

Mediterranean Marine Science

Vol 22, No 3 (2021)

VOL 22, No 3 (2021)



Commercial catches and discards composition in the central Tyrrhenian Sea: a multispecies quantitative and qualitative analysis from shallow and deep bottom trawling

FRANCESCO TIRALONGO, EMANUELE MANCINI, DANIELE VENTURA, STEPHANIE DE MALERBE, FRANCESCO PALADINI DE MENDOZA, MASSIMILIANO SARDONE, ROBERTO ARCIPRETE, DANIELA MASSI, MARCO MARCELLI, FABIO FIORENTINO, ROBERTO MINERVINI

doi: [10.12681/mms.25753](https://doi.org/10.12681/mms.25753)

To cite this article:

TIRALONGO, F., MANCINI, E., VENTURA, D., DE MALERBE, S., PALADINI DE MENDOZA, F., SARDONE, M., ARCIPRETE, R., MASSI, D., MARCELLI, M., FIORENTINO, F., & MINERVINI, R. (2021). Commercial catches and discards composition in the central Tyrrhenian Sea: a multispecies quantitative and qualitative analysis from shallow and deep bottom trawling. *Mediterranean Marine Science*, 22(3), 521–531. <https://doi.org/10.12681/mms.25753>

Commercial catches and discards composition in the central Tyrrhenian Sea: a multispecies quantitative and qualitative analysis from shallow and deep bottom trawling

Francesco TIRALONGO, Emanuele MANCINI, Daniele VENTURA, Stephanie DE MALHERBE, Francesco PALADINI DE MENDOZA, Massimiliano SARDONE, Roberto ARCIPRETE, Daniela MASSI, Marco MARCELLI, Fabio FIORENTINO and Roberto MINERVINI

Mediterranean Marine Science, 2021, 22 (3)

Table S1. List of species found in landings and discards during the whole survey period.

SPECIES	FISHING GROUND	TARGET	BYCATCH	DISCARD
Elasmobranchii				
<i>Etmopterus spinax</i>	DEEP			X
<i>Galeus melastomus</i>	DEEP		X	X
<i>Hexanchus griseus</i>	DEEP			X
<i>Mustelus mustelus</i>	BOTH		X	
<i>Raja asterias</i>	BOTH		X	
<i>Raja clavata</i>	BOTH		X	
<i>Scyliorhinus canicula</i>	BOTH		X	X
<i>Scyliorhinus stellaris</i>	BOTH		X	
<i>Torpedo marmorata</i>	SHALLOW			X
<i>Torpedo torpedo</i>	SHALLOW			X
Osteichthyes				
<i>Alosa fallax</i>	SHALLOW		X	
<i>Anthias anthias</i>	SHALLOW			X
<i>Apterichthys caecus</i>	SHALLOW			X
<i>Argentina sphyraena</i>	BOTH		X	X
<i>Argyropelecus hemigymnus</i>	DEEP			X
<i>Ariosoma balearicum</i>	DEEP			X
<i>Arnoglossus laterna</i>	DEEP		X	X
<i>Arnoglossus thori</i>	SHALLOW		X	X
<i>Blennius ocellaris</i>	SHALLOW			X
<i>Boops boops</i>	SHALLOW		X	X
<i>Callanthias ruber</i>	SHALLOW			X
<i>Callionymus maculatus</i>	SHALLOW			X
<i>Capros aper</i>	DEEP			X
<i>Carapus acus</i>	SHALLOW			X
<i>Centrolophus niger</i>	SHALLOW		X	
<i>Cepola macrophthalma</i>	SHALLOW			X
<i>Chauliodus sloani</i>	DEEP			X
<i>Chelidonichthys cuculus</i>	SHALLOW		X	
<i>Chelidonichthys lucerna</i>	SHALLOW		X	
<i>Chelidonichthys obscurus</i>	SHALLOW		X	
<i>Chlorophthalmus agassizi</i>	DEEP		X	X
<i>Citharus linguatula</i>	SHALLOW		X	X
<i>Coelorinchus caelorhincus</i>	DEEP			X

Continued

Table continued

SPECIES	FISHING GROUND	TARGET	BYCATCH	DISCARD
<i>Conger conger</i>	BOTH		X	X
<i>Dalophis imberbis</i>	SHALLOW			X
<i>Deltentosteus colonianus</i>	SHALLOW			X
<i>Deltentosteus quadrimaculatus</i>	SHALLOW			X
<i>Dentex dentex</i>	SHALLOW		X	
<i>Diaphus rafinesquii</i>	DEEP			X
<i>Diplodus annularis</i>	SHALLOW			X
<i>Echelus myrus</i>	SHALLOW			X
<i>Echiodon dentatus</i>	BOTH			X
<i>Engraulis encrasicolus</i>	BOTH		X	X
<i>Epigonus spp.</i>	DEEP			X
<i>Gadiculus argenteus</i>	DEEP			X
<i>Gaidropsarus vulgaris</i>	SHALLOW			X
<i>Glossanodon leioglossus</i>	DEEP		X	X
<i>Gnathophis mystax</i>	SHALLOW			X
<i>Gobius niger</i>	SHALLOW		X	X
<i>Helicolenus dactylopterus</i>	DEEP		X	X
<i>Hippocampus hippocampus</i>	SHALLOW			X
<i>Hoplostethus mediterraneus</i>	DEEP			X
<i>Hygophum spp.</i>	DEEP			X
<i>Hymenocephalus italicus</i>	DEEP			X
<i>Lampanyctus crocodilus</i>	DEEP			X
<i>Lepidopus caudatus</i>	BOTH	X		X
<i>Lepidorhombus boscii</i>	BOTH		X	X
<i>Lepidorhombus whiffiagonis</i>	BOTH		X	X
<i>Lepidotrigla cavillone</i>	SHALLOW			X
<i>Lepidotrigla dieuzeidei</i>	SHALLOW			X
<i>Lestidiops sphyrenoides</i>	SHALLOW			X
<i>Lesueurigobius friesii</i>	SHALLOW			X
<i>Lesueurigobius sueri</i>	SHALLOW			X
<i>Chelon ramada</i>	SHALLOW		X	
<i>Lophius budegassa</i>	BOTH	X		
<i>Lophius piscatorius</i>	BOTH	X		
<i>Macroramphosus scolopax</i>	BOTH			X
<i>Maurolicus muelleri</i>	DEEP			X
<i>Merlangius merlangus</i>	BOTH		X	X
<i>Merluccius merluccius</i>	BOTH	X		X
<i>Microchirus variegatus</i>	SHALLOW			X
<i>Molva macrophthalma</i>	DEEP		X	
<i>Mullus barbatus</i>	BOTH	X		X
<i>Mullus surmuletus</i>	SHALLOW	X		X
<i>Muraena helena</i>	SHALLOW			X
<i>Nettastoma melanurum</i>	DEEP			X
<i>Nezumia sclerorhynchus</i>	DEEP			X
<i>Notacanthus bonaparte</i>	DEEP			X

Continued

Table continued

SPECIES	FISHING GROUND	TARGET	BYCATCH	DISCARD
<i>Ophichthus rufus</i>	SHALLOW			X
<i>Ophidion barbatum</i>	SHALLOW			X
<i>Ophisurus serpens</i>	BOTH			X
<i>Pagellus acarne</i>	SHALLOW		X	X
<i>Pagellus bogaraveo</i>	BOTH		X	X
<i>Pagellus erythrinus</i>	BOTH		X	X
<i>Pagrus pagrus</i>	SHALLOW		X	
<i>Paralepis spp.</i>	SHALLOW			X
<i>Peristedion cataphractum</i>	BOTH			X
<i>Phycis blennoides</i>	BOTH		X	X
<i>Pomatomus saltatrix</i>	SHALLOW		X	
<i>Pomatoschistus marmoratus</i>	SHALLOW			X
<i>Psetta maxima</i>	SHALLOW		X	
<i>Sarda sarda</i>	SHALLOW		X	
<i>Sardina pilchardus</i>	BOTH		X	X
<i>Sardinella aurita</i>	SHALLOW		X	X
<i>Sarpa salpa</i>	SHALLOW		X	X
<i>Scomber scombrus</i>	BOTH		X	X
<i>Scophthalmus rhombus</i>	SHALLOW		X	
<i>Scorpaena scrofa</i>	SHALLOW		X	X
<i>Seriola dumerili</i>	SHALLOW		X	
<i>Serranus cabrilla</i>	SHALLOW		X	X
<i>Serranus hepatus</i>	SHALLOW		X	X
<i>Solea solea</i>	SHALLOW		X	
<i>Sparus aurata</i>	SHALLOW		X	
<i>Spicara maena</i>	SHALLOW		X	X
<i>Spicara smaris</i>	SHALLOW		X	X
<i>Spondyliosoma cantharus</i>	SHALLOW		X	X
<i>Stomias boa boa</i>	DEEP			X
<i>Symbolophorus veranyi</i>	DEEP			X
<i>Symphurus nigrescens</i>	BOTH			X
<i>Synchiropus phaeton</i>	DEEP			X
<i>Synodus saurus</i>	SHALLOW			X
<i>Trachinus draco</i>	SHALLOW		X	X
<i>Trachipterus trachipterus</i>	DEEP			X
<i>Trachurus trachurus</i>	BOTH		X	X
<i>Trigla lyra</i>	BOTH		X	X
<i>Trigloporus lastoviza</i>	SHALLOW		X	
<i>Trisopterus minutus</i>	BOTH		X	X
<i>Uranoscopus scaber</i>	SHALLOW		X	X
<i>Xiphias gladius</i>	DEEP		X	
<i>Zeus faber</i>	BOTH		X	X
Crustacea				
<i>Aegaeon cataphractus</i>	SHALLOW			X
<i>Aegaeon lacazei</i>	SHALLOW			X

Continued

Table continued

SPECIES	FISHING GROUND	TARGET	BYCATCH	DISCARD
<i>Alpheus glaber</i>	SHALLOW			X
<i>Aristaeomorpha foliacea</i>	DEEP		X	X
<i>Aristeus antennatus</i>	DEEP		X	X
<i>Bathynectes maravigna</i>	DEEP			X
<i>Chlorotocus crassicornis</i>	BOTH			X
<i>Dardanus arrosor</i>	SHALLOW			X
<i>Dardanus calidus</i>	SHALLOW			X
<i>Goneplax rhomboides</i>	BOTH			X
<i>Homarus gammarus</i>	SHALLOW		X	
<i>Jaxea nocturna</i>	SHALLOW			X
<i>Leptochela pugnax</i>	SHALLOW			X
<i>Liocarcinus depurator</i>	SHALLOW			X
<i>Lophogaster typicus</i>	BOTH			X
<i>Macropipus tuberculatus</i>	BOTH			X
<i>Macropodia tenuirostris</i>	SHALLOW			X
<i>Medorippe lanata</i>	SHALLOW			X
<i>Meganictyphanes norvegica</i>	BOTH			X
<i>Monodaeus couchii</i>	SHALLOW			X
<i>Munida rugosa</i>	SHALLOW			X
<i>Munida rutilanti</i>	DEEP			X
<i>Nephrops norvegicus</i>	DEEP	X		X
<i>Pagurus excavatus</i>	SHALLOW			X
<i>Pagurus prideaux</i>	SHALLOW			X
<i>Palinurus elephas</i>	SHALLOW		X	
<i>Palinurus mauritanicus</i>	DEEP		X	
<i>Parapenaeus longirostris</i>	BOTH	X		X
<i>Paromola cuvieri</i>	DEEP			X
<i>Pasiphaea multidentata</i>	BOTH		X	X
<i>Pasiphaea sivado</i>	BOTH		X	X
<i>Penaeus kerathurus</i>	SHALLOW		X	
<i>Plesionika edwardsii</i>	DEEP		X	X
<i>Plesionika heterocarpus</i>	DEEP		X	X
<i>Polycheles typhlops</i>	DEEP			X
<i>Pontophilus spinosus</i>	SHALLOW			X
<i>Processa spp.</i>	SHALLOW			X
<i>Rissoides pallidus</i>	DEEP			X
<i>Scalpellum scalpellum</i>	BOTH			X
<i>Eusergestes arcticus</i>	DEEP			X
<i>Robustosergia robusta</i>	DEEP			X
<i>Solenocera membranacea</i>	BOTH			X
<i>Squilla mantis</i>	SHALLOW	X	X	X
Mollusca				
<i>Acanthocardia echinata</i>	SHALLOW			X
<i>Alloteuthis media</i>	BOTH		X	X
<i>Aplysia parvula</i>	SHALLOW			X

Continued

Table continued

SPECIES	FISHING GROUND	TARGET	BYCATCH	DISCARD
<i>Armina tigrina</i>	SHALLOW			X
<i>Atrina fragilis</i>	SHALLOW			X
<i>Bolinus brandaris</i>	SHALLOW			X
<i>Calliostoma spp.</i>	BOTH			X
<i>Callistoctopus macropus</i>	SHALLOW		X	
<i>Chromodoris luterosa</i>	SHALLOW			X
<i>Cymbulia peronii</i>	BOTH			X
<i>Eledone cirrhosa</i>	BOTH	X		
<i>Eledone moschata</i>	BOTH	X		
<i>Galeodea echinophora</i>	SHALLOW			X
<i>Glossus humanus</i>	BOTH			X
<i>Histioteuthis spp.</i>	DEEP			X
<i>Illex coindetii</i>	BOTH		X	X
<i>Loligo vulgaris</i>	BOTH	X	X	
<i>Naticarius stercusmuscarum</i>	SHALLOW			X
<i>Octopus defilippi</i>	SHALLOW		X	
<i>Octopus vulgaris</i>	SHALLOW		X	
<i>Ommastrephes bartramii</i>	DEEP		X	
<i>Philine spp.</i>	SHALLOW			X
<i>Pleurobranchea meckeli</i>	SHALLOW			X
<i>Pteria hirundo</i>	SHALLOW			X
<i>Rossia macrosoma</i>	DEEP		X	X
<i>Semicassis granulata</i>	SHALLOW			X
<i>Sepia elegans</i>	BOTH		X	X
<i>Sepia officinalis</i>	SHALLOW		X	
<i>Sepia orbignyana</i>	BOTH		X	X
<i>Sepiola sp.</i>	BOTH		X	X
<i>Tethys fimbria</i>	SHALLOW			X
<i>Todarodes sagittatus</i>	BOTH		X	
<i>Todaropsis eblanae</i>	BOTH		X	X
<i>Turritella spp.</i>	BOTH			X
Echinodermata				
<i>Amphipholis squamata</i>	BOTH			X
<i>Antedon mediterranea</i>	SHALLOW			X
<i>Astropecten aranciacus</i>	SHALLOW			X
<i>Astropecten bispinosus</i>	SHALLOW			X
<i>Astropecten irregularis</i>	BOTH			X
<i>Astrospartus mediterraneus</i>	SHALLOW			X
<i>Brissopsis atlantica mediterranea</i>	DEEP			X
<i>Echinaster sepositus</i>	SHALLOW			X
<i>Echinus melo</i>	SHALLOW			X
<i>Gracilechinus acutus</i>	SHALLOW			X
<i>Holoturia tubulosa</i>	SHALLOW			X
<i>Leptopentacta elongata</i>	BOTH			X
<i>Leptopentacta tergistina</i>	BOTH			X

Continued

Table continued

SPECIES	FISHING GROUND	TARGET	BYCATCH	DISCARD
<i>Luidia ciliaris</i>	SHALLOW			X
<i>Martasteria glacialis</i>	SHALLOW			X
<i>Ocnus planci</i>	SHALLOW			X
<i>Ocnus syracusanus</i>	SHALLOW			X
<i>Ophiotrix fragilis</i>	SHALLOW			X
<i>Ophiura albida</i>	SHALLOW			X
<i>Ophiura ophiura</i>	SHALLOW			X
<i>Parastichopus regalis</i>	BOTH			X
<i>Tethyaster subinermis</i>	SHALLOW			X
<i>Thyone fusus</i>	BOTH			X
Cnidaria				
<i>Adamsia palliata</i>	BOTH			X
<i>Alcyonium palmatum</i>	BOTH			X
<i>Aurelia aurita</i>	SHALLOW			X
<i>Rhizostoma pulmo</i>	SHALLOW			X
<i>Calliactis parasitica</i>	SHALLOW			X
<i>Funiculina quadrangularis</i>	BOTH			X
<i>Pennatula phosphorea</i>	SHALLOW			X
<i>Pennatula rubra</i>	SHALLOW			X
<i>Pteroeides spinosum</i>	SHALLOW			X
Anellida				
<i>Chloeia venusta</i>	SHALLOW			X
<i>Aphrodita alta</i>	BOTH			X
<i>Labioleanira yhleni</i>	SHALLOW			X
<i>Laetmonice hystrix</i>	SHALLOW			X
<i>Lepidasthenia brunnea</i>	SHALLOW			X
<i>Lumbrinereis latreilli</i>	SHALLOW			X
<i>Marphysa bellii</i>	SHALLOW			X
<i>Orbinia spp.</i>	SHALLOW			X
<i>Phyllodoce madeirensis</i>	SHALLOW			X
<i>Sabella pavonina</i>	SHALLOW			X
<i>Sternaspis scutata</i>	BOTH			X
<i>Pontobdella muricata</i>	BOTH			X
Brachiopoda				
<i>Gryphus vitreus</i>	DEEP			X
Nemertea				
<i>Lineus sp.</i>	SHALLOW			X
Tunicata				
<i>Phallusia mammillata</i>	BOTH			X
<i>Pyrosoma atlanticum</i>	BOTH			X
<i>Salpa maxima</i>	BOTH			X

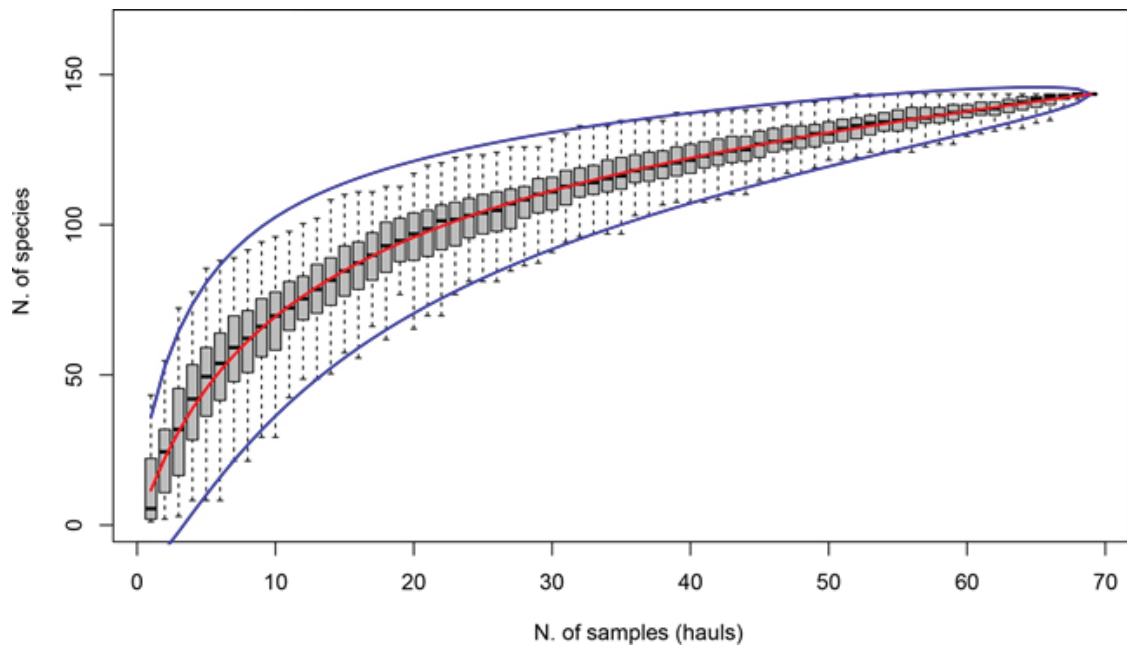


Fig. S1: Species accumulation curve by number of hauls. Blue line represents 95% confidence intervals from standard deviation (standard error of the estimate).