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Fisheries

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In 2019, global production of fisheries products, including aquaculture, amounted to 177.9 million tonnes (excluding marine mammals and aquatic plants, [FAO Fisheries and Aquaculture Information and Statistics Service](#)). Marine fishery products account for 63.1% (112.2 million tonnes) of which 71.7% (80.4 million tonnes) are wild catch. In the EU, the share of wild catch in marine fishery products is 81.5% ([FAO Fisheries and Aquaculture Information and Statistics Service](#)).

Total landings of marine fishery products (including aquaculture but excluding marine mammals and aquatic plants) within the EU in 2019 (including the United Kingdom) amounted to 5.1% (5.7 million tonnes) of global marine fishery production. Spain, the United Kingdom, Denmark and France provided over half of the EU landings. EU marine wild catch amounted to 5.8% (4.7 million tonnes) of the global marine wild catch. In the same year, Belgian landings represented 0.4% (19,309 tonnes) of the EU total ([FAO Fisheries and Aquaculture Information and Statistics Service 2020](#)). The number of Belgian fishing vessels in 2020 (64 fishing vessels) represented less than 0.1% of the total European fleet, the tonnage and engine power represented 0.8% and 0.6% respectively ([Velghe et al. 2020, Fishing fleet capacities](#)).

The global or European catch by recreational sea anglers is unknown. The number of individual boat anglers within Europe is estimated at around 9 million. Together, they undertake almost 78 million fishing trips at sea on an annual basis, which corresponds to over 200,000 fishing trips per day. The total economic activity related to this sector is estimated at 10.5 billion euro on an annual basis, of which 5.1 billion euro are direct expenditures ([Hyder et al. 2017a](#), [Hyder et al. 2017b](#)). Belgium is a small player in the European recreational sea fishing context. The number of days at sea by vessels was estimated at 7,700 in 2019. The landings of fishery products by the entire recreational sea fishing community were estimated at around 150 tonnes for 2019 ([Verleye et al. 2020a](#)). A first estimate of direct expenditures (purchase of equipment, boat maintenance, etc.), as part of the wider national monitoring programme for marine recreational fisheries (see website [marine recreational fisheries](#)), amounted to at least 8.6 million euro per year ([Verleye et al. 2019](#)). [Hyder et al. \(2017b\)](#) previously estimated the total expenditure by Belgian recreational sea anglers (direct, indirect and induced) at around 33 million euro per year based on an input-output model.

6.1 Policy context

6.1.1 Commercial sea fisheries

The management of the European fishing fleet and the conservation of fish stocks are primarily governed by the Common Fisheries Policy (CFP) (Regulation (EU) 1380/2013) as imposed by Articles 38 to 44 of the Treaty on the Functioning of the European Union (TFEU). The European fisheries policy is implemented by the Directorate General for Maritime Affairs and Fisheries (DG MARE) of the European Commission (EC) and by the EU member states (more information [Overview of European legislation relating to the CFP](#)). The CFP was developed within the framework of the European Union's Sustainable Development Strategy (COM (2001) 264, renewed in 2016 (10917/06)) and Sustainable Development Goal 14 (SDG 14) of the United Nations, aimed at an ecosystem-based approach and a sustainable exploitation of living marine biological resources. The formulation of European fisheries policy relies on contributions from advisory councils (see Articles 43 to 45 and Annex III of the CFP), as well as from a number of national services and international bodies such as the EC's Scientific, Technical and Economic Committee for Fisheries (STECF) and Joint Research Centre (JRC), and the International Council for the Exploration of the Sea (ICES). European fisheries management relies on scientific data collected by EU member states under the data collection framework (Directive 2017/1004, Implementing Decision (EU) 2019/909 and Delegated Decision (EU) 2019/910) (see **6.5 Sustainable use**).

The Brexit (1 January 2021) significantly reshapes the European fishing landscape. In concrete terms, the Brexit means that European regulations, including the CFP, will no longer apply to British waters. The UK-EU trade and cooperation agreement (24 December 2020) states that European vessels will continue to have access to UK waters (200 nautical mile (nm) zone) for at least 5.5 years, in return for a quota transfer that will be phased in over time until 2026. Access to the 6 to 12 nm zone is restricted to 'qualified vessels' holding the necessary fishing authorisation. In total, the EU will transfer 1.6 billion euro on fishing rights to the UK. After the transitional period, the EU may have to negotiate access to UK waters on an annual basis. These measures may have a major impact on Belgian fisheries as more than 50% of Belgian landings come from UK waters ([Van Bogaert et al. 2021](#)).

At national level, Flanders has the exclusive authority with regard to sea fisheries (Decree of 28 June 2013 on agricultural and fisheries policy), with the exception of crew and inspection conditions for vessels for which the federal Government is still the competent authority (FPS Mobility). For commercial sea fishery, the policy is determined by the [Flemish Department of Agriculture and Fisheries \(Crevits 2019\)](#). The Department of Agriculture

and Fisheries is primarily responsible for policy preparation at European and Flemish level. Within this department, the [Policy Coordination and Environment division](#) has a broader mission because it is not only responsible for formulating policy proposals and drafting regulations, but also for the translation of European policy and the implementation of fisheries policy. The [Fisheries service](#) is part of the Policy Coordination and Environment division and is responsible for the coordination, implementation and control of fisheries policy. This also includes the legal tasks of collecting economic data, including the landing statistics.

The implementation of the European policy for investments and actions in favour of the fisheries sector is regulated among others through the European Maritime and Fisheries Fund (EMFF; Regulation (EU) 508/2014) and the subsequent European Maritime, Fisheries and Aquaculture Fund (EMFAF, Regulation (EU) 2021/1139). The Belgian Operational Programme (2014-2020; renewed OP expected in 2022) (see **6.5.4 Sustainable fisheries sector**) creates a framework and a manual for the funds of the EMF(A)F. The Flemish *Financieringsinstrument voor de Visserij- en Aquacultuursector* (Financial Instrument for the Fisheries and Aquaculture Sector, FIVA) provides the necessary co-financing (decision of the Government of Flanders of 5 February 2016 and MD of 19 May 2016). The modalities and legislative frameworks for the latter will be adjusted at the start of the new fund.

The implementation of the fisheries policy also includes the monitoring of fishing activities and data collection, including the publication of part of the collected data in [annual reports](#) (see also [Data Collection Framework](#)).

The Flemish fisheries policy is scientifically supported by the Flanders Research Institute of Agriculture, Fisheries and Food (ILVO). The Strategic Advisory Council for Agriculture and Fisheries (SALV) advises the Government of Flanders and the Flemish parliament on agriculture and fisheries in a broad sense. The advices, as adopted by the stakeholders represented in the SALV, are part of a supported political decision-making process. The fisheries related advice is prepared by a permanent working committee: the Technical Working Committee on Fisheries (TFC) of the SALV. The Environmental and Nature Council of Flanders ([Minaraad](#)) also provided advice on a number of fishery-related matters. The [Rederscentrale](#) is recognised as the producer organisation of fisheries products and as the professional association of specialists representing the employers. The Flanders' Agricultural Marketing Board ([VLAM](#)) coordinates the promotion campaigns of fish produced in Flanders (e.g. fish of the year, seasonal fish). The policy context in which the Belgian fishing industry operates is further outlined in [Vanderperren and Polet \(2009\)](#) (CLIMAR project [phase 1](#) and [phase 2](#) BELSPO), the Belgian [Operational Programme \(EMFF\) 2014-2020](#) and [Van Bogaert et al. \(2021\)](#). A comprehensive overview of the legislation relating to fishing is given in the Codex Coastal Zone, theme [Fisheries](#).

6.1.2 Marine recreational fisheries

Marine recreational fishing is subject to European, federal, Flemish and communal regulations. At European level, the emergency catch limits for sea bass apply, which were introduced in 2016 and are reviewed annually. The federal level mainly deals with aspects related to safety, vessel registrations and licences (Law of 5 July 2018, RD of 28 June 2019), as well as spatial measures at sea (e.g. RD of 4 August 1981, RD of 22 May 2019) and catch restrictions for certain species (RD of 21 December 2001). At the Flemish level, both technical, temporal and spatial restrictions are imposed by the Government of Flanders' Decision of 9 September 2016 and an explicit ban on the use of trammel nets and gill nets was introduced by the Government of Flanders' Decree of 13 March 2015. Municipal police ordinances provide for additional provisions for beach fishing. An overview of the relevant regulations is available on the website for [marine recreational fisheries](#).

6.2 Spatial use

The CFP applies in the Belgian fishing zone (Law of 10 October 1978), the borders of which in Belgium correspond with the exclusive economic zone (EEZ; Law of 22 April 1999). In this zone, the practicing of fishing activities is subject to Belgian jurisdiction (fishing is however a Flemish competence, see above), taking into account the rights of foreign vessels in the context of the CFP (Regulation (EU) 1380/2013 Article 5 and Annex I).

In the territorial waters (the zone from the baseline up to 12 nm), fishing is regulated by national legislation (Law of 19 August 1891). This legislation defines that only fishing boats of <221 kW are allowed to fish in the territorial waters if they use a beam trawl, while between 0 and 3 nm, only ships with a gross tonnage (GT) below 70 GT are allowed to fish (see **6.3.2 Belgian fishing fleet**).

In the territorial sea, fishing is reserved exclusively for Belgian fishermen, although Dutch and French fishermen are also allowed, on the basis of multilateral agreements and European regulations ([Douvere and Maes 2005](#),

GAUFRE project BELSPO). The CFP (Annex I) grants the Netherlands unlimited access to the Belgian 3 to 12 nm zone. The treaty revising the treaty establishing the Benelux Economic Union concluded on 3 February 1958 (2008) also gives the Netherlands the right to fish without restriction in the 0 to 3 nm zone. Furthermore, the Belgian-French convention on 'ijle haring' (herring caught between December and April) and sprat fisheries in French and Belgian territorial waters (1975) provides, under certain conditions, an authorisation for French fishing vessels to catch these fish in the Belgian territorial sea (see also CFP Annex I).

The marine spatial plan (MSP 2020-2026, RD of 22 May 2019, see also [Verhalle and Van de Velde 2020](#)) prohibits bottom trawling near the 'Paardenmarkt' site, a dumpsite for war ammunition (see also [Maes et al. 2000](#)) (see thematic chapter **Military use**). The MD of 4 October 2016 prohibits certain fishing activities around some shipwrecks to protect the underwater cultural heritage. In addition, the RD of 4 February 2020 imposes a ban on regular shipping (and thus *de facto* fishing) in a safety zone of 500 m around wind parks (see thematic chapter **Energy (including cables and pipes)**). A similar safety zone has been implemented by the MD of 15 June 2021 around the first phase of the sea farm in CIA-zone C (zone for commercial and industrial activities). This area will be closed to fishing from the day the construction phase starts.

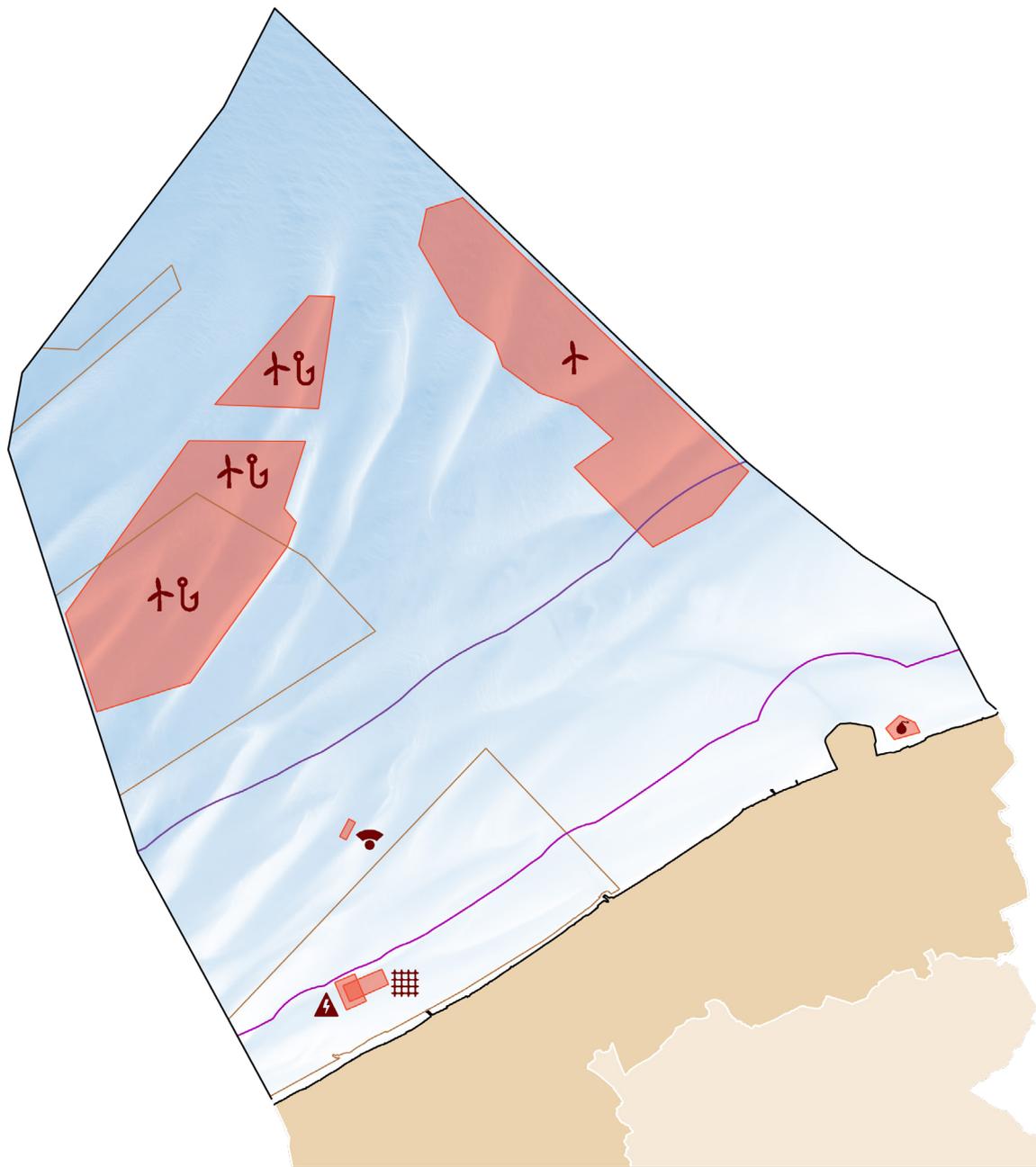
Three search zones are designated in the BNS by the MSP 2020-2026, two of which are within the Flemish Banks, in which the most valuable zones will be protected by imposing restrictions on bottom-disturbing activities, with the aim of restoring and maintaining soil integrity (figure 1) (see [VISNAT2](#) project). These zones were designated after previous measures, aimed at restoring and maintaining soil integrity and encouraging alternative/sustainable fishing, were rejected by the European Parliament ([2018/2614\(DEA\)](#)). Recreational fisheries are allowed in the Flemish Banks area as long as the activities have no impact on the seabed, with some exceptions for the existing recreational shrimp fisheries, including manually towed gear.

Further, the MSP 2020-2026 defines new renewable energy zones, in which passive fishing (fishing with static gear such as fish cages) activities will be allowed under certain conditions. The compatibility of offshore wind farms and passive fishing and mariculture was extensively investigated in the framework of the MARIPAS project ([Verhaeghe et al. 2011](#)). This topic was also investigated within the [AquaValue](#) project, the subsequent research project [EDULIS](#) and the project [Wier en Wind](#) (see also thematic chapter **Marine Aquaculture**). The [SYMAPA](#) project is studying the possible synergies between mariculture and passive fishing.

A detailed overview of the fishing activities of the Belgian (see also [GeoFish](#)), Dutch and British vessels in the BNS, i.e. the spatial distribution of the fleet (vessel monitoring system (VMS) data) and information about the target species for the period 2010-2012 (log data), is given in [Pecceu et al. \(2014\)](#). The results of the analyses of fisheries intensity and the landings of target species in the BNS are shown for each flag state, for each fishing technique and for each quarter (3 months). In any case, the BNS is of minor importance for the Belgian commercial fishing fleet as only 11% of the total landings in 2019 originated from ICES region IVc, of which the BNS is part of ([Velghe et al. 2020](#)). In contrast, the Belgian coastal fishing vessels as well as the Dutch beam trawlers and pulse trawlers were quite active in the BNS. Note that since the summer of 2019 (MD of 19 July 2019) the use of the electric pulse trawl has been prohibited in Belgian territorial waters and from 1 July 2021 in all Union waters (Regulation (EU) 2019/1241), which may cause spatial shifts in fishing activity (see also 6.4.2 Impact of fishing gear). Belgian fishermen are mainly active outside the BNS (see also [GeoFish](#)), such as in the southern and central North Sea, the Celtic Sea, the English Channel, the Irish Sea and the Bay of Biscay. In the context of the CFP and through multilateral conventions, Belgian fishing boats have acquired access to the coastal waters of a few other EU member states (see [Van Bogaert et al. 2021](#)). In addition, Belgian fishermen also have limited quotas in Norwegian waters. A list of these sea areas is provided in [Van Bogaert et al. \(2021\)](#). However, due to the Brexit, mid-term fishing opportunities in UK waters are uncertain (see **6.1 Policy context**).

A map of the historical fishing grounds (1929-1999) can be found on the website '[One Century of Sea Fishing in Belgium](#)' of the Flanders Marine Institute (VLIZ). The historical spatial occurrence of various West-European marine fish species can be consulted via Olsen's Piscatorial Atlas (1883), which can be found on the portal [HisGISKust](#).

Marine recreational anglers and trawlers (beam trawl, otter trawl) are mainly active within the 3 nm zone. Marine recreational fishing from land (beach angling or angling from piers or breakwaters, passive nets, wading using a small shrimp net, horseback shrimp fishing) is characterised by a strong spatial variability along the Flemish coast (website [marine recreational fisheries](#)).



— Belgian part of North Sea
 — 3 nautical mile line
 — 12 nautical mile line

□ Research zone sea bottom integrity
 □ Area for renewable energy (wind farms)
 □ Commercial mariculture
 □ Safety zone 'Westdiep Sea Farm'*

□ Area for renewable energy (wind farms)*
 □ Ammunition dump site 'Paardenmarkt'**
 □ Calibration area acoustic equipment**

* In effect after start construction of project (cf. MD 15 June 2021)
 ** The possibilities for passive fishery are being explored
 *** No bottom-disturbing operations allowed

Figure 1. The delineation of fishing zones and sites prohibited for fishing activities in the BNS (Source: RBINS, MarineAtlas.be (based on RD 22 May 2019 (MSP 2020-2026)), Coastal Portal).

6.3 Social interest

6.3.1 Employment

Employment in the fisheries sector is declining, which relates to the crisis that has affected the sector (see **6.5 Sustainable use**). In 2020, the fisheries sector in Belgium consisted of 370 accredited sea fishermen, with an average age of 39.5 years (Van Bogaert et al. 2021). In 2017, 246 Belgian companies were processing fish, of which 66 companies had fish processing as their main activity. These companies are mainly located at the coast and in the Brussels region. In the year 2018, companies with fish processing as their main activity provided employment to 1,227 full-time equivalents (FTE). The vast majority (92%) had fewer than 50 employees, while the average employment per company was around 21 FTEs. The employees are predominantly male (60.4% in 2018) (De Peuter 2020).

One of the main challenges within the sector is to increase the attractiveness of the sea fishing profession and to find well-trained young people, as the number of young fishermen has been declining in recent years (SALV 2015, SALV 2016, Van Bogaert et al. 2021). This is partly due to the hard work, the long time away from home and the increased risk of work accidents (28 in 2019), even though there are many regulations in place to improve working conditions on board and to optimise safety (Van Bogaert et al. 2021). Previs is responsible for, among other things, promoting a preventive policy and raising awareness of health and safety on board fishing vessels. Efforts are being made to improve the influx of young people into the sector by, for example, setting up the **Fund for young ship crew members**, in which Belgian ship owners annually deposit a mandatory contribution (for 2021: Decision of the Government of Flanders of 2 April 2021).

6.3.2 Belgian fishing fleet

6.3.2.1 The commercial fishing fleet

Based on the decision of the Government of Flanders of 16 December 2005, the fishing fleet is divided into three segments:

- Large fleet segment: All fishing vessels with an engine power capacity between 221 kW and 1,200 kW;
- Small fleet segment: All fishing vessels with an engine power capacity of 221 kW or less, except for the coastal fleet segment;
- Coastal fleet segment: All fishing vessels with an engine power capacity of 221 kW or less, a tonnage of maximum 70 GT and undertaking fishing trips of maximum 48 hours with both the start and end points in a Belgian port (MD of 16 March 2012). Joining the coastal fleet segment occurs on a voluntary basis and has to be agreed on by the Fisheries Service.

At present, the possibility and desirability for the establishment of a new small-scale professional fishing segment is being studied. The usefulness of a small-scale professional fishing segment is also emphasised by SALV (2019). The bottlenecks which inhibit the flow from the recreational fishery sector to the commercial segment are discussed in van Winsen et al. (2016) (LIVIS project, GIFS project).

In 2020, the Belgian sea fishing fleet consisted of 64 vessels with a total engine power of 41,229 kW and a gross tonnage of 12,478 GT (Belgian fleet report 2021; Statistics Flanders). The reported engine power differs from the one in the Official List of Belgian Fishing Vessels of the FPS Mobility because the latter does not consider the additional fictive engine power. Between 1950 (457 vessels) and 2000 (127 vessels), there was a sharp decrease in the number of active fishing vessels. Compared to 2000, the number has now again halved. However, the total engine power did not experience a similar decrease and remained relatively stable (figure 2). This is mainly due to the trend towards larger vessels in the beam trawling fisheries (Rijnsdorp et al. 2008) which was made possible by the aggregation of engine powers (Operational Programme implementing the National Strategic Plan for the Belgian Fisheries Sector 2007-2013).

Another major challenge for the Belgian fishing industry is to rejuvenate the fleet. In 2019, the average age of the hull of Belgian fishing vessels was 33 years. Only two vessels were younger than 10 years. However, in the meantime investments have been made to improve the engine and fishing gear. There are also eight new ships in the pipeline that will gradually be brought into service as of 2021 (Rederscentrale 2021). EMFAF and FIVA will make 4 million euro available for extra-legal investments to improve safety, comfort and energy efficiency (Van Bogaert et al. 2021).

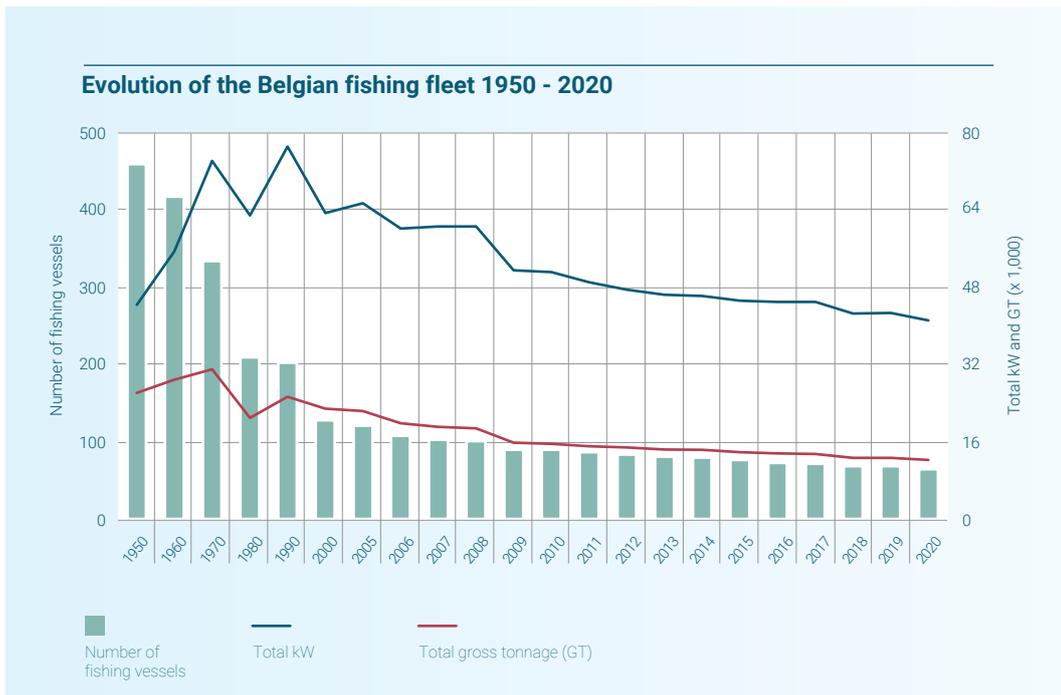


Figure 2. Evolution of the Belgian fishing fleet, number of vessels and capacity (GT and kW) on 31 December of the year, 1950-2020 (Velghe et al. 2020, Maertens 2020).

The dynamics of the Belgian fishing fleet with changing owners, immatriculation numbers, ports of registration and technological equipment can be consulted in a database on the website [One Century of Sea Fishing in Belgium](#) of VLIZ and in [Lescrauwaet et al. \(2013\)](#). A reference work on the key aspects of the wider fishing industry during 500 years of Flemish sea fishing has recently been published ([Lescrauwaet et al. 2018](#)).

6.3.2.2 The recreational fishing fleet

In the Flemish coastal ports, 814 unique vessels were identified in 2016 that are visibly equipped to undertake marine recreational fishing activities. The majority (87%) are angling vessels, while the other 13% are equipped for trawl fishing (otter trawl (7%) and beam trawl (6%)). These vessels are characterised by a high variability in sailing frequency. The average power of the angling vessels is 118 kW (160 hp) ([Verleye et al. 2019](#)).

6.3.3 Landings and value

6.3.3.1 Commercial landings and value

The historical landings (1929-1999) by Belgian fishing vessels per species and per fishing ground are registered on the website [A Century of Sea Fishing in Belgium](#) of VLIZ. The landings show a peak after World War II when more than 70,000 tonnes of fish per year were landed in the Belgian ports. Since then, landings dropped almost constantly until 2009 (19,175 tonnes), and reached a new low in 2020: 18,306 tonnes ([Flemish agriculture and fisheries in figures](#)). The long-lasting decrease of the landings until 2009 can be explained, amongst others, by a change in the species composition of the catch ([Platteau et al. 2014](#)), but the fuel crisis, the declining fish stocks, the declining fishing fleet, the limiting quota, the technological evolutions and the fishing effort limits all played a significant role (see **6.5 Sustainable use**). In 2020, 12,796 tonnes of the Belgian catch were landed in Belgian ports and 5,510 tonnes in foreign ports. The port of Zeebrugge is responsible for 53% of the landings in Belgian ports, followed by Port Oostende (45%) and Nieuwpoort (2%). In terms of landing volumes, plaice, sole, skates, squids and gurnards were the most important species in 2020 ([Flemish agriculture and fisheries in figures](#)).

The value of landings or turnover is the value of landed fish and fish products sold by public auction (calculated on the total of both traded and non-traded products). The total value of landings of fish by Belgian fishing vessels increased almost constantly after World War II from approximately 80 million euro (indexed value with respect to the reference year 2007) to peaks of approximately 130 million euro at the end of the eighties and in the early

nineties ([A Century of Sea Fishing in Belgium](#), VLIZ). Afterwards, the annual turnover decreased until 2009 (68.4 million euro). In 2020, the turnover was 74.3 million euro. Sole remained by far the most important fish species for the Belgian fishery in 2020, accounting for 42.3% of the turnover ([Flemish agriculture and fisheries in figures](#)). For the recent years, the landing values per species can be found on the website of the Department of Agriculture and Fisheries, as well as on [GeoFish](#). In spring 2020, the Covid-19 pandemic caused a temporary significant drop in fish prices. This was due to a constant supply of fish products while market demand (catering, export, etc.) fell. The Government of Flanders therefore supported the Flemish shipowners in a temporary halt so that the supply could decrease and prices could recover ([SALV 2020](#), [Van Bogaert et al. 2021](#)).

6.3.3.2 Recreational landings

Total landings (i.e. fish retained on board) from the recreational sea fishing sector in 2019 amounted to 150 tonnes. In terms of landings volume, brown shrimp (24%), whiting (20%), mackerel (19%), dab (14%), sole (9%) and sea bass (8%) were the main species. Angling vessels account for 60% of the landings (91 tonnes), followed by trawlers (31 tonnes), beach/dam anglers (20 tonnes), waders for shrimp (6 tonnes) and passive fisheries (3 tonnes) ([Verleye et al. 2020a](#)). Notwithstanding the ban on commercialisation of the catch, the marine recreational fisheries sector has an economic interest in terms of direct expenditures (8.6 million euro) ([Verleye et al. 2019](#)). The total economic value (including indirect value added such as tourism, jobs, etc.) is estimated at 33 million euro per year ([Hyder et al. 2019](#)). The Covid-19 crisis also impacted marine recreational fishing in 2020. For example, the loss in catch volume during the spring lockdown was estimated to be at least 18 tonnes, and direct expenditures at the daily level decreased by about 84% ([Verleye et al. 2020b](#)). The absence of recreational vessels at sea during the lockdown was also demonstrated in [Verleye et al. \(2020c\)](#).

6.3.4 Trade and consumption of fish products

In Belgium, there are three active fish auctions: Zeebrugge, Ostend and Nieuwpoort. Zeebrugge and Ostend together constitute the [Vlaamse visveiling](#) (Flemish fish auction). The average prices of fish caught by Belgian fishing vessels have increased almost constantly after World War II with a peak of 4.48 euro per kilo in 2006. In 2020, the average fish price in Belgian ports was 4.06 euro per kg ([Flemish agriculture and fisheries in figures](#)).

Figures from GfK Panel Services Benelux for VLAM reveal that in 2019, Belgians consumed on average 9.0 kg of fish products at home per capita, for an amount of 114 euro ([VLAM 2020](#)). Belgium's self-sufficiency rate for fishery products is 8.8% according to the [Food Balances](#) (FAO). In 2019, the import value of fishery products amounted to 1.6 billion euro, with 58% of the imported products coming from EU member states. The Netherlands are the main supplier, with a 27% market share. Exports clocked in at 860 million euro (95% within the EU), with the Netherlands (31%) and France (28%) as the main EU markets, followed by Germany (9%) ([Van Bogaert et al. 2021](#)).

6.3.5 Fishing communities

6.3.5.1 Commercial and small-scale fisheries

The social dimension of the fisheries sector (training, employment, wellbeing, etc.) is discussed in detail in [Van Bogaert and Platteau \(2018\)](#). One of the issues raised in the SALV analysis on the socio-economic aspects within the fisheries sector ([SALV 2016](#)) was the absence of local fishing communities. The impact of the CFP on the social and economic aspects of fishing communities was examined in a European study in 2011 ([Fish/2006/06](#)) with a case study in Ostend ([Delaney et al. 2010](#)). The GIFS project examined the socio-economic and cultural importance of inshore fishing for coastal communities. Within ILVO, the VISEO socio-economic research unit aims to bring together knowledge about technology, ecosystems and society in integrated and goal-oriented social-scientific research that meets the needs of the fishery sector and the policy ([VISEO 2012](#)). The research themes include research on company and sector level, value chain research, research on the sector in an international market environment and research on the impact of policy on the competitiveness of the sector and the environment.

Complementary to the 'FAO Code of Conduct for Responsible Fisheries' ([FAO 1995](#)), the FAO published the 'Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication' ([FAO 2015](#)). These guidelines aim to contribute to the visibility, recognition and reinforcement of the already important role of small-scale fishing, to the promotion of international efforts to combat hunger and poverty, as well as to the promotion of responsible fishing and sustainable socio-economic development.

Furthermore, [Stobberup et al. \(2017\)](#) discussed the potential role of small-scale fisheries in the 'Blue Growth' story, including the potential impact on coastal communities in terms of economic growth, employment and innovation. In [Pascual-Fernández et al. \(2020\)](#), a comprehensive overview is given of the situation of small-scale fisheries in Europe, including the challenges they face and the potential for economic growth and synergies with other sectors. This book also includes a chapter specifically devoted to the Belgian situation ([Verlé et al. 2020](#)).

6.3.5.2 Recreational fisheries

FAO published technical guidelines for the sustainable and socially-responsible management of recreational fisheries in 'FAO Technical Guidelines for Responsible Fisheries – Recreational Fisheries' ([FAO 2012](#)). The size of the Belgian marine recreational fishing community is estimated at over 2,000 individuals, of which 32% are affiliated with one of the many marine fishing clubs. The majority of the population are men (98%) and the average age is 56. About 67% lives in the province of West Flanders ([Verleye et al. 2019](#)). Within the context of marine recreational fishing, 15 horseback shrimp fishermen (recognised as a UNESCO World Heritage Site) and three '*kruier*' associations (shrimp fishing in the intertidal zone with a small manually towed net) are active in Oostduinkerke. In the first place, they can be considered as a folklore tradition (see [Paardevisser and Province West Flanders 2008](#), see thematic chapter **Maritime and coastal heritage**).

6.4 Impact

Fishing activities have an impact on the (marine) ecosystem, but the precise impact is still subject to debate. In addition to killing, displacing, influencing and extracting marine organisms, some fishing techniques cause a certain amount of disturbance of the seabed (BENTHIS project, [Depestele et al. 2014](#), [Teal et al. 2014](#), [Depestele et al. 2016](#), [Depestele et al. 2019](#), National BENTHIS project). This causes changes in the natural equilibrium after fishing. Furthermore, factors such as the energy consumption of fishing vessels, which consists solely of fossil fuels, and waste production also have an impact on the environment. (i.e. [Van Bogaert et al. 2021](#)). An overview of the impact of fishing activities is provided in [Polet and Depestele \(2010\)](#), [Adriaens et al. \(2013\)](#) and [Helsen et al. \(2021\)](#). A Strategic Environmental Assessment (SEA) is required for the Operational Programme (OP) on the basis of the RD of 18 May 2008 and will also be made up for the new OP. Some of the effects are discussed in more detail below.

6.4.1 Overfishing and illegal, unreported and unregulated fishing

The CFP stipulates that each member state must provide an annual [overview](#) of their fleet, quotas, catches, fishing methods and fishing activity (the 'fleet report'). This is necessary to manage fishing capacity and to adjust where necessary (CFP Article 22.2). The fleet report describes the balance between fishing capacity and fishing opportunities. In other words: between the total possible catch with the number of vessels and the engine power of the Belgian fleet and the quantity of fish available, given the restrictions such as quotas, fishing days and (temporarily) closed areas. Both factors are described using economic and biological indicators, such as number of vessels, quota uptake, landings in Belgian and foreign ports and catches per day at sea. The methodologies used to carry out the calculations are defined by a group of European experts and are in accordance with the European requirements (JRC and STECF).

The fleet report is made up by the Department of Agriculture and Fisheries and submitted to the European Commission, who checks and analyses the quality of the report provided. In case of an unbalanced fleet, an action plan is drawn up by the Department containing measures to rebalance the fleet. Such measures may be economic or biological, such as limiting the number of days at sea, banning the catch of a certain species or adjusting the minimum length of a fish species. According to the [Belgian fleet report \(2021\)](#), the Belgian fleet capacity has decreased by 39% in kW and by 48% in GT compared to the reference year 2003. As a result, fishing capacity is well below the reference levels.

Quota lists and additional quota measures are published on the [website](#) of the Fisheries Service of the Department of Agriculture and Fisheries. Exceedances of the Belgian quota are rather exceptional. The legal basis for possible measures in case of violations on the imposed quotas is Regulation (EC) 1224/2009 and Article 16 of the Decision of the Government of Flanders of 16 December 2005.

The impact on marine biological communities is exacerbated by illegal, unreported and unregulated (IUU) fishing ([handbook on IUU Regulation 2010](#), website [Fisheries service](#), website [DG MARE](#)) and discarding species that are

not wanted or have less economic value (so-called unwanted by-catch). Illegal practices such as high-grading, where the value of the catch is maximised by discarding smaller individuals of a given species in favour of larger ones (more information: [Vandendriessche et al. 2008](#), [CFP manual 2009](#)), also contribute to this. Therefore, a landing obligation was introduced through the CFP (Article 15). In the Global Atlas of Marine Fisheries ([Pauly and Zeller 2016](#)), fishery data from 273 countries is reported from independent sources and not based on member state reporting to the FAO. [Lescrauwaet et al. \(2013\)](#) provides an estimate of the unreported catch and bycatch of Belgian marine fisheries between 1929 and 2010.

In 2010, ICES introduced the principle of maximum sustainable yield (MSY) as the basis for its advice. A healthy MSY means that the biomass levels of a particular stock is sufficiently high and the fishing mortality sufficiently low to ensure that maximum sustainable yield can be achieved in the long term (e.g. [Van Bogaert and Platteau 2018](#)). An evolution of the status of the various fish stocks can be visualised per sea area in the online GIS tool [GeoFish](#). For the North Sea stocks assessed by ICES in 2020, 61% (28 out of 46) of the stocks are exploited at or below the FMSY level (i.e. fishing pressure corresponding to MSY). Average fishing mortality for the crustacean, demersal and benthic groups has been declining since the late 1990s ([ICES 2020a](#)).

For cod however, the spawning stock biomass in the North Sea is far below MSY level ([ICES 2020b](#)). There is also a downward trend in spawning biomass over the last six years below the limit. This hampers future reproduction. Fishing pressure is increasing, above MSY and even above the limit. This is far too high to allow sustainable management of this stock. The slow recovery of this stock is facilitated by the low reproductive success and the high natural mortality. Finally, several subpopulations in the North Sea have recently been discovered to exhibit different dynamics. ICES tries to incorporate these most recent findings in their estimates and advice for this fish stock.

The sole stock in the North Sea shows a decrease in fishing pressure, but is still above MSY level ([ICES 2020c](#)). The spawning stock biomass has fluctuated around the limit (below MSY) for several years. However, as the reproductive success was recently estimated to be high, a positive advice for 2021 was given for this stock. The sole stock in the Celtic Sea is in better shape. Fishing pressure is around sustainable levels and spawning stock biomass is well above sustainable levels.

6.4.2 Impact of fishing gear

The impact of fisheries on the ecosystem and biological communities depends to a large extent on the fishing gear used, the duration of the activity, the time and place where fishing takes place, although factors such as the mesh size of the nets and the experience of the fishermen also play an important role. The [BENTHIS](#) project (2012-2017) has brought together all knowledge on seabed disturbance. It provides an in-depth understanding of the problem and also proposes a method for quantifying seabed disturbance as a function of fishing gear and habitat. One case study focused on the North Sea. The results already point to a more nuanced story regarding seabed disturbance and associated mortality of benthic organisms, especially as scientific understanding improves with the availability of high-resolution fishery distribution data ([Teal et al. 2014](#), [Eigaard et al. 2016](#)). Table 1 provides an overview of studies on the impact of the gear types used by Belgian fisheries. Current Belgian research on the impact of otter trawling is limited, but the technique has been studied by some international partners within the [BENTHIS](#) project. Some alternative fishing techniques are discussed in [Polet and Van Peteghem \(2010\)](#).

[Sys et al. \(2016\)](#) studied whether the variations in landings by Belgian fishing vessels active in the Southern Bight of the North Sea were subject to competitive interactions with the Dutch beam trawl/pulse trawl fleet. The study demonstrated that after the establishment of the Dutch pulse trawler fleet in 2011, there was an increased negative weekday effect in the Flemish landings for sole. Further research is also being conducted into the possible negative ecosystem effects of pulse fishing ([VLIZ 2014](#), [Soetaert et al. 2015](#), [Soetaert et al. 2016a](#), [Soetaert et al. 2016b](#), [Soetaert et al. 2016c](#), [Soetaert et al. 2016d](#), [Desender et al. 2016](#), [Verschuere and Lenoir 2016](#), [Desender et al. 2017a](#), [Desender et al. 2017b](#), [Desender 2018](#), [Depestele et al. 2018](#), [WGELECTRA 2018](#), [Verschuere et al. 2018](#), [Vansteenbrugge et al. 2020 \(Pulsvisserij Vlaamse Kust Deel 1\)](#)). An overview of the scientific findings can also be found in [Sandra et al. \(2019\)](#) and on the European [Pulse Fishing](#) website. This fishing technique was frequently used by Dutch vessels in the Belgian part of the North Sea. The MD of 19 July 2019 banned pulse fishing in the Belgian 12 nm zone. From 1 July 2021 onwards, a general ban on the use of electric pulse fishing in all Union waters applies in accordance with Regulation (EU) 2019/1241 (Annex V - Part D).

6.4.3 Marine litter and impact on fisheries products

The presence of marine litter is a global problem that continues to grow in all seas and the ocean. The EU states in its new approach to a sustainable blue economy (COM (2021) 240) that 70% of marine litter in EU waters is plastic and fishing gear. Therefore, in addition to focusing on the energy efficiency of the fishing fleet, the EU will act to develop standards for the circular design of fishing gear in order to facilitate its reuse and recyclability. Furthermore, EMFAF will continue to support fishermen for the retrieval and collection of litter and lost fishing gear and will continue to invest in its proper treatment in ports and landing sites, in accordance with Directive (EU) 2019/883.

The first findings of the EMFF project [Marine Plastics](#) show that the fishery-related waste is fairly evenly spread across the area where the Belgian fleet operates ([De Witte et al. 2020](#)). Within the framework of a student project, the origin of litter on the beach (Oosteroever), the Visserijdok and the port of Ostend was traced ([Lescroart 2018-2019](#)). About 57% of the litter could be linked to a source (e.g. sector), of which 42% could be linked to fishing and offshore activities. Research on stranded birds on the Belgian coast showed that 0.6% was entangled in litter, mainly fishery-related ([Claessens et al. 2013](#)). [De Witte et al. \(2021a\)](#) showed that fishery-related waste in the BNS mainly consists of synthetic ropes (including fishing lines), fishing nets, fishery-related metal and rubber bobbins (see also [Devriese and Janssen 2021](#)). The highest absolute concentrations of fishing waste were observed near the coast. The relative share of fishing waste in the total number of observed items was lower in the coastal zone (31%) compared to the zone beyond 12 nm (52%). At the level of microplastics in fishery products, [De Witte et al. \(2021b\)](#) showed that the exposure to microplastics during the consumption of Belgian fish products is limited. For more information on microplastics in food and the potential impact on food safety, we refer to [Devriese and Janssen \(2021\)](#).

The Belgian fishing industry contributes to combating waste at sea within the [Fishing for Litter](#) project, linked to the international [Seas-at-Risk](#) project. Since 50% of the collected fishery waste is made up of old nets and 25% of rubber waste, the shipowners, in cooperation with a material supplier, are actively looking for a way to recycle it ([Van Bogaert et al. 2021](#)). Between 2013 and 2014, the [SPEKVIS](#) project investigated possible alternatives to the polyethylene dolly ropes (loose ropes that protect the bottom trawling nets against wear and tear) (see also **6.5.4 Sustainable fisheries sector**). Additionally, divers of the non-profit organisation Ecodivers are removing fishing nets, lead, lines and hooks from and around shipwrecks off the Belgian coast. The fishing nets go to an organisation that recycles marine waste into among others swimwear and socks.

Within recreational fishing, efforts are also being made to prevent waste from ending up in the sea and inland waters via the Flemish [Fishing Line Recycling Project](#). Furthermore, both at European level ([ECHA](#)) and in Belgium, steps are being taken together with the sector to phase out the use of fishing lead in marine (recreational) fishing ([Verleye and Dauwe 2021](#)). Lead is a persistent, bio-accumulative toxic element whose annual loss in Belgian marine waters is estimated at 2 tonnes. A first pilot project with lead alternatives at sea was carried out within the framework of the study [Verleye and Devriese \(2019\)](#).

6.4.4 Impact on other users

The spatial impact of fishing activities on other users of the sea was addressed in the [GAUFRE](#) project (BELSPO). In [Maes et al. \(2004\)](#) ([MARE-DASM](#) project (BELSPO)), a bottleneck analysis of professional fishing was carried out. The compatibility with other users in the BNS is also addressed in the MSP 2020-2026. On the other hand, other human activities in the BNS also have impact on fisheries (spatial claims, changing fish populations, etc.), these effects are dealt with in the respective thematic chapters.

6.4.5 Marine recreational fisheries

With the exception of passive beach fisheries (nets), marine recreational fishing in Belgium does not require any licence. As a consequence, it is difficult to determine the scale of this type of fisheries. The national monitoring programme (VLIZ, ILVO, FPS Environment, Province of West Flanders), in which cooperation with the marine recreational fishermen is the central pillar, has been generating extensive insights into the recreational catch, fishing effort, population size and economic impact ([Verleye et al. 2015](#), [Verleye et al. 2019](#), [Verleye et al. 2020a](#)). There was also intensive cooperation with marine recreational fishermen on other projects, such as the impact of Covid-19 on recreational fisheries on a national ([Verleye et al. 2020b](#)) and global level ([Pita et al. 2021](#)), alternatives to fishing lead ([Verleye and Devriese 2019](#); [Verleye and Dauwe 2021](#)) and the marking of sea bass ([Population dynamics of sea bass on the Belgian continental shelf - Part 2](#)).

Table 1. An overview of studies into the impact on the ecosystem of the most common types of fishing gear used in Belgian fisheries.

Fishing gear	Ecosystem impact	Literature
	Soil disturbance and associated impact on benthos and habitat	Lindeboom en de Groot 1998, Houziaux et al. 2008 (BELSPO), Polet et al. 2008, Rabaut et al. 2008, Depestele et al. 2008, Polet et al. 2010, Polet en Depestele 2010, Depestele et al. 2012 (WAKO-II project BELSPO), Van Lancker et al. 2012 (QUEST-4D project BELSPO), Depestele et al. 2014 (WAKO-II project BELSPO), Depestele 2015, Operationeel Programma EFMZV 2014-2020, Eigaard et al. 2016 (see also corrigendum), Eigaard et al. 2016, Depestele et al. 2016, Rijnsdorp et al. 2016, Depestele et al. 2018
Beam trawling	By-catch and discards	Depestele et al. 2008, Vandendriessche et al. 2008, Polet et al. 2010, Polet en Depestele 2010, Depestele et al. 2011, Depestele et al. 2012 (WAKO-II project BELSPO), Verschueren et al. 2012, Depestele et al. 2014, Depestele 2015, Theunynck en Verschueren 2015, Operationeel Programma EFMZV 2014-2020, Uhlmann et al. 2016, Verschueren en Lenoir 2016, van Marlen et al. 2016
	The food chain based on discards	Sotillo et al. 2012, Depestele et al. 2014 (BENTHIS), Sotillo et al. 2014, Depestele 2015, Depestele et al. 2016
	Consumption of fuels and raw materials	Depestele et al. 2007, Polet et al. 2008, Polet et al. 2010, Polet en Van Peteghem 2010, Polet en Depestele 2010, Operationeel Programma EFMZV 2014-2020
	Litter (see also 6.4.3 Marine litter and impact on fisheries product)	Bekaert et al. 2015 (SPEKVIS)
Sign trawling	Soil disturbance and associated impact on benthos and habitat	Buhl-Mortensen et al. 2016, Gislason et al. 2017
	Sediment suspension	Mengual et al. 2016
	By-catch of seabirds and marine mammals	Haelters en Kerckhof 2004, Depestele et al. 2006, Depestele et al. 2008, Haelters en Camphuysen 2009, Depestele et al. 2012 (WAKO-II project BELSPO), Depestele et al. 2014 (WAKO-II project BELSPO)
Trammel nets (a type of standing rigging)	Ghost fishing	Depestele et al. 2006, Depestele et al. 2008, Depestele et al. 2012 (WAKO-II project BELSPO), Depestele et al. 2014 (WAKO-II project BELSPO)
	By-catch and discards	Depestele et al. 2012 (WAKO-II project BELSPO), Depestele et al. 2014 (WAKO-II project BELSPO)

6.5 Sustainable use

6.5.1 Common fishery policy (CFP)

The CFP (Regulation (EU) 1380/2013) manages European fisheries and aims for a sustainable exploitation of marine resources as well as the creation of jobs and growth in coastal areas (see also [European Commission 2016](#)). This policy has to ensure that both fisheries and aquaculture are ecologically, economically and socially sustainable and form a healthy food source for the European citizens. There is a focus on the improvement of the scientific knowledge of the fish stocks.

The EC strives towards long-term management, by drafting multiannual plans that will contribute to a sustainable exploitation of the fish stocks and the protection of the marine ecosystems. The multiannual management plan for demersal fish stocks in the North Sea (Regulation (EU) 2018/973) provides a further implementation of the principles (i.e. sustainability, regionalisation) of the CFP. The aim of this regulation is to strive for sustainable fisheries and achieve a stable arrangement that can serve as a guideline for future decisions about catch possibilities in the North Sea. An overview of all multiannual plans is given on the [website](#) of the EC.

A few elements included in the CFP include the gradual introduction of the landing obligation (ban on discards), the achievement of maximum sustainable yield (MSY) for fish stocks (by 2020) and the focus on regional decision-making through new Advisory Councils ([website DG MARE](#)). To achieve the objectives of the CFP, the EU applies a number of conservation measures which can be divided into four groups ([Adriansens 2009](#), [website DG MARE](#)):

- Europe defines the Total Allowable Catch (TAC) of specific fish stocks within a certain period. These TACs are divided among the member states by means of quota. The Flemish quota measures are kept up to date on the [website](#) of the Fisheries service. An overview of the quota and the related degree of utilisation is shown on the [website](#) of the *Redercentrale*. The quota can be swapped among the member states. At the World Summit on Sustainable Development in Johannesburg (UN 2002), the international community committed itself to adopt a new management system for fish stocks based on the MSY concept at the latest by 2015, where possible (Adriansens 2009, CFP manual 2009). At present, MSY is determined for the important commercial fish species for which solid data is available. For certain species such as skates, the level of MSY cannot yet be calculated. ICES must provide quantitative TAC advice for Europe based on all available information for all stocks for which there is no management plan and no MSY value. The current Belgian fleet mainly focuses on typical mixed fisheries. In order to face this challenge, fisheries management is evolving towards 'multi-species management'. This issue is discussed in the ICES working group on mixed fisheries (WGMIXFISH). In addition, the effects of extensive selective fishing are being pointed out and some authors (e.g. Garcia et al. 2012) advocate a balanced fishery in which the fish are caught in accordance with their natural occurrence (i.e. even distribution of the fishing effort over the entire ecosystem);
- Technical measures have been introduced, such as a minimum mesh size, selective fishing gear, closed areas, minimum landing sizes and a gradual introduction of a ban on discards;
- The fishing effort is limited by restricting the number of days on which fishing boats are allowed to fish at sea. In addition, the fishing effort is reoriented by closing certain zones (temporarily) for fishing activities;
- Fleet measures have been set with maximum kW and GT capacities for every EU member state. For fleet segments with overcapacity, the member states can take measures.

EMFAF (Regulation (EU) 2021/1139) was established in order to support the implementation of the member states' operational programmes comprising, inter alia, the measures referred to above and giving effect to the EU priorities listed in the EMFAF Regulation (see also **6.5.4 Sustainable fisheries sector**). In doing so, EMFAF strives for competitive, environmentally sustainable, economically viable and socially responsible fishing and aquaculture. For the period 2021-2027, 40.3 million euro is reserved for Belgium, which corresponds to 0.8% of the total EMFAF budget under shared management (5.3 billion euro).

Since 1 January 2010, the control system for ensuring compliance with the CFP has been settled by Regulation (EC) 1224/2009, which refers to Regulation (EC) 1005/2008 (see also Verleye et al. 2018) in order to prevent and eliminate IUU-fisheries (see **6.4.1 Overfishing and illegal, unreported and unregulated fisheries**). As a result, fishing activities of all fishing vessels, with the exception of the small traditional vessels (<12 m), can be monitored by means of a satellite tracking system (VMS). Additionally, all ships have to be equipped with an electronic logbook, in which fishermen need to report the date, place, catch method and size of the catch for every species (website DG MARE). The possibility of on-board weighing is currently being explored so that the weight of catches can be recorded more accurately in the future. In order to organise cooperation and coordination between member states with regard to fisheries control and inspection, the Community Fisheries Control Agency (CFCA) was set up in Vigo in 2006.

6.5.2 Marine Strategy Framework Directive

Besides the CFP, the Marine Strategy Framework Directive (MSFD, Directive 2008/56/EC) also offers a framework to limit or avoid the impact of fisheries on the marine environment. A number of descriptors have been developed to define a good environmental status, some of them directly or indirectly related to fisheries (see also thematic chapter **Nature and environment**): descriptor 1 (biodiversity; Cochrane et al. 2010), descriptor 3 (populations of commercially exploited species; Piet et al. 2010), descriptor 4 (marine food chain; Rogers et al. 2010), descriptor 6 (integrity of the seabed; Rice et al. 2010), descriptor 9 (polluting substances in marine organisms for human consumption; Swartenbroux et al. 2010) and descriptor 10 (marine litter; Galgani et al. 2010).

The physical damage to the seabed due to fishing activities and the selective extraction of species, including the incidental catch of non-target species, has also been included in the indicative list of pressures and impacts. Furthermore, the need for a monitoring programme for the chemical pollution of commercial fish species has been highlighted. In the context of the MSFD related programme of measures for the Belgian marine waters (Belgian State 2016), there is also attention for marine recreational fisheries next to the commercial fisheries (measures 11, 24, 27 and 29D).

In 2018, a first version of the revision of the initial assessment of the Belgian marine waters (Belgian State 2018) was published in which the specific environmental targets for fisheries were evaluated. Despite the fact that

descriptor 3 was positively evaluated, fisheries in Belgian waters still have a high negative impact on the benthic habitat quality (descriptor 6) ([IA2017 Condition of Benthic Habitat Communities: Subtidal Habitats of the Southern North Sea](#)). As a result, the soft substrate was assessed as inadequate and the good environmental status (GES) was not achieved.

6.5.3 Data collection in Europe and Belgium

The collection of reliable and complete (both temporal and spatial) data is essential for fisheries management under the CFP, which is based on the best available scientific advice. The main instrument for data collection and management is Directive (EU) 2017/1004.

Within the context of the data collection framework, the EC draws up implementing acts to describe a multiannual Union programme for data collection. Those implementing acts lay down the detailed obligations of data collection for the member states:

- Implementing Decision (EU) 2019/909 lays down the list of mandatory surveys and thresholds for the implementation of the multiannual Union programme for the collection and management of data in the fisheries and aquaculture sector for the period 2020 to 2021.
- Commission Delegated Decision (EU) 2019/910 establishes the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors.

The financing of data collection has been covered by the EMF(A)F since 2014. The advice of the CFP based on the scientific information is provided through various bodies:

- ICES provides biological advice for EU fisheries management through international cooperation of fisheries biologists. The conclusions of the working groups within ICES that work on fish stock assessment are incorporated into the deliberations of the ICES Advisory Committee ([ACOM](#));
- STECF is the regular advisory body to the EC on fisheries. This body was established in 1993 (Commission Decision 93/619/EC), renewed in 2005 (Commission Decision 2005/629/EC) and renewed at the beginning of 2016 under the new CFP (Commission Decision 2016/C 74/05). The STECF consists of a group of independent scientists from the different member states and advises the EC on all aspects of fisheries policy.

In Belgium, the research group [Fisheries Biology](#) of ILVO is responsible for the coordination and execution of the Belgian data collection of commercial fisheries, recreational fisheries (in cooperation with VLIZ), the fish processing industry and aquaculture. Based on the data collection, ILVO provides advice on the state and management of Belgian and European fish stocks. Furthermore, this research group supports research on the ecosystem approach, stock assessment methods, dynamics of marine ecosystems and the possible impact of fisheries management on the stocks and fisheries as such. In order to achieve these general objectives, research activities focus, among other things, on the collection and analysis of data relating to the size of fish stocks, the exploitation pattern of commercially important species and the marine ecosystem.

Inventories and studies on the economic and social data of the fisheries sector, the fish processing industry and aquaculture sector are also carried out by ILVO. This research results in both scientific and (socio-) economic advice to support the development and implementation of the CFP. Some of the key challenges are: the evolution from a single-species to a multi-species approach, ecosystem approach for fisheries, regionalisation, promoting cooperation between the fisheries sector and scientists through the Fisheries-Science Partnership (VWP), the Brexit (see [SALV 2020](#)), the socio-economic impact of policy changes, the evolution towards a full value chain policy, the expansion of end-users, the monitoring of protected and vulnerable species and the landing obligation.

The Implementing Decision (EU) 2019/910 also provides for an obligation to collect biological data from recreational fisheries. For the North Sea, data (catch and discards) should be collected within the recreational context for the following species: cod, sea bass, pollack, salmon, eel and elasmobranchs. The [monitoring programme](#) for marine recreational fisheries (VLIZ, ILVO, FPS Environment, Province of West Flanders), provides for the collection of catch data (all species) and a first economic impact analysis in close cooperation with the marine recreational fisheries community ([Verleye et al. 2019](#), [Verleye et al. 2020a](#)).

6.5.4 Sustainable fishing sector

The fishing industry has gone through several years of crisis in which the authorities have tried to respond appropriately with specific measures. The aim is to achieve more sustainability in the Flemish fishing industry, which is linked, among other things, to investments in increased profitability, energy-saving techniques in the broad sense (including engines, auxiliary engines, fishing gear, equipment, etc.), alternative, environmentally friendly or more selective fishing techniques, scrapping programmes to balance fleet capacity and quota, emphasis on other target species, changes in landing volumes, improvement of the quality of the fish, improved working conditions and safety of crews and the development of a sustainable aquaculture sector in Flanders (a.o. [Roegiers et al. 2012](#)). An overview of the current problems within the fisheries sector is provided in [SALV \(2016\)](#).

In order to be able to deal with the profitability problems of the fishing fleet, the Government of Flanders drew up an overall action and restructuring plan in 2006 ([Fisheries Task Force 2006](#)), aiming towards sustainable Flemish fisheries by means of structural measures. More specifically, the following restructuring measures were implemented:

- Adapted fleet policy: This plan is part of the European Regulation (EC) 744/2008, which provided public aid to vessel owners engaging in partial decommissioning and increased aid for modernisation for a certain period of time (until 31 December 2010 at the latest). In addition, the scrapping of vessels was temporarily supported by government intervention (MD of 2 June 2009). In addition, the maximum engine power was increased to 1,200 kW, creating more space for the pooling of engine power. A third fleet segment, the 'coastal fleet segment', was also established (see [6.3.2 Belgian fishing fleet](#));
- Adjusted quota policy: The adjusted Flemish quota policy (in force since 1 February 2006) must contribute to an optimal and efficient quota use (more information: [Adriansens 2009](#));
- Supporting policy: Alternative fishing techniques are being explored in order to convert the remaining vessels into a sustainable fleet.

In the pursuit towards a sustainable fishing sector, each member states is required to draw up an Operational Programme (OP) and an SEA of the national programme within the framework of the EMF(A)F (see RD of 18 May 2008). For the Belgian fishing sector, a SWOT analysis and a description of the strategy were made in relation to the four priorities of the EMFAF. The renewed Belgian OP is expected in 2022.

In 2012, the Government of Flanders already developed an [Action plan selective fishing \(2012\)](#) in order to react pro-actively on a few topics of the reformed CFP that came into effect in 2014. In this action plan, 10 priorities were proposed which must lead towards more sustainable fisheries. One of the actions points at the importance of the [first societal covenant](#) for sustainable fisheries (2011) that has been developed by the fishery sector and that lays down the guidelines for a transition to a sustainable fishery sector. As a result of this first covenant, these outlines were set out in the report '[Vistraject](#)' ([De Snijder et al. 2015](#)). This report must ensure that the sustainability objectives of the current CFP are achieved. [Vistraject](#) identifies seven main goals concerning the transition of the sector towards sustainable Flemish fisheries. These are based on three pillars: (1) profitability, (2) care for the environment and (3) the social aspect of fishing. In June 2015, the [second social covenant](#) implementing the objectives of the [Vistraject](#) project was signed (2015-2020). This new covenant was based on the ambitions within a renewed approach, both in terms of content and organisation, and with an increase in the number of partners involved. In this way, the Belgian fishery was able to evolve further towards sustainability based on responsible entrepreneurship and to provide the consumer with fresh fish that scores highly in terms of quality, and this with respect for the biological balances in the sea. As a result of the successful voluntary and positive involvement of the sector (bottom-up) in the policy process, a [third covenant](#) and accompanying action plan were published, which serve as a framework for the next period. With this third social covenant (2021-2025), the parties involved want to renew their commitment and want to support the Flemish fishery in the further pursuit of sustainability based on a multidisciplinary approach by all involved and interested parties.

ILVO is conducting research into more sustainable fishing techniques. For example, the design of the beam trawl is being adapted to increase selectivity and reduce seabed disturbance, drag and thus fuel consumption ([Depestele et al. 2007](#), [Stouten et al. 2007](#), [Depestele et al. 2016](#), [Depestele et al. 2019](#)). Experimental modifications to fishing gear are also being tested in order to reduce discards of undersized fish and non-commercial organisms. It is expected that research on improved species and length selectivity will remain necessary in the future due to the discard ban (a.o. [Depestele et al. 2011](#)). Research is also being carried out into alternative fishing techniques such as, for example, handline fishing, gillnets, flyshooting and shrimp pulse trawls (Hovercran) (a.o. [Van Craeynest 2009](#), [Polet and Van Peteghem 2010](#), [Verhaeghe et al. 2011](#), [Verschueren et al. 2012](#), [Depestele et al. 2012](#) (WAKO-II project (BELSPO)), [Depestele et al. 2014](#) (WAKO-II project (BELSPO)), [Soetaert et al. 2015](#), [Depestele et al. 2016](#), [Soetaert et al. 2018](#), [Depestele et al. 2019](#), [Soetaert et al. 2019](#), [Verschueren et al. 2019](#), [Boute et al. 2021](#)).

Numerous research projects aim to make fisheries more sustainable. One of the most prominent projects with practical results is the [VALDUVIS](#) project (2012-2017). The [VALDUVIS](#) methodology determines the sustainability score at the level of each individual fish box landed on the basis of indicators relating to the three pillars of sustainability. The [MaViTrans](#) project (2017-2019) is a first application of the [VALDUVIS](#) tool on the market. The project aims to make the Belgian fishing fleet more sustainable by giving a market recognition to vessels that are formally committed to improve their sustainability score within a period of three years (started 11 June 2018). When the products meet a certain minimum score, they receive the sustainability mark '*Visserij verduurzaamt*', which is displayed on the auction clock. Recently, pilot projects are trying to make this sustainability score visible further down the commercialisation chain, right up to the consumer.

In addition, many other research projects aiming to provide further scientific support to the fishing sector can be cited:

- The [VISTools](#) project (2018-2020) aimed to automatically collect the data from various sensors on board a fishing vessel (scale, GPS, tensiometer, depth meter, fuel consumption) so that the yield, catch composition and fuel consumption can be determined at the level of each fishing activity. The real-time provision of information can support shipowners in making any adjustments to their operations;
- The [Combituig](#) project aimed to reduce the catch of choke species and other by-catches in beam trawling and improve their survival by innovative technical developments of the nets;
- The [VALOREVIS](#) project (2014-2015) in turn aimed, on the one hand, at mapping the residual flows in the fisheries sector that are the most interesting to valorise and, on the other hand, at facilitating and creating new industrial activities and cooperations in Flanders based on valorisation;
- The [SPEKVIS](#) project (2013-2014) aimed at identifying alternative materials for the polyethylene dolly ropes and thus bridge the gap with the textile sector. The introduction of plastics into the sea and their fragmentation into so-called microplastics can lead to the ingestion of these particles by marine organisms, and therefore constitute an important research field with a view to improving the quality of fish ([De Witte et al. 2014](#), [Van Cauwenberghe and Janssen 2014](#), [Devriese et al. 2015](#), [Vandermeersch et al. 2015](#), [Devriese et al. 2017](#), [Devriese and Janssen 2021](#)). Additionally to this, a test project was started in the autumn of 2018 by the FPS Environment and VLIZ on the use of lead-free fishing weights in cooperation with the marine recreational fisheries sector ([Verleye and Devriese 2019](#)). This study was, together with the comprehensive follow-up study of [Verleye and Dauwe \(2021\)](#), taken into account by the European Chemicals Agency ([ECHA](#)) in the preparation process to develop a ban on the use and sale of lead for angling purposes;
- The [Geovis](#) project gathers the available information (both scientific data and sector information) about Belgian fishing grounds into an online platform, accessible to the sector and the policymakers. This initiative helps both the sector and the policymakers to take the necessary decisions in order to be able to carry out their activities, in a flexible way and with solid background information.

The legislative framework and the sustainability limits (economic, social and ecological) framing the development of the Belgian fisheries in the future, are determined by the CFP, as well as numerous other directives such as the Habitats Directive (Directive 92/43/EEC), the MSFD, the European Framework Directive for Maritime Spatial Planning (Directive 2014/89/EU), etc. Within these frameworks, the actors within the fisheries sector will be decisive for the future of the sector in Flanders. A prospective study has already been carried out by the [SALV \(2017\)](#).

Legislation reference list

Overview of the relevant legislation on European, federal and Flemish level. For the consolidated European policy context see [Eurlex](#). The national legislation can be consulted on the [Belgian official journal](#) and the [Justel-database](#), the Flemish legislation is available on the [Flemish Codex](#).

European legislation and policy context			
Document number	Title	Year	Number
Decisions			
C/2016/1084	Commission Decision establishing a Scientific, Technical and Economic Committee for Fisheries	2016	1084
Implementing Decision (EU) 2019/909	Implementing Decision laying down the list of mandatory surveys and the thresholds for the application of the multiannual Union programme for the collection and management of data in the fisheries and aquaculture sector	2019	909
Delegated Decision (EU) 2019/910	Delegated Decision establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors	2019	910
Communications			
COM (2001) 264	Communication from the Commission: A sustainable Europe for a better world: A European Union strategy for sustainable development	2001	264
COM (2009) 163	Green Paper: Reform of the Common Fisheries Policy	2009	163
COM (2011) 417	Communication from the Commission: Reform of the common fisheries policy	2011	417
Directives			
Directive 92/43/EEC	Directive on the conservation of natural habitats and of wild fauna and flora (Habitats Directive)	1992	43
Directive 2008/56/EC	Directive establishing a framework for Community action in the field of marine environmental policy (Marine Strategy Framework Directive)	2008	56
Directive 2014/89/EU	Directive establishing a framework for maritime spatial planning (MSP Directive)	2014	89
Directive (EU) 2017/1004	Regulation on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy and repealing Council Regulation (EC) No 199/2008	2017	1004
Directive (EU) 2019/883	Directive on port reception facilities for the delivery of waste from ships	2019	883
Regulations			
Regulation (EC) 744/2008	Regulation instituting a temporary specific action aiming to promote the restructuring of the European Community fishing fleets affected by the economic crisis	2008	744
Regulation (EC) 1005/2008	Regulation establishing a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Regulations (EEC) No 2847/93, (EC) No 1936/2001 and (EC) No 601/2004 and repealing Regulations (EC) No 1093/94 and (EC) No 1447/1999 (IUU Regulation)	2008	1005
Regulation (EC) 1224/2009	Regulation establishing a Community control system for ensuring compliance with the rules of the Common Fisheries Policy, amending Regulations (EC) No 847/96, (EC) No 2371/2002, (EC) No 811/2004, (EC) No 768/2005, (EC) No 2115/2005, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1049/2007 and (EC) No 1049/2007 2115/2005, (EC) No 2166/2005, (EC) No 388/2006, (EC) No 509/2007, (EC) No 676/2007, (EC) No 1098/2007, (EC) No 1300/2008, (EC) No 1342/2008 and repealing Regulations (EEC) No 2847/93, (EC) No 1627/94 and (EC) No 1966/2006 (Control Regulation)	2009	1224
Regulation (EU) 1380/2013	Regulation on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC (Common Fisheries Policy)	2013	1380

European legislation and policy context (continuation)			
Document number	Title	Year	Number
Regulation (EU) 508/2014	Regulation on the European Maritime and Fisheries Fund and repealing Council Regulations (EC) No 2328/2003, (EC) No 861/2006, (EC) No 1198/2006, (EC) No 791/2007 and Regulation (EU) No 1255/2011 of the European Parliament and of the Council	2014	508
Regulation (EU) 1242/2019	Regulation on the conservation of fisheries resources and the protection of marine ecosystems through technical measures, amending Council Regulations (EC) No 1967/2006 and (EC) No 1224/2009 and Regulations (EU) No 1380/2013, (EU) 2016/1139, (EU) 2018/97, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council, and repealing Council Regulation (EC) No 1224/2009, 1380/2013, (EU) 2016/1139, (EU) 2018/973, (EU) 2019/472 and (EU) 2019/1022 of the European Parliament and of the Council and repealing Council Regulations (EC) 894/97, (EC) 850/98, (EC) 2549/2000, (EC) 254/2002, (EC) 812/2004 and (EC) 2187/2005	2019	1241
Regulation (EU) 1139/2021	Regulation establishing the European Maritime, Fisheries and Aquaculture Fund and amending Regulation (EU) 2017/1004	2021	1139

Belgian and Flemish legislation		
Dates	Title	File number
Decisions of the Govt. of Flanders		
Decision of the Government of Flanders of 16 December 2005	Besluit van de Vlaamse Regering tot de instelling van een visvergunning en houdende tijdelijke maatregelen voor de uitvoering van de communautaire regeling inzake de instandhouding en de duurzame exploitatie van de visbestanden	2005-12-16/48
Decision of the Government of Flanders of 13 March 2015	Besluit van de Vlaamse Regering houdende een verbod op het gebruik van warrelnetten en kieuwnetten in de Vlaamse strandzone ter bescherming van zeezoogdieren	2015-03-13/02
Decision of the Government of Flanders of 5 February 2016	Besluit van de Vlaamse Regering houdende vaststelling van de werking en het beheer van het Financieringsinstrument voor de Vlaamse visserij- en aquacultuursector (FIVA) en de verrichtingen die voor steun in aanmerking komen	2016-02-05/24
Decision of the Government of Flanders of 9 September 2016	Besluit van de Vlaamse Regering tot vaststelling van aanvullende nationale maatregelen voor de instandhouding en het beheer van de visbestanden en voor controle op de visserijactiviteiten	2016-09-09/03
Decision of the Government of Flanders of 2 April 2021	Besluit van de Vlaamse Regering tot vaststelling van de regels voor de verplichte bijdrage van de reders van Belgische vissersvaartuigen aan het Fonds voor Scheepsjongeren	2021-04-02/32
Decrees		
Decree of 13 May 1997	Decreet houdende oprichting van een Financieringsinstrument voor de Vlaamse visserij- en aquacultuursector	1997-05-13/31
Decree of 28 June 2013	Decreet betreffende het landbouw- en visserijbeleid	2013-06-28/15
Royal Decrees		
RD of 4 August 1981	Koninklijk besluit houdende politie- en scheepvaartreglement voor de Belgische territoriale zee, de havens en de stranden van de Belgische kust	1981-08-04/31
RD of 21 December 2001	Koninklijk besluit betreffende de soortenbescherming in de zeegebieden onder de rechtsbevoegdheid van België	2001-12-21/72
RD of 18 May 2008	Koninklijk besluit tot vaststelling van het feit dat een beoordeling van de gevolgen op het milieu vereist is voor het nationaal operationeel programma voor de visserijsector en dat een beoordeling van de gevolgen op het milieu niet vereist is voor het nationaal strategisch plan voor de visserijsector	2008-05-18/32
RD of 23 June 2010	Koninklijk besluit betreffende de mariene strategie voor de Belgische zeegebieden	2010-06-23/05
RD of 22 May 2019	Koninklijk besluit tot vaststelling van het marien ruimtelijk plan voor de periode van 2020 tot 2026 in de Belgische zeegebieden	2019-05-22/23
RD of 28 June 2019	Koninklijk besluit betreffende de pleziervaart	2019-06-28/08
RD of 4 February 2020	Koninklijk besluit tot instelling van veiligheidszones in de zeegebieden onder Belgische rechtsbevoegdheid	2020-02-04/12

Belgian and Flemish legislation (continuation)		
Dates	Title	File number
Ministerial Decrees		
MD of 2 June 2009	Ministerieel besluit tot toekenning van een beëindigingspremie voor de definitieve onttrekking van vissersvaartuigen aan de zeevisserijactiviteit in het kader van een vlootaanpassingsregeling	2009-06-02/01
MD of 16 March 2012	Ministerieel besluit tot uitvoering van het besluit van de Vlaamse Regering van 16 december 2005 tot de instelling van een visvergunningen houdende tijdelijke maatregelen voor de uitvoering van de communautaire regeling inzake de instandhouding en de duurzame exploitatie van de visbestanden, wat betreft het kustvissersegment en de opdeling van bestaande visvergunningen	2012-03-16/10
MD of 19 May 2016	Ministerieel besluit tot uitvoering van het besluit van de Vlaamse Regering van 5 februari 2016 houdende vaststelling van de werking en het beheer van het FIVA en de verrichtingen die voor steun in aanmerking komen	2016-05-19/06
MD of 4 October 2016	Ministerieel besluit betreffende individuele maatregelen ter bescherming van het cultureel erfgoed onder water	2016-10-04/03
MD of 19 July 2019	Ministerieel besluit houdende het verbod op de pulsvisserij in de Belgische twaalfmijlszone	2019-07-19/06
MD of 24 December 2020	Ministerieel besluit houdende tijdelijke aanvullende maatregelen voor het jaar 2021 tot het behoud van de visbestanden in zee	2020-12-24/07
MD of 15 June 2021	Ministerieel besluit tot instelling van een veiligheidszone rond de zeeboerderij	2021-06-15/02
Laws		
Law of 19 August 1891	Wet betreffende de zeevisserij in de territoriale zee	1891-08-19/30
Law of 10 October 1978	Wet houdende vaststelling van een Belgische visserijzone	1978-10-10/30
Law of 22 April 1999	Wet betreffende de exclusieve zone van België in de Noordzee.	1999-04-22/47
Law of 5 July 2018	Wet betreffende de pleziervaart	2018-07-05/07

