



WWF

POLICY BRIEF

EU

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MITIGATING CLIMATE CHANGE IMPACTS ON FOOD SECURITY FROM THE OCEAN

EXECUTIVE SUMMARY

A changing climate poses significant challenges to both fisheries management and food security. Millions of people depend on a healthy ocean for their livelihoods, and billions for their food. Yet, overfishing, pollution and habitat destruction have had devastating consequences on marine ecosystems and the biodiversity they support. These pressures are amplified by climate change.

Existing fisheries management needs to be reformed to take into account shifts in fish population distributions, changing habitats and decreasing sizes of fish. Sustainable fisheries management must be prioritised alongside a reduction in fish discards. Encouraging consumption of non-traditional fish species from lower in the food chain and a transition to sustainable aquaculture methods are vital to alleviate the impacts of climate change.

Failure to mitigate and adapt to climate change will lead to dramatic falls in fishery productivity, with negative consequences for both people and the environment. However, a concerted and adaptive response to climate change can lead to more abundant marine resources and increased profits. WWF's vision is to ensure the long-

term sustainability of fish populations, to maintain healthy ecosystems and safeguard marine biodiversity – which ultimately delivers a viable and sustainable seafood industry.

A transformation of European Union (EU) fisheries and seafood governance is urgently required to deliver the 2030 Agenda and, specifically, the United Nations Sustainable Development Goals (SDGs) 1, 2 and 14, to which all parties of the United Nations and all EU Member States (MS) have committed.

WWF calls on the EU to provide global leadership on ocean governance and urges all MS and industry stakeholders to intensify efforts towards sustainable fisheries and ecosystem-based management of our ocean.

The United Nations Sustainable Development Goals 1, 2 and 14 are required to deliver the European Union 2030 Agenda.



THE GLOBAL GOALS
For Sustainable Development



**DIVERSIFICATION OF MARINE ACTIVITIES WILL
IMPROVE LIVELIHOOD
RESILIENCE FOR COMMUNITIES**

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OUR OCEAN IN THE GLOBAL CLIMATE CONTEXT

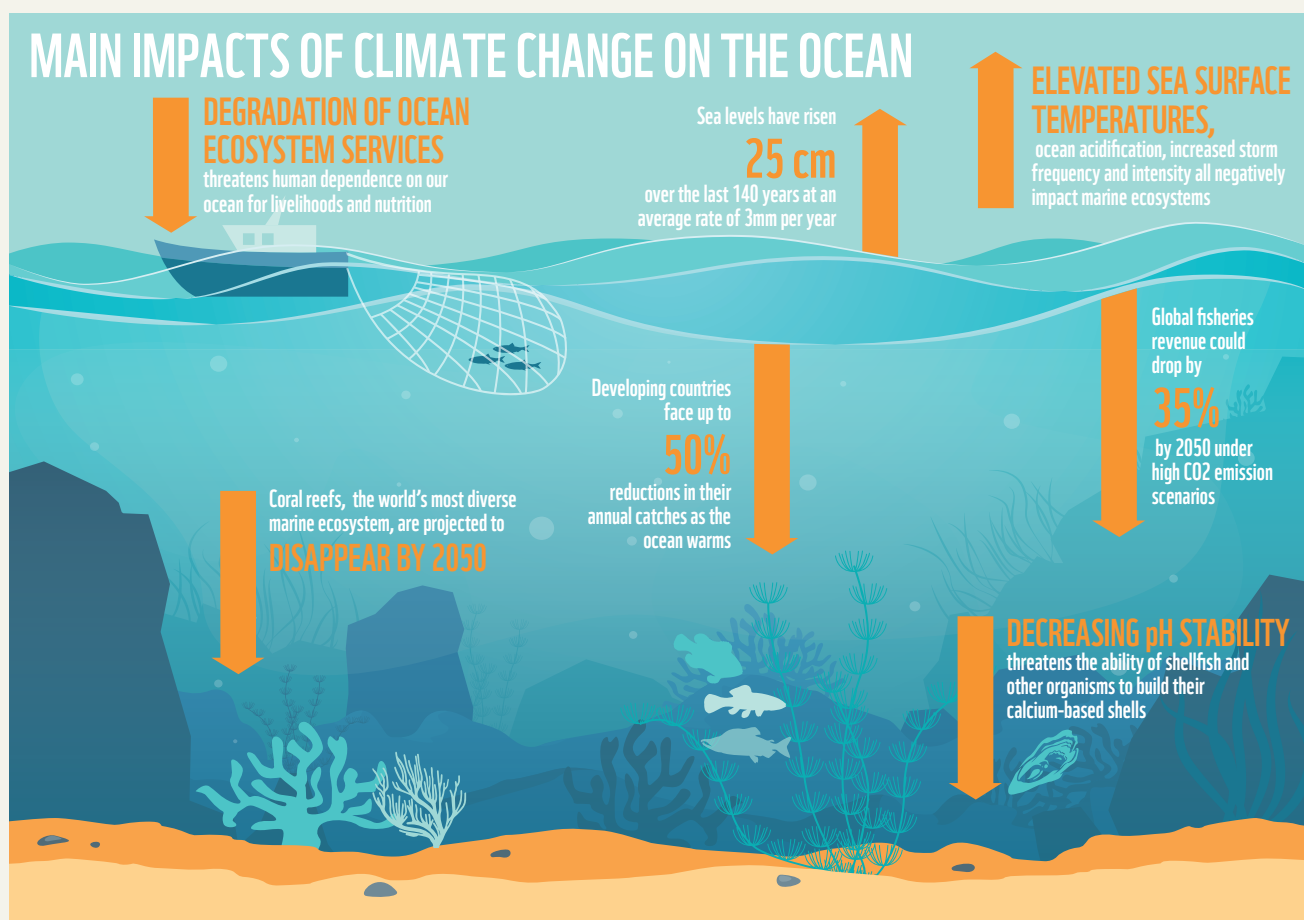



Figure 1: Climate change impacts our ocean, including its biological and physical processes, in many different ways.¹



**DEVELOPING COUNTRIES
FACE POTENTIAL
REDUCTIONS IN ANNUAL
CATCHES OF UP TO
50% BY
2050**

Climate change is unequivocal and the impacts will have severe repercussions for the ocean in many different ways (Figure 1). Higher temperatures cause physical modifications to the marine environment: warmer surface temperatures affect how water circulates at depth and disrupts complex food webs, whilst changing weather patterns bring more frequent and severe storms with implications for both coastal habitats and fisheries. In addition, warmer seas hold less oxygen, affecting ecosystems and species populations. By absorbing more CO₂ from the atmosphere, the ocean's chemical composition is changing at an unprecedented rate, resulting in a more acidic ocean with negative consequences for many species.

In an ocean warming scenario of over 1.5°C, global catch potential is projected to decrease by over 3 million tonnes for every additional degree of warming.² However, if global warming can be restricted to 1.5°C above pre-industrial levels and if full adaptive management were put in place on a global scale, scientists estimate that we could see potential gains in fish biomass, resulting in increased seafood harvests and profits by 2100³ (Figure 2). The EU's seafood supply and the European consumer's dependency on imported seafood will change in the face of a warming world. In the North Sea for example, scientists have found that overfishing makes fisheries increasingly vulnerable to warming waters.⁴ Food security is a crucial challenge, especially in developing countries, as these places are warming faster than the global average (e.g. India, Philippines) and face potential reductions in annual catches of up to 50% by 2050.⁵ As the global population looks set to reach nearly 10 billion by 2050 and require more resources than ever before, it is unlikely that we will be able to rely on our marine resources as we did in the past – not nutritionally, economically, culturally, socially or recreationally.

ESTIMATED INCREASE IN FISH BIOMASS, HARVEST & PROFIT FROM ADAPTATION TO CLIMATE CHANGE

SCENARIO: ■ Full adaptation: assumes that fisheries management addresses challenges in both ocean productivity (marine food web biodiversity and population density) and shifting distribution of marine resources.
 ■ No adaptation: assumes that neither climate challenge is addressed.

Percent difference in biomass, harvest, and profit relative to today

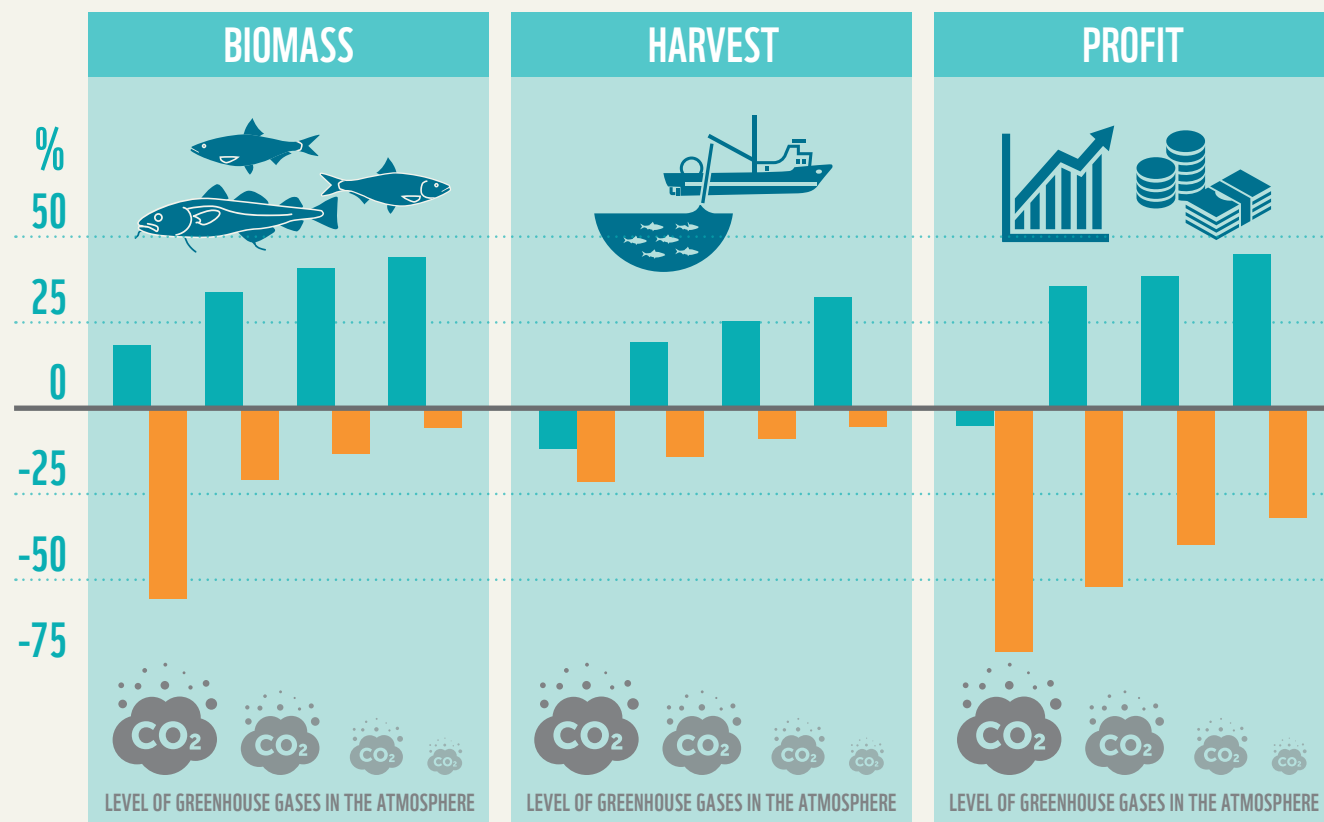


Figure 2: In a scenario of full adaptation to climate change, studies have predicted significant opportunities and benefits in seafood production.⁶



BY 2030, END HUNGER, ACHIEVE FOOD SECURITY & IMPROVED NUTRITION

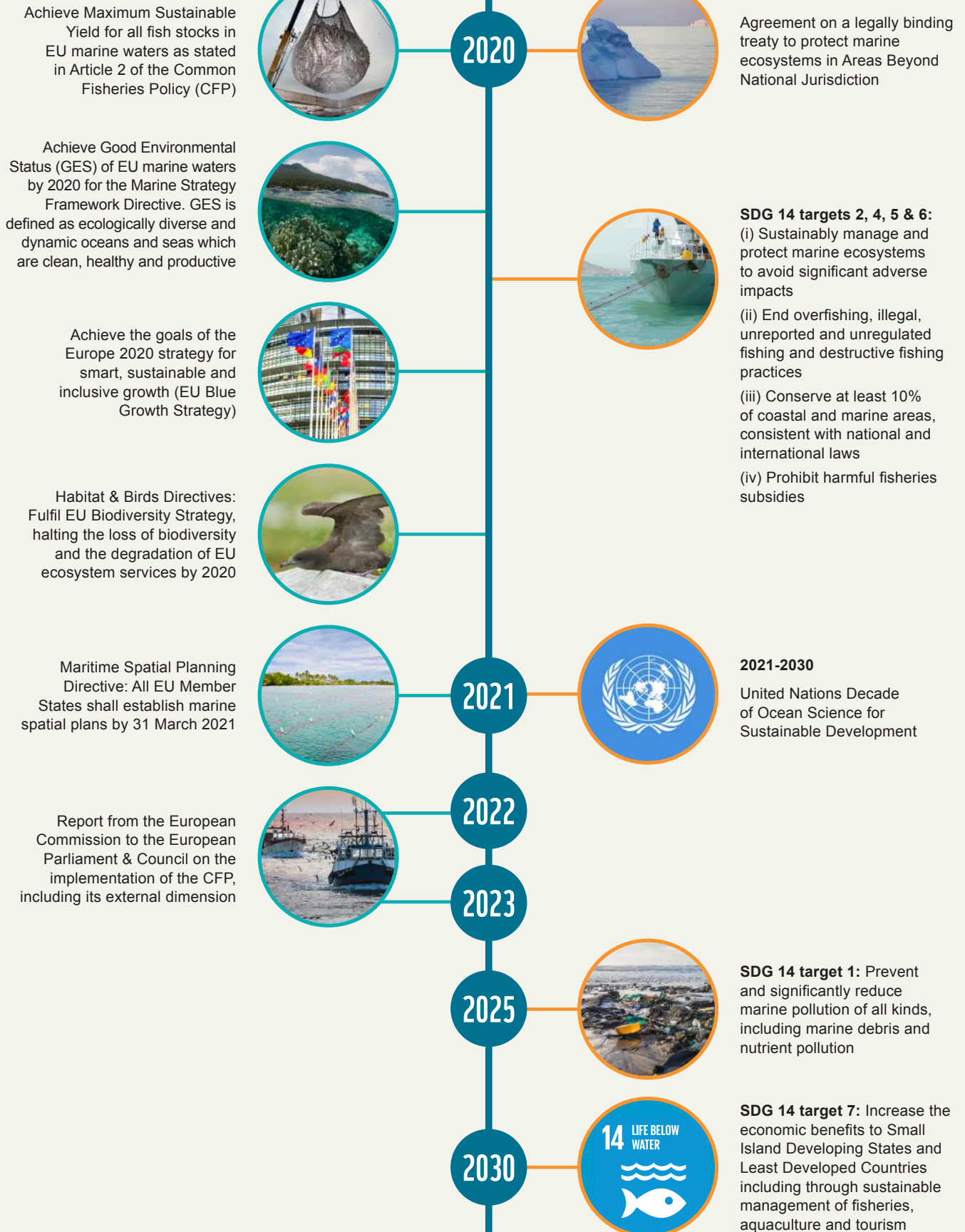
The EU has committed to an action plan for international ocean governance.⁷ This includes increasing international collaboration for the protection and restoration of marine ecosystems, promoting the development of ‘green/blue infrastructure’ and fighting the consequences of ocean warming. Beyond the Exclusive Economic Zones (EEZ) of its 23 marine Member States, the EU is an active member of 16 Regional Fisheries Management Organisations (RFMO). EU vessels operate in the waters of many countries via Sustainable Fisheries Partnership Agreements (SFPA) and other arrangements. However, the EU cannot deliver the necessary changes alone. The collaborative efforts of all MS who are committed to the Paris Agreement⁸ are required – to build consensus and work collaboratively to support a resilient ocean that will ensure food security, sustainable livelihoods, functioning ecosystems and rich biodiversity globally, and for many generations to come.

Urgent interventions are essential to prevent further climate change impacts. WWF has been engaging extensively with stakeholders at global, European and national levels for almost 60 years. These dialogues have incorporated stakeholders from governments, fisheries sectors, coastal communities, public agencies, scientists and broader civil society, who all share the vision of securing healthy marine ecosystems essential for human well-being and which support sustainable fisheries. In this paper, we outline the minimum environmental, socio-cultural and economic measures WWF deems vital to be effectively implemented for this vision to be achieved.

POLICY TIMELINE

EU LEGISLATION

INTERNATIONAL LEGISLATION



70% OF SEAFOOD CONSUMED IN THE EU IS IMPORTED*

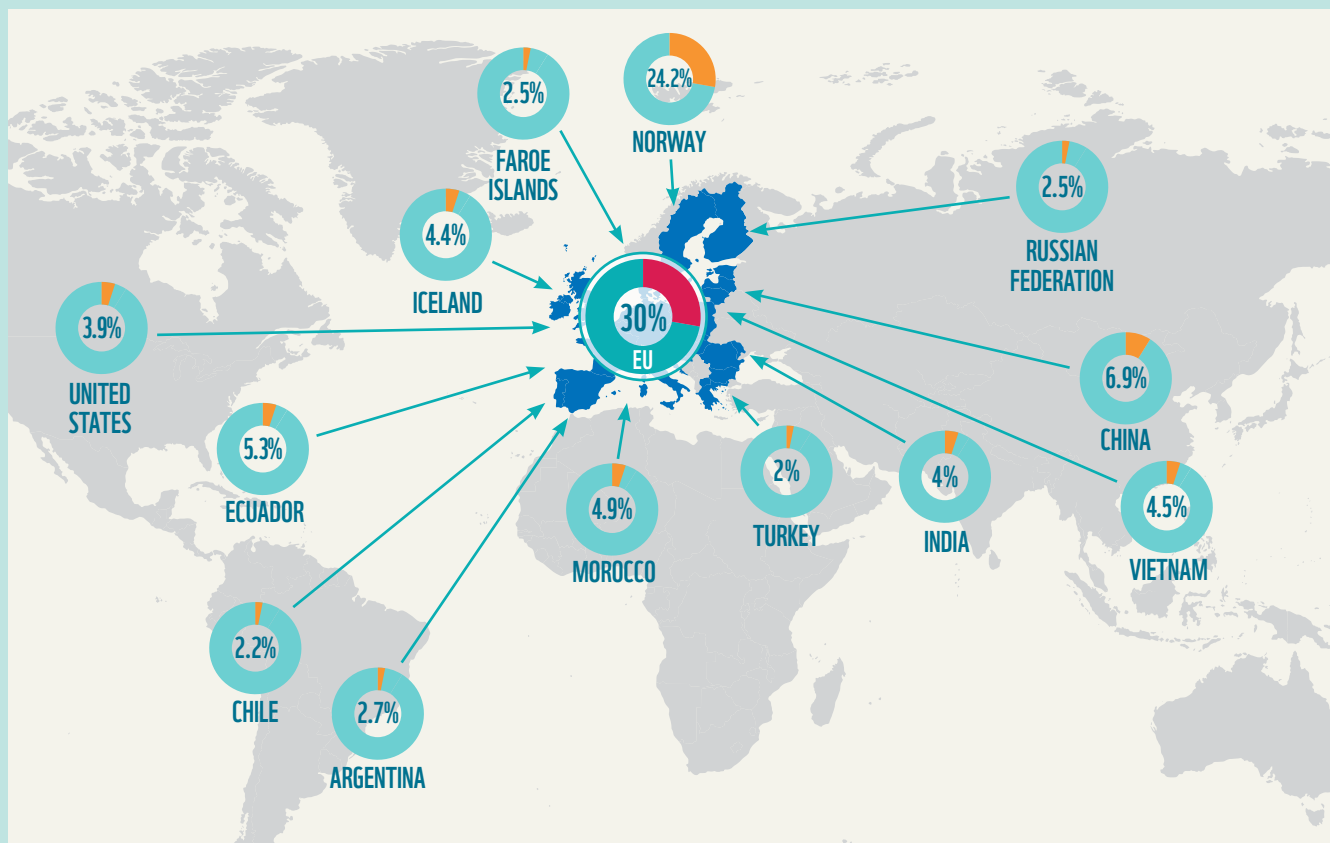


Figure 3: Most relevant extra-EU seafood trade flow by exporting country⁹

TOP FIVE SPECIES CONSUMED IN THE EU



TUNA



COD



SALMON



ALASKA POLLOCK























TROPICAL SHRIMP

The world's capture fisheries and aquaculture production has continued to increase, primarily due to rapidly increasing aquaculture, which now accounts for roughly half of all seafood consumed at global scale.¹⁰ Similarly, the EU's supply of seafood, including both domestic production and imports, has increased to reach 14.22 million tonnes.¹¹ Currently, consumption of seafood per person in the EU averages 24.33kg per annum, with substantial variations between EU Member States. Wild-caught fish dominates the EU seafood market, accounting for 76% of the per capita consumption. The EU's increasing demand for seafood is currently met by increases in imported seafood, despite

increased internal EU production. The top five species consumed in the EU – tuna, cod, salmon, Alaska pollock and tropical shrimp – represent nearly half of the entire market; these species are mostly imported from non-EU countries, with a significant proportion of these originating in developing countries.

Since 2015, the EU self-sufficiency ratio, the ratio of domestic production over domestic demand, has decreased due to higher demand being met through imports rather than through EU catches or aquaculture production. The 10 most consumed seafood products, except for mackerel, present a domestic demand higher than EU domestic production (Table 1).

ALL BUT ONE OF THE EU'S MOST CONSUMED SEAFOOD PRODUCTS ARE IMPORTED TO THE EU MARKET

Products and share of total apparent consumption		Self-sufficiency rate
MACKEREL (2%)		 123%
HERRING (5%)		 91%
MUSSEL (5%)		 82%
SARDINE (3%)		 74%
HAKE (4%)		 38%
TUNA (11%)		 28%
SALMON (9%)		 16%
COD (10%)		 9%
ALASKA POLLOCK (7%)		 0%
SHRIMP (6%)		 9%

The EU is the world's largest trader of fishery and aquaculture products and is the fifth-largest fish producer following China, Indonesia, India and Vietnam. However, interregional flows of seafood products between the EU and the global market are significant (Figure 3). Salmon is the largest trade flow entering the EU from Norway and is exported by northern MS to other EU countries. Imports from non-EU countries reached a 10-year peak of EUR 25.3 billion in 2017, mainly due to increased imports of frozen cuttlefish and squid originating principally from India and China, and of prepared/preserved skipjack tuna from Ecuador. However, breaches in monitoring and reporting of fisheries activities reduce the accuracy of official statistics, leaving this trade inadequately or inaccurately reflected,¹² particularly for Africa and some countries in Asia. Oceania, the developing countries of Asia, Latin America and the Caribbean region remain net fish exporters.

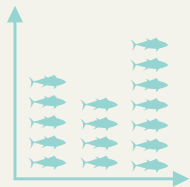
Table 1: Self-sufficiency refers to the ratio of domestic production over domestic demand. Nine of the 10 most consumed seafood products in the EU present a domestic demand higher than EU domestic production can sustain.¹³



**FAILURE TO MITIGATE
AND ADAPT TO CLIMATE
CHANGE WILL LEAD TO
DRAMATIC FALLS
IN FISHERY
PRODUCTIVITY,
FOR BOTH PEOPLE AND THE
ENVIRONMENT**

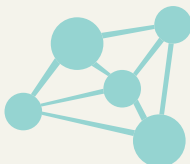
1. INTEGRATED ENVIRONMENTAL APPROACH TO INCREASE OCEAN RESILIENCE

ADOPT SCIENCE-BASED TARGETS OR CONSERVATION REFERENCE POINTS FOR MANAGEMENT OF ALL STOCKS



Exploitation of marine resources should be determined based on scientific evidence. Managing fish population harvesting within safe biological limits allows stocks to remain at healthy and sustainable levels, otherwise understood as maximum sustainable yield (MSY). Conservation reference points, such as MSY, should be established for all stocks, including unintended catch and bycatch species. The absence of scientific data can no longer be a justification for failing to apply conservation and precautionary management measures. When fishing mortality exceeds reference points, harvest control rules should be implemented to bring the affected stock back to sustainable levels. When advised by scientific evidence and advice, the EU, SFPA and RFMO contracting parties must take action by closing fisheries which have breached conservation reference limits.

PRIORITISE AN ECOSYSTEM-BASED APPROACH TO OCEAN GOVERNANCE



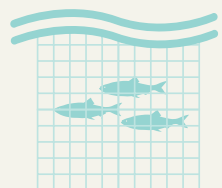
Maintaining abundant marine resources and healthy marine ecosystems are the most effective mechanisms to increase ocean resilience, i.e. the ocean's capacity to adapt to climate change. The United Nations SDGs align closely with EU environmental objectives agreed in the Habitats Directive, the Birds Directive and the Marine Strategy Framework Directive. Establishing ecosystem conservation measures includes spatial and temporal protection of habitats important for different species' life cycle phases. Ecosystem-based management plans are critical to support the recovery of depleted marine stocks and the rehabilitation of marine ecosystems, in particular with sensitive and vulnerable species.¹⁴ Finally, as agreed in the EU Maritime Spatial Planning Directive, marine spatial plans and integrated coastal zone management both support the protective role of marine ecosystems to act as natural buffer zones and mitigate against climate-related hazards, including sudden impacts such as storms and gradual impacts such as sea level rise.

ADAPT FISHERIES MANAGEMENT TO MINIMISE RISK OF FISHING RIGHTS DISPUTES



In a changing climate, shifts in species distribution and fish populations are either appearing in new areas or disappearing from where they were traditionally targeted. Therefore, it is crucial to recognise new parties targeting fish stocks and that all parties involved in the fisheries collaborate to collect independent and scientifically sound data on the relevant stocks. Subsequently, all parties must make every effort to agree new conservation and management measures to cover all relevant actors. To take account of potential disruptions to traditional fishing patterns that shifting fish populations may cause, parties should ensure greater flexibility and adaptability in their management schemes. This will allow the overall total allowed catches to be respected, without compromising the sustainability and profits of the fleets. Finally, improved cooperation mechanisms in transboundary stock management will help prevent and arrange for dispute settlement.

SUPPORT SUSTAINABLE AQUACULTURE TO MINIMISE IMPACTS ON MARINE ECOSYSTEMS



Aquaculture can be a climate-friendly method of food production when it has a low carbon footprint, minimises marine pollution and limits degradation of coastal habitats.¹⁵ Aquaculture, fisheries and all the other users of the sea need to integrate an ecosystem-based approach to adapt for climate change. Successful adaptation approaches will need to focus on the benefits from integrating inland and coastal seafood into broader environmental management plans, in addition to improved integrated water and land management. An important strategy to achieve this is marine spatial planning, basin scale management plans and the development of transboundary management bodies to develop and implement the agreed plans.

THE EU'S SUPPLY OF SEAFOOD HAS
INCREASED TO REACH

14.22 MILLION TONNES

SOURCE: FAO, 2018



2. SOCIO-CULTURAL ADAPTATIONS FOR INCREASED COMPLIANCE

VALUE SEAFOOD CONSUMPTION AND TARGET RESOURCES LOWER IN THE MARINE FOOD WEB



A transformation in seafood consumption in the EU is required, due to limitations in food supplies as global population is projected to reach 10 billion by 2050. For the sake of food security, EU citizens cannot rely on seafood and fish as they have in the past – not nutritionally, economically, culturally, socially or recreationally. A cultural shift depends on EU policy and market consumption schemes which favour high-quality, locally harvested, sustainably sourced and managed fish species, as well as sustainable management of aquaculture activities. Promoting the consumption of species from lower in the food chain is also required to reduce the fish and seafood footprint of EU citizens¹⁶. Local social priorities and cultural values need to be taken into account to raise consumer awareness on food security risks and environmental implications.

INCREASE CAPACITY BUILDING AND STAKEHOLDER INVOLVEMENT



Increasing awareness of climate change impacts is fundamental to integrate the issue into research, management and policy, and thus ensure acceptance and support of climate change mitigation and adaptation governance. Improved understanding of how species distribution may shift and affect fishing grounds, together with increased knowledge on diminished fish stocks and species size, is crucial to promote climate adaptive policy targets. The EU should proactively build strong political, legal, financial and social infrastructures within all of its partnerships to enable the appropriate practical tools and approaches for implementing adaptation to climate change.

ENFORCE SANCTIONS TO IMPROVE OCEAN GOVERNANCE



WWF urges the EU to take a leadership role on global sustainable seafood and ocean governance and promote enforcement and compliance to regulations in all MS. Sanctions, whether they are in the form of lost fishing opportunities, other dissuasive financial mechanisms or improved dispute settlement mechanisms across RFMOs, have proven to be one of the most effective instruments to encourage reporting, promote compliance and increase sustainable ocean governance.

INCREASE COMPLIANCE & TRUST IN MANAGEMENT OF MARINE RESOURCES THROUGH TRANSPARENT AND OPEN DATA POLICIES



Decision-making processes, especially in RFMOs, lack transparency, with many crucial issues closed to external scrutiny. Marine resources are publicly owned assets managed by government officials and funded by public money. Public engagement remains isolated to limited observation by non-governmental organisations, with many critical meetings closed to non-government representatives. This lack of engagement of civil society enables management decisions to be made without scrutiny or review of potential biases. An essential step to overcome the opacity of these decisions is to publicly disclose fisheries and seafood data and report transparently on the proceedings of fisheries management decisions, including RFMO and SFPA meetings.

ESTABLISH FULL TRANSPARENCY TO COMBAT ILLEGAL, UNREPORTED AND UNREGULATED (IUU) FISHING



IUU fishing threatens the sustainability of global marine resources by contributing to their overexploitation, impeding their recovery and undermining the viability of legal fishing operations. This, in turn, endangers the livelihoods of honest fishers. All coastal, flag, port and market states, contracting parties or non-contracting parties of RFMOs such as the EU need to act jointly and sanction any national and vessel engaged in or supporting IUU fishing by refusing fishing licences and depriving access to ports and markets. IUU vessel lists must be publicly accessible and shared across RFMOs with, at minimum, the master's name, nationality, the vessel identification number and vessel's beneficial owner(s) disclosed.¹⁷ International Maritime Organization (IMO) numbers should be made mandatory for all vessels above 12 metres and the use of electronic catch documentation schemes should be introduced and encouraged in order to achieve improved traceability.

3. ECONOMIC ADAPTATIONS FOR THRIVING COMMUNITIES



REDUCE THE CARBON FOOTPRINT OF SEAFOOD AND INCREASE MARKET VALUE

Healthy marine populations require less time to harvest, meaning less fuel and other resources are consumed in the process. This has direct benefits on seafood market value. Achieving sustainable ocean governance and healthy stocks will deliver fishing activities with a reduced carbon footprint. Lowering emissions and reducing other non-climate stressors in the fisheries sector (e.g. habitat destruction, pollution) and of other marine activities by EU Member States and RFMO contracting parties will increase sustainability, seafood market value and enhance ocean resilience.



ACT URGENTLY TO INCREASE LIVELIHOOD RESILIENCE

Adapting to climate change will require actions to avoid or reduce negative impacts, but may also bring new opportunities and potential benefits¹⁸, such as new fish populations to harvest sustainably. Delays in climate action will increase the adaptation deficit of seafood production¹⁶ and increase the risk of negative climate change impacts. Diversification of marine activities, including improvement of product sustainability such as increased selectivity, reduction of post-harvest losses and wastage, credible eco-labelling and development of higher-value seafood markets will all contribute to ensuring increased livelihood resilience for coastal communities both in and outside of the EU. Public money, such as the European Maritime Fisheries Fund (EMFF)¹⁹, is available for research, capacity building, sharing of best practices and for experimental trials. These funds must not go towards harmful subsidies that are counterproductive to the SDGs' achievement (e.g. for the expansion of fishing capacity) and act as disincentives to the required technological innovation on fish product value and market development.²⁰ Evaluation of public money expenditure is essential to avoid i) any climate change adaptation measures resulting in displacing pressures onto other socio-ecological systems and ii) investment in activities that will quickly become obsolete due to climate change.



ENSURING FOOD SECURITY AND MONITORING OPPORTUNITIES

Climate change mitigation and adaptation plans need to address underlying poverty and food insecurity issues, which systematically limit adaptation effectiveness. Promoting the reduction of socio-economic inequalities and implementing measures to increase global food security are critical, as these correlate to increased compliance, system resilience and the sustainable exploitation of natural resources.²¹ Plans must also systematically include data collection and monitoring to follow climate change trends, threats and opportunities, such as locally new and more abundant species. Both aspects can contribute to successfully anticipating and mitigating negative impacts to the dependant industries and societal groups, whilst promoting sustainable, thriving practices.

WAY FORWARD



WE MUST SEE LONG-TERM BEHAVIOUR CHANGES TO RESPOND TO THE IMPACTS OF CLIMATE CHANGE

Our global response to climate change needs to be accelerated, starting with the significant and immediate reduction of greenhouse gas emissions.²² Climate change adaptation must, in turn, be further developed to protect and restore our ocean's health and to support ocean resilience to the impacts of climate change that are already being observed. Building and mobilising the capacity of our societies to better cope with the impacts of a warming ocean, from individuals to communities, from villages to nations, will position us to eventually take advantage of the challenges and opportunities presented by climate change.

Now is the time to take action. We must see long-term behaviour changes and respond to the current and projected impacts of climate change. Timely decision-making processes for mitigation and adaptation are crucial to avoid the costs of inaction and ensure ecological, social and economic sustainability of EU seafood. Critical actions include systematic monitoring of targeted fish populations and species that end up in fishing nets as bycatch, supporting research into ecosystem dynamics and adopting the appropriate adaptive management approaches as scientific evidence and knowledge is acquired.

WWF stresses the need for policy makers and political leaders to deliver sustainable fisheries, seafood and aquaculture production, as well as to increase our ocean's resilience to minimise the impacts of climate change. The EU's actions are now crucial for strengthening global ocean governance and guaranteeing ambitious climate, fisheries and environmental policy implementation to ensure this common resource is sustainably managed. All stakeholders play an important role to protect our marine ecosystems, improve industry practices, end harmful fisheries subsidies and foster greater consumer demand for sustainable seafood.



A photograph of a fisherman in a blue boat pulling a large, dark red fishing net from the ocean. The net is lined with orange floats and extends across the water. The water is dark and choppy. The fisherman is wearing a white shirt and a blue cap.

TO ENSURE
**ECOLOGICAL, SOCIAL
AND ECONOMIC
SUSTAINABILITY OF
EU SEAFOOD,**
THE IMPLEMENTATION OF EFFECTIVE
POLICY TO MITIGATE AND ADAPT TO
CLIMATE CHANGE IS CRUCIAL

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WWF – WORKING FOR THE WORLD’S OCEANS

WWF is working globally for resilient oceans with functioning ecosystems that support rich biodiversity, food security and sustainable livelihoods all over the world. We work with fishers, scientists, businesses, authorities – and we also need your help!



For more information
please visit the Fish
Forward website:
www.fishforward.eu

WHAT CAN YOU DO?

Everyone can help in the fight to save our oceans. The most important thing consumers can do is to buy sustainable fish:

- Sustainably managed fish stocks will cope better with the changing environment.
- Healthy stocks and sustainable fisheries governance means fishing has a reduced footprint on the ecosystem: this leads to more resilient ocean populations and habitats.
- Healthy stocks mean less fuel and other resources needed to harvest them.
- Fish from responsible aquaculture don't destroy coastal habitats – such as mangroves – that are key as critical ecosystems supporting communities adapting to climate change.

WWF is one of the world's largest independent conservation organisations, with over 5 million supporters and a global network active in more than 100 countries. WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable and promoting the reduction of pollution and wasteful consumption.

The WWF European Policy Office contributes to the achievement of WWF's global mission by leading the WWF network to shape EU policies impacting on the European and global environment.

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ADDRESSING MARINE RESOURCE VULNERABILITY IN A CHANGING CLIMATE

100%
RECYCLED



70%

Over 2/3 of seafood products consumed in the EU are caught abroad

35%

Under high CO₂ emission scenarios, global fisheries revenue could drop by over 1/3

1.5°C

To help keep temperature rise to 1.5°C as stated in the Paris Agreement, the EU must set a target of net zero greenhouse gas emissions by 2040

2050

Essential marine ecosystems like coral reefs are projected to disappear in the next 30 years



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