLACK SEA. List of species by GSA selected by the ranking system (in bold selected mixed categories).

GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
1	ANE	3688.5	7236686.3	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	185.8	5044233.4	<i>Aristeus antennatus</i>	Blue and red shrimp	(Risso 1816)	Aristaeidae
	BLT	950.1	1012314.2	<i>Auxis rochei</i>	Bullet tuna	(Risso 1810)	Scombridae
	DPS	113.8	1648620.5	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	295.1	1833094.7	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	HMM	1593.9	1313849.2	<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	HOM	1689.3	1504618.5	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	MAC	785.3	1109919.0	<i>Scomber scombrus</i>	Atlantic mackerel	Linnaeus 1758	Scombridae
	MAS	1310.2	603745.8	<i>Scomber japonicus</i>	Pacific chub mackerel	Houttuyn 1782	Scombridae
	<b>MAX</b>	<b>571.0</b>	<b>2018018.6</b>	<b>Scombridae</b>	<b>Mackerels nei</b>		<b>Scombridae</b>
	OCC	1204.1	5185069.7	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	PIL	6710.7	12277253.3	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	2249.0	1012838.9	<i>Sardinella aurita</i>	Round sardinella	Valenciennes 1847	Clupeidae
	SBR	172.6	2169235.5	<i>Pagellus bogaraveo</i>	Blackspot(=red) seabream	(Brünnich 1768)	Sparidae
SWO	1433.0	8650281.6	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae	



GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
5	ANB	261.2	175110.9	Anchoa mitchilli	Bay anchovy	(Valenciennes 1848)	Engraulidae
	ANE	318.8	617935.6	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	152.6	4062074.5	Aristeus antennatus	Blue and red shrimp	(Risso 1816)	Aristaeidae
	DOL	97.7	496453.5	Coryphaena hippurus	Common dolphinfish	Linnaeus 1758	Coryphaenidae
	HKE	78.0	487753.7	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	HMM	69.6	57648.9	Trachurus mediterraneus	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	JOD	38.0	617329.1	Zeus faber	John dory	Linnaeus 1758	Zeidae
	MUR	49.8	444161.1	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	OCC	91.8	403506.1	Octopus vulgaris	Common octopus	Cuvier 1797	Octopodidae
	<b>PIC</b>	<b>112.4</b>	<b>351122.3</b>	<b>Spicara spp</b>	<b>Picarels nei</b>		<b>Centracanthidae</b>
	PIL	142.5	256204.0	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	RSE	60.4	960875.2	Scorpaena scrofa	Red scorpionfish	Linnaeus 1758	Scorpaenidae
	<b>SKA</b>	<b>122.1</b>	<b>326903.3</b>	<b>Raja spp</b>	<b>Raja rays nei</b>		<b>Rajidae</b>
	SLO	28.7	1060018.5	Palinurus elephas	Common spiny lobster	(Fabricius 1787)	Palinuridae
	<b>SQC</b>	<b>69.2</b>	<b>782358.9</b>	<b>Loligo spp</b>	<b>Common squids nei</b>		<b>Loliginidae</b>
SQR	50.1	628080.6	Loligo vulgaris	European squid	Lamarck 1798	Loliginidae	
6	ANE	12523.0	25289332.1	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	545.7	14558470.0	Aristeus antennatus	Blue and red shrimp	(Risso 1816)	Aristaeidae
	BFT	1255.9	14906982.9	Thunnus thynnus	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	EOI	623.9	1556826.2	Eledone cirrhosa	Horned octopus	(Lamarck 1798)	Octopodidae
	HKE	2156.2	13451733.7	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	MON	501.9	2811471.1	Lophius piscatorius	Angler(=Monk)	Linnaeus 1758	Lophiidae
	MUT	713.2	3972013.0	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	NEP	373.0	6881950.5	Nephrops norvegicus	Norway lobster	(Linnaeus 1758)	Nephropidae
	OCC	1305.5	5811882.9	Octopus vulgaris	Common octopus	Cuvier 1797	Octopodidae
	PIL	7449.1	13613945.7	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	1733.0	783837.6	Sardinella aurita	Round sardinella	Valenciennes 1847	Clupeidae
	SBG	672.6	5120015.0	Sparus aurata	Gilthead seabream	Linnaeus 1758	Sparidae
WHB	790.5	1840077.9	Micromesistius poutassou	Blue whiting(=Poutassou)	(Risso 1827)	Gadidae	
7	ANE	2359.2	3219466.3	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	BFT	376.3	4681249.7	Thunnus thynnus	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	ELE	317.8	2793684.9	Anguilla anguilla	European eel	(Linnaeus 1758)	Anguillidae
	HKE	1375.8	6411952.5	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae

GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
7	HOM	366.5	380635.4	Trachurus trachurus	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	MAC	732.2	1084904.2	Scomber scombrus	Atlantic mackerel	Linnaeus 1758	Scombridae
	<b>MNZ</b>	<b>395.5</b>	<b>2133855.6</b>	<b>Lophius spp</b>	<b>Monkfishes nei</b>		<b>Lophiidae</b>
	OCC	721.8	3349150.2	Octopus vulgaris	Common octopus	Cuvier 1797	Octopodidae
	<b>OCT</b>	<b>854.5</b>	<b>1758977.8</b>	<b>Octopodidae</b>	<b>Octopuses, etc. nei</b>		<b>Octopodidae</b>
	PIL	1078.5	1539410.7	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	POD	617.6	943780.0	Trisopterus minutus	Poor cod	(Linnaeus 1758)	Gadidae
	SBG	365.4	2984037.7	Sparus aurata	Gilthead seabream	Linnaeus 1758	Sparidae
	SOL	119.9	2137000.1	Solea solea	Common sole	(Linnaeus 1758)	Soleidae
	<b>SQZ</b>	<b>201.9</b>	<b>2322489.2</b>	<b>Loliginidae</b>	<b>Inshore squids nei</b>		<b>Loliginidae</b>
8	<b>CRW</b>	<b>8.7</b>	<b>261559.7</b>	<b>Palinurus spp</b>	<b>Palinurid spiny lobsters nei</b>		<b>Palinuridae</b>
	DEC	12.6	289206.1	Dentex dentex	Common dentex	(Linnaeus 1758)	Sparidae
	ELE	5.2	51570.6	Anguilla anguilla	European eel	(Linnaeus 1758)	Anguillidae
	HOM	9.2	13104.1	Trachurus trachurus	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	JOD	5.3	103501.0	Zeus faber	John dory	Linnaeus 1758	Zeidae
	<b>MGS</b>	<b>14.4</b>	<b>26139.8</b>	<b>Mugil spp</b>			<b>Mugilidae</b>
	MUR	9.8	100114.1	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	NEP	12.9	260734.3	Nephrops norvegicus	Norway lobster	(Linnaeus 1758)	Nephropidae
	SCR	7.2	11918.3	Maja squinado	Spinous spider crab	(Herbst 1788)	Majidae
	<b>SCS</b>	<b>19.0</b>	<b>173226.9</b>	<b>Scorpaena spp</b>	<b>Scorpionfishes, rockfishes nei</b>		<b>Scorpaenidae</b>
	SLO	6.4	215355.6	Palinurus elephas	Common spiny lobster	(Fabricius 1787)	Palinuridae
	SOL	5.0	82524.5	Solea solea	Common sole	(Linnaeus 1758)	Soleidae
	SWO	31.4	325584.9	Xiphias gladius	Swordfish	Linnaeus 1758	Xiphiidae
	<b>VLO</b>	<b>9.4</b>	<b>35572.5</b>	<b>Palinuridae</b>	<b>Spiny lobsters nei</b>		<b>Palinuridae</b>
9	ANE	4594.3	9118728.5	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	148.9	4615104.8	Aristeus antennatus	Blue and red shrimp	(Risso 1816)	Aristaeidae
	CTC	477.6	4896779.5	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	586.1	5114724.8	Parapenaeus longirostris	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	EOI	651.6	4636245.0	Eledone cirrhosa	Horned octopus	(Lamarck 1798)	Octopodidae
	HKE	1211.1	10002950.4	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	<b>MAZ</b>	<b>282.6</b>	<b>542381.2</b>	<b>Scomber spp</b>	<b>Scomber mackerels nei</b>		<b>Scombridae</b>
	MTS	283.9	1766862.6	Squilla mantis	Spottail mantis squillid	(Linnaeus 1758)	Squillidae
	MUR	254.4	3528975.6	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	MUT	817.2	5219316.2	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	NEP	153.2	4262982.5	Nephrops norvegicus	Norway lobster	(Linnaeus 1758)	Nephropidae
	OCC	370.9	3378517.5	Octopus vulgaris	Common octopus	Cuvier 1797	Octopodidae
	PIL	1623.7	1276918.9	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae

GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
10	ANE	4533.1	9177850.6	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	ARS	337.8	6112755.5	Aristaeomorpha foliacea	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	1021.5	12075301.3	Thunnus thynnus	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	CTC	321.4	3555956.7	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
	DOL	526.2	2095320.2	Coryphaena hippurus	Common dolphinfish	Linnaeus 1758	Coryphaenidae
	DPS	520.4	4180960.5	Parapenaeus longirostris	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	1143.5	10385669.7	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	HOM	705.0	1436238.8	Trachurus trachurus	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	<b>JAX</b>	<b>607.0</b>	<b>1758921.2</b>	<b>Trachurus spp</b>	<b>Jack and horse mackerels nei</b>		<b>Carangidae</b>
	OCC	346.4	3071111.3	Octopus vulgaris	Common octopus	Cuvier 1797	Octopodidae
	<b>OMZ</b>	<b>376.0</b>	<b>3485234.4</b>	<b>Ommastrephidae</b>	<b>Ommastrephidae squids nei</b>		<b>Ommastrephidae</b>
	PIL	695.9	1050979.1	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SFS	599.7	2830048.2	Lepidopus caudatus	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
	SWO	893.4	8825445.1	Xiphias gladius	Swordfish	Linnaeus 1758	Xiphiidae
11	ARA	94.1	1680546.2	Aristeus antennatus	Blue and red shrimp	(Risso 1816)	Aristaeidae
	ARS	121.7	2138268.6	Aristaeomorpha foliacea	Giant red shrimp	(Risso 1827)	Aristaeidae
	BPI	256.2	767727.2	Spicara maena	Blotched picarel	(Linnaeus 1758)	Centracanthidae
	CTC	277.0	2236617.6	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
	EDT	153.7	700660.4	Eledone moschata	Musky octopus	(Lamarck 1798)	Octopodidae
	HKE	264.7	2078505.0	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	MUR	252.6	3164374.4	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	MUT	184.3	1274844.2	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	OCC	1024.6	6136713.9	Octopus vulgaris	Common octopus	Cuvier 1797	Octopodidae
	<b>SCO</b>	<b>307.7</b>	<b>2343162.3</b>	<b>Scorpaenidae</b>	<b>Scorpionfishes nei</b>		<b>Scorpaenidae</b>
	SLO	44.6	2320747.2	Palinurus elephas	Common spiny lobster	(Fabricius 1787)	Palinuridae
	SQR	178.6	2272229.4	Loligo vulgaris	European squid	Lamarck 1798	Loliginidae
SWO	378.6	3452508.9	Xiphias gladius	Swordfish	Linnaeus 1758	Xiphiidae	
15	ARS	37.8	752141.6	Aristaeomorpha foliacea	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	149.5	1245794.9	Thunnus thynnus	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BOG	42.3	119263.1	Boops boops	Bogue	(Linnaeus 1758)	Sparidae
	DOL	256.9	1324666.4	Coryphaena hippurus	Common dolphinfish	Linnaeus 1758	Coryphaenidae
	MAS	461.5	540409.0	Scomber japonicus	Pacific chub mackerel	Houttuyn 1782	Scombridae
	MUR	48.7	397678.0	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	RPG	20.7	322652.2	Pagrus pagrus	Red porgy	(Linnaeus 1758)	Sparidae

GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
15	RSE	26.0	329486.2	Scorpaena scrofa	Red scorpionfish	Linnaeus 1758	Scorpaenidae
	SAA	206.2	486613.8	Sardinella aurita	Round sardinella	Valenciennes 1847	Clupeidae
	SFS	60.1	301934.6	Lepidopus caudatus	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
	SPR	57.0	30196.8	Sprattus sprattus	European sprat	(Linnaeus 1758)	Clupeidae
	SWO	440.7	3036998.4	Xiphias gladius	Swordfish	Linnaeus 1758	Xiphiidae
16	ANE	1965.8	4911321.2	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	ARS	1623.6	29319641.3	Aristaeomorpha foliacea	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	255.7	2485445.8	Thunnus thynnus	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BPI	495.7	2921225.3	Spicara maena	Blotched picarel	(Linnaeus 1758)	Centranchthidae
	CTC	373.3	3656171.7	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	5784.9	34307110.6	Parapenaeus longirostris	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	1487.7	9038740.2	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	MUR	570.0	5238987.0	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	MUT	491.1	2274745.8	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	NEP	340.2	5976992.1	Nephrops norvegicus	Norway lobster	(Linnaeus 1758)	Nephropidae
	PIL	1566.5	2361785.0	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SFS	766.4	2057030.2	Lepidopus caudatus	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
	SWO	801.8	8579867.0	Xiphias gladius	Swordfish	Linnaeus 1758	Xiphiidae
17	ANE	27261.4	32681492.3	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	<b>CLV</b>	<b>1448.7</b>	<b>6529485.0</b>	<b>Veneridae</b>	<b>Venus clams nei</b>		<b>Veneridae</b>
	CTC	3099.9	20122314.4	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
	HKE	2934.8	17414917.8	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	MTS	2793.1	19144809.4	Squilla mantis	Spottail mantis squillid	(Linnaeus 1758)	Squillidae
	<b>MUL</b>	<b>4147.7</b>	<b>4070420.0</b>	<b>Mugilidae</b>	<b>Mullets nei</b>		<b>Mugilidae</b>
	MUT	3167.3	9235235.3	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	NEP	947.1	15503247.5	Nephrops norvegicus	Norway lobster	(Linnaeus 1758)	Nephropidae
	PIL	68999.6	31306193.6	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SOL	1823.9	20783886.8	Solea solea	Common sole	(Linnaeus 1758)	Soleidae
	SVE	15832.4	34682331.3	Chamelea gallina	Striped venus	(Linnaeus 1758)	Veneridae
18	ANE	4853.1	9385301.1	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	CTC	830.8	7327892.5	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae

GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
18	DPS	631.4	4384354.2	Parapenaeus longirostris	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	EDT	753.2	4783648.3	Eledone moschata	Musky octopus	(Lamarck 1798)	Octopodidae
	EOI	692.5	4518508.8	Eledone cirrhosa	Horned octopus	(Lamarck 1798)	Octopodidae
	HKE	2506.8	16728826.0	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	<b>JAX</b>	<b>652.5</b>	<b>762663.2</b>	<b>Trachurus spp</b>	<b>Jack and horse mackerels nei</b>		<b>Carangidae</b>
	<b>MAZ</b>	<b>967.2</b>	<b>1999631.1</b>	<b>Scomber spp</b>	<b>Scomber mackerels nei</b>		<b>Scombridae</b>
	MON	430.0	3734333.5	Lophius piscatorius	Angler(=Monk)	Linnaeus 1758	Lophiidae
	MTS	1277.2	5416752.1	Squilla mantis	Spottail mantis squillid	(Linnaeus 1758)	Squillidae
	MUT	1539.4	6953665.7	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	NEP	579.3	10128491.2	Nephrops norvegicus	Norway lobster	(Linnaeus 1758)	Nephropidae
PIL	1324.9	774110.0	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae	
19	ALB	662.8	2624919.4	Thunnus alalunga	Albacore	(Bonnaterre 1788)	Scombridae
	ANE	544.6	2987189.3	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	268.5	7205717.2	Aristeus antennatus	Blue and red shrimp	(Risso 1816)	Aristaeidae
	ARS	310.5	6034643.7	Aristaeomorpha foliacea	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	283.0	3164261.8	Thunnus thynnus	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BOG	485.5	1186396.4	Boops boops	Bogue	(Linnaeus 1758)	Sparidae
	BON	608.7	2232051.1	Sarda sarda	Atlantic bonito	(Bloch 1793)	Scombridae
	CTC	339.2	3413273.8	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	416.2	3654418.2	Parapenaeus longirostris	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	725.1	6275040.0	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	HOM	371.9	832490.8	Trachurus trachurus	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	MUR	220.1	2654286.0	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	SFS	504.0	1777342.7	Lepidopus caudatus	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
SWO	899.8	9913390.6	Xiphias gladius	Swordfish	Linnaeus 1758	Xiphiidae	
20	ANE	403.1	1167057.0	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	CTC	219.3	1385128.0	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
	DEC	129.4	2252933.0	Dentex dentex	Common dentex	(Linnaeus 1758)	Sparidae
	HKE	584.5	5804440.0	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	MUF	235.9	1388587.0	Mugil cephalus	Flathead grey mullet	Linnaeus 1758	Mugilidae
	MUT	303.9	3296117.0	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	PIL	526.1	1076565.0	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	296.0	397525.0	Sardinella aurita	Round sardinella	Valenciennes 1847	Clupeidae
SBG	229.6	3068521.0	Sparus aurata	Gilthead seabream	Linnaeus 1758	Sparidae	

GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
20	SWA	250.9	3584755.0	Diplodus sargus	White seabream	(Valenciennes 1830)	Sparidae
	TGS	239.2	4007497.0	Penaeus kerathurus	Caramote prawn	(Forsskål 1775)	Penaeidae
22	ANE	7001.3	23647519.0	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	BOG	1154.9	3855416.0	Boops boops	Bogue	(Linnaeus 1758)	Sparidae
	DPS	2298.0	8912781.0	Parapenaeus longirostris	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	2041.3	19563206.0	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
	<b>JAX</b>	<b>880.1</b>	<b>2788559.0</b>	<b>Trachurus spp</b>	<b>Jack and horse mackerels nei</b>		<b>Carangidae</b>
	MAS	1016.4	3862112.0	Scomber japonicus	Pacific chub mackerel	Houttuyn 1782	Scombridae
	MUR	1145.0	15393732.0	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
	MUT	781.8	8770835.7	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	NEP	368.9	5949446.0	Nephrops norvegicus	Norway lobster	(Linnaeus 1758)	Nephropidae
	OCC	1096.5	5257671.7	Octopus vulgaris	Common octopus	Cuvier 1797	Octopodidae
	PIL	5549.7	17512179.0	Sardina pilchardus	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	1074.0	2037923.0	Sardinella aurita	Round sardinella	Valenciennes 1847	Clupeidae
	SBG	419.0	5714369.0	Sparus aurata	Gilthead seabream	Linnaeus 1758	Sparidae
	SOL	419.2	5692317.0	Solea solea	Common sole	(Linnaeus 1758)	Soleidae
	23	BOG	140.0	476057.0	Boops boops	Bogue	(Linnaeus 1758)
CBR		29.7	77299.0	Serranus cabrilla	Comber	(Linnaeus 1758)	Serranidae
CTC		35.7	185660.0	Sepia officinalis	Common cuttlefish	Linnaeus 1758	Sepiidae
DPS		37.1	215248.0	Parapenaeus longirostris	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
HKE		56.8	579323.0	Merluccius merluccius	European hake	(Linnaeus 1758)	Merlucciidae
MUR		58.3	851179.0	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae
MUT		133.1	1623535.0	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
PAC		25.8	286528.0	Pagellus erythrinus	Common pandora	(Linnaeus 1758)	Sparidae
PRR		73.7	390636.0	Sparisoma cretense	Parrotfish	(Linnaeus 1758)	Scaridae
RPG		26.5	494968.0	Pagrus pagrus	Red porgy	(Linnaeus 1758)	Sparidae
<b>SCS</b>		<b>22.8</b>	<b>216783.0</b>	<b>Scorpaena spp</b>	<b>Scorpionfishes, rockfishes nei</b>		<b>Scorpaenidae</b>
SPC		99.5	348302.0	Spicara smaris	Picarel	(Linnaeus 1758)	Centranchthidae
SWA		23.0	351588.0	Diplodus sargus	White seabream	(Valenciennes 1830)	Sparidae
25	ALB	370.5	915019.5	Thunnus alalunga	Albacore	(Bonnaterre 1788)	Scombridae
	BFT	31.5	417580.8	Thunnus thynnus	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BOG	88.1	654184.7	Boops boops	Bogue	(Linnaeus 1758)	Sparidae
	CBR	45.7	130707.9	Serranus cabrilla	Comber	(Linnaeus 1758)	Serranidae
	MUR	26.2	523673.3	Mullus surmuletus	Surmullet	Linnaeus 1758	Mullidae

GSA	SP CODE	MEAN LANDINGS (tons)	MEAN VALUE (EURO)	Scientific name	English name	Author	Family
25	MUT	20.3	364019.2	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	<b>OCT</b>	<b>38.3</b>	<b>227986.2</b>	<b>Octopodidae</b>	<b>Octopuses, etc. nei</b>		<b>Octopodidae</b>
	<b>PIC</b>	<b>71.3</b>	<b>270498.7</b>	<b>Spicara spp</b>	<b>Picarels nei</b>		<b>Centracanthidae</b>
	PRR	23.5	303188.5	Sparisoma cretense	Parrotfish	(Linnaeus 1758)	Scaridae
	SBA	26.8	101262.0	Pagellus acarne	Axillary seabream	(Risso 1827)	Sparidae
	SPC	32.0	163846.3	Spicara smaris	Picarel	(Linnaeus 1758)	Centracanthidae
	<b>SPI</b>	<b>18.4</b>	<b>272375.7</b>	<b>Siganus spp</b>	<b>Spinefeet(=Rabbitfishes) nei</b>		<b>Siganidae</b>
	SWO	31.5	265258.5	Xiphias gladius	Swordfish	Linnaeus 1758	Xiphiidae
29	ANE	191.9	153851.0	Engraulis encrasicolus	European anchovy	(Linnaeus 1758)	Engraulidae
	BLU	186.4	232154.6	Pomatomus saltatrix	Bluefish	(Linnaeus 1766)	Pomatomidae
	BON	32.3	60218.6	Sarda sarda	Atlantic bonito	(Bloch 1793)	Scombridae
	DGS	33.7	62830.8	Squalus acanthias	Picked dogfish	Linnaeus 1758	Squalidae
	HMM	271.7	313762.3	Trachurus mediterraneus	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	MUT	199.1	207427.9	Mullus barbatus	Red mullet	Linnaeus 1758	Mullidae
	<b>RPN</b>	<b>4448.2</b>	<b>2224525.5</b>	<b>Rapana spp</b>	<b>Sea snails</b>		<b>Muricidae</b>
	RPW	1285.3	1046992.3	Rapana venosa	Thomas' rapa whelk	(Valenciennes 1846)	Muricidae
	SPR	3151.0	1153087.8	Sprattus sprattus	European sprat	(Linnaeus 1758)	Clupeidae
	TUR	81.6	517678.4	Psetta maxima	Turbot	(Linnaeus 1758)	Scophthalmidae

### 3.2 Main issues

In the top ranking 10 stocks based on both in terms of live weight and economic value by GSA applied to AER Landings, many combined/nei groups categories were selected.

While in some cases it could be relatively easy to identify which species belonging to the category (e.g. *Lophius* spp. likely means *Lophius budegassa* and *L. piscatorius*) in other case the identification seemed more difficult (e.g. *Raja* spp.).

Eventually, based on local expert knowledge it was possible split some mixed categories at species level (e.g. *Lophius* spp.) while, it was decided to drop from the list both the misreporting species (e.g. *Anchoa mitchilli*, *Rapana* spp.) and the mixed categories for which it wasn't possible defined clearly the species composition (e.g. Octopodidae) (Table 4).

**Table 4** FAO Major Fishing Area 37 - MEDITERRANEAN AND BLACK SEA. List of mixed categories by GSA selected by the ranking system and final decision taken (drop, split in species, misreporting and delete)

GSA	3A_CODE	Scientific_name	English_name	Final decision
1	MAX	<i>Scombridae</i>	Mackerels nei	Dropped
5	ANB	<i>Anchoa mitchilli</i>	Bay anchovy	Misreported - Deleted
5	PIC	<i>Spicara spp.</i>	Picarels nei	Spicara spp. was split in <i>S.maena</i> e <i>S. smaris</i>
5	SKA	<i>Raja spp.</i>	Raja rays nei	Raja spp. was split in <i>R. asterias</i> and <i>R. clavata</i>
5	SQC	<i>Loligo spp.</i>	Common squids nei	Dropped
7	MNZ	<i>Lophius spp.</i>	Monkfishes nei	Lophius spp. was split in <i>L. piscatorious</i> and <i>L. budegassa</i>
7	OCT	<i>Octopodidae</i>	Octopuses, etc. nei	Dropped
7	SQZ	<i>Loliginidae</i>	Inshore squids nei	Assigned as <i>Loligo vulgaris</i>
8	CRW	<i>Palinurus spp.</i>	Palinurid spiny lobsters nei	Dropped
8	MGS	<i>Mugil spp.</i>		Dropped
8	SCS	<i>Scorpaena spp.</i>	Scorpionfishes, rockfishes nei	Assigned as <i>Scorpaena scrofa</i>
8	VLO	<i>Palinuridae</i>	Spiny lobsters nei	Dropped
9	MAZ	<i>Scomber spp.</i>	Scomber mackerels nei	Dropped
10	JAX	<i>Trachurus spp.</i>	Jack and horse mackerels nei	Assigned as <i>Trachurus mediterraneus</i>
10	OMZ	<i>Ommastrephidae</i>	Ommastrephidae squids nei	Assigned as <i>Illex coindetii</i>
11	SCO	<i>Scorpaenidae</i>	Scorpionfishes nei	Dropped
17	CLV	<i>Veneridae</i>	Venus clams nei	Assigned as <i>Venus verrucosa</i>
17	MUL	<i>Mugilidae</i>	Mulletts nei	Dropped
18	JAX	<i>Trachurus spp.</i>	Jack and horse mackerels nei	Trachurus spp. was split in <i>T. mediterraneus</i> and <i>T. trachurus</i>
18	MAZ	<i>Scomber spp.</i>	Scomber mackerels nei	Assigned as <i>Scomber japonicus</i>
22	JAX	<i>Trachurus spp.</i>	Jack and horse mackerels nei	Trachurus spp. was split in <i>T. mediterraneus</i> and <i>T. trachurus</i>
23	SCS	<i>Scorpaena spp.</i>	Scorpionfishes, rockfishes nei	Scorpaena spp. was split in <i>S. porcus</i> and <i>S. scrofa</i>



GSA	3A_CODE	Scientific_name	English_name	Final decision
25	OCT	<i>Octopodidae</i>	Octopuses, etc. nei	Dropped
25	PIC	<i>Spicara spp.</i>	Picarels nei	Spicara spp. was split in <i>S.maena</i> e <i>S. smarís</i>
25	SPI	<i>Siganus spp.</i>	Spinefeet(=Rabbitfishes) nei	Dropped
29	RPN	<i>Rapana spp.</i>	Sea snails	Misreported - Deleted

### 3.3 Final ranking

After the revision a total of 230 stocks were selected.

**Table 5** FAO Major Fishing Area 37 - MEDITERRANEAN AND BLACK SEA. Final list of species by GSA.

GSA	3A_CODE	Scientific_name	English_name	Author	Family
1	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	<i>Aristeus antennatus</i>	Blue and red shrimp	(Risso 1816)	Aristaeidae
	BLT	<i>Auxis rochei</i>	Bullet tuna	(Risso 1810)	Scombridae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	HMM	<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	HOM	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	MAC	<i>Scomber scombrus</i>	Atlantic mackerel	Linnaeus 1758	Scombridae
	MAS	<i>Scomber japonicus</i>	Pacific chub mackerel	Houttuyn 1782	Scombridae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	<i>Sardinella aurita</i>	Round sardinella	Valenciennes 1847	Clupeidae
	SBR	<i>Pagellus bogaraveo</i>	Blackspot(=red) seabream	(Brünnich 1768)	Sparidae
	SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae
5	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	<i>Aristeus antennatus</i>	Blue and red shrimp	(Risso 1816)	Aristaeidae
	DOL	<i>Coryphaena hippurus</i>	Common dolphinfish	Linnaeus 1758	Coryphaenidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	HMM	<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	JOD	<i>Zeus faber</i>	John dory	Linnaeus 1758	Zeidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	RJC	<i>Raja clavata</i>	Thornback ray	Linnaeus 1758	Rajidae
	JRS	<i>Raja asterias</i>	Mediterranean starry ray	Delaroche 1809	Rajidae

GSA	3A_CO DE	Scientific_name	English_name	Author	Family
5	BPI	<i>Spicara maena</i>	Blotched picarel	(Linnaeus 1758)	Centracanthidae
	SPC	<i>Spicara smaris</i>	Picarel	(Linnaeus 1758)	Centracanthidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	RSE	<i>Scorpaena scrofa</i>	Red scorpionfish	Linnaeus 1758	Scorpaenidae
	SLO	<i>Palinurus elephas</i>	Common spiny lobster	(Fabricius 1787)	Palinuridae
	SQR	<i>Loligo vulgaris</i>	European squid	Lamarck 1798	Loliginidae
6	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	<i>Aristeus antennatus</i>	Blue and red shrimp	(Risso 1816)	Aristaeidae
	BFT	<i>Thunnus thynnus</i>	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	EOI	<i>Eledone cirrhosa</i>	Horned octopus	(Lamarck 1798)	Octopodidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MON	<i>Lophius piscatorius</i>	Angler(=Monk)	Linnaeus 1758	Lophiidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	NEP	<i>Nephrops norvegicus</i>	Norway lobster	(Linnaeus 1758)	Nephropidae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	<i>Sardinella aurita</i>	Round sardinella	Valenciennes 1847	Clupeidae
	SBG	<i>Sparus aurata</i>	Gilthead seabream	Linnaeus 1758	Sparidae
	WHB	<i>Micromesistius poutassou</i>	Blue whiting(=Poutassou)	(Risso 1827)	Gadidae
7	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	BFT	<i>Thunnus thynnus</i>	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BSS	<i>Dicentrarchus labrax</i>	European seabass	(Linnaeus 1758)	Moronidae
	ELE	<i>Anquilla anguilla</i>	European eel	(Linnaeus 1758)	Anguillidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	HOM	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	MAC	<i>Scomber scombrus</i>	Atlantic mackerel	Linnaeus 1758	Scombridae
	MON	<i>Lophius piscatorius</i>	Angler(=Monk)	Linnaeus 1758	Lophiidae
	ANK	<i>Lophius budegassa</i>	Blackbellied angler	Spinola 1807	Lophiidae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	POD	<i>Trisopterus minutus</i>	Poor cod	(Linnaeus 1758)	Gadidae
	SBG	<i>Sparus aurata</i>	Gilthead seabream	Linnaeus 1758	Sparidae
	SOL	<i>Solea solea</i>	Common sole	(Linnaeus 1758)	Soleidae
	SQR	<i>Loligo vulgaris</i>	European squid	Lamarck 1798	Loliginidae
8	DEC	<i>Dentex dentex</i>	Common dentex	(Linnaeus 1758)	Sparidae
	ELE	<i>Anquilla anguilla</i>	European eel	(Linnaeus 1758)	Anguillidae
	HOM	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	JOD	<i>Zeus faber</i>	John dory	Linnaeus 1758	Zeidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	NEP	<i>Nephrops norvegicus</i>	Norway lobster	(Linnaeus 1758)	Nephropidae

GSA	3A_CODE	Scientific_name	English_name	Author	Family
8	SCR	<i>Maja squinado</i>	Spinous spider crab	(Herbst 1788)	Majidae
	RSE	<i>Scorpaena scrofa</i>	Red scorpionfish	Linnaeus 1758	Scorpaenidae
	SLO	<i>Palinurus elephas</i>	Common spiny lobster	(Fabricius 1787)	Palinuridae
	SOL	<i>Solea solea</i>	Common sole	(Linnaeus 1758)	Soleidae
	SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae
9	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	<i>Aristeus antennatus</i>	Blue and red shrimp	(Risso 1816)	Aristaeidae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	EOI	<i>Eledone cirrhosa</i>	Horned octopus	(Lamarck 1798)	Octopodidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MTS	<i>Squilla mantis</i>	Spottail mantis squillid	(Linnaeus 1758)	Squillidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	NEP	<i>Nephrops norvegicus</i>	Norway lobster	(Linnaeus 1758)	Nephropidae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
10	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARS	<i>Aristaeomorpha foliacea</i>	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	<i>Thunnus thynnus</i>	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	DOL	<i>Coryphaena hippurus</i>	Common dolphinfish	Linnaeus 1758	Coryphaenidae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	HOM	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	HMM	<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	SQM	<i>Illex coindetii</i>	Broadtail shortfin squid	(Verany 1839)	Ommastrephidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SFS	<i>Lepidopus caudatus</i>	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae	
11	ARA	<i>Aristeus antennatus</i>	Blue and red shrimp	(Risso 1816)	Aristaeidae
	ARS	<i>Aristaeomorpha foliacea</i>	Giant red shrimp	(Risso 1827)	Aristaeidae
	BPI	<i>Spicara maena</i>	Blotched picarel	(Linnaeus 1758)	Centracanthidae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	EDT	<i>Eledone moschata</i>	Musky octopus	(Lamarck 1798)	Octopodidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae

GSA	3A_CODE	Scientific_name	English_name	Author	Family
11	SLO	<i>Palinurus elephas</i>	Common spiny lobster	(Fabricius 1787)	Palinuridae
	SQR	<i>Loligo vulgaris</i>	European squid	Lamarck 1798	Loliginidae
	SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae
15	ARS	<i>Aristaeomorpha foliacea</i>	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	<i>Thunnus thynnus</i>	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BOG	<i>Boops boops</i>	Bogue	(Linnaeus 1758)	Sparidae
	DOL	<i>Coryphaena hippurus</i>	Common dolphinfish	Linnaeus 1758	Coryphaenidae
	MAS	<i>Scomber japonicus</i>	Pacific chub mackerel	Houttuyn 1782	Scombridae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	RPG	<i>Pagrus pagrus</i>	Red porgy	(Linnaeus 1758)	Sparidae
	RSE	<i>Scorpaena scrofa</i>	Red scorpionfish	Linnaeus 1758	Scorpaenidae
	SAA	<i>Sardinella aurita</i>	Round sardinella	Valenciennes 1847	Clupeidae
	SFS	<i>Lepidopus caudatus</i>	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
	SPR	<i>Sprattus sprattus</i>	European sprat	(Linnaeus 1758)	Clupeidae
	SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae
16	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARS	<i>Aristaeomorpha foliacea</i>	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	<i>Thunnus thynnus</i>	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BPI	<i>Spicara maena</i>	Blotched picarel	(Linnaeus 1758)	Centracanthidae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	NEP	<i>Nephrops norvegicus</i>	Norway lobster	(Linnaeus 1758)	Nephropidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SFS	<i>Lepidopus caudatus</i>	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae	
17	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	VEV	<i>Venus verrucosa</i>	Warty venus	Linnaeus 1758	Veneridae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MTS	<i>Squilla mantis</i>	Spottail mantis squillid	(Linnaeus 1758)	Squillidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	NEP	<i>Nephrops norvegicus</i>	Norway lobster	(Linnaeus 1758)	Nephropidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SOL	<i>Solea solea</i>	Common sole	(Linnaeus 1758)	Soleidae
	SVE	<i>Chamelea gallina</i>	Striped venus	(Linnaeus 1758)	Veneridae
18	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae

GSA	3A_CODE	Scientific_name	English_name	Author	Family
18	EDT	<i>Eledone moschata</i>	Musky octopus	(Lamarck 1798)	Octopodidae
	EOI	<i>Eledone cirrhosa</i>	Horned octopus	(Lamarck 1798)	Octopodidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MON	<i>Lophius piscatorius</i>	Angler(=Monk)	Linnaeus 1758	Lophiidae
	MTS	<i>Squilla mantis</i>	Spottail mantis squillid	(Linnaeus 1758)	Squillidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	NEP	<i>Nephrops norvegicus</i>	Norway lobster	(Linnaeus 1758)	Nephropidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	HMM	<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	HOM	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	MAS	<i>Scomber japonicus</i>	Pacific chub mackerel	Houttuyn 1782	Scombridae
19	ALB	<i>Thunnus alalunga</i>	Albacore	(Bonnaterre 1788)	Scombridae
	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	ARA	<i>Aristeus antennatus</i>	Blue and red shrimp	(Risso 1816)	Aristaeidae
	ARS	<i>Aristaeomorpha foliacea</i>	Giant red shrimp	(Risso 1827)	Aristaeidae
	BFT	<i>Thunnus thynnus</i>	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BOG	<i>Boops boops</i>	Bogue	(Linnaeus 1758)	Sparidae
	BON	<i>Sarda sarda</i>	Atlantic bonito	(Bloch 1793)	Scombridae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	HOM	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	SFS	<i>Lepidopus caudatus</i>	Silver scabbardfish	(Euphrasen 1788)	Trichiuridae
	SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae
20	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	DEC	<i>Dentex dentex</i>	Common dentex	(Linnaeus 1758)	Sparidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MUF	<i>Mugil cephalus</i>	Flathead grey mullet	Linnaeus 1758	Mugilidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	<i>Sardinella aurita</i>	Round sardinella	Valenciennes 1847	Clupeidae
	SBG	<i>Sparus aurata</i>	Gilthead seabream	Linnaeus 1758	Sparidae
	SWA	<i>Diplodus sargus</i>	White seabream	(Valenciennes 1830)	Sparidae
	TGS	<i>Penaeus kerathurus</i>	Caramote prawn	(Forsskål 1775)	Penaeidae
22	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	BOG	<i>Boops boops</i>	Bogue	(Linnaeus 1758)	Sparidae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae

GSA	3A_CODE	Scientific_name	English_name	Author	Family
22	MAS	<i>Scomber japonicus</i>	Pacific chub mackerel	Houttuyn 1782	Scombridae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	NEP	<i>Nephrops norvegicus</i>	Norway lobster	(Linnaeus 1758)	Nephropidae
	OCC	<i>Octopus vulgaris</i>	Common octopus	Cuvier 1797	Octopodidae
	PIL	<i>Sardina pilchardus</i>	European pilchard(=Sardine)	(Walbaum 1792)	Clupeidae
	SAA	<i>Sardinella aurita</i>	Round sardinella	Valenciennes 1847	Clupeidae
	SBG	<i>Sparus aurata</i>	Gilthead seabream	Linnaeus 1758	Sparidae
	SOL	<i>Solea solea</i>	Common sole	(Linnaeus 1758)	Soleidae
	HMM	<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	HOM	<i>Trachurus trachurus</i>	Atlantic horse mackerel	(Linnaeus 1758)	Carangidae
23	BOG	<i>Boops boops</i>	Bogue	(Linnaeus 1758)	Sparidae
	CBR	<i>Serranus cabrilla</i>	Comber	(Linnaeus 1758)	Serranidae
	CTC	<i>Sepia officinalis</i>	Common cuttlefish	Linnaeus 1758	Sepiidae
	DPS	<i>Parapenaeus longirostris</i>	Deep-water rose shrimp	(Lucas 1846)	Penaeidae
	HKE	<i>Merluccius merluccius</i>	European hake	(Linnaeus 1758)	Merlucciidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	PAC	<i>Pagellus erythrinus</i>	Common pandora	(Linnaeus 1758)	Sparidae
	PRR	<i>Sparisoma cretense</i>	Parrotfish	(Linnaeus 1758)	Scaridae
	RPG	<i>Pagrus pagrus</i>	Red porgy	(Linnaeus 1758)	Sparidae
	SPC	<i>Spicara smaris</i>	Picarel	(Linnaeus 1758)	Centracanthidae
	SWA	<i>Diplodus sargus</i>	White seabream	(Valenciennes 1830)	Sparidae
	BBS	<i>Scorpaena porcus</i>	Black scorpionfish	Linnaeus 1758	Scorpaenidae
	RSE	<i>Scorpaena scrofa</i>	Red scorpionfish	Linnaeus 1758	Scorpaenidae
25	ALB	<i>Thunnus alalunga</i>	Albacore	(Bonnaterre 1788)	Scombridae
	BFT	<i>Thunnus thynnus</i>	Atlantic bluefin tuna	(Linnaeus 1758)	Scombridae
	BOG	<i>Boops boops</i>	Bogue	(Linnaeus 1758)	Sparidae
	CBR	<i>Serranus cabrilla</i>	Comber	(Linnaeus 1758)	Serranidae
	MUR	<i>Mullus surmuletus</i>	Surmullet	Linnaeus 1758	Mullidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	PRR	<i>Sparisoma cretense</i>	Parrotfish	(Linnaeus 1758)	Scaridae
	SBA	<i>Pagellus acarne</i>	Axillary seabream	(Risso 1827)	Sparidae
	SWO	<i>Xiphias gladius</i>	Swordfish	Linnaeus 1758	Xiphiidae
	BPI	<i>Spicara maena</i>	Blotched picarel	(Linnaeus 1758)	Centracanthidae
	SPC	<i>Spicara smaris</i>	Picarel	(Linnaeus 1758)	Centracanthidae
29	ANE	<i>Engraulis encrasicolus</i>	European anchovy	(Linnaeus 1758)	Engraulidae
	BLU	<i>Pomatomus saltatrix</i>	Bluefish	(Linnaeus 1766)	Pomatomidae
	BON	<i>Sarda sarda</i>	Atlantic bonito	(Bloch 1793)	Scombridae
	DGS	<i>Squalus acanthias</i>	Picked dogfish	Linnaeus 1758	Squalidae

GSA	3A_CODE	Scientific_name	English_name	Author	Family
29	HMM	<i>Trachurus mediterraneus</i>	Mediterranean horse mackerel	(Steindachner 1868)	Carangidae
	MUT	<i>Mullus barbatus</i>	Red mullet	Linnaeus 1758	Mullidae
	RPW	<i>Rapana venosa</i>	Thomas' rapa whelk	(Valenciennes 1846)	Muricidae
	SPR	<i>Sprattus sprattus</i>	European sprat	(Linnaeus 1758)	Clupeidae
	TUR	<i>Psetta maxima</i>	Turbot	(Linnaeus 1758)	Scophthalmidae

**Table 6** FAO Major Fishing Area 37 - MEDITERRANEAN AND BLACK SEA. Number of species by GSAs selected by the ranking system after updating and splitting species codes that were mixed at family level.

GSA	N° Species	GSA	N° Species
1	14	16	13
5	16	17	10
6	13	18	14
7	15	19	14
8	11	20	11
9	12	22	15
10	14	23	14
11	12	25	11
15	12	29	9

The number of species code by GSA ranged between a minimum of 9 (GSA 29) to maximum of 16 (GSA 5) (Table 6) for a total of 230 stocks selected.

## 4 Conclusions

The Mediterranean and Black Sea list of stocks to be used for computing the indicators was based on a ranking system approach for which the species having a rank in the first ten positions either in total live weight or total economic values were chosen.

Landings and economic values for the Mediterranean and Black Sea (FAO area 37) provided by "2016\_STECF 16-11 - EU Fleet Economic and Transversal data tables" were used.

The reference years were 2012 and 2014 (the last three years available for all the GSAs) and, as geographic strata, the Geographical Sub Areas (GSAs) belonging to EU countries and for which data were available were considered.

In the top ranking 10 stocks based on both in terms of live weight and economic value by GSA applied to AER Landings, many combined/nei groups categories were selected.

Based on local expert knowledge it was possible split some mixed categories at species level while, it was decided to drop from the list both the misreporting species and the mixed categories for which it wasn't possible defined clearly the species composition.

Eventually 230 stocks were selected.



## References

ASFIS List of Species for Fishery Statistics Purposes  
(<http://www.fao.org/fishery/collection/asfis/en>)

2016\_STECF 16-11 - EU Fleet Economic and Transversal data tables.  
<https://stecf.jrc.ec.europa.eu/data-reports> (Electronic data annex tables of STECF report)

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## Annexes

### Annex 1. R code

#### R code

```
## Script to ranking MED&BS species based on transversal data in value and weight ##
## Updated: remove all categories no defined at species level ##
remove(list=ls())
library(data.table)
library(tidyr)

#####
## Import dataset ##
#####
# Dataset is based on the Fleet Economic and Transversal data tables
(https://stecf.jrc.ec.europa.eu/data-reports)
gsa=as.data.frame((fread("MED_2011_2015_GSA.csv")))

#####
# Setting DB #
#####
# We use ASFIS DB to get which codes are related to undefined species (i.e generic
faunistic groups, mixed species, ect)
ASFIS=fread("ASFIS_2016.csv")## Upload ASFIS code ##
names(ASFIS)[names(ASFIS)=="3A_CODE"] <- "SP_CODE"
names(gsa)[names(gsa)=="species_code"] <- "SP_CODE"
gsa=merge(gsa,ASFIS,by="SP_CODE",all=F)
#dim(gsa)
gsa=subset(gsa,!(gsa$Family==""))
#names(gsa)

## remove useless columns ##
gsa=gsa[,-c(2,9:11,22:28,30:34,41:43,47)]

#####
#####
## Here you can choose how many years consider in the mean computation##
#####
#####
# sort(unique(gsa$year)) #nb of years in the file ##
```

```

# table(gsa$year) ## to have an idea how many records per year ##
gsa_agg=aggregate(gsa$value,list(area=gsa$sub_reg,yr=gsa$year,sp=gsa$SP_CODE,va
r=gsa$variable_name),sum)
#gsa1=gsa ##all the years in the file
#gsa1=subset(gsa,gsa$year<2015,drop=T) ## drop the last year 2015 not all GSA
covered
gsa1=subset(gsa_agg,gsa_agg$yr>2011 & gsa_agg$yr<2015,drop=T) ## only the last 3
complete years

#####
#####

## Here you can choose how many positions you want consider in the ranking system
#####
#####

pos=10

#####
#### RANKING ####
#####

#Ranking by value#
values=subset(gsa1,gsa1$var=="Value of landings")
values=separate(values,area,c("sa", "gsa"), sep = 3)
values=values[,-1]
a=as.integer(unique(values$gsa))
datalist = list()
for (i in unique(a))
{
  value=subset(values,values$gsa==i)
  value=aggregate(value$x,list(sp=value$sp),mean)
  value2 <- value[order(-value$x),]
  dat=data.frame(head(value2,pos))
  dat$i <- i
  datalist[[i]] <- dat
}
rank_value = do.call(rbind, datalist)
names(rank_value)=c("SP_CODE","MEAN_VALUE","GSA")
#head(rank_value)

#Ranking by weight #

```

```

landings=subset(gsa1,gsa1$var=="Live weight of landings")
landings=separate(landings,area,c("sa", "gsa"), sep = 3)
landings=landings[,-1]
b=as.integer(unique(landings$gsa))
datalist1 = list()
for (i in unique(b))
{
  land=subset(landings,landings$gsa==i)
  land=aggregate(land$x,list(sp=land$sp),mean)
  land2 <- land[order(-land$x),]
  dat=data.frame(head(land2,pos))
  dat$i <- i
  datalist1[[i]] <- dat
}
rank_land = do.call(rbind, datalist1)
names(rank_land)=c("SP_CODE","MEAN_LAND","GSA")
#head(rank_land)

## Final RANKING ##
MED_RANK=merge(rank_land,rank_value,by=c("SP_CODE","GSA"),all=T)
# ASFIS=fread("ASFIS_2016.csv")## Upload ASFIS code ##
# names(ASFIS)[names(ASFIS)="3A_CODE"] <- "SP_CODE"
MED_RANK=as.data.frame(merge(MED_RANK,ASFIS,by="SP_CODE",all=F))
MED_RANK1=MED_RANK[MED_RANK$GSA
c(1,2,5,6,7,8,9,10,11,15,16,17,18,19,20,22,23,25,29),]# here you can chose GSAs
unique(MED_RANK1$GSA)
MED_RANK1=MED_RANK1[,-c(11,12,13,17)]
MED_RANK1=MED_RANK1[c(2,1,3:13)]
MED_RANK1=MED_RANK1[order(MED_RANK1$GSA),]
MED_RANK1=MED_RANK1[,-c(3,4)]
MED_RANK1=MED_RANK1[,c(1,2,5:11,3,4)]
names(MED_RANK1)[2]="3A_CODE"
write.csv(MED_RANK1,"MED_RANK_SF.csv",row.names=F)
#####
### END OF SCRIPT ###
#####

```

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