

6.2 Bay of Biscay and the Iberian Coast ecoregion – Fisheries overview

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Executive summary

The commercial fisheries in the ecoregion target a wide variety of stocks, resulting in a diverse and spatially varied fishing industry. The countries with the largest landings and effort in the ecoregion are Spain, Portugal, and France, with minor landings from Ireland, Belgium, and the UK. The most common gear used in the area is bottom trawls that target demersal species. The highest landings, however, are taken by midwater trawls mainly targeting species such as blue whiting, mackerel, and to a lesser extent species such as sardine.

Of the wide variety of stocks both targeted and caught as bycatch, 73 stocks are evaluated by ICES for spawning-stock biomass (SSB) size and fishing pressure. Twenty-two stocks have been evaluated against maximum sustainable yield (MSY) reference points for fishing mortality, and 86% of these are fished below F_{MSY} .

In addition to biomass removal, ecosystem effects of fisheries include abrasion, ghost fishing, damage to benthic fauna by demersal trawling, and bycatch of marine mammals, elasmobranchs, and seabirds. Several regulatory and research efforts are in place or are being developed, aimed at reducing the impact of fishing on the ecosystem.

Definition of the ecoregion

The Bay of Biscay and Iberian Coast ecoregion covers the southwestern areas of the EU. It includes areas of the deeper eastern Atlantic Ocean, as well as coastal areas from Brittany in the north to the Iberian Peninsula and Gulf of Cadiz in the south. The following areas constitute this ecoregion:

- Bay of Biscay (divisions 8.a and 8.b, and part of subdivisions 8.d.2 and 8.e.2);
- The Cantabrian Sea (Division 8.c); and
- The western coast of Spain, the Portuguese coast, and the Gulf of Cadiz (Division 9.a and part of Subdivision 9.b.2).

At its southeastern limit, this ecoregion is connected to the Mediterranean Basin by the Strait of Gibraltar. Deepwater currents composed of Mediterranean water have a strong influence on the southwest Iberian and Gulf of Cadiz circulation patterns.

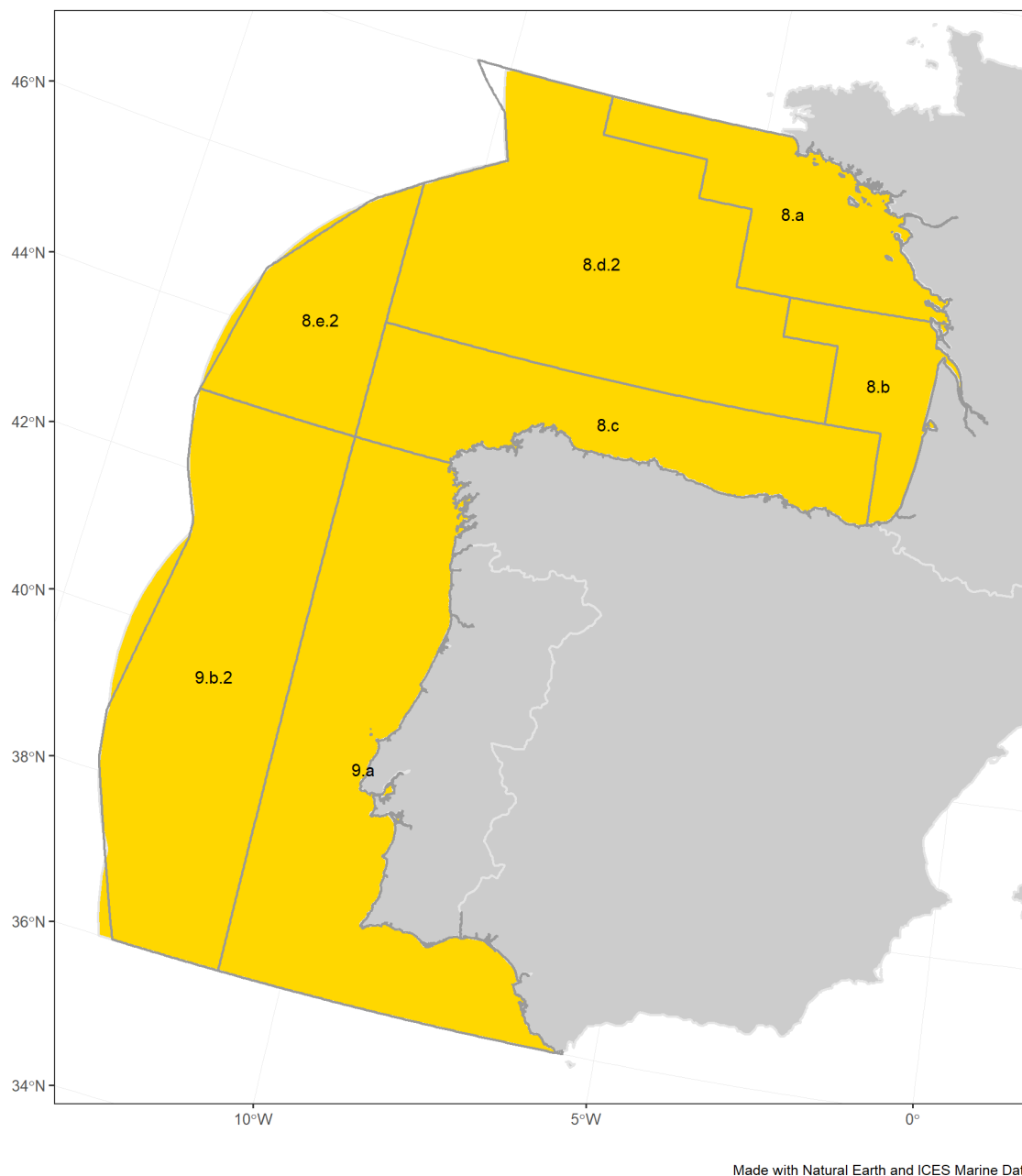


Figure 1 The Bay of Biscay and Iberian Coast ecoregion (highlighted in yellow) and ICES statistical areas.

Who is fishing

Seven nations currently have fisheries targeting the many marine stocks within this diverse and extensive ecoregion. The highest landings are by Spain, Portugal, and France. Lesser amounts are landed by other countries including the Netherlands, Belgium, Ireland, and UK (Figure 2).

Portugal

The fleet is comprised of otter trawls, purse-seine, deep-water longline, and small-scale fisheries; it operates primarily in Division 9.a.

There are 80 bottom otter trawlers; 25 target crustaceans (deep-water rose shrimp and Norway lobster) and blue whiting in deep waters from 200 to 800 m, while 55 catch finfish in waters shallower than 500 m. The majority of the vessels are between 18 and 40 m in overall length, and only eight are smaller than 12 m in length.

The purse-seine fleet predominantly operates at depths between 20 and 100 m, and traditionally target sardine. The fleet comprises around 150 vessels, between 9 and 27 m in overall length. They contribute to more than 50% of the total catch, and mainly harvest sardine, chub mackerel, anchovy, horse mackerel, and blue jack mackerel.

The small-scale fishery is composed of around 2000 vessels smaller than 12 m in length, operating within 30 miles of the Portuguese coast. They are licensed for several gears, namely gillnet (80 mm mesh size), trammelnet (100 mm mesh size), hand- and longlines, pots and dredges, small purse-seines, and other gears. This small-scale fleet catches, among others, hake, anglerfish, octopus, pout, horse mackerel and clams.

A deep-water longline fleet, composed of 15 vessels with an average of 20 m length, operates offshore at the slope at depths ranging from 800 to 1450 m; it targets black scabbard fish.

France

There are around 1500 vessels operating primarily in ICES Subarea 8, representing more than 4000 fishers. 71% of all vessels operate predominantly within the 12 nautical mile limit. Around 1000 vessels operate in Division 8.a, and 500 in Division 8.b. Around 20 vessels operate occasionally in Division 8.c.

The mean size of the vessels is 12 m, while more than 1100 vessels are under 12 m. The main gears used by coastal vessels are nets, lines (longlines and handlines), pots, scoop nets, dredges and bottom trawls. The offshore fishery is mostly carried out by bottom trawlers, netters, and a few longliners. The main species caught by French vessels in the area are hake, anglerfish, sole, sea bass, nephrops, sardines, cuttlefish, albacore, squids, pollack, and anchovy.

Spain

There are around 4500 vessels in this fleet, operating mainly in the Northern Spanish waters. The fleet comprises artisanal vessels, trawlers, purse-seiners, demersal longliners, and gillnetters. Around 4000 vessels are operating in the artisanal fishery (of 7 m average length) using artisanal gears including dredges, trammelnets, gillnets, pots, bottom longline, handline, purse-seine and beam trawl; they are targeting mackerel, clams and octopus. The trawlers (75 vessels of 29 m average length) use bottom- and pairtrawl to target horse mackerel, mackerel, blue whiting, and hake. The purse-seiners (250 vessels of 22 m average length) target mackerel, anchovy, horse mackerel, and sardine. The demersal longliners (55 vessels of 16 m average length) target hake as main species, as well as European conger. The gillnetters (65 vessels of 18 m average length) catch mainly hake and anglerfish.

Around 700 vessels operate mainly in the Gulf of Cadiz Spanish waters. The fleet comprises artisanal vessels, trawlers, and purse-seiners. Around 500 vessels are operating in the artisanal fishery (of 9 m average length) using artisanal gears including dredges, trammelnets, gillnets, bottom longline, and handline; they are targeting blackspot seabream, striped venus, octopus and cuttlefish. The trawlers (130 vessels of 19 m average length) target shellfish and cephalopods. The purse-seiners are composed of 80 vessels of 17 m average length.

The fleets operating in Iberian waters comprise trawlers, trollers, pelagic longliners, and purse-seiners. Around ten vessels are operating in the trawl fishery (of 25 m average length). The trolling fleet targets albacore.

Around 57 vessels operate mainly in the Bay of Biscay. The fleet comprises trawlers and passive gears (bottom longline and gillnet). 15 vessels are operating in the trawler fleet targeting hake, anglerfish, and megrim. 42 vessels use passive gears (mainly bottom longlines and some gillnets) which target hake.

Netherlands

The Netherlands has fishing rights for sole in the Bay of Biscay. In the last two decades, however, the Dutch fleet has not been active in the area. Since the mid-2000s, the Netherlands has been using their fishing rights in the Bay of Biscay for quota swaps with Belgium; the Dutch quota in the Bay of Biscay in exchange for Belgian quota in the North Sea.

Belgium

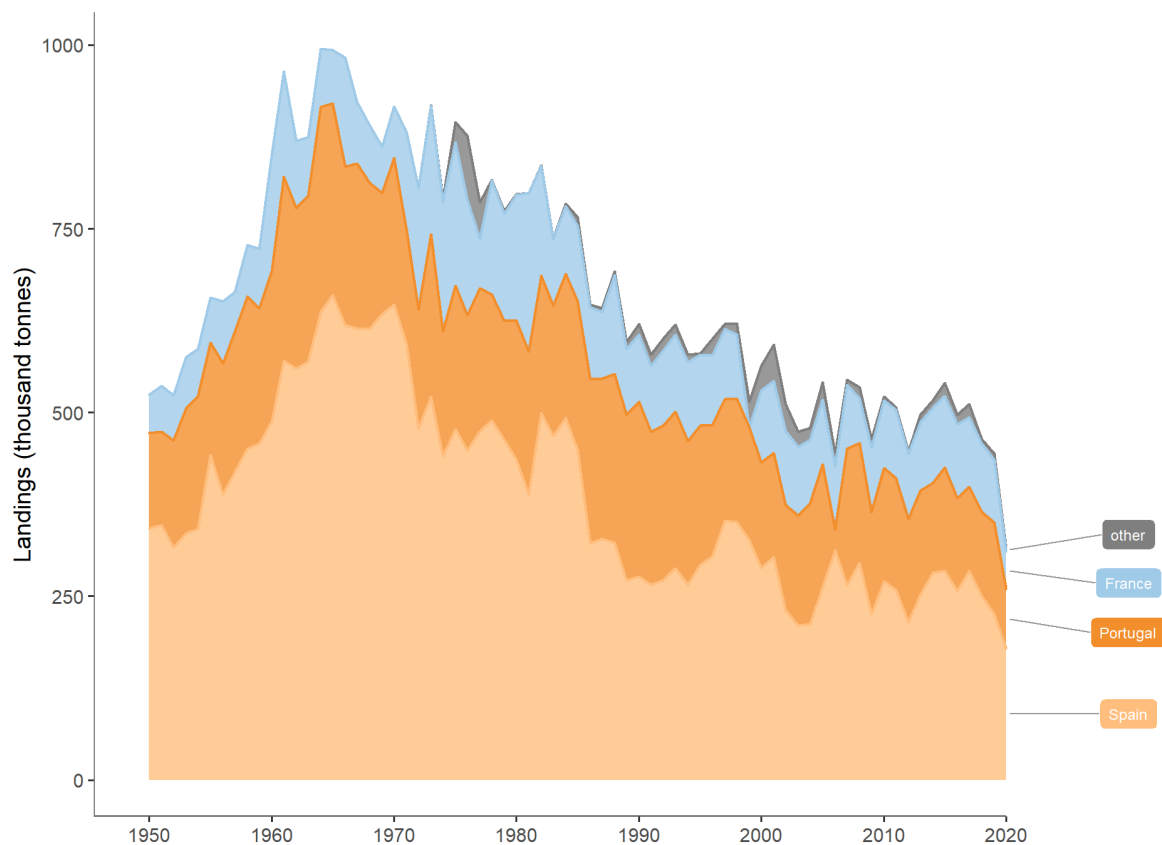
The Belgian fisheries in the Bay of Biscay mainly take place in Division 8.b. There are fifteen vessels operating, all with beam trawl, and the fishery takes place from 1 June to 30 September. The main target species is sole with monkfish as a bycatch species, though monkfish is increasing in importance in the landings.

Ireland

Ireland has four fisheries in this ecoregion. The highest catches are made by around 8 large vessels (> 40 m in length) targeting small pelagic fish, mainly boarfish, horse mackerel, and mackerel. Approximately 40 vessels target albacore tuna, with paired mid-water pelagic trawls in the summer as the fish migrate northward. The gillnet fishery for hake involves around 15 vessels, and there is minor demersal otter trawl activity involving up to eight vessels in Subarea 8.

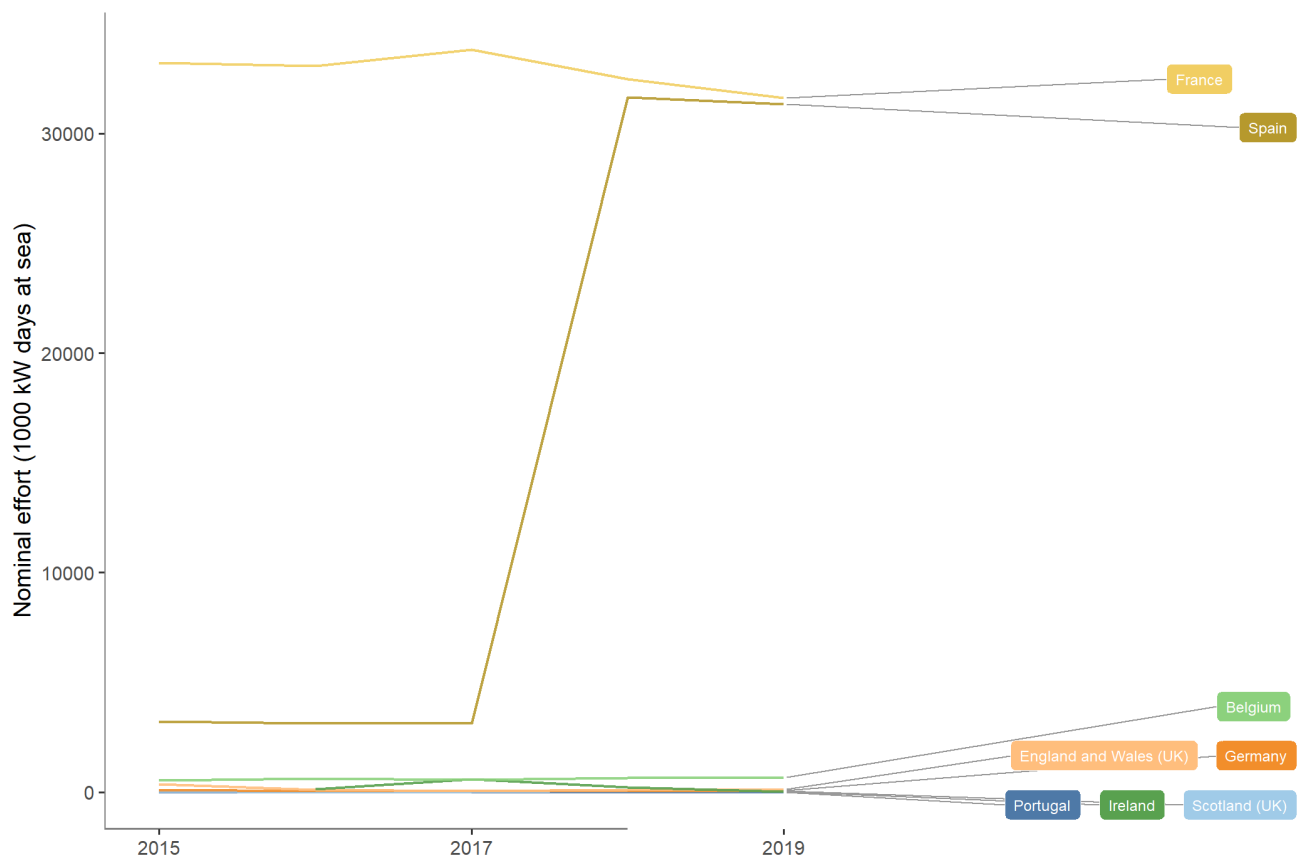
UK

The UK fleet operating in the ecoregion mainly operates in divisions 8.a and b, and further offshore in Division 8.d. The fleet is comprised of pelagic trawlers, gillnetters, and longliners; the fleet size varies, from 7 to 13 vessels over the last 4 years. The pelagic trawlers are the larger of the vessels, with an overall total length of between 50 and 114 m. Pelagic trawlers mainly target mackerel and horse mackerel in divisions 8.a and b. Longliners and gillnetters target a mix of species, and have an overall length of between 20 and 35 m; they operate in both divisions 8.a and 8.b and further offshore in Division 8.d. The main target species of the longliners is hake, whereas gillnetters target hake, anglerfish, and pollack.



Historical Nominal Catches 1950-2010,
Official Nominal Catches 2006-2019
Preliminary Catches 2020
ICES, Copenhagen.

Figure 2 Landings (thousand tonnes) from ICES subareas 8 and 9, between 1950 and 2020. The three countries with the highest landings over the period are shown individually, while the remaining countries are aggregated and displayed as “other”.



STECF. Accessed October/2021.

Figure 3 ICES subareas 8 and 9. Fishing effort (1000 kW days-at-sea) in 2015–2019 for EU Member States. Some confidential values reported by France, Belgium, and Ireland.

Catches over time

In the descriptions below, the term “landings” is used because the analyses are based on landings reported in logbooks.

Landings in the ecoregion are variable, but showed an increasing trend over the period from 1950 to 1960 before a general decline to recent levels (Figure 2). The total landings comprise a large mix of pelagic, demersal, benthic, and shellfish species, with pelagic fisheries contributing the highest proportion. The number of species landed by the different nations makes this a very rich and diverse ecoregion, and not all species could be displayed in the figure, resulting in a very large combined “Undefined” category (Figure 4).

Of the species presented in Figure 4, sardine gives the highest proportion of the total landings, followed by blue jack and horse mackerel; these are all pelagic species. Sardine landings are showing a decreasing trend since the 80’s whereas the other main species landings fluctuate without trends (Figure 5). Other notable species in the area include mackerel, hake, and anchovy. As a large proportion of the landings are comprised of pelagic species, it follows that the pelagic gears also give the highest landings (Figure 6). Static gears such as nets, lines, and pots are also important in this ecoregion.

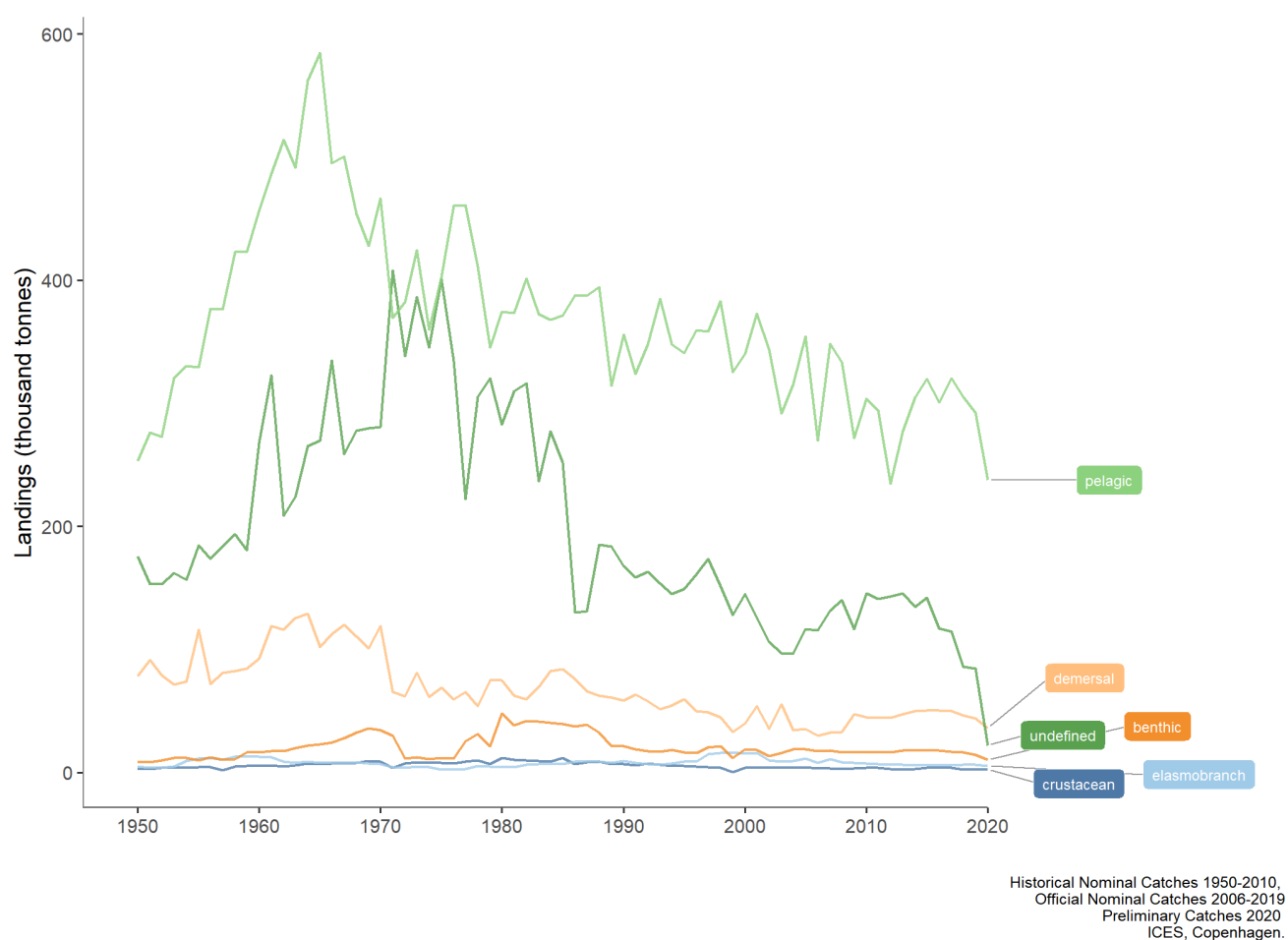


Figure 4 Landings (thousand tonnes) from ICES subareas 8 and 9 in 1950–2020, by fisheries guild. Table A1 in the Annex details the species that belong to each fish category.

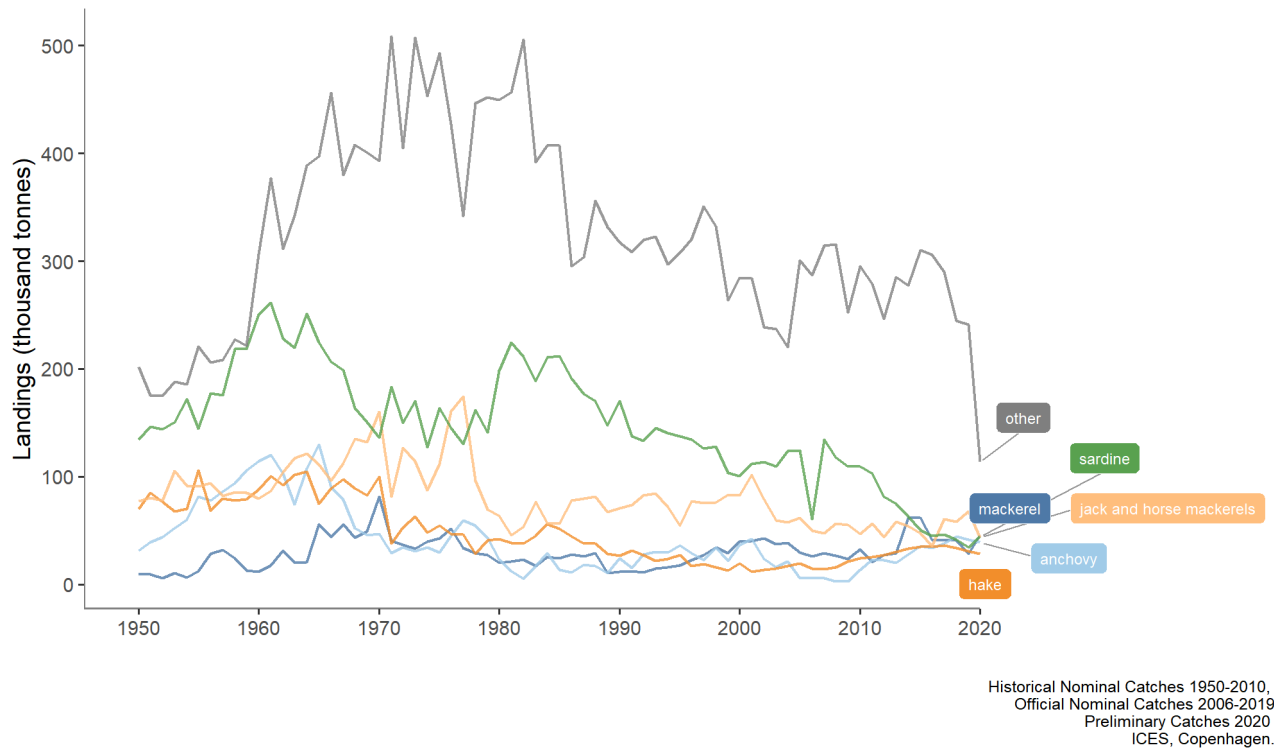
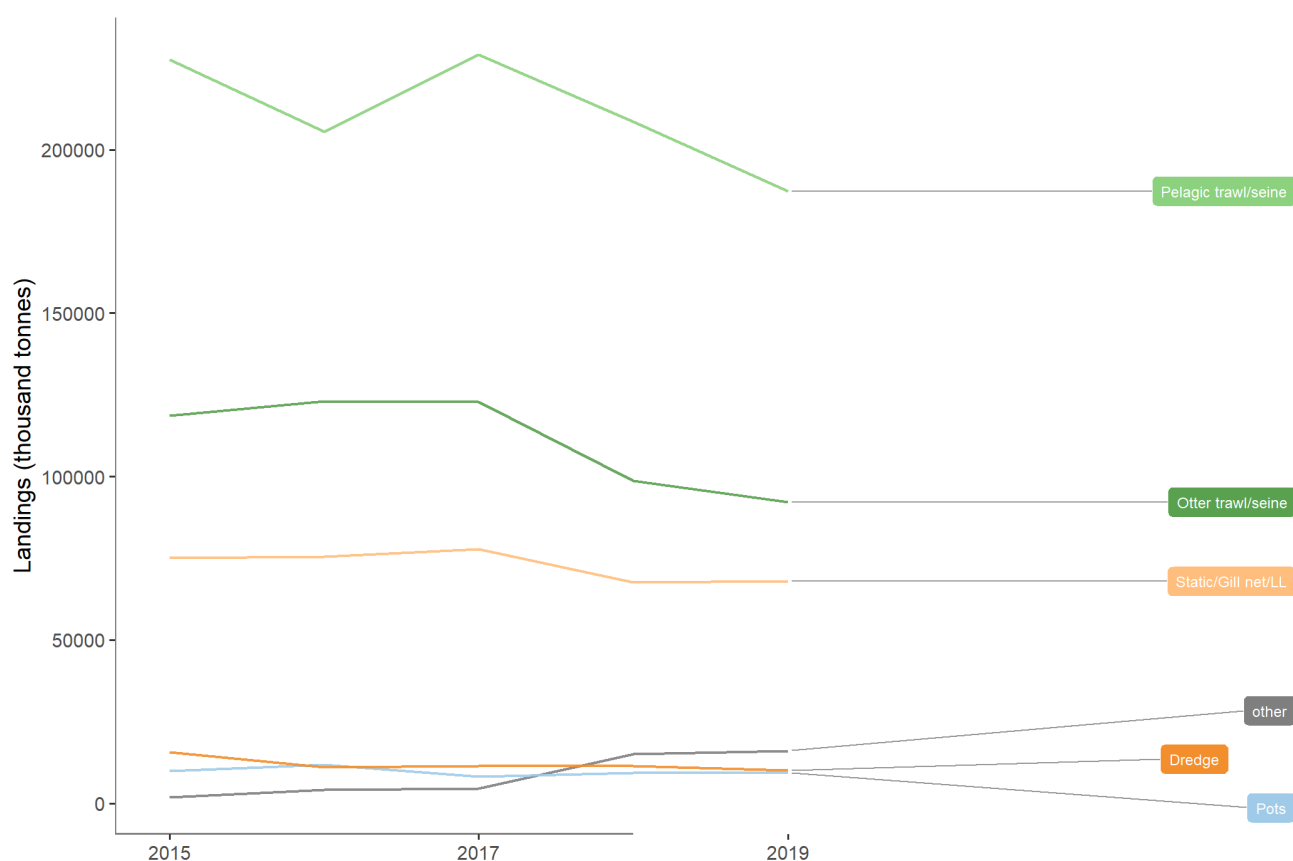


Figure 5 Landings (thousand tonnes) from ICES subareas 8 and 9 in 1950–2020, by species. The species groupings with the highest cumulative landings over the entire time-series are displayed separately; the remaining species are aggregated and labelled as “other”.



STECF. Accessed October/2021.

Figure 6 Commercial landings (thousand tonnes) from ICES subareas 8 and 9 2015–2019, by gear type for EU Member States. Some confidential values reported by France, Belgium, and Ireland.

Discards

The percentage of pelagic species discarded is estimated to be very low (Figure 7), with very high catches. Discards of demersal and benthic species are around 10%, whereas the discard rate for crustacean is higher at around 20%. The EU landing obligation for pelagic species came into force in 2015, while for demersal stocks it has come into force incrementally since 2016. Discard estimates for several species of elasmobranch are highly uncertain due to low encounter probabilities, and are so not shown here.

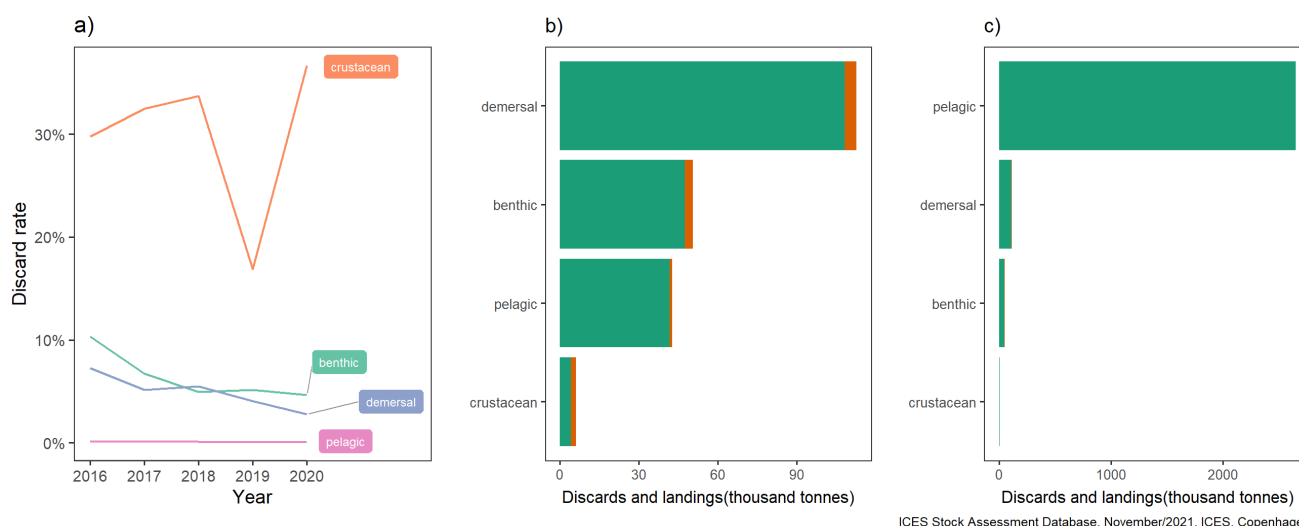
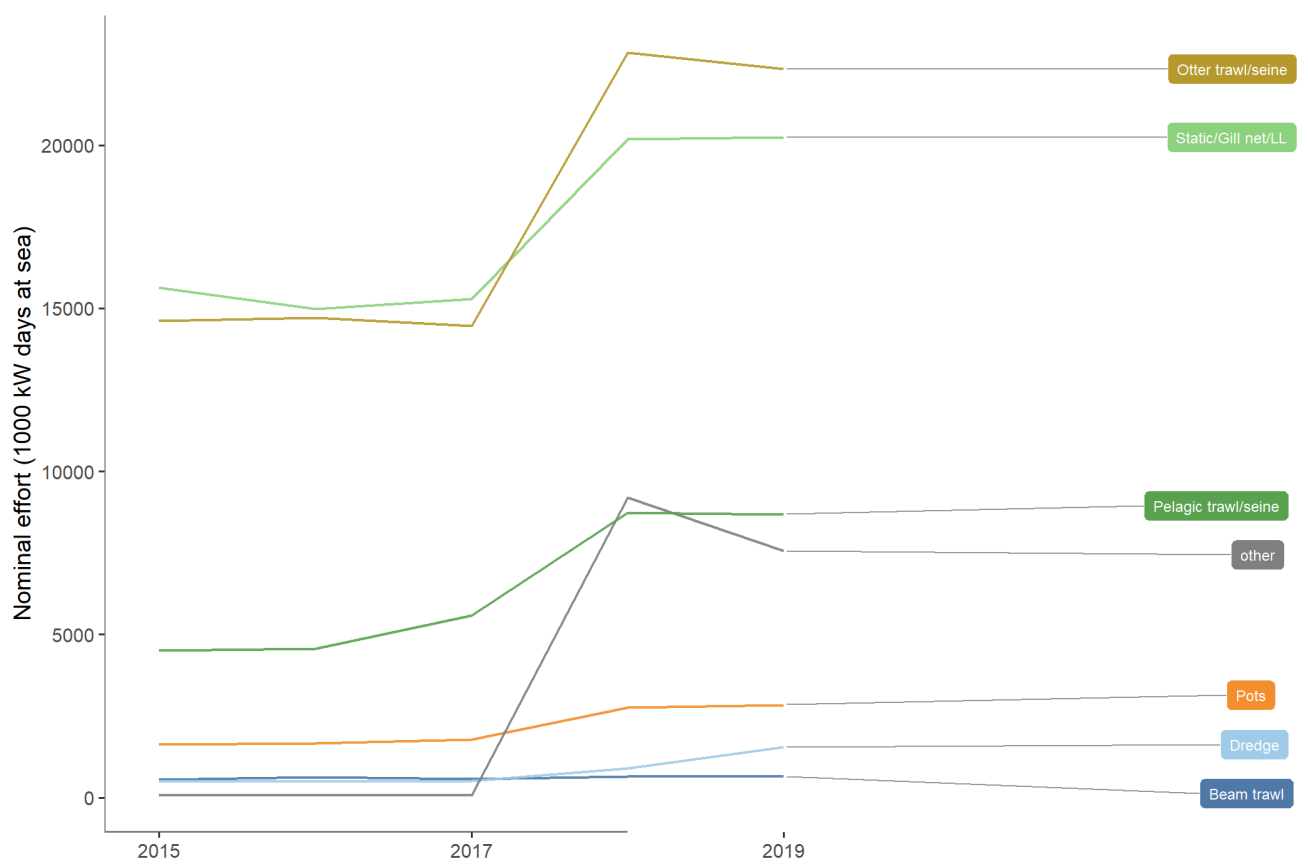


Figure 7 ICES subareas 8 and 9. Left panel (a): discard rates 2016–2020 by fish category, shown as percentages (%) of the total annual catch in that category. Middle panel (b): landings (green) and discards (orange) in 2020 by fish category (in thousand tonnes) only of those stocks with recorded discards. Right panel (c): landings (green) and discards (orange) in 2020 by fish category (in thousand tonnes) of all stocks, including stocks with zero discards or without discard information. There is uncertainty over the elasmobranch data, so they are not presented here.

Description of the fisheries

Fisheries operating within the Bay of Biscay and Iberian Coast Ecoregion catch a wide range of different species, including those considered to be demersal, pelagic, wide-ranging and deep sea. Various elasmobranch species are also caught.

Demersal otter trawls account for a large proportion of the fishing effort in the ecoregion, followed by static gears. Demersal trawls have shown a decline in recent years, but still operate throughout the shelf areas of the ecoregion (Figure 8). Static gears also operate throughout the shelf area, but there are some instances of them operating further offshore. The increase in 2018 is due to the increase in Spanish effort reported (Figure 2). Reported effort is consistent since 2018.



STECF. Accessed October/2021.

Figure 8 ICES subareas 8 and 9. Fishing effort (thousand kW days-at-sea) in 2015–2019 by EU vessels, by gear type. Some confidential values reported by France, Belgium, and Ireland.

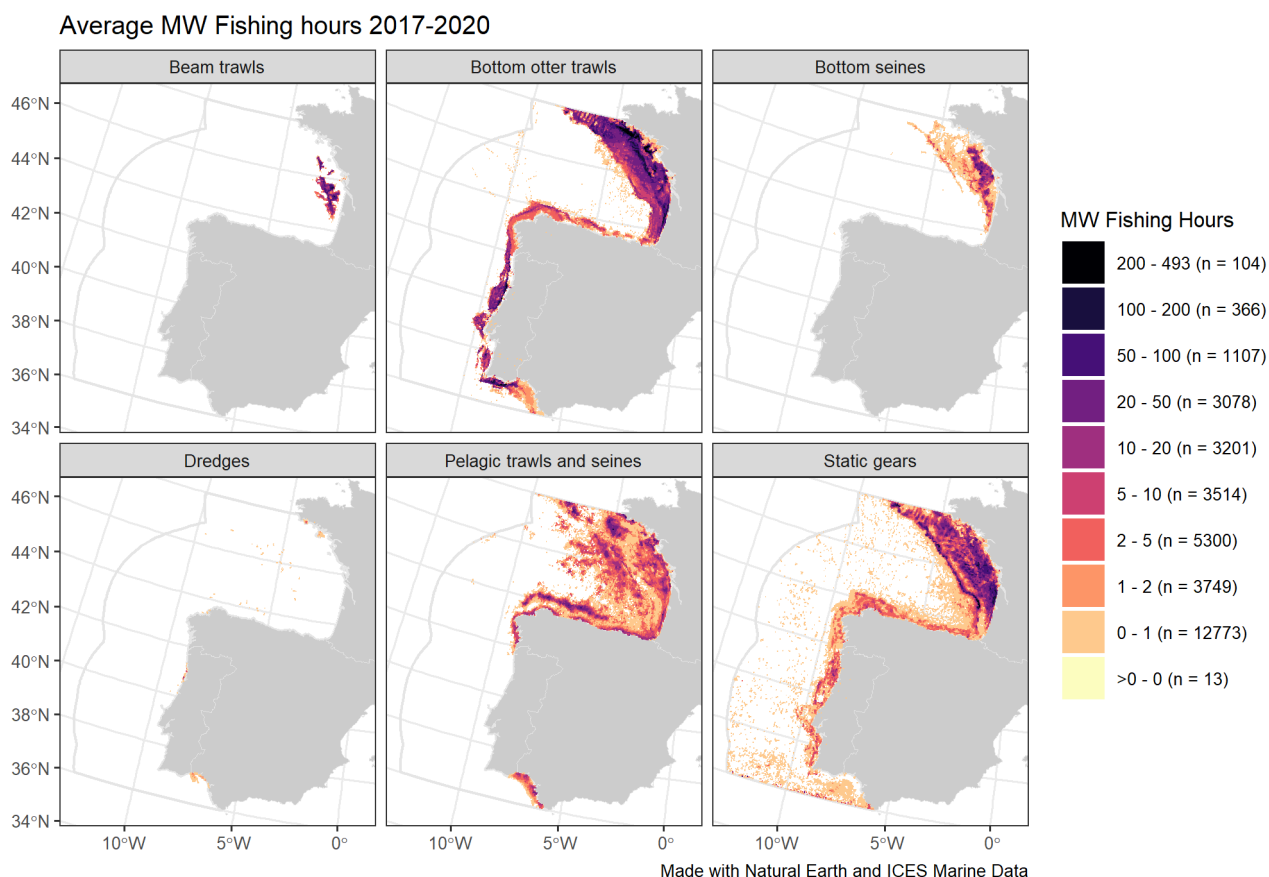


Figure 9 Spatial distribution of average annual fishing effort (mW fishing hours) in the Bay of Biscay and Iberian Coast ecoregion, by gear type. Fishing effort data are only shown for vessels > 12 m in length that have vessel monitoring systems (VMS); this will bias the distributions, particularly in coastal areas. Portuguese purse-seine data is not available.

Otter trawl

Otter trawl is the main gear used in demersal fisheries in the ecoregion. The species caught depends on the area and on the range of depths range fished, as well as on the cod-end mesh size, but in all cases the catches consist of a mixture of different species.

Hake is an important target species; other species caught as targets in these fisheries are anglerfishes, megrims, Norway lobster, horse mackerel, mackerel, blue whiting, sea bass, pollack and red mullet. This targeting typically utilizes, although not exclusively, 70–100 mm mesh; other species taken as bycatch in relatively low levels include cuttlefish and squids.

Gillnet fisheries

Three fleets of gillnetters operate within the Iberian Coast area. A fleet called *Beta* uses a mesh size of 60 mm targeting hake, while the *Volanta* fleet uses a mesh size of 90 mm and also targets hake. The *Rasco* fleet uses a mesh size of 280 mm for targeting anglerfish.

In the Bay of Biscay, the main gillnet fishery involving Spanish and French vessels targets hake along the continental slope. In shallower waters, target species include sole and sea bass.

Purse-seiners

Purse-seiners in the ecoregion are mainly targeting sardine, anchovy and chub.

Longline and line fisheries

Longliners target hake along the continental slope, with bycatches of deep-water species.

Pelagic trawls

The pelagic trawls are mainly targeting anchovy and sardine in divisions 8.a–b.

Artisanal

Artisanal fisheries are small-scale inshore fisheries targeting demersal, benthic, and crustacean stocks. As well as those stocks assessed by ICES, a number of non-assessed stocks are targeted throughout the ecoregion. These include, for example dredging for shellfish such as a mix of clam species, cockles, and oysters. There are also important pot and trap fisheries for crabs and octopus. Some coastal waters in the ecoregion have fisheries targeting resident immature European eels or migrating spawners. In addition, in some transitional waters there are also fisheries targeting resident or migrating European eel.

Fisheries management measures

The ecoregion includes all or parts of the Exclusive Economic Zones (EEZs) of three current EU Member States (France, Spain, and Portugal). Within EU waters, management is conducted in accordance with the EU Common Fisheries Policy (CFP), and catching opportunities for stocks under EU competency are agreed upon during meetings of the Council of Ministers. Under the CFP's regionalization policy, proposals on certain issues (for example discard plans) are made by the South Western Waters Regional Fisheries Group. National authorities manage activities in coastal waters (i.e. within 12 nautical miles). The fisheries for some stocks are managed based on agreements by the North East Atlantic Fisheries Commission (NEAFC) and by coastal states. Salmon fisheries are managed nationally, based on agreements at the North Atlantic Salmon Conservation Organization (NASCO), and fisheries for large pelagic fish are managed based on agreements at the International Commission for the Conservation of Atlantic Tunas (ICCAT). International fisheries advice is provided by the International Council for the Exploration of the Sea (ICES), the European Commission's Scientific Technical and Economic Committee for Fisheries (STECF), and the Standing Scientific Committee of ICCAT.

Total allowable catch (TAC) is the main fishery management tool in the ecoregion. These were introduced for most stocks in the 1980s, but the TACs (and quotas) were generally not restrictive until the early 1990s. The 2013 reform of the Common Fisheries Policy aimed to eliminate discarding through the introduction of the EU landing obligation (LO). The LO was introduced for pelagic species in 2015 and has been phased in for demersal TAC species since 2016. From 2019 the LO will apply to all TAC species, although there are some exemptions.

A new multiannual plan (MAP) was implemented in 2019 for 11 management units/stocks. The objectives of the plan are to minimize bycatch and the fishing impacts on the marine ecosystem, and to contribute to the elimination of discards as well as encompassing the CFP objectives and MSY approach.

A large number of technical measures are in place. These include measures to improve the selectivity of towed gears (partly in order to reduce bycatch) and gear restrictions.

Spatial management also occurs, both for fisheries and for ecosystem reasons. Closed areas/seasons are used to protect spawning and juvenile fish, for example. Protected areas have also been designated for habitats and species listed by EU Nature Directives. Fishery regulations are in place to restrict certain fisheries that may affect vulnerable habitats.

Status of the resource

Within ICES, the scientific assessments of the stocks relevant to this ecoregion are the responsibility of several expert groups, namely WGBIE, WGWIDE, WGHANSA, WGDEEP and WGEF.

Within these groups fishing mortalities and spawning-stock sizes have been evaluated against maximum sustainable yield (MSY) and precautionary approach (PA) reference points; the status of these stocks has also been assessed relative to safe biological limits, i.e. $F < F_{pa}$ and $SSB > B_{pa}$ (Figure 10). 30% of the stocks have full analytical assessment. Around 85% of the stocks with full analytical assessments, reference points and forecast are fished at or below F_{MSY} target levels.

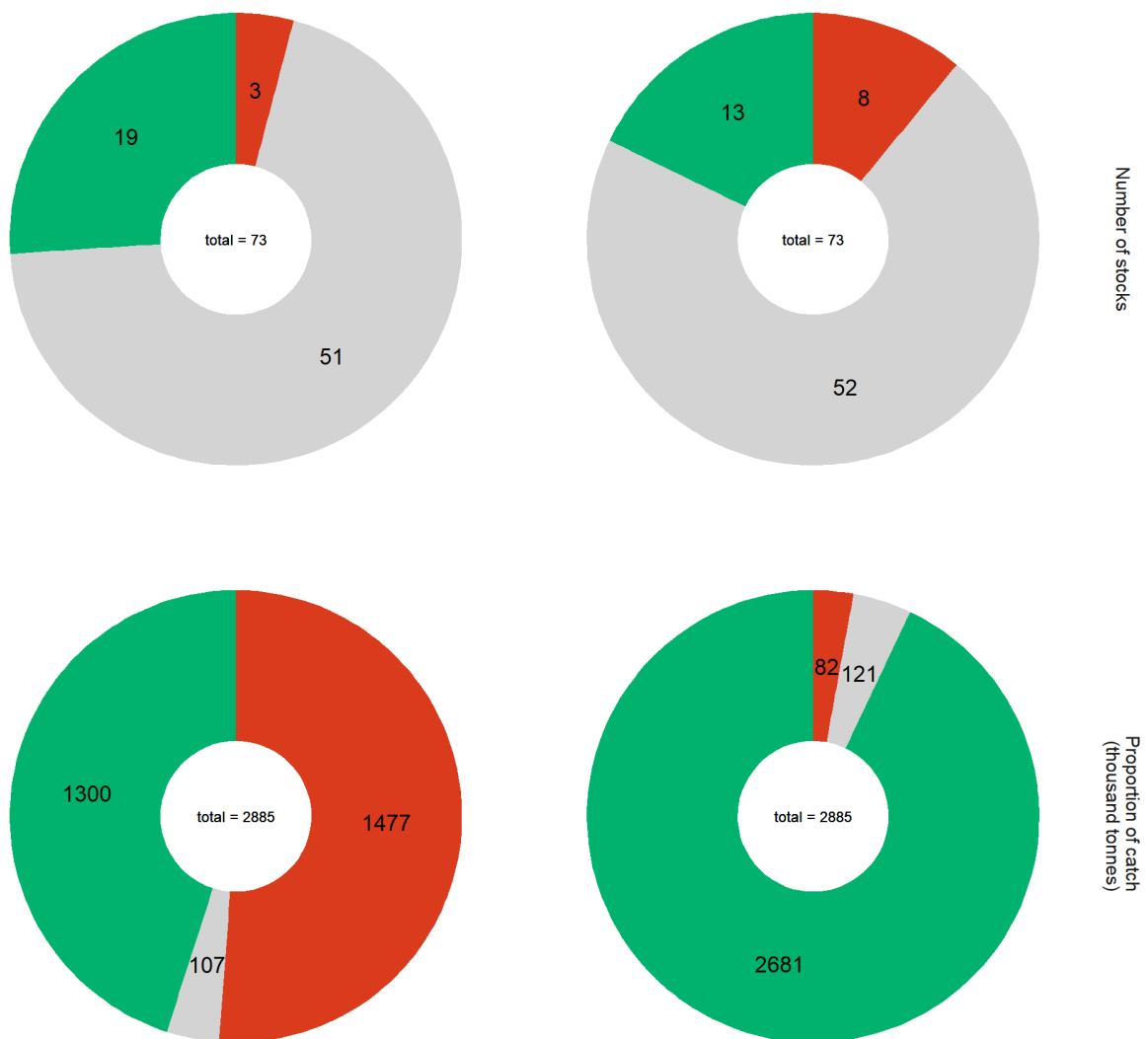


ICES Stock Assessment Database, November 2021. ICES, Copenhagen

Figure 10

Status summary of Bay of Biscay and Iberian Coast stocks in 2021, relative to ICES maximum sustainable yield (MSY) approach and precautionary approach (PA [excluding European eel, salmon, and sea trout]). Grey represents unknown reference points. *For the MSY approach:* green represents a stock that is either fished below F_{MSY} or where its size is greater than $MSY B_{trigger}$; red represents a stock that is either fished above F_{MSY} or where its size is lower than $MSY B_{trigger}$. *For the PA:* green represents a stock that is fished at or below F_{pa} while its size is equal to or greater than B_{pa} ; orange represents a stock that is either fished between F_{pa} and F_{lim} or where its size is between B_{lim} and B_{pa} ; red represents a stock that is fished above F_{lim} or where its size is less than B_{lim} . Stocks with a fishing mortality at or

below F_{pa} and a stock size above B_{pa} are defined as being inside safe biological limits. If this condition is not fulfilled, the stock is defined as being outside safe biological limits. For stock-specific information, see Table A1 in the Annex.



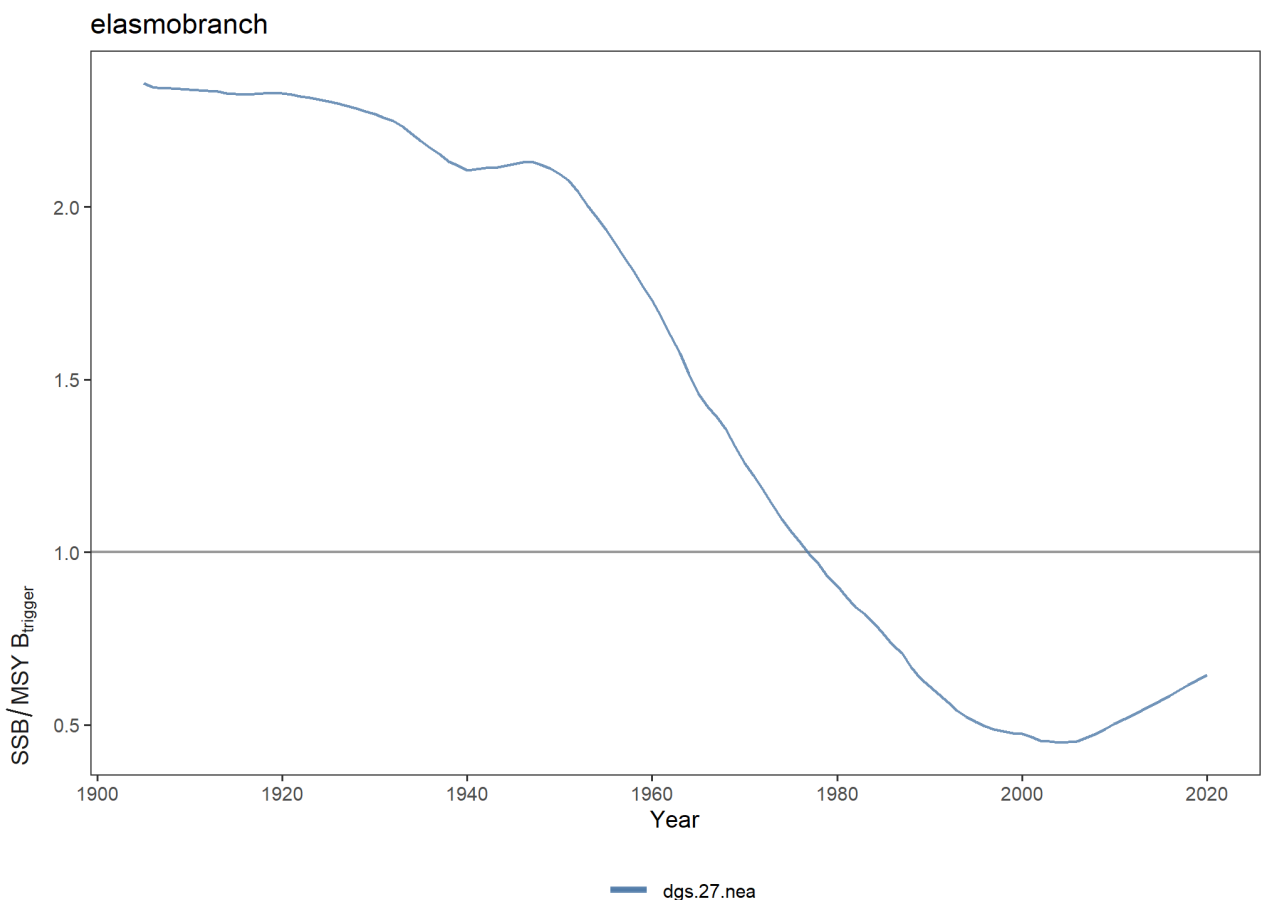
ICES Stock Assessment Database, November 2021. ICES, Copenhagen

Figure 11

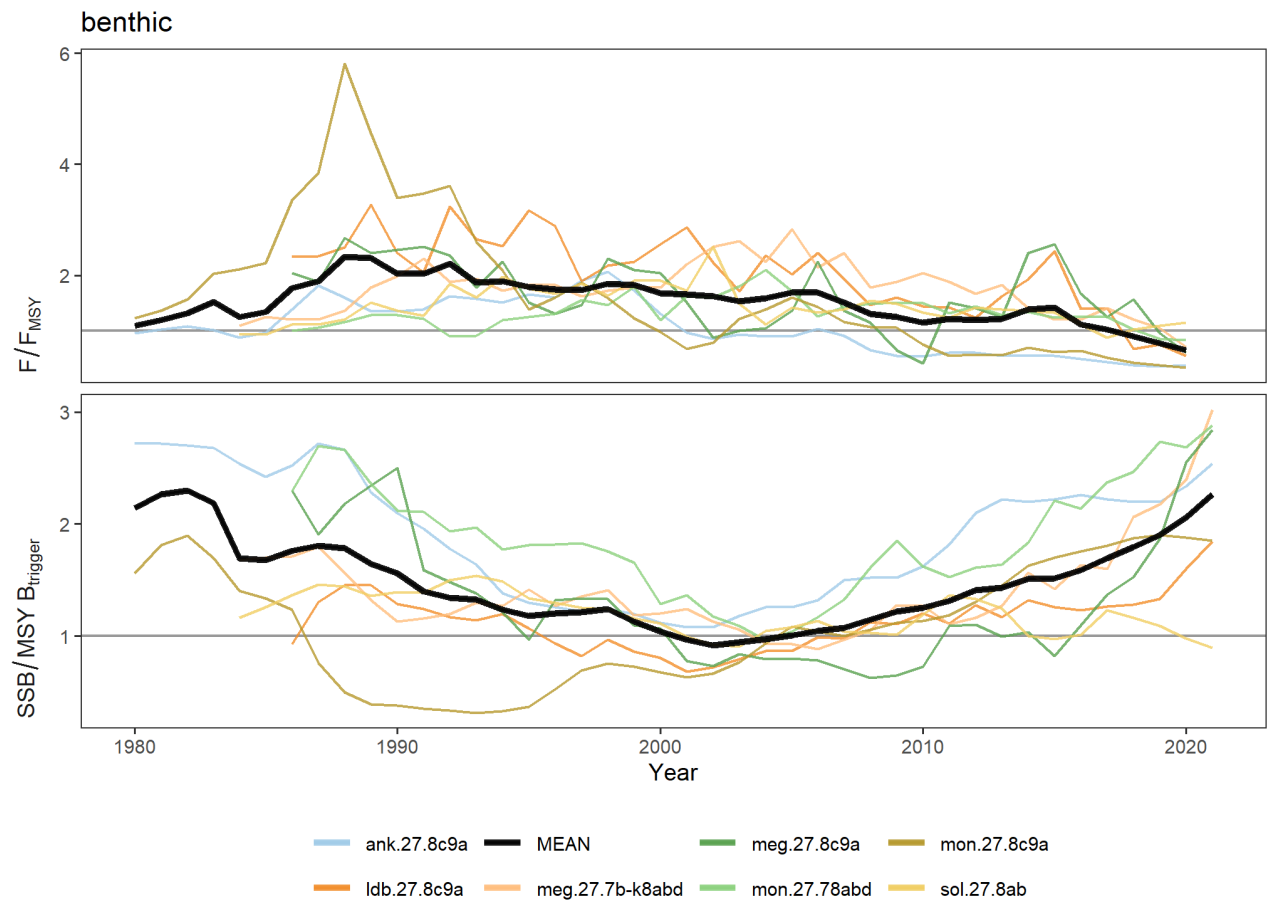
Status summary of Bay of Biscay and Iberian Coast stocks in 2021, relative to the EU Marine Strategy Framework Directive (MSFD) assessment criteria of the level of pressure of fishing activity (D3C1) and reproductive capacity of the stock (D3C2). Green represents the proportion of stocks that are either fished below F_{MSY} or where the stock size is greater than $MSY B_{trigger}$, for criteria D3C1 and D3C2. Red represents the proportion of stocks that are either fished above F_{MSY} or where the stock size is lower than $MSY B_{trigger}$, for criteria D3C1 and D3C2. Grey represents the proportion of stocks without MSY reference points. For stock-specific information, see Table A1 in the Annex.

ICES provided advice in 2021 on 73 stocks within the Bay of Biscay and Iberian Coast ecoregion. These are categorized into: ten benthic, six crustacean (*Nephrops*), 20 demersal, 26 elasmobranch, and 11 pelagic stocks. Out of these categories the pelagic, *Nephrops*, and benthic stocks are the best known, as they have the highest number of quantitative assessments with forecasts (ICES data category 1 stocks). Approximately 85% of stocks with full analytical assessment are sustainably fished (i.e. D3C1 where $F < F_{MSY}$); these account for 45 % of the total landings (Figure 11). For other groups, such as the elasmobranchs, there is a more limited knowledge base. These limited data mean there can be no forecasts, so these stocks are placed in ICES categories 3, 5, and 6. While these “data-limited stocks” account for a large proportion of stocks (70%), they only account for 4% of the total landings (Figure 11). Around 60 % of the stocks with full analytical assessment were assessed to be above $MSY B_{trigger}$ (D3C2); these accounted for around 92% of the total biomass caught.

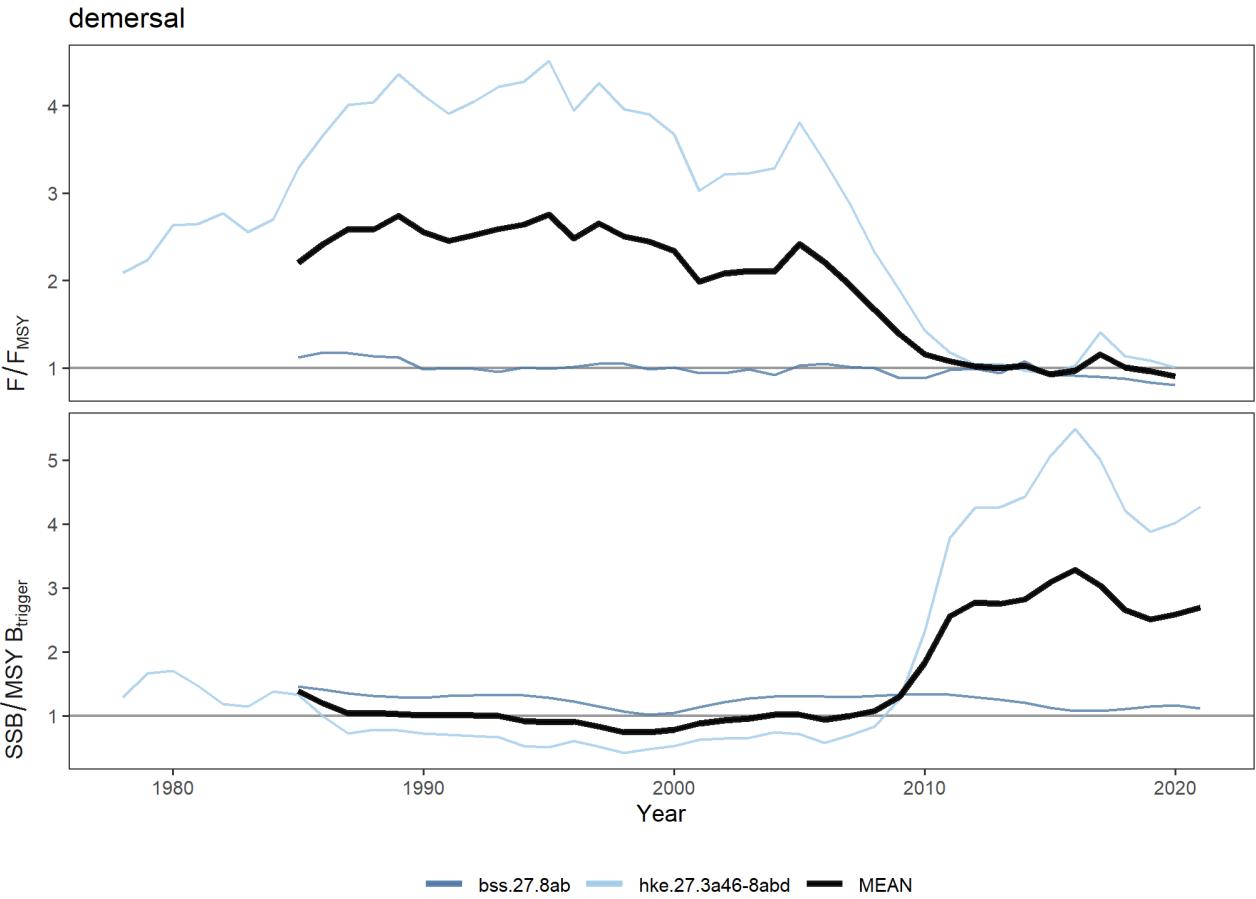
A declining trend in the fishing mortality ratio for category 1 stocks is shown for both demersal and crustacean stocks since the late-1990s (Figure 12), as well as for the benthic stocks to a lesser extent. The mean fishing mortality is now at or below the F_{MSY} target. The SSB ratio shows an increasing trend over the same period, and the mean values are now above $MSY B_{trigger}$, with the exception of the elasmobranch. Note that although the mean fishing mortality and biomass ratios are in a desirable condition for most species categories, this does not imply that all stocks are in that condition.



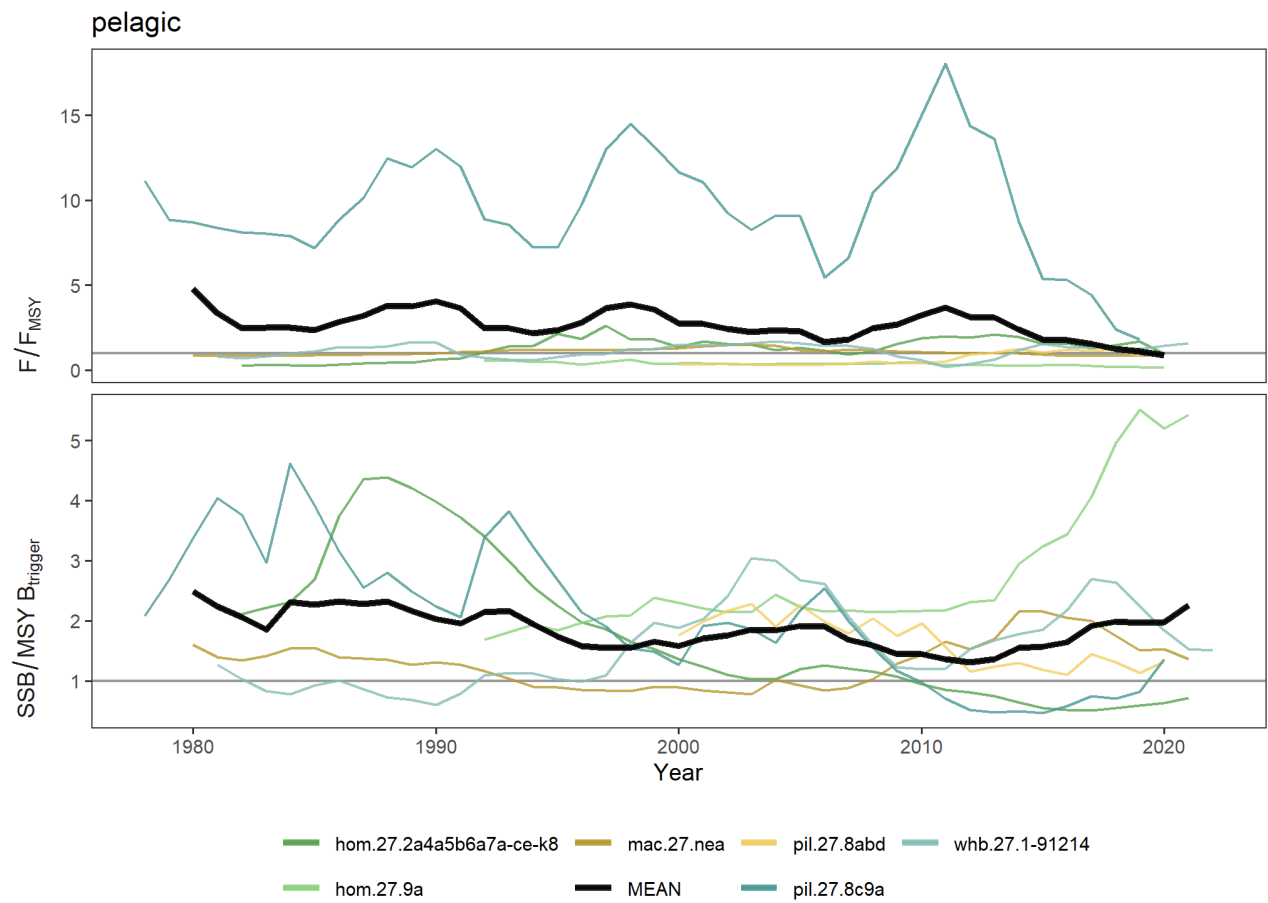
ICES Stock Assessment Database, November/2021. ICES, Copenhagen



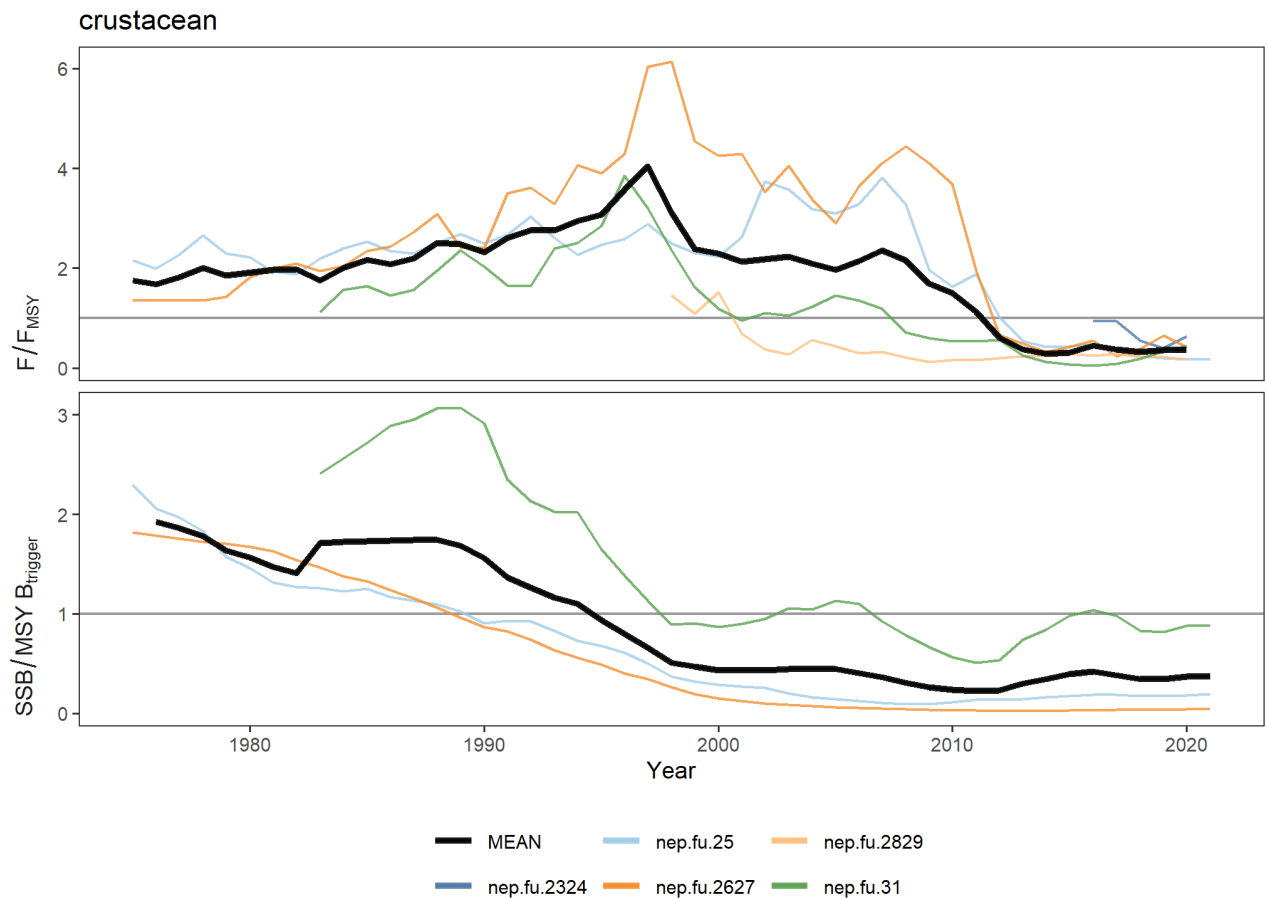
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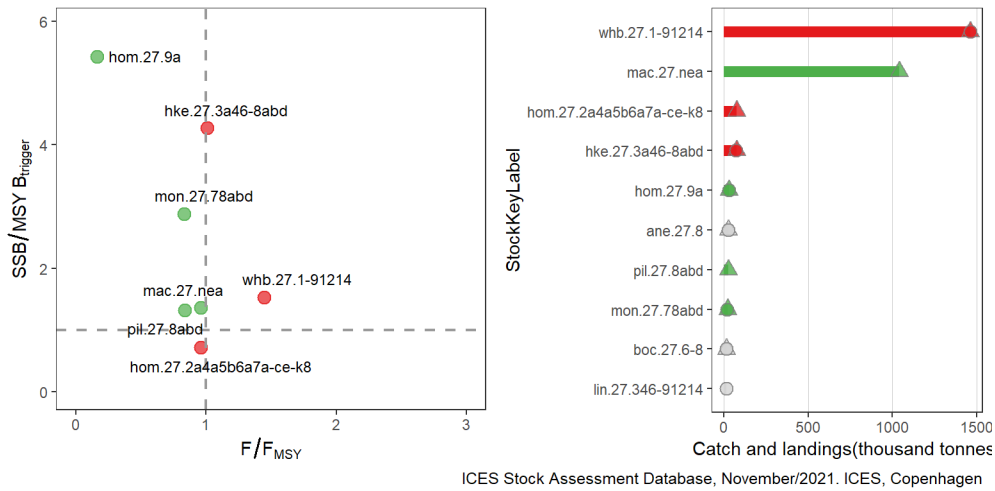


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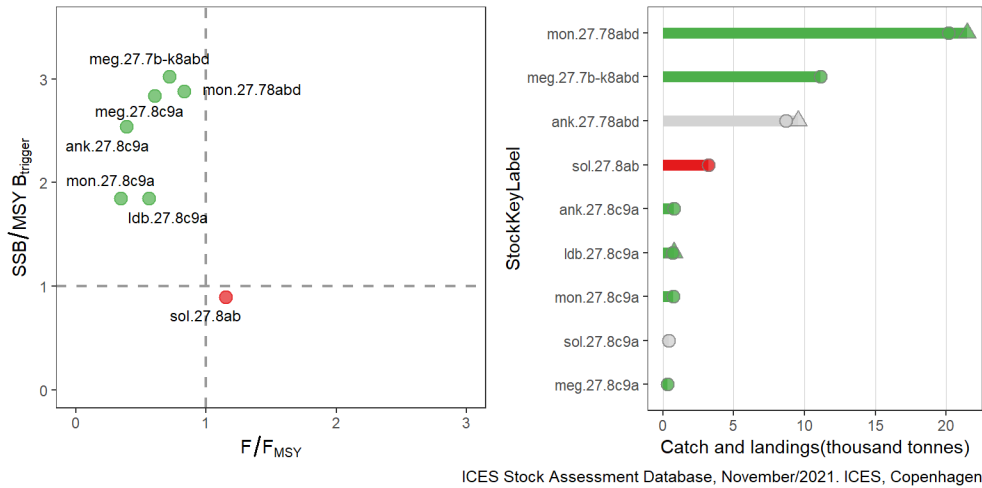
Figure 12 Temporal trends in F/F_{MSY} and $SSB/MSY B_{trigger}$ for Bay of Biscay and Iberian Coast benthic, crustacean, demersal, and pelagic stocks. Only stocks with defined MSY reference points are considered. Stocks for which only proxy reference points are available are not shown. For full stock names, see Table A1 in the Annex.

The stock status relative to F_{MSY} and $MSY B_{trigger}$ are shown for stocks with reference points and partitioned by stock groups in Figure 13. This figure shows that the horse mackerel stock in Division 9.a has the best status among all stocks (almost six times $MSY B_{trigger}$ and fished below F_{MSY}). Sardine in divisions 8.c and 9.a has the worst status, being fished almost two times higher than F_{MSY} . Blue whiting and mackerel account for the highest landings, but most of the landings of these stocks are not made in this ecoregion. In general, the benthic stocks have a better stock status than the other stock groups.

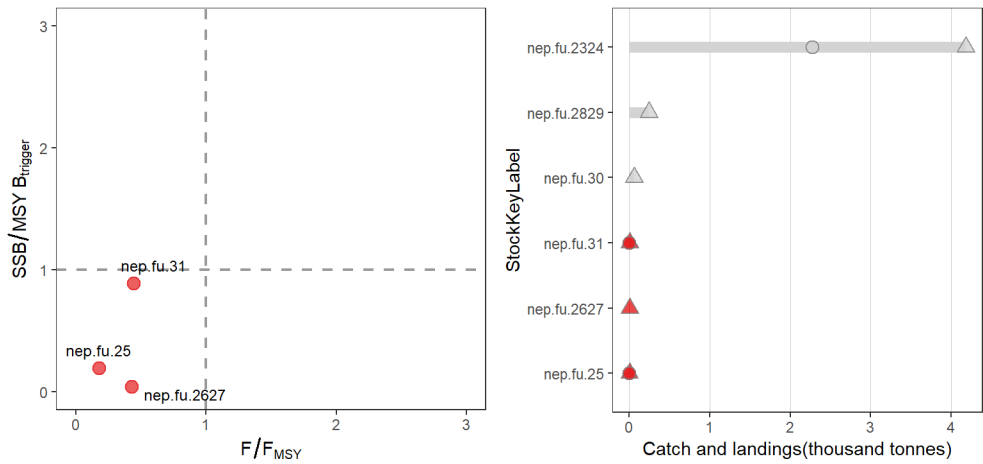
All stocks



benthic

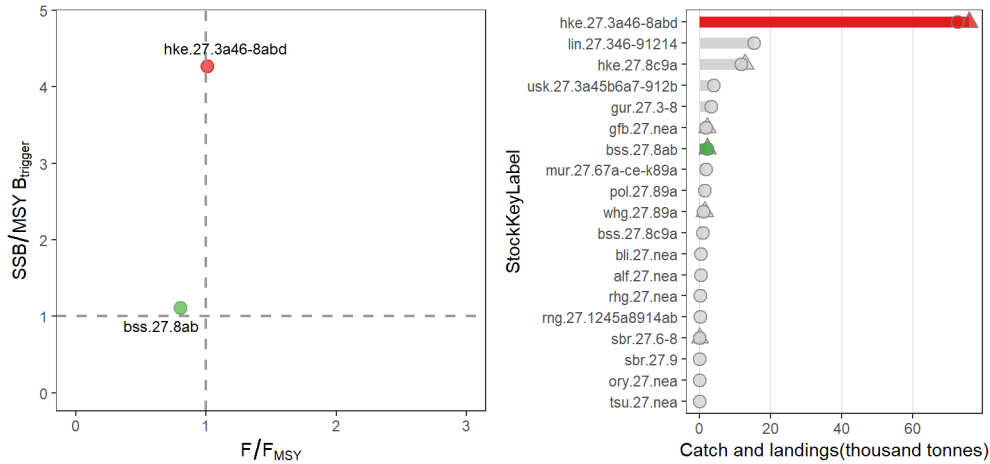


crustacean



ICES Stock Assessment Database, November/2021. ICES, Copenhagen

demersal



ICES Stock Assessment Database, November/2021. ICES, Copenhagen

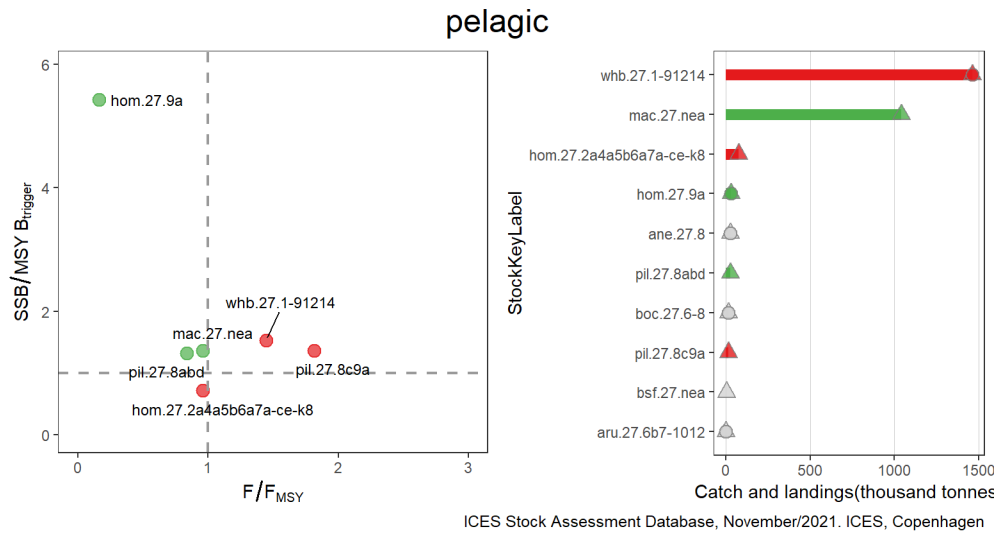


Figure 13 Status of Bay of Biscay and Iberian Coast stocks relative to the joint distribution of exploitation (F/F_{MSY}) and stock size ($SSB/MSY B_{trigger}$) [left panels, by individual stocks] and catches (triangles)/landings (circles) from these stocks in 2021 [right panels]. The left panels only include stocks for which MSY reference points have been defined (MSY where available). Stocks for which only proxy reference points are available are not shown on the left plots. Stocks in green are exploited at or below F_{MSY} while their size is at or above $MSY B_{trigger}$. Stocks in red are either exploited above F_{MSY} or their size is below $MSY B_{trigger}$, or both. Stocks in grey have unknown/undefined status in relation to reference points. “All stocks” refers to the ten stocks with highest catch and landings across fisheries guilds in 2020. For full stock names, see Table A1 in the Annex.

European eel cannot be assessed against any PA or MSY reference points. Recruitment of European eel has declined sharply in recent decades because of a range of potential threats.

Mixed-fisheries

Mixed-fisheries advice

The Iberian Coast

Mixed-fisheries advice in 2021 is presented for black-bellied anglerfish (ank.27.8c9a), hake (hke.27.8c9a), four-spot megrim (lbd.27.8c9a), megrim (meg.27.8c9a), and white anglerfish (mon.27.8c9a) in the Atlantic Iberian waters. Based on mixed-fisheries considerations and single-stock catch advice, hake is the most limiting stock for Atlantic Iberian waters demersal fisheries, corresponding to an undershoot of the advised catch for the other stocks considered in the mixed-fisheries analysis. Conversely, anglerfish stocks are the least limiting stocks, corresponding to an overshoot of the advised catch for the other stocks. If fleets set their effort in order to catch their anglerfish stock shares, overshoot and reduction of SSB is more noticeable in hake and the four-spot megrim stock, possibly due to an increased technical interaction between this species and the anglerfish stocks.

Bay of Biscay

Mixed-fisheries advice in 2021 is presented for black-bellied anglerfish (ank.27.78abd), hake (hke.27.3a46-8abd), horse mackerel (hom.27.2a4a5b6a7a-ce-k8), mackerel (mac.27.nea), megrim (meg.27.7b-k8abd), white anglerfish (mon.27.78abd), Norway lobster (nep.fu.2324), pollack (pol.27.89a), smooth-hound (sdv.27.nea), sole (sol.27.8ab), blue whiting (whb.27.1-91214), and whiting (whg.27.89a). Based on current fishing patterns and single-stock catch advice, the most limiting stock for Bay of Biscay demersal fisheries is pollack, whose quota is first reached for 15 of 22 defined fleets. The least limiting stock is black-bellied anglerfish (11 of 22 fleets).

Mixed-fisheries description

Fishing operations typically catch more than one species at a time (mixed-fisheries), although some gears are more selective than others. Pelagic trawling and purse-seining, for example, typically only catch one species with small proportions of bycatch; gillnetters and longliners catch few species, while demersal trawling catch several species simultaneously.

In the Bay of Biscay and Iberian waters, fisheries target a large range of species with different gears. Trawl fisheries (using otter, beam or pelagic trawls) take place for *Nephrops*, hake, anglerfishes, megrims, sole, and sea bass as well as some pelagic species (blue whiting, mackerel, and horse mackerel) and cephalopods (cuttlefish and squid). Gillnet fisheries target sole, hake, pollack, sea bass, and anglerfishes, while longline fisheries target mainly hake. In the Bay of Biscay, the fisheries are mainly carried out by French and Spanish vessels, though some Belgian beam trawl vessels target sole and, in Iberian waters, by Portuguese and Spanish vessels, with a small participation of French vessels.

Analyses of the Spanish demersal fleets in divisions 8.c and 9.a show that the main target species are hake, anglerfishes, megrims, *Nephrops*, horse mackerel, mackerel, and blue whiting. Three pelagic/semi-pelagic species (blue whiting, mackerel, and horse mackerel) constitute 65% of the total landings in these demersal métiers (Figure 14). The same type of analysis performed for the Portuguese demersal métiers indicate that the most important species caught by the demersal fish trawlers are horse mackerel, blue whiting, and hake. The crustacean trawlers target mainly Norway lobster, rose shrimp, and blue whiting. Hake, anglerfishes, sole, and rays are present in trawl catches but they are mainly caught by artisanal métiers using gill- and trammelnets (Figure 15).

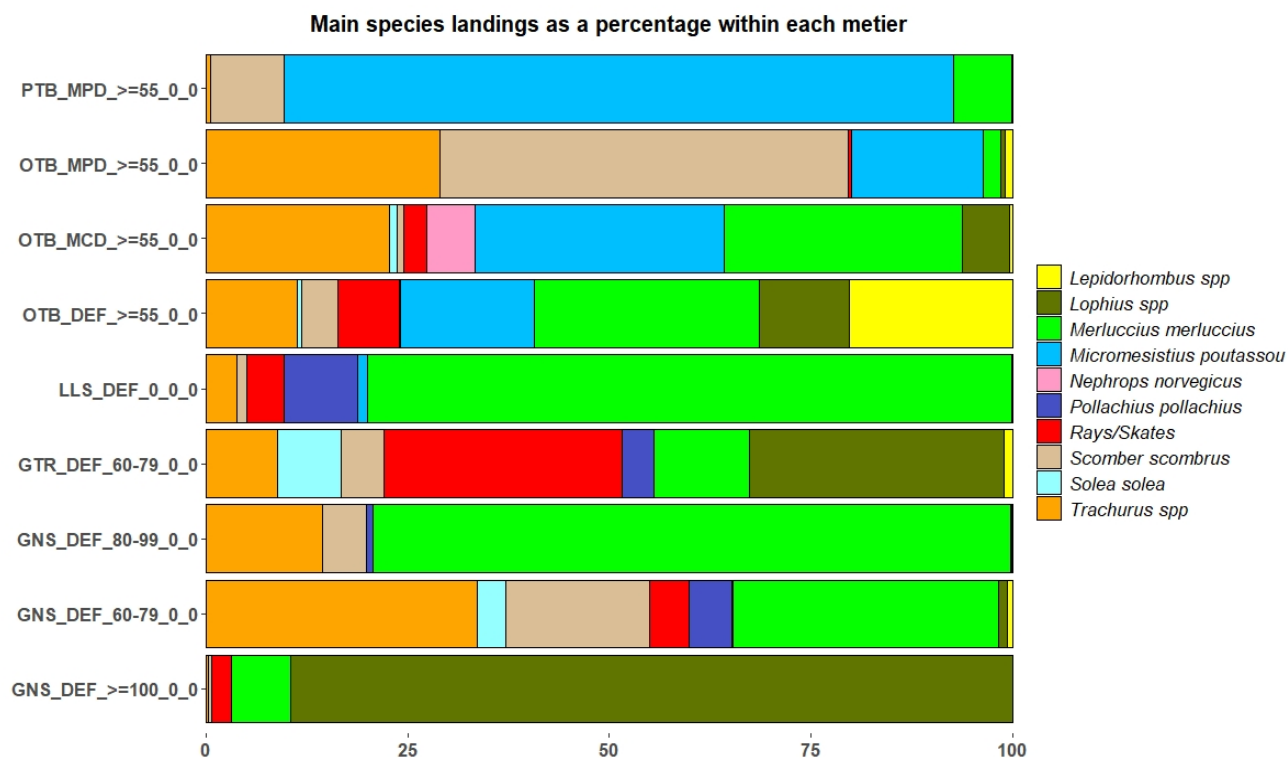


Figure 14 Main species landings as a percentage within each Spanish demersal métier in divisions 8.c and 9.a.

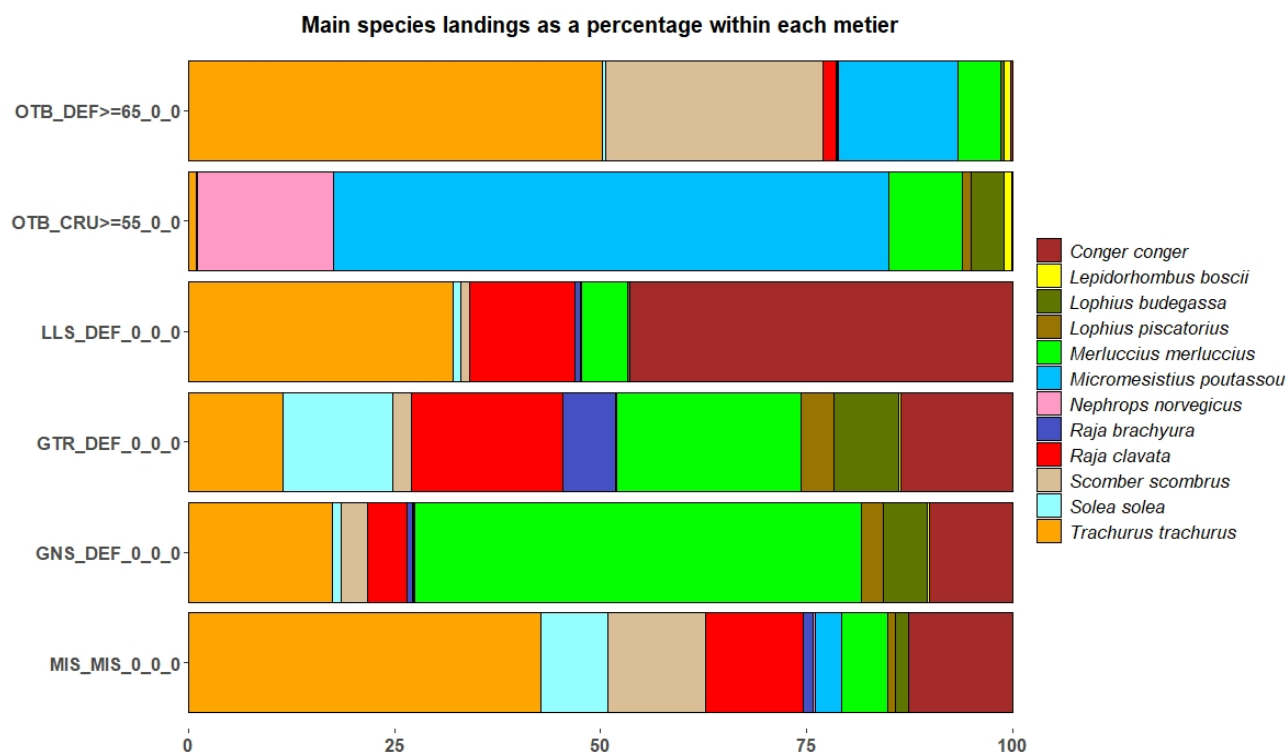


Figure 15 Main species landings as a percentage within each Portuguese demersal métier in divisions 8.c and 9.a.

There is a large small-scale multigear fleet operating in the area which uses a diversity of gears that allow exploitation of ecological communities in different habitat types, depths, and substrata. The composition of the landings depends largely

on the fishing gear used and on the ecological community of the fishing grounds visited, which may change seasonally. Segmentation of these large small-scale fishing fleets presents a challenge in the area.

Hake is present in almost all métiers analysed and is a target species for longlines and gillnets fisheries.

Blue whiting is present in most métiers and is the main target species for the small mesh demersal trawls.

Two stocks of horse mackerel (Table A1 in the Annex) are defined in divisions 8.c and 9.a; both are key stocks in mixed-fisheries considerations.

Mackerel is caught together with horse mackerel, and is the main species of otter trawls with mesh sizes > 55 mm (OTB_MPD_> = 55_0_0; Figure 14); they are also caught with other pelagic and demersal species in eight other métiers.

Métier definitions are presented in Table A4 in the Annex.

The trammelnet métier lands a large variety of demersal species, but pollack and sole are of the highest economic importance.

The species interactions and relative proportions of catches in mixed fisheries are not likely to change greatly between years. Generally, the interactions between species and the selectivity of fisheries change gradually over time.

The French demersal fleets – demersal métiers fishing in divisions 8.a, 8.b and 8.d – are mostly dominated by hake, sole, sea bass, and Norway lobster for crustacean trawlers (Figure 16). Pollack, whiting, and anglerfishes are also caught by many demersal métiers. Hake is the main species landed by demersal métiers in that area (38% of the total landings), followed by sole (17%) and sea bass (11%). Megrimms and anglerfishes together represent about 15%.

In the most recent years the landing data of the Spanish demersal fleets in divisions 8.a, 8.b, and 8.d show that the main target species are hake, anglerfishes, megrimms, mackerel, and horse mackerel (Figure 17). Most of the landings in this area are hake (81%); megrimms, and anglerfishes together represent the 12% of the landings and mackerel accounts for the 5%.



Figure 16 Main species landings as a percentage within each French demersal métier in divisions 8.a, 8.b, and 8.d.

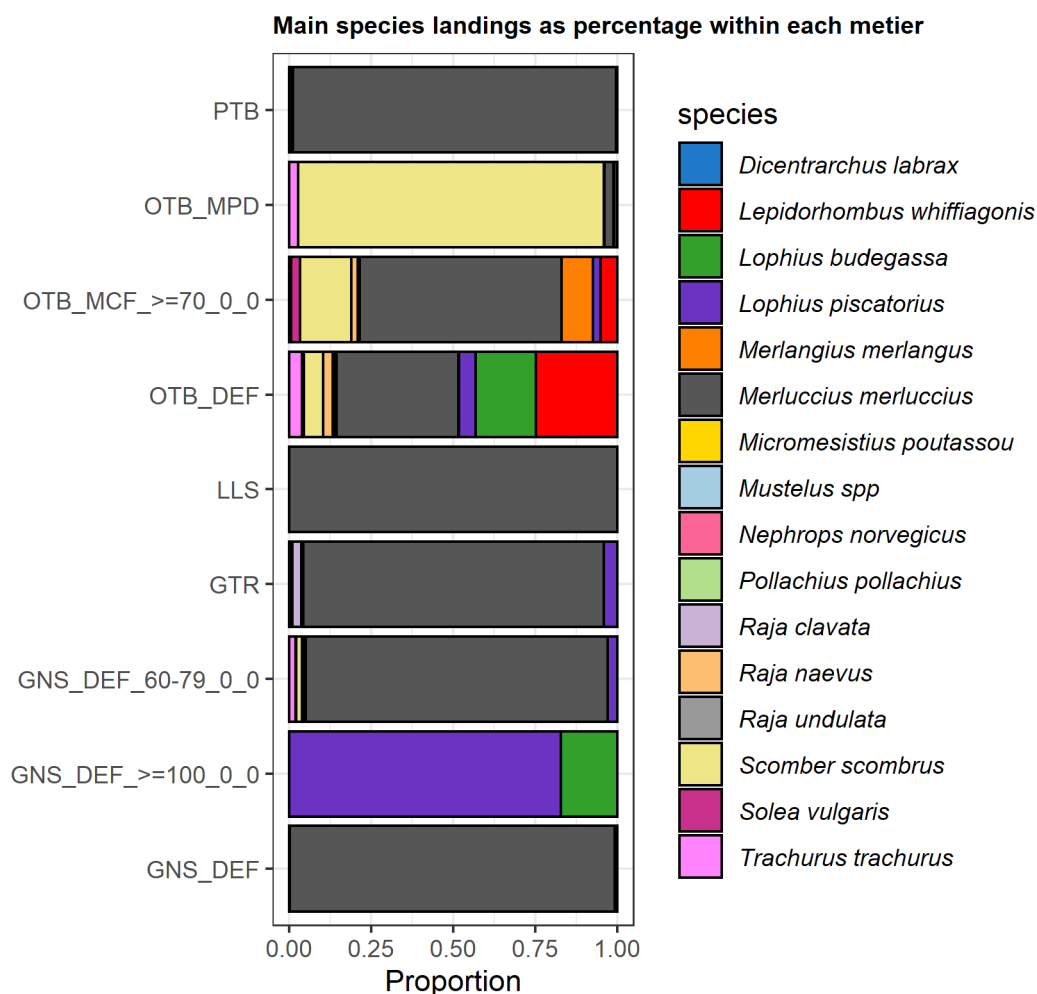


Figure 17 Main species landings as a percentage within each Spanish demersal métier in divisions 8.a, 8.b, and 8.d.

Species interaction

Fish species are part of the marine foodweb and interact in various ways, including through predation and competition. Natural mortality is becoming proportionately more significant in the ecoregion, because fishing mortality has been reduced on many stocks. Predation mortality can occur from other fish, seabirds, and marine mammals.

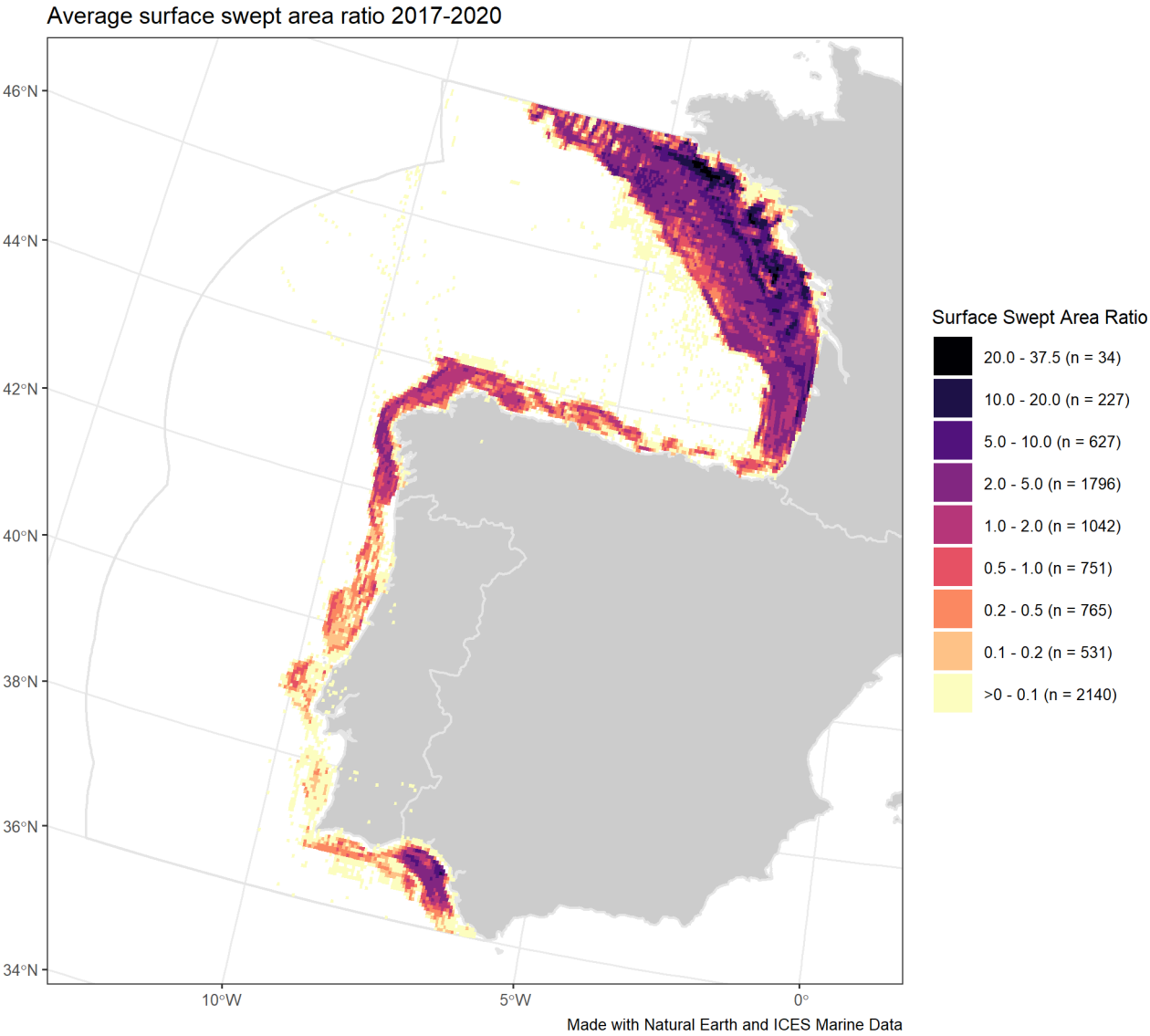
For this ecoregion, foodweb modelling studies indicate that yields of many commercially exploited stocks are affected by the abundance of main fish species predators such as hake and anglerfish. Changes in fishing mortality on these species therefore influence the abundance and yield of the pelagic fish stocks that are their main prey, such as blue-whiting, mackerel, horse mackerel, sardine and anchovy; this depends on their spatial distribution across the ecoregion. Predation mortality cannot be fully quantified as there are not specific multispecies modelling or simulations of the interactions of species in this ecoregion.

Effects of fisheries on the ecosystem

Fishing can disturb the food web. Predator–prey relationships can change, depending on the species and on the amount of food (prey) that is available for a given predator. Poor management of fishing for one species could have an adverse effect on the whole food web. Multispecies assessment methods can account for some of these interactions and guide appropriate management measures.

Fishing also affects the seabed habitats and benthonic species and it is associated with bottom-contacting mobile fishing gear, in particular beam trawling and otter trawling. The extent, magnitude and impact of mobile bottom-contacting

fishing gear on the seabed and benthic habitats varies geographically across the ecoregion (Figure 18). These maps are calculated in terms of a swept-area ratio. Swept area is calculated as hours fished \times average fishing speed \times gear width. Values for each of these factors were derived from VMS data and from other sources. The swept-area ratio is calculated for all 0.05×0.05 degree grid cells and is the sum of the swept area divided by the area of each grid cell. The resultant values indicate the theoretical number of times the entire grid cell area would have been swept if effort was evenly distributed within each cell. The swept-area ratio is calculated separately for surface- and subsurface contact. Different gear types interact with the seabed in different ways and thus exert different levels of physical disturbance, in terms of the substrate areas affected and the penetration depth. Surface abrasion is defined as the damage to seabed surface features; subsurface abrasion as the penetration and/or disturbance of the substrate beneath the seabed surface. For further information on these effects, see the Bay of Biscay and Iberian Coast ecosystem overview (ICES, 2019h).



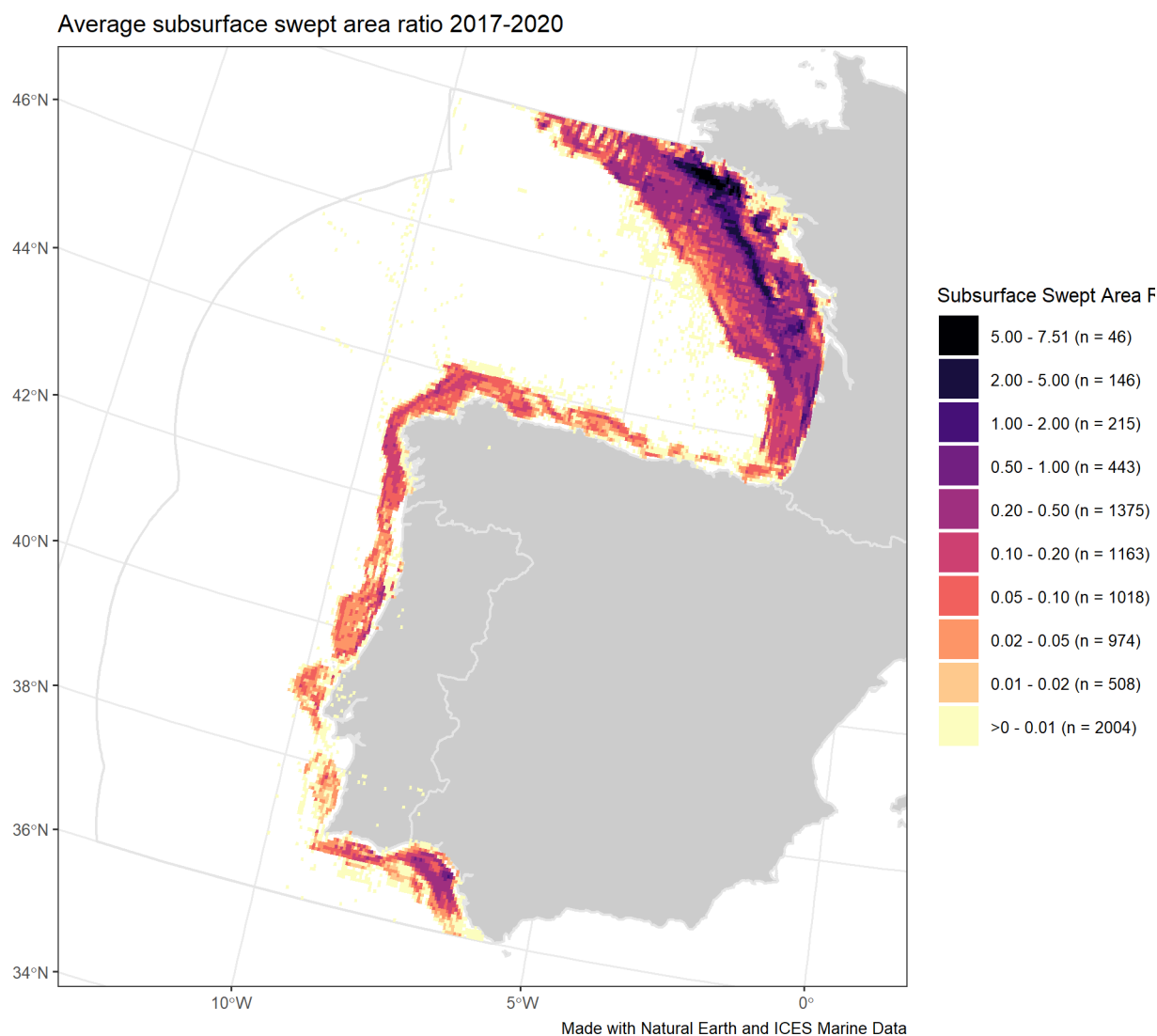


Figure 18 Average annual surface (top) and subsurface (bottom) disturbance by mobile bottom-contacting fishing gear (bottom otter trawls, bottom seines, dredges, beam trawls) in the Bay of Biscay and Iberian Coast Ecoregion, expressed as average swept-area ratios (SAR).

Bycatch of protected, endangered, and threatened species

ICES evaluated bycatch mortality across métiers for the common dolphin in the Celtic Seas, in the Bay of Biscay and the Iberian Coast, and in the western English Channel. Based on limited information, the at-sea monitoring point estimate of bycatch mortality is just below the potential biological removal while the point estimate from strandings data exceeded it.

The mean annual bycatch estimated from at sea observations for 2016–2018 across all métiers amounted to 3973 (95% CI 1998–6599) dolphins, with trammelnets accounting for the largest bycatch. Common dolphin bycatch mortality estimated from stranded animals along the French coastlines of the Bay of Biscay and the western English Channel was 5800–17 900 individuals in 2017 and 3400–10 500 individuals in 2018. The estimated bycatch rate of common dolphin in pelagic trawls in the ICES statistical area 27.8.c in 2018 was relatively high relative to other monitored métiers/ecoregions – 0.091 specimens per monitored days-at-sea.

A number of bird species groups are known to be susceptible to bycatch in various types of fishing gear. Bycatch risk is generally considered to be closely linked to species-specific foraging behaviour. Bycatch rates of birds in the ecoregion are mostly unknown. For the Bay of Biscay, bycatch rates are only available for common guillemot in the gillnet fishery

and for the Balearic shearwater in gillnets and trammelnets; they are at generally comparable levels to other ecoregions in the Northeast Atlantic.

The high numbers of bycaught animals (birds and marine mammals) recorded on the shores of the ecoregion indicate that a dedicated bycatch observer programme is required for relevant fisheries in this area.

Bycatch of elasmobranchs is common in the ecoregion, with notably high bycatch rates of sandy ray in nets, but also undulate ray and blackmouth catshark in bottom trawls.

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Annex

Supporting data used in the Bay of Biscay and Iberian Coast Fisheries Overview is archived at ICES (2021j).

Table A1 Status summary of the Bay of Biscay and Iberian Coast ecosystem stocks in 2020, with regards to ICES maximum sustainable yield (MSY) approach and precautionary approach (PA) for stocks within the Bay of Biscay and Iberian Coast ecoregion. Grey represents unknown reference points. *For the MSY approach*: green represents either a stock that is fished below F_{MSY} or whose size is greater than $MSY B_{trigger}$; red represents either a stock that is fished above F_{MSY} or whose size is less than $MSY B_{trigger}$. *For the PA*: green represents either a stock that is fished below F_{pa} or whose size is greater than B_{pa} ; yellow represents a stock that is either fished between F_{pa} and F_{lim} or whose size is between B_{lim} and B_{pa} ; red represents a stock that is fished above F_{lim} or whose size is less than B_{lim} . SBL = safe biological limits; MSFD = EU Marine Strategy Framework Directive; D3C1 = MSFD indicator for fishing mortality; D3C2 = MSFD indicator for spawning-stock biomass; GES = good environmental status.

Stock name	Stock description	Fisheries guild	Data category	Assessment year	Advice category	SBL	GES	Reference point	Fishing pressure	Stock size	D3C1	D3C2
ane.27.8	Anchovy in Subarea 8	Pelagic	1	2020	MP	?	?	Maximum sustainable yield	?	?	?	?
								Precautionary approach	?	✓	?	✓
ane.27.9a					PA	?	?	Maximum sustainable yield	?	?	?	?
									?	✓	?	✓
ank.27.78abd	Black-bellied anglerfish in Subarea 7 and divisions 8.a-b and 8.d	Benthic	3.2			?	?		✓	?	✓	?
								Precautionary approach	✓	?	✓	?
ank.27.8c9a	Black-bellied anglerfish in divisions 8.c and 9.a	Benthic	2.11	2021	MSY	✓	✓	Maximum sustainable yield	✓	✓	✓	✓
								Precautionary	✓	✓	✓	✓

Stock name	Stock description	Fisheries guild	Data category	Assessment year	Advice category	SBL	GES	Reference point	Fishing pressure	Stock size	D3C1	D3C2
								approach				
bli.27.nea	Blue ling in subareas 1, 2, 8, 9, and 12, and divisions 3.a and 4.a	Demersal	5.3	2019	PA	?	✗	Maximum sustainable yield	?	✗	?	✗
								Precautionary approach	?	✗	?	✗
bss.27.8ab	Seabass in divisions 8.a-b	Demersal	1	2021	MP	✓	✓	Maximum sustainable yield	✓	✓	✓	✓
								Precautionary approach	✓	✓	✓	✓
dgs.27.nea	Spurdog in subareas 1–10, 12, and 14	Elasmobranch	1.2	2020	MSY/PA	?	✗	Maximum sustainable yield	✓	✗	✓	✗
								Precautionary approach	✓	?	✓	?
ele.2737.nea	European eel throughout its natural range	Demersal	3.14	2021	PA	?	✗	Maximum sustainable yield	?	✗	?	✗
								Precautionary approach	?	✗	?	✗
hke.27.3a46-8abd	Hake in subareas 4, 6, and 7, and divisions 3.a, 8.a–b, and 8.d, northern stock	Demersal	1	2021	MSY	✓	✓	Maximum sustainable yield	✓	✓	✓	✓
								Precautionary approach	✓	✓	✓	✓

Stock name	Stock description	Fisheries guild	Data category	Assessment year	Advice category	SBL	GES	Reference point	Fishing pressure	Stock size	D3C1	D3C2
hom.27.2a4a5b6a7a-ce-k8	Horse mackerel in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a–c,e–k	Pelagic	1	2021	MSY			Maximum sustainable yield				
								Precautionary approach				
hom.27.9a	Horse mackerel in Division 9.a	Pelagic	1	2021	MSY			Maximum sustainable yield				
								Precautionary approach				
ldb.27.8c9a	Four-spot megrim in divisions 8.c and 9.a	Benthic	1	2021	MP			Maximum sustainable yield				
								Precautionary approach				
mac.27.nea	Mackerel in subareas 1–8 and 14 and division 9.a	Pelagic	1	2021	MSY			Maximum sustainable yield				
								Precautionary approach				
meg.27.7b-k8abd	Megrim in divisions 7.b–k, 8.a–b, and 8.d	Benthic	1	2021	MSY			Maximum sustainable yield				
								Precautionary approach				

Stock name	Stock description	Fisheries guild	Data category	Assessment year	Advice category	SBL	GES	Reference point	Fishing pressure	Stock size	D3C1	D3C2
meg.27.8c9a	Megrim in divisions 8.c and 9.a	Benthic	1	2021	MP			Maximum sustainable yield				
								Precautionary approach				
mon.27.78abd	White anglerfish in Subarea 7 and divisions 8.a–b and 8.d	Benthic	1	2021	MSY			Maximum sustainable yield				
								Precautionary approach				
mon.27.8c9a	White anglerfish in divisions 8.c and 9.a	Benthic	1	2021	MP			Maximum sustainable yield				
								Precautionary approach				
nep.fu.2324	Norway lobster in divisions 8.a and 8.b, functional units 23–24	Crustacean	1	2021	MSY			Maximum sustainable yield				
								Precautionary approach				
nep.fu.25	Norway lobster in Division 8.c, Functional Unit 25	Crustacean	2.11	2021	MSY/PA			Maximum sustainable yield				
								Precautionary approach				

Stock name	Stock description	Fisheries guild	Data category	Assessment year	Advice category	SBL	GES	Reference point	Fishing pressure	Stock size	D3C1	D3C2
nep.fu.2627	Norway lobster in Division 9.a, Functional Units 26-27	Crustacean	2.11	2021	MSY/PA			Maximum sustainable yield				
								Precautionary approach				
nep.fu.2829	Norway lobster in Division 9.a, functional units 28-29	Crustacean	3.2	2021	PA			Maximum sustainable yield				
								Precautionary approach				
nep.fu.31	Norway lobster in Division 8.c, Functional Unit 31	Crustacean	2.11	2021	MSY			Maximum sustainable yield				
								Precautionary approach				
ory.27.nea	Orange roughy in subareas 1-10, 12 and 14	Demersal	6.3	2020	PA			Maximum sustainable yield				
								Precautionary approach				
pil.27.8abd	Sardine in divisions 8.a-b and 8.d	Pelagic	1	2020	MSY			Maximum sustainable yield				
								Precautionary approach				

Stock name	Stock description	Fisheries guild	Data category	Assessment year	Advice category	SBL	GES	Reference point	Fishing pressure	Stock size	D3C1	D3C2
pil.27.8c9a	Sardine in divisions 8.c and 9.a	Pelagic	1	2020	MSY			Maximum sustainable yield				
								Precautionary approach				
sbr.27.6-8	Blackspot seabream in subareas 6–8	Demersal	6.3	2020	PA			Maximum sustainable yield				
								Precautionary approach				
sol.27.8ab	Sole in divisions 8.a–b	Benthic	1	2021	MP			Maximum sustainable yield				
								Precautionary approach				
whb.27.1-91214	Blue whiting in subareas 1–9, 12, and 14	Pelagic	1	2021	MP			Maximum sustainable yield				
								Precautionary approach				

Table A2 Stocks in the Bay of Biscay and Iberian Coast ecoregion in 2021 that do not have a full set of reference points.

Stock name	Stock description	Latin name	Fisheries guild	Data category	Assessment year	Advice category
agn.27.nea	Angel shark in subareas 1–10, 12, and 14	<i>Squatina squatina</i>	Elasmobranch	6.3	2019	PA
alf.27.nea	Alfonsinos in subareas 1–10, 12, and 14	<i>Beryx</i>	Demersal	5.2	2020	PA
aru.27.6b7-1012	Greater silver smelt in subareas 7–10, and 12, and Division 6.b	<i>Argentina silus</i>	Pelagic	3.2	2021	PA
boc.27.6-8	Boarfish in subareas 6-8	<i>Capros aper</i>	Pelagic	3.2	2021	PA
bsf.27.nea	Black scabbardfish in subareas 1, 2, 4–8, 10, and 14, and divisions 3.a, 9.a, and 12.b	<i>Aphanopus carbo</i>	Pelagic	3.2	2020	PA
bsk.27.nea	Basking shark in subareas 1–10, 12, and 14	<i>Cetorhinus maximus</i>	Elasmobranch	6.3	2019	PA
bss.27.8c9a	Seabass in divisions 8.c and 9.a	<i>Dicentrarchus labrax</i>	Demersal	5.2	2021	PA
cyo.27.nea	Portuguese dogfish in subareas 1–10, 12, and 14	<i>Centrophorus squamosus</i> , <i>Centroscymnus coelolepis</i>	Elasmobranch	6.3	2019	PA
gag.27.nea	Tope in subareas 1–10, 12, and 14	<i>Galeorhinus galeus</i>	Elasmobranch	5.2	2021	PA
gfb.27.nea	Greater forkbeard in subareas 1–10, 12, and 14	<i>Phycis blennoides</i>	Demersal	3.2	2020	PA
guq.27.nea	Leafscale gulper shark in subareas 1–10, 12, and 14	<i>Centrophorus squamosus</i>	Elasmobranch	6.3	2019	PA

Stock name	Stock description	Latin name	Fisheries guild	Data category	Assessment year	Advice category
gur.27.3-8	Red gurnard in subareas 3–8	<i>Chelidonichthys cuculus</i>	Demersal	3	2021	PA
hke.27.8c9a	Hake in divisions 8.c and 9.a, southern stock	<i>Merluccius merluccius</i>	Demersal	3.2	2020	PA
ldb.27.7b-k8abd	Four-spot megrim in divisions 7.b–k, 8.a–b, and 8.d	<i>Lepidorhombus boscii</i>	Benthic	5.2	2021	PA
lin.27.346-91214	Ling in subareas 3,4, 6–9, 12, and 14	<i>Molva molva</i>	Demersal	3.2	2021	PA
mur.27.67a-ce-k89a	Striped red mullet in subareas 6 and 8, and divisions 7.a–c, 7.e–k, and 9.a	<i>Mullus surmuletus</i>	Demersal	5.2	2020	PA
nep.fu.30	Norway lobster in Division 9.a, Functional Unit 30	<i>Nephrops norvegicus</i>	Crustacean	3.2	2021	PA
pol.27.89a	Pollack in Subarea 8 and Division 9.a	<i>Pollachius pollachius</i>	Demersal	5.2	2021	PA
por.27.nea	Porbeagle in subareas 1–10, 12, and 14	<i>Lamna nasus</i>	Elasmobranch	6.3	2019	PA
raj.27.89a	Other rays and skates in Subarea 8 and Division 9.a	<i>Rajidae</i>	Elasmobranch	5.9	2020	No advice
rhg.27.nea	Roughhead grenadier in subareas 5–8, 10, 12, and 14	<i>Macrourus berglax</i>	Demersal	6.3	2020	PA
rja.27.nea	White skate in subareas 1-10, 12, and 14	<i>Rostroraja alba</i>	Elasmobranch	6.3	2019	PA
rib.27.89a	Common skate complex and flapper skate in Subarea 8 and Division 9.a	<i>Dipturus batis</i>	Elasmobranch	6.3	2020	PA/Stock status only

Stock name	Stock description	Latin name	Fisheries guild	Data category	Assessment year	Advice category
rjc.27.8	Thornback ray in Subarea 8	<i>Raja clavata</i>	Elasmobranch	3.2	2020	PA
rjc.27.9a	Thornback ray in Division 9.a	<i>Raja clavata</i>	Elasmobranch	3.2	2020	PA
rjh.27.9a	Blonde ray in Division 9.a	<i>Raja brachyura</i>	Elasmobranch	3.2	2020	PA
rjm.27.8	Spotted ray in Subarea 8	<i>Raja montagui</i>	Elasmobranch	3.2	2020	PA
rjm.27.9a	Spotted ray in Division 9.a	<i>Raja montagui</i>	Elasmobranch	5.2	2020	PA
rjn.27.678abd	Cuckoo ray in subareas 6–7 and divisions 8.a–b, and 8.d	<i>Leucoraja naevus</i>	Elasmobranch	3.2	2020	PA
rjn.27.8c	Cuckoo ray in Division 8.c	<i>Leucoraja naevus</i>	Elasmobranch	3.2	2020	PA
rjn.27.9a	Cuckoo ray in Division 9.a	<i>Leucoraja naevus</i>	Elasmobranch	3.2	2020	PA
rju.27.8ab	Undulate ray in divisions 8.a-b	<i>Raja undulata</i>	Elasmobranch	6	2020	PA
rju.27.8c	Undulate ray in Division 8.c	<i>Raja undulata</i>	Elasmobranch	6.9	2020	PA
rju.27.9a	Undulate ray in Division 9.a	<i>Raja undulata</i>	Elasmobranch	6.9	2020	PA
rng.27.1245a8914ab	Roundnose grenadier in subareas 1, 2, 4, 8, and 9, Division 14.a, and in subdivisions 14.b.2 and 5.a.2	<i>Coryphaenoides rupestris</i>	Demersal	6.2	2019	PA

Stock name	Stock description	Latin name	Fisheries guild	Data category	Assessment year	Advice category
sbr.27.9	Blackspot seabream in Subarea 9	<i>Pagellus bogaraveo</i>	Demersal	3.2	2020	PA
sck.27.nea	Kitefin shark in subareas 1–10, 12, and 14	<i>Dalatias licha</i>	Elasmobranch	6.3	2019	PA
sdv.27.nea	Smooth-hound in subareas 1–10, 12, and 14	<i>Mustelus asterias</i>	Elasmobranch	3.2	2021	PA
sho.27.89a	Black-mouth dogfish in Subarea 8 and Division 9.a	<i>Galeus melastomus</i>	Elasmobranch	3.9	2021	PA/Stock status only
sol.27.8c9a	Sole in divisions 8.c and 9.a	<i>Solea solea</i>	Benthic	3	2021	MSY
syc.27.8abd	Lesser-spotted dogfish in divisions 8.a–b and 8.d	<i>Scyliorhinus canicula</i>	Elasmobranch	3.9	2021	PA/Stock status only
syc.27.8c9a	Lesser-spotted dogfish in divisions 8.c and 9.a	<i>Scyliorhinus canicula</i>	Elasmobranch	3.9	2021	PA/Stock status only
tsu.27.nea	Roughsnout grenadier in subareas 1–2, 4–8, 10, 12, 14 and Division 3a	<i>Trachyrincus scabrus</i>	Demersal	6.3	2020	PA
usk.27.3a45b6a7-912b	Tusk in subareas 4 and 7–9 and divisions 3.a, 5.b, 6.a, and 12.b	<i>Brosme brosme</i>	Demersal	3.2	2021	PA
whg.27.89a	Whiting in Subarea 8 and Division 9.a	<i>Merlangius merlangus</i>	Demersal	5.2	2021	PA

Table A3 Scientific names of species.

Common name	Species name
Albacore tuna	<i>Thunnus alalunga</i>
Anchovy	<i>Engraulis</i> sp.
Anglerfish	<i>Lophius</i> sp.
Blackmouth catshark	<i>Galeus melastomus</i>
Balearic shearwater	<i>Puffinus mauretanicus</i>
Black-bellied anglerfish	<i>Lophius budegassa</i>
Black scabbardfish	<i>Aphanopus carbo</i>
Blackspot seabream	<i>Pagellus bogaraveo</i>
Blue jack mackerel	<i>Trachurus picturatus</i>
Blue whiting	<i>Micromesistius poutassou</i>
Boarfish	<i>Capros aper</i>
Chub mackerel	<i>Scomber japonicus</i>
Clams:	
Solid surf clam	<i>Spisula solida</i>
Donax clam	<i>Donax trunculus</i>
Razor clam	<i>Ensis siliqua</i>
Stipped venus clam	<i>Chamelea gallina</i>
Common dolphin (Long-finned)	<i>Delphis delphinus</i>
Common guillemot	<i>Uuria algae</i>
Cuttlefish	<i>Sepia officinalis</i>
European conger	<i>Conger conger</i>
European eel	<i>Anguilla anguilla</i>
Deepwater rose shrimp	<i>Parapenaeus longirostris</i>
Four-spot megrim	<i>Lepidorhombus boscii</i>
Hake	<i>Merluccius merluccius</i>
Harbour porpoise	<i>Phocoena phocoena</i>
Herring	<i>Clupea harengus</i>
Horse mackerel	<i>Trachurus trachurus</i>
Mackerel	<i>Scomber scombrus</i>
Megrim	<i>Lepidorhombus</i> sp.
Monkfish	<i>Lophius</i> sp.
Norway lobster	<i>Nephrops norvegicus</i>
Pilot whale	<i>Globicephala</i> sp.
Pollack	<i>Pollachius pollachius</i>
Pout	<i>Trisopterus luscus</i>
Red mullet	<i>Mullus</i> sp.
Sandy ray	<i>Leucoraja circularis</i>

Common name	Species name
Sardine	<i>Sardina pilchardus</i>
Sea bass	<i>Dicentrarchus labrax</i>
Sole	<i>Solea solea</i>
Undulate ray	<i>Raja undulata</i>
White anglerfish	<i>Lophius piscatorius</i>
Whiting	<i>Merlangius merlangus</i>

Table A4 Métier categories used in the Iberian waters mixed-fisheries analysis.

Acronym	Definition	Description
GNS_DEF_> = 100_0_0	Set gillnet targeting demersal fish with mesh sizes > 100 mm	Spanish set gillnet (“ <i>rasco</i> ”) targeting white anglerfish in ICES Division 8.c with a mesh size of 280 mm
GNS_DEF_0_0_0	Set gillnet targeting demersal fish	Artisanal Portuguese fleet using set gillnets
GNS_DEF_60-79_0_0	Set gillnet targeting demersal fish with mesh sizes 60–79 mm	Spanish small set gillnet (“ <i>beta</i> ”) targeting a variety of demersal fish in northwestern Spanish waters
GNS_DEF_80-99_0_0	Set gillnet targeting demersal fish with mesh sizes 80–99 mm	Spanish set gillnet (“ <i>volanta</i> ”) targeting hake with nets of 90 mm mesh size in northwestern Spanish waters
GTR_DEF_0_0_0	Trammelnet targeting demersal fish	Artisanal Portuguese fleet using trammelnets
GTR_DEF_60-79_0_0	Trammelnet targeting demersal fish with mesh sizes 60–79 mm	Spanish trammelnet targeting a variety of demersal species in northwestern Spanish waters
LLS_DEF_0_0_0	Set longline targeting demersal fish	Spanish set longline targeting a variety of demersal fish in Spanish Iberian waters
MIS_MIS_0_0_0_HC	Miscellaneous	Portuguese and Spanish artisanal fleet not covered by other métiers
OTB_CRU_> = 55_0_0	Bottom otter trawl targeting crustaceans, with mesh sizes > 55 mm	Portuguese bottom otter trawl targeting <i>Nephrops</i> and rose shrimp