

ANNEX XIII

Seasonal dominance frequencies for the abundance and biomass values of each fish and cephalopod species discarded by **fish trawls**.

Bycatch and discards of commercial trawl fisheries in the South coast of Portugal

Species	WINTER ABUNDANCE Dominance (%)	Species	WINTER BIOMASS Dominance (%)
<i>Malacocephalus laevis</i>	35.0	<i>Scomber scombrus</i>	23.6
<i>Centrophorus granulosus</i>	11.5	<i>Scymnodon ringens</i>	20.5
<i>Scomber scombrus</i>	6.8	<i>Malacocephalus laevis</i>	8.8
<i>Setarches guentheri</i>	6.4	<i>Callanthias ruber</i>	7.2
<i>Macroramphosus scolopax</i>	6.0	<i>Centrophorus granulosus</i>	4.8
<i>Microchirus azevia</i>	4.6	<i>Setarches guentheri</i>	4.2
<i>Scymnodon ringens</i>	4.6	<i>Mola mola</i>	3.8
<i>Mola mola</i>	3.0	<i>Microchirus azevia</i>	3.1
<i>Scaevargus unicolor</i>	2.4	<i>Scaevargus unicolor</i>	2.9
<i>Callanthias ruber</i>	2.3	<i>Trachurus trachurus</i>	2.3
<i>Chelidonichthys lucerna</i>	1.8	<i>Macroramphosus scolopax</i>	2.1
<i>Microchirus ocellatus</i>	1.7	<i>Scophthalmus rhombus</i>	1.6
<i>Coelorinchus caelorinchus</i>	0.9	<i>Cyttopsis rosea</i>	1.6
<i>Leucoraja naevus</i>	0.9	<i>Loligo vulgaris</i>	1.3
<i>Atherina presbyter</i>	0.8	<i>Scyliorhinus canicula</i>	1.1
<i>Scophthalmus rhombus</i>	0.8	<i>Chelidonichthys lucerna</i>	1.1
<i>Scyliorhinus canicula</i>	0.8	<i>Hexanchus griseus</i>	1.0
<i>Micromesistius poutassou</i>	0.8	<i>Trachyrinchus scabrus</i>	0.9
<i>Trachurus trachurus</i>	0.7	<i>Microchirus ocellatus</i>	0.8
<i>Alosa fallax</i>	0.7	<i>Micromesistius poutassou</i>	0.8
<i>Callionymus spp.</i>	0.7	<i>Coelorinchus caelorinchus</i>	0.6
<i>Arnoglossus laterna</i>	0.7	<i>Chimaera monstrosa</i>	0.6
<i>Cyttopsis rosea</i>	0.6	<i>Raja miraletus</i>	0.4
<i>Hexanchus griseus</i>	0.5	<i>Pteroctopus tetracirrus</i>	0.4
<i>Sepietta obscura</i>	0.4	<i>Rossia macrosoma</i>	0.4
<i>Sepia officinalis</i>	0.4	<i>Lepidopus caudatus</i>	0.4
<i>Lepidopus caudatus</i>	0.4	<i>Ruvettus pretiosus</i>	0.3
<i>Trachyrinchus scabrus</i>	0.3	<i>Sepietta obscura</i>	0.3
<i>Arnoglossus rueppelii</i>	0.3	<i>Scomber colias</i>	0.3
<i>Chimaera monstrosa</i>	0.3	<i>Chaunax pictus</i>	0.3
<i>Gaidropsaurus biscayensis</i>	0.3	<i>Leucoraja naevus</i>	0.2
<i>Lepidotrigla dieuzeidei</i>	0.2	<i>Arnoglossus laterna</i>	0.2
<i>Ruvettus pretiosus</i>	0.2	<i>Atherina presbyter</i>	0.2
<i>Scomber colias</i>	0.2	<i>Serranus hepatus</i>	0.2
<i>Chaunax pictus</i>	0.1	<i>Engraulis encrasicolus</i>	0.2
<i>Trigloporus lastoviza</i>	0.1	<i>Pagellus bogaraveo</i>	0.2
<i>Alloteuthis spp</i>	0.1	<i>Callionymus spp.</i>	0.1
<i>Lesueurigobius sanzi</i>	0.1	<i>Callionymus maculatus</i>	0.1
<i>Loligo vulgaris</i>	0.1	<i>Trigloporus lastoviza</i>	0.1
<i>Pagellus bogaraveo</i>	0.1	<i>Lepidotrigla dieuzeidei</i>	0.1
<i>Pteroctopus tetracirrus</i>	0.1	<i>Lophius piscatorius</i>	0.1
<i>Chelidonichthys obscurus</i>	0.1	<i>Arnoglossus rueppelii</i>	0.1
<i>Epigonus denticulatus</i>	0.1	<i>Alosa fallax</i>	0.1
<i>Engraulis encrasicolus</i>	0.1	<i>Sepia officinalis</i>	0.1
<i>Serranus hepatus</i>	0.1	<i>Chelidonichthys obscurus</i>	0.1
<i>Capros aper</i>	0.1	<i>Epigonus denticulatus</i>	0.1
<i>Arnoglossus thori</i>	0.1		
<i>Callionymus maculatus</i>	0.1		

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Species	SPRING	Species	SPRING
	ABUNDANCE Dominance (%)		BIOMASS Dominance (%)
<i>Lepidotrigla cavillone</i>	15.6	<i>Scomber scombrus</i>	22.5
<i>Lepidopus caudatus</i>	9.8	<i>Lepidotrigla cavillone</i>	10.6
<i>Macroramphosus scolopax</i>	7.1	<i>Scomber colias</i>	8.8
<i>Scomber scombrus</i>	6.8	<i>Boops boops</i>	8.5
<i>Sardina pilchardus</i>	5.9	<i>Sardina pilchardus</i>	5.8
<i>Serranus hepatus</i>	5.3	<i>Scorpaena notata</i>	5.0
<i>Boops boops</i>	5.2	<i>Lepidopus caudatus</i>	4.6
<i>Capros aper</i>	4.8	<i>Spondylisoma cantharus</i>	4.2
<i>Scorpaena notata</i>	4.5	<i>Cepola macrophthalma</i>	3.7
<i>Macroramphosus gracilis</i>	3.8	<i>Serranus hepatus</i>	3.3
<i>Scomber colias</i>	2.9	<i>Callionymus lyra</i>	2.4
<i>Merluccius merluccius</i>	2.6	<i>Trachurus trachurus</i>	1.9
<i>Lepidotrigla dieuzeidei</i>	2.6	<i>Lepidotrigla dieuzeidei</i>	1.8
<i>Engraulis encrasicolus</i>	2.5	<i>Illex coindetii</i>	1.7
<i>Trachurus trachurus</i>	2.1	<i>Macroramphosus scolopax</i>	1.5
<i>Alloteuthis subulata</i>	1.8	<i>Merluccius merluccius</i>	1.3
<i>Cepola macrophthalma</i>	1.7	<i>Engraulis encrasicolus</i>	1.2
<i>Spondylisoma cantharus</i>	1.7	<i>Balistes capriscus</i>	1.1
<i>Callionymus lyra</i>	1.7	<i>Pagellus acarne</i>	1.0
<i>Trigloporus lastoviza</i>	1.6	<i>Trigloporus lastoviza</i>	1.0
<i>Illex coindetii</i>	1.0	<i>Conger conger</i>	1.0
<i>Eledone moschata</i>	0.8	<i>Eledone moschata</i>	0.9
<i>Pagellus acarne</i>	0.7	<i>Raja clavata</i>	0.8
<i>Citharus linguatula</i>	0.6	<i>Scyliorhinus canicula</i>	0.7
<i>Alloteuthis media</i>	0.6	<i>Macroramphosus gracilis</i>	0.7
<i>Lesueurigobius sanzi</i>	0.6	<i>Chelidonichthys obscurus</i>	0.6
<i>Conger conger</i>	0.5	<i>Capros aper</i>	0.6
<i>Sepia elegans</i>	0.5	<i>Raja miraletus</i>	0.4
<i>Raja clavata</i>	0.5	<i>Citharus linguatula</i>	0.4
<i>Trachurus mediterraneus</i>	0.4	<i>Todaropsis eblanae</i>	0.4
<i>Arnoglossus imperialis</i>	0.4	<i>Trachurus mediterraneus</i>	0.3
<i>Chelidonichthys obscurus</i>	0.4	<i>Zeus faber</i>	0.2
<i>Microchirus variegatus</i>	0.3	<i>Alloteuthis subulata</i>	0.2
<i>Balistes capriscus</i>	0.3	<i>Lesueurigobius sanzi</i>	0.2
<i>Lophius piscatorius</i>	0.3	<i>Microchirus variegatus</i>	0.2
<i>Sepietta oweniana</i>	0.3	<i>Sepia elegans</i>	0.1
<i>Todaropsis eblanae</i>	0.3	<i>Anthias anthias</i>	0.1
<i>Scyliorhinus canicula</i>	0.2	<i>Micromesistius poutassou</i>	0.1
<i>Raja miraletus</i>	0.2	<i>Lophius piscatorius</i>	0.1
<i>Micromesistius poutassou</i>	0.2	<i>Arnoglossus imperialis</i>	0.1
<i>Arnoglossus laterna</i>	0.2	<i>Helicolenus dactylopterus</i>	0.1
<i>Anthias anthias</i>	0.2	<i>Loligo vulgaris</i>	0.1
<i>Callionymus maculatus</i>	0.1	<i>Alloteuthis media</i>	0.1
<i>Loligo vulgaris</i>	0.1		
<i>Helicolenus dactylopterus</i>	0.1		
<i>Rossia macrosoma</i>	0.1		
<i>Argentina sphyraena</i>	0.1		

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Species	SUMMER	Species	SUMMER
	ABUNDANCE		BIOMASS
	Dominance (%)		Dominance (%)
<i>Macroramphosus scolopax</i>	44.1	<i>Macroramphosus scolopax</i>	20.3
<i>Macroramphosus gracilis</i>	25.5	<i>Macroramphosus gracilis</i>	16.6
<i>Capros aper</i>	6.9	<i>Boops boops</i>	9.3
<i>Micromesistius poutassou</i>	5.4	<i>Scyliorhinus canicula</i>	6.9
<i>Serranus hepatus</i>	2.5	<i>Micromesistius poutassou</i>	6.5
<i>Scyliorhinus canicula</i>	2.0	<i>Capros aper</i>	5.3
<i>Boops boops</i>	2.0	<i>Lepidopus caudatus</i>	3.9
<i>Lepidopus caudatus</i>	1.3	<i>Scomber scombrus</i>	3.4
<i>Argentina sphyraena</i>	0.9	<i>Serranus hepatus</i>	3.0
<i>Microchirus variegatus</i>	0.6	<i>Balistes capriscus</i>	2.8
<i>Merluccius merluccius</i>	0.6	<i>Merluccius merluccius</i>	1.8
<i>Arnoglossus rueppelii</i>	0.6	<i>Scomber colias</i>	1.6
<i>Citharus linguatula</i>	0.5	<i>Sardina pilchardus</i>	1.4
<i>Alloteuthis subulata</i>	0.5	<i>Trachurus mediterraneus</i>	1.2
<i>Sardina pilchardus</i>	0.4	<i>Pagellus acarne</i>	1.2
<i>Scorpaena notata</i>	0.4	<i>Leucoraja naevus</i>	1.2
<i>Scomber scombrus</i>	0.4	<i>Scorpaena notata</i>	1.0
<i>Lepidotrigla cavillone</i>	0.4	<i>Illex coindetii</i>	1.0
<i>Arnoglossus imperialis</i>	0.3	<i>Microchirus variegatus</i>	0.8
<i>Scomber colias</i>	0.3	<i>Raja clavata</i>	0.8
<i>Pagellus acarne</i>	0.2	<i>Citharus linguatula</i>	0.8
<i>Sepia orbignyana</i>	0.2	<i>Zeus faber</i>	0.8
<i>Callionymus lyra</i>	0.2	<i>Conger conger</i>	0.7
<i>Helicolenus dactylopterus</i>	0.2	<i>Cepola macrophthalma</i>	0.7
<i>Loligo vulgaris</i>	0.2	<i>Callionymus lyra</i>	0.6
<i>Engraulis encrasicolus</i>	0.2	<i>Eledone moschata</i>	0.5
<i>Cepola macrophthalma</i>	0.2	<i>Lepidotrigla cavillone</i>	0.4
<i>Trachurus mediterraneus</i>	0.2	<i>Lophius piscatorius</i>	0.4
<i>Conger conger</i>	0.2	<i>Helicolenus dactylopterus</i>	0.4
<i>Raja clavata</i>	0.2	<i>Argentina sphyraena</i>	0.4
<i>Eledone moschata</i>	0.1	<i>Sepia orbignyana</i>	0.3
<i>Microchirus boscanion</i>	0.1	<i>Arnoglossus imperialis</i>	0.3
<i>Raja montagui</i>	0.1	<i>Raja montagui</i>	0.3
<i>Leucoraja naevus</i>	0.1	<i>Arnoglossus rueppelii</i>	0.3
<i>Illex coindetii</i>	0.1	<i>Todaropsis eblanae</i>	0.2
<i>Anthias anthias</i>	0.1	<i>Loligo vulgaris</i>	0.2
<i>Zeus faber</i>	0.1	<i>Engraulis encrasicolus</i>	0.2
<i>Trigloporus lastoviza</i>	0.1	<i>Spondylisoma cantharus</i>	0.2
<i>Sepia elegans</i>	0.1	<i>Trachurus trachurus</i>	0.2
<i>Blennius ocellaris</i>	0.1	<i>Trigloporus lastoviza</i>	0.1
<i>Callionymus maculatus</i>	0.1	<i>Anthias anthias</i>	0.1
<i>Balistes capriscus</i>	0.1	<i>Scorpaena elongata</i>	0.1
<i>Synchiropus phaeton</i>	0.1	<i>Octopus vulgaris</i>	0.1
<i>Lesueurigobius sanzi</i>	0.1	<i>Alosa fallax</i>	0.1
<i>Trachurus picturatus</i>	0.1	<i>Eledone cirrhosa</i>	0.1
<i>Arnoglossus laterna</i>	0.1	<i>Microchirus boscanion</i>	0.1
<i>Trigla lyra</i>	0.1	<i>Trachurus picturatus</i>	0.1
<i>Peristedion cataphractum</i>	0.1	<i>Alloteuthis subulata</i>	0.1
<i>Arnoglossus thori</i>	0.1	<i>Chelidonichthys lucerna</i>	0.1
		<i>Scaevurgus unicirrhus</i>	0.1

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Species	AUTUMN ABUNDANCE Dominance (%)	Species	AUTUMN BIOMASS Dominance (%)
<i>Lepidotrigla dieuzeidei</i>	13.9	<i>Scophthalmus rhombus</i>	19.2
<i>Setarches guentheri</i>	9.4	<i>Lepidotrigla dieuzeidei</i>	10.4
<i>Scophthalmus rhombus</i>	8.5	<i>Callanthias ruber</i>	9.8
<i>Microchirus azevia</i>	7.3	<i>Scaevurgus unicolor</i>	9.7
<i>Scaevurgus unicolor</i>	7.0	<i>Scomber scombrus</i>	8.5
<i>Lesueurigobius sanzi</i>	6.3	<i>Pagellus bogaraveo</i>	5.9
<i>Pagellus bogaraveo</i>	5.6	<i>Setarches guentheri</i>	5.9
<i>Alosa fallax</i>	5.1	<i>Microchirus azevia</i>	4.4
<i>Callanthias ruber</i>	4.7	<i>Lesueurigobius sanzi</i>	4.0
<i>Alloteuthis spp</i>	2.7	<i>Scymnodon ringens</i>	2.1
<i>Coelorinchus caelorinchus</i>	2.6	<i>Coelorinchus caelorinchus</i>	1.8
<i>Scomber scombrus</i>	2.5	<i>Stomias boa boa</i>	1.5
<i>Atherina presbyter</i>	2.2	<i>Trachyrinchus scabrus</i>	1.5
<i>Sepia officinalis</i>	2.0	<i>Scyliorhinus canicula</i>	1.5
<i>Arnoglossus laterna</i>	1.8	<i>Pagellus acarne</i>	1.2
<i>Scyliorhinus canicula</i>	1.6	<i>Chimaera monstrosa</i>	1.0
<i>Callionymus spp.</i>	1.6	<i>Lepidopus caudatus</i>	0.9
<i>Trachyrinchus scabrus</i>	1.6	<i>Callionymus maculatus</i>	0.9
<i>Alloteuthis subulata</i>	1.1	<i>Engraulis encrasicolus</i>	0.8
<i>Arnoglossus rueppelii</i>	1.1	<i>Trachurus trachurus</i>	0.7
<i>Microchirus ocellatus</i>	0.9	<i>Chaunax pictus</i>	0.7
<i>Centrophorus granulosus</i>	0.8	<i>Raja miraletus</i>	0.6
<i>Scymnodon ringens</i>	0.6	<i>Arnoglossus laterna</i>	0.6
<i>Chaunax pictus</i>	0.6	<i>Atherina presbyter</i>	0.6
<i>Stomias boa boa</i>	0.6	<i>Cyttopsis rosea</i>	0.5
<i>Micromesistius poutassou</i>	0.5	<i>Alosa fallax</i>	0.5
<i>Chimaera monstrosa</i>	0.5	<i>Mola mola</i>	0.5
<i>Mola mola</i>	0.5	<i>Sepia officinalis</i>	0.5
<i>Callionymus maculatus</i>	0.5	<i>Trachurus mediterraneus</i>	0.4
<i>Malacocephalus laevis</i>	0.5	<i>Microchirus ocellatus</i>	0.4
<i>Macroramphosus scolopax</i>	0.5	<i>Micromesistius poutassou</i>	0.4
<i>Engraulis encrasicolus</i>	0.4	<i>Arnoglossus rueppelii</i>	0.3
<i>Dentex macrophthalmus</i>	0.4	<i>Callionymus spp.</i>	0.3
<i>Trachurus trachurus</i>	0.4	<i>Diplodus vulgaris</i>	0.2
<i>Pagellus acarne</i>	0.4	<i>Alloteuthis spp</i>	0.2
<i>Lepidopus caudatus</i>	0.3	<i>Centrophorus granulosus</i>	0.2
<i>Leucoraja naevus</i>	0.3	<i>Torpedo marmorata</i>	0.2
<i>Lophius budegassa</i>	0.3	<i>Serranus hepatus</i>	0.1
<i>Raja miraletus</i>	0.3	<i>Lophius budegassa</i>	0.1
<i>Cyttopsis rosea</i>	0.2	<i>Malacocephalus laevis</i>	0.1
<i>Torpedo marmorata</i>	0.2	<i>Raja montagui</i>	0.1
<i>Sepiolo atlantica</i>	0.2	<i>Macroramphosus scolopax</i>	0.1
<i>Sepietta oweniana</i>	0.2	<i>Epigonus denticulatus</i>	0.1
<i>Epigonus denticulatus</i>	0.2	<i>Leucoraja naevus</i>	0.1
<i>Trachurus mediterraneus</i>	0.1	<i>Sepia orbignyana</i>	0.1
<i>Sepia orbignyana</i>	0.1	<i>Dicologlossa cuneata</i>	0.1
<i>Serranus hepatus</i>	0.1	<i>Boops boops</i>	0.1
<i>Boops boops</i>	0.1		
<i>Lepidorhombus boscii</i>	0.1		
<i>Diplodus vulgaris</i>	0.1		
<i>Venefica proboscidea</i>	0.1		
<i>Dicologlossa cuneata</i>	0.1		
<i>Serranus cabrilla</i>	0.1		