

Greenpeace 'Red-Grade' Criteria for Unsustainable Fisheries

Defining which fisheries should be on a red list is a complex task. Every fishery on the Greenpeace International red list, and many others, was submitted through a methodology with very specific criteria. By evaluating them through this methodology, it is possible to identify the most unsustainable ones that Greenpeace considers should be avoided (graded red).

Uses of the criteria

1. The criteria can be used to advise fish buyers within the retail and catering industries to identify all fisheries that should be avoided as part of a sustainable seafood procurement policy that aims to:
 - Avoid the worst
 - Support the best
 - Change the rest.
2. The criteria are used in the development of national Greenpeace red lists of species that have a very high risk of being sourced from unsustainable fisheries or farms.

How does it work?

The procedure is based on answering a relatively simple set of 'worst practice' questions in various aspects of fishing for which an answer of 'yes' immediately grades a fishery as red. The questions are not presented in order of importance, rather they are ordered in a manner that allows the assessor to ask as few questions as possible, with the minimum detailed research required, to determine whether a fishery should be graded red.

Fisheries are defined according to the species targeted (scientific name), the stock, and the fishing method used. Each criterion includes one or two key questions to ask of a fishery along with supporting information and key references.

1. Targeting highly vulnerable species
2. Fishing in deep-water habitats
3. Using destructive fishing methods
4. Disregarding scientific advice
5. Overfishing
6. Using indiscriminate fishing methods
7. Catching threatened or protected species
8. Impacting entire ecosystems
9. Illegal, Unregulated and Unreported (IUU) Fishing

For the final criterion, the user will need to assess down the level of the owner/operator/vessel.

Use of data

The assessment is only as good as the information used. Please use data published within the last five years, or provide good evidence that older data is relevant to the current situation.

What if data is not available?

For some fisheries, particularly small-scale local fisheries, the only data available is on the target species and the fishing method – there may be no scientific data on stock status, fishing rates or the wider impacts on the environment. These fisheries are not red-graded for having a lack of data, as they often have a lower impact than most of the larger fisheries and are of particular importance to local communities. We encourage fish buyers to support small-scale local fisheries to provide data and improve their sustainability as part of the 'Improve the Rest' section of sustainability policies.

On what basis are fisheries/species then listed on Greenpeace red lists?

The key fisheries and farms supplying each of the most commonly sold species nationally are assessed. Where the majority of these fisheries or farms are red-graded, the species are then placed on the red list. These species should be the focus of immediate attention for retailers as they implement their new policies by shifting to the few sources that are not destructively fished or farmed, or by dropping the species altogether. The resulting national red lists vary as they focus on the key 15–20 red list species sold in the supermarkets in their country rather than on every species sold.

Why do we focus on a red list?

Sourcing seafood sustainably can be a complicated process – we need to consider the direct impacts on the marine environment, as well as the impacts on the wider environment (particularly with regard to climate change) and on local communities. For this reason we have developed a red list of seafood from fisheries or farming practices which are clearly the most damaging and in need of immediate attention – it separates the worst from the rest. Those fisheries or farming methods that do not appear on these red lists are not necessarily sustainable (indeed some may be graded red but rarely sold in a particular country), but seafood buyers need some flexibility to weigh up various 'better' options in order to reduce the impacts of their overall consumption practices, not just for seafood.

Criterion 1: Targeting highly vulnerable species

Many fish species have life histories which render them highly vulnerable to overfishing (long life span, late age of maturity, slow growth rates, low reproductive capacity, low metabolic rate), with little resistance to overexploitation. Key examples include many deep-water demersal species and coral reef species,^{1,2} and many species of the cartilaginous fish group,³ which includes sharks, skates, rays and chimeras.

Most commercial fish that are categorised on the FishBase⁴ database as having 'very low resistance' and/or 'high to very high vulnerability' or 'very high vulnerability' to fishing are already declining in many areas, and an increasing number appear on the IUCN red list each year. Greenpeace considers this a key indicator for species that should not be commercially targeted by fisheries.

1. Does this fishery target species that are listed on www.fishbase.org as having 'very low resilience' and/or 'high to very high vulnerability'?

- Yes. RED
- No. Go to the next question.

Criterion 2: Fishing in deep-water habitats

The deep ocean is one of the last great wilderness areas. Advances in technology and research are constantly revealing new information about remote habitats such as canyons, **seamounts**, **hydrothermal vents** and **cold seeps**. Rapid expansion of deep-sea fisheries, as well as demands on other resources (including oil and gas exploration and, in the near future, deep sea mining), threaten widespread and irreversible damage to such sensitive habitats, even before they have been fully documented.^{5, 6, 7}

Deep-water fish species, many of which are already highly vulnerable to overfishing (see criterion 1), aggregate on isolated topographic features such as seamounts, and as a consequence are easy to overexploit.

Deep-sea fisheries are all too effectively exploiting the last refuges for commercial fish species. Greenpeace believes that, rather than being seen as a replacement for declining resources in shallow waters, deep-water species and the complex habitats they occupy should be subject to immediate and strictly enforced conservation measures.

2. Does this fishery target species in sensitive deep-water habitats (hydrothermal vents, cold seeps, coldwater coral reefs, seamounts, or canyons)?

- Yes. RED
- No. Go to the next question.

Criterion 3: Using destructive fishing methods

Indiscriminate methods that impact both on marine species and their habitats are the most unsustainable of fishing practices. The most damaging practices, fishing with explosives and poisons, are banned in many countries. However, they are still used illegally, often in coral reefs, especially in south-east Asia, the Pacific and east Africa.⁸ The other key damaging practices – **bottom trawling** or bottom ‘dragging’ and **dredging** – are used globally.

Bottom trawls (including flatfish **beam trawls** and **demersal ‘otter’ trawls** for demersal round fish) and dredges (including suction and hydraulic dredges) disturb the **benthic** (bottom dwelling) ecosystem in a number of ways: by removing, damaging or killing organisms; by altering seabed complexity; and/or by altering overall benthic production, with knock-on effects for **pelagic** (mid-water) production, biochemical processes and wider functioning of the marine ecosystem.^{9, 10, 11}

While the magnitude of these impacts are not uniform for all bottom trawl fisheries, and depend on certain factors (e.g. the type of trawl gear used, habitat composition, life history of component species, the natural disturbance regime), even for those bottom trawls operating in the least sensitive benthic environments, these areas are often regularly trawled so have little chance to recover, and there are significant levels of bycatch. Fish that are too small or of the wrong species are thrown overboard, dead or dying. Demersal otter trawls commonly throw away over 30% of their catches (by weight) while for beam and shrimp trawls this is often much higher.^{12, 13}

Furthermore, a recent study shows that trawling impacts on ecosystems even at depths where trawlers do not go: the impact of commercial trawling on fish abundance extends to roughly double the depth, and so double the area, where fishing actually takes place – an increase from 11% to 23% of the sea floor.¹⁴

Considering, firstly, that management bodies have tended to put very few limits on where

bottom trawls can operate, and secondly, that there is a serious lack of marine reserves to allow for both recovery and for scientific comparison of unfished and fished areas, Greenpeace does not currently support the use of bottom trawling.

3. Does this fishery use any one of the following methods: explosives or poisons, demersal otter trawl, beam trawl, or dredge?

- Yes. RED
- No. Go to next question.

Criterion 4: Disregarding scientific advice

In order to protect biological resources and to make sustainable exploitation and rebuilding possible, management should adhere to the advice provided by those scientific bodies tasked to provide data on the status of fish stocks and the associated ecosystem(s) (e.g. ICES for NE Atlantic stocks, NAFO Scientific Council for NW Atlantic stocks). Fisheries for which management disregards scientific advice to such an extent that it ignores advice for zero 'quotas' or Total Allowable Catch (TAC), or fishery closures, are considered to be among the most unsustainable.

4. Has the body responsible for managing this fishery disregarded scientific advice for zero catch or fishery closures?

- Yes. RED
- No. Go to the next question.

Criterion 5: Overfishing

The **FAO** estimates that, by 2005, 77% of the world's assessed fisheries stocks were fully exploited (52%), over-exploited (17%), depleted (7%), or recovering from depletion (1%).¹⁵ Despite the perception that marine fish are highly resistant to large population reductions, for many species there is very little evidence for rapid recovery from prolonged decline.^{16,17, 18}

Fisheries scientists generally assess the status of a fish population or **stock** by applying various mathematical models of the dynamics of the population, which estimate the overall fishing rate (**F: fishing mortality**) and the size of the adult stock (**SSB: spawning stock biomass**). Most management methods set two key 'limit reference points' that indicate whether the stock/fishery is in an 'undesirable' state. The first is the SSB below which the stock will have difficulty maintaining its population (Blim). The second is the rate of fishing above which the stock is highly likely to decline, usually expressed as the proportion of the entire population caught in a year (Flim). The fishing rate, that will produce the largest average catch that can continuously be taken from a stock under existing environmental conditions – the 'maximum sustainable yield' (MSY) – is known as FMSY. FMSY is usually used to set Flim.¹⁹ In practice, the stock level and the fishing rate that will produce the MSY are very difficult to determine accurately. Scientists have argued for years that even at **MSY**, stock instability and risk of **recruitment** failure are already high.²⁰ For this reason 'threshold reference points', or 'precautionary limits' (Fpa and Bpa) may be calculated and set as 'triggers' to ensure that there is a low risk that the limit reference points or the MSY are breached accidentally.

In 2002 at the World Summit on Sustainable Development World, governments agreed to implement the FAO Code of Conduct for Sustainable Fishing with the goal of restoring global fish stocks by 2015.²¹ A key part of the code is not only to set negative limit reference points – the levels at which stock collapse is a real danger – but also to set positive target reference points. Ideally, a truly sustainable management practice would set fishing target levels well below the fishing rate of F_{pa} and well above the biomass of B_{pa} , in order to ensure a plentiful stock that considers both human use and the ecosystem as a whole.²² In reality, few fisheries management practices have set these positive targets and many continue to set targets as close as possible to the threshold or precautionary limits, continuing to allow fishing even when these limits are triggered, with little regard for the impacts on the overall ecosystem.

Identifying fisheries that are trying to operate sustainably by developing management plans based on using positive FAO targets, is not so difficult. However, finding a simple method to consistently identify the most unsustainable practices across the range of different management practices is very difficult. Firstly, definitions of 'sustainable' and 'overfished', and methods used to calculate limit and precautionary reference points vary, not just from management system to management system, but even within one system depending on the data available for each stock. To quote a review of this issue: "All limit reference points are not created equal in terms of their inherent degree of cautiousness"²³ For example, one method might set B_{lim} as the lowest stock level recorded for the fishery while another might calculate the level based on a percentage of the unfished biomass (either known or estimated). Secondly, even if we had historical and current data for each fishery, it is not possible to have simple cut-off values that indicate an unsustainable fishing rate and biomass that would be applicable to all species, because resilience to fishing varies considerably from species to species. For example, a fishery targeting slow-growing species that produce few young requires a much lower fishing rate to be sustainable, as would **forage fish** (such as herring, menhaden, squid, and krill) which are abundant but whose populations fluctuate widely under various environmental influences, are key prey for many larger marine species, and therefore require considerably more precautionary management.

At best, we can grade red any fishery where the stock has dropped to levels below precautionary limits set by management, or where the stock is above these limits but management is allowing fishing at a rate which is causing a decline in the stock. (Key phrases to look for in scientific advice are provided below.)

5a. Is the current adult stock level considered to be so low that there is a risk that the population may struggle to maintain itself?

- Yes. RED
- No. Go to the next question.

Key phrases:

The SSB is at risk of being below full reproductive capacity ($<B_{pa}$)

The stock is below the threshold or trigger precautionary reference points set for the fishery

The stock is overfished, depleted, or in long term decline

Where stock status is described as 'unknown' or precautionary reference points have not been set, consider the fishery to be at risk if recruitment is impaired AND/OR age, size or sex distribution is skewed relative to the natural condition AND the stock has been declining over the past five years

5b. Is there a high risk that the most recently reported fishing rate will cause, or is causing, a decline in the stock in the short to medium term AND has the management failed to address this according to scientific advice in the latest quotas?

- Yes. RED

- No. Go to the next question.

Key phrases:

The mortality/fishing rate is well above both Fpa and Flim

The stock is being harvested unsustainably

Overfishing is occurring

Fishing pressure should be reduced

The management plan is not in accordance with the precautionary principle

Criterion 6: Using indiscriminate fishing methods

Unselective fishing practices that catch and kill large numbers of juvenile fish; low value or non-commercial fish, cephalopods and crustaceans; seabirds; turtles; and/or marine mammals, are highly unsustainable. This high 'bycatch' can have significant negative impacts on both commercial and non-commercial species by, for example, killing threatened species, removing key food species from ecosystems, or dramatically reducing juvenile numbers before they have a chance to mature and spawn. In addition, much of this bycatch is undocumented so that catch statistics produced for fisheries management are inaccurate.²⁴

As a key example, 63% of the 186 million fish and cephalopods (72,000 t) caught commercially in Britain – 117 million fish weighing 24,500 tons – are thrown back into the English Channel and other British seaways because they are found to be too small or the wrong species²⁵ (beam trawlers and demersal otter trawlers were together responsible for more than 90% of these discards). By weight this figure is 34%, similar to the FAO's figure of 37.9% for the UK.²⁶

Whether this bycatch is thrown away at sea, or landed as 'trash fish' for fertilisers, animal feed or fish meal, high levels of bycatch are unsustainable. Management practices should aim to reduce discards to zero, and ensure that all species landed are marketable and well-managed from an ecosystem perspective.

6a. Does this fishery use an indiscriminate fishing practice that results in 25% or greater by weight of the catch of fish and cephalopods being discarded?

- Yes. RED
- No. Go to the next question.

6b. Does this fishery use an indiscriminate fishing practice that results in 25% or greater by weight of the catch that is landed being composed of juveniles or unmarketable species?

- Yes. RED
- No. Go to the next question.

NOTE: Although ideally we would consider ALL discards, including shellfish, by number rather than weight (because discards include disproportionate amounts of small, immature fish), these figures are very difficult to find because discard figures, if recorded at all, tend to focus on finfish by weight of catch. The figure of 25% is the average figure suggested by reviewers,

and a trigger point used by some better managed fisheries to temporarily close areas where too many juveniles are being caught (e.g. Icelandic cod ²⁷)

Criterion 7: Catching threatened or protected species

Non-commercial marine species that are classified as threatened, endangered, critically endangered or under moratorium by national or international conservation bodies must be given full protection from the impacts of fisheries. Fisheries that continue to have adverse impacts on these listed species, by causing further decline of species or displacing species from the area, are considered to be among the most unsustainable. (Commercial species that may be classified are addressed specifically by stock in criterion 5.)

7. Is this fishery associated with adverse impacts on populations of non-target species classified on domestic or international conservation lists as threatened, endangered, critically endangered or protected species OR is listed as a moratorium species?

- Yes. RED list
- No. Go to the next question.

Conservation lists: Examples include IUCN Redlist, CITES Appendices, OSPAR List of Threatened and/or Declining Species and Habitats, China Species Red List, US Endangered Species Act, Canada Species at Risk Public Registry, New Zealand Threat Classification System List

Criterion 8: Impacting entire ecosystems

Top predators often control the composition and structure of marine communities, and fishing them can result in far-reaching ecosystem alterations. ²⁸ These can be envisioned as a domino or 'cascade' effect that is triggered by changing the abundance of species at high trophic levels in the food web, resulting in changes in the abundance of prey species, which in turn impact even the lowest levels in the food web.

Key examples of 'top-down' fishery-induced cascade effects that have been demonstrated include exploitation of:

- NW Atlantic cod stocks ^{29,30}
- Apex predatory sharks in the US Atlantic. ³¹
- NW Atlantic demersal fish on the Georges Bank, off the coast of New England ³²
- Sharks and other predatory fish, crocodiles and Caribbean monk seals in the Caribbean coral reef/sea grass ecosystem. ³³

8. Is this fishery responsible or partly responsible for ecosystem alteration through cascade effects?

- Yes. RED
- No. Go to the next question.

Criterion 9: Illegal, Unregulated and Unreported (IUU) Fishing

IUU or pirate fishing is an issue of international concern impacting coastal communities, the fishing industry and the marine environment.³⁴ Greenpeace does not support the sale of any species caught by owners and/or operators that engage in IUU fishing. This final criterion does not fail a whole fishery, but does allow the user to fail individual owner/operators within a particular fishery.

9. Do any of the following statements apply to the supplier of fish from this fishery?

- Fish cannot be traced fish back to the fishing vessel
- The vessel and/or operators are **blacklisted**
- Transshipments at sea occur without 100% independent observer coverage

- Yes. RED
- No. Fishery not red graded

Blacklists: Examples include IUU vessel lists maintained by Regional Fisheries Management Organisations, the FAO, or the Greenpeace blacklist vessel database
<http://blacklist.greenpeace.org/home>

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