for a living planet®

WWF Bycatch Initiative

NORTH ATLANTIC COD

Management and Technical Measures in the Norwegian Cod and Groundfish Fisheries

WWF–Norway October 2008

Front Cover Picture:

Management and Technical Measures in the Norwegian Cod and Groundfish Fisheries

WWF- Norway October 2008

PREFACE

The North Atlantic cod fisheries have been an iconic and essential part of western civilization for over 1,000 years. Unfortunately, due to centuries of overexploitation, cod populations on both sides of the Atlantic have declined drastically. Stocks in the North Atlantic, especially the Grand Banks and the North Sea, have been impacted heavily due to poor fisheries management and sustained excessive fishing pressure by modern fleets.

The Barents Sea holds the largest cod stock in the world. The fishery is defined by ICES as having full reproductive capacity and to be harvested sustainably. The aim of this report is to provide a detailed description of management and specific measures in the Norwegian cod and groundfish fisheries, and promote these as solutions for other cod and groundfish fisheries.

These are practical measures with a proven positive effect that could be adopted by any other fishery.

Compared with other groundfish fisheries around the world, the management and the regulatory measures in the Norwegian fisheries have over the years shown that it can ensure a relatively robust and rational management. Commercially important species such as saithe, cod and haddock have spawning stock biomasses well over critical levels, and thereby also provides a reasonable stability for the fishing industry. There are a number of issues related to the management of the Norwegian groundfish fisheries where WWF would like to see improvements, but there are also good examples of efficient management measures that WWF promotes strongly to be adopted in other fisheries.

WWF would especially like to highlight the total discard ban, closures of areas with juvenile fish, the use of sorting grids and a relatively large minimum catch size. These are practical measures with a proven positive effect that could be adopted by any other fishery. The procedure of closing sensitive areas has probably contributed substantially to the recovery of cod and haddock in the Barents Sea, and is today regarded as the single most important technical measure in this process.

In 2006, WWF started the organisations global *Bycatch Initiative* where recovering and rebuilding of cod stocks is one of the three long-term goals. Examples from management measures in the Norwegian cod and groundfish fisheries can hopefully provide good technical and management solutions for other fisheries facing significant challenges in rebuilding cod stocks.

The report is based on information from the Norwegian Directorate of Fisheries, the International Council of Exploration of the Sea (ICES), the North East Atlantic Fisheries Commission (NEAFC), the Norwegian Ministry of Fisheries and Coastal Affairs, the Institute of Marine Research (IMR), the Joint Norwegian-Russian Fisheries Commission and white papers to the Norwegian Parliament.

Oslo, October 2008

Nina Jensen, WWF-Norway

EXECUTIVE SUMMARY

The Barents Sea holds the largest cod stock in the world - the North-East Arctic cod (NEA) - and this is one of Norway's key fisheries. The NEA cod stock has historically been the most productive cod stock in terms of commercial landings. Over the past five years, an annual catch near half a million tonnes of cod have been caught in the Barents Sea, and Russia and Norway are the only coastal states sharing the management of the stocks.

The most important commercial fish stocks in the Barents Sea-Lofoten area are cod, haddock, saithe, Greenland halibut, herring and capelin. This report focuses mainly on measures in the cod, saithe and haddock fishery. The cod and haddock fisheries are undergoing an MSC (Marine Stewardship Council) cerification, while the saithe fishery is now MSC certified.

A suite of regulatory measures has maintained healthy stocks which include mesh size limitations; a minimum catching size; a maximum bycatch of undersized fish; maximum bycatch of non-target species; closure of areas with high densities of juveniles; and other seasonal and geographic restrictions. Since January 1997, sorting grids (that minimize cod bycatch) have been mandatory for the trawl fisheries in most of the Barents Sea and Svalbard area. Additionally, the Norwegian government has introduced a discard ban for the most economically important species, mostly to ensure that the actual fishing mortality is reflected in the landings. Bycatch of non-target fish is controlled by several regulations: total cod quota is restricted and area closures are implemented. Regulation of these measures is relatively effective when compared to that of other countries. Both Norwegian and foreign fishing vessels are subject to stringent controls in all Norwegian waters with comprehensive measures aimed at strengthening control of fishing activities both at sea, when landing the fish and when they are exported. The procedure of closing sensitive areas has probably contributed substantially to the recovery of cod and haddock in the Barents Sea, and is today regarded as the single most important technical measure in this process. In a detailed analysis from the University of British Columbia (UBC 2007), Norway gets the highest score when assessing coastal states fisheries regimes against the FAO code of conduct for sustainable fisheries. This is also a good indication of why WWF are using the Norwegian groundfish regime as an example.

In addition to the regulated fishery in the Barents, impacting on stock sizes and structures, there is also a significant amount of fish taken illegally. Illegal, Unreported and Unregulated fishing (IUU fishing) is a serious problem facing the management of the world's fisheries, and it is also significant in the Barents Sea. This issue is not specifically addressed in this report, although general control mechanisms are described. More details on IUU fishing in the Barents can be found in the WWF report from April 2008, *Illegal fishing in Arctic waters, catch of today – gone tomorrow?*

INTRODUCTION

Norway controls some of the richest fishing grounds in the world within its Exclusive Economic Zone (EEZ), parts of the North Sea, most of the Norwegian Sea, sea areas along the Norwegian coast, half of the Barents Sea and the Polar Front (Appendix 1). These are all very productive areas, and according to the Food and Agriculture Organization of the United Nations (FAO) official numbers, three of the world's ten largest fish stocks have their main distribution within the Norwegian EEZ, namely Norwegian Spring Spawning herring, blue whiting and capelin.

Fisheries have historically been, and still are, a basis for coastal settlements and a very significant export industry. Norway is, in value, the second largest seafood exporter in the world including both wild catch and aquaculture. Most stocks with commercial value are regulated through quotas and licensing, but there are still fisheries in Norwegian waters with little or no management regime in place. The management for stocks such as redfish, halibut, coastal cod, sandeel and blue whiting, all now facing historically low biomass due to years of overfishing mainly by Norway, has not shown to be effective in maintaining stocks. The fisheries are also regulated by mesh size limitations, a minimum catching size, a level of maximum bycatch of undersized fish and non-target species, a discard ban, closure of areas with high densities of juveniles, and other seasonal and areal restrictions. Since January 1997, sorting grids have been mandatory for the trawl fisheries in most of the Barents Sea and Svalbard area.

The most important commercial fish stocks in Norwegian waters are NEA cod, NEA haddock, NEA saithe, capelin, Norwegian spring spawning herring, North Sea herring, mackerel, cod, haddock and whiting in the North Sea, saithe in the North Sea and west of Scotland, and blue whiting (Table 1).

The most important fish stocks migrate between Norwegian and foreign waters. Therefore one of the most critical management decisions, the Total

Table 1: Catch (tonnes) by stock for the most important fish stocks in Norwegian waters

Fish species	2000	2001	2002	2003	2004	2005	2006	2007
Atlantic cod	219 197	208 977	228 096	217 352	230 746	225 775	221 293	217 401
Haddock	45 934	51 651	55 222	59 329	64 932	63 337	71 408	72 992
Saithe	169 728	169 558	203 052	212 228	211 267	230 567	256 842	224 406
Tusk	21 915	18 817	18 167	13 463	11 897	11 862	14 346	15 281
Ling/Blue ling	17 733	14 660	16 242	14 547	14 554	15 133	17 195	19 045
Greenland halibut	13 019	15 113	12 178	12 613	16 948	15 632	13 336	10 424
Atlantic redfish	25 632	28 680	16 327	16 792	16 751	12 960	17 196	13 590
Groundfish	**513 158**	**507 456**	**549 284**	**546 324**	**567 095**	**575 266**	**611 616**	**573 139**
Capelin	370 769	482 834	522 349	249 497	49 054	67 339	2 047	41 098
Blue whiting	553 478	573 686	557 684	815 395	958 768	738 599	642 452	539 588
NEA Mackerel	174 228	180 751	184 382	163 535	157 432	119 695	122 011	131 679
Atlantic herring	800 059	581 202	573 777	563 049	616 221	748 161	710 591	884 738
Pelagic fish	**1 898 534**	**1 818 473**	**1 838 192**	**1 791 476**	**1 781 475**	**1 673 794**	**1 477 101**	**1 597 103**

Allowable Catch (TAC), for a given stock requires close cooperation with neighbouring countries. Norway has established three zones of 200 nautical miles; the legal regime of the Norwegian EEZ around the Norwegian mainland is enshrined in the UN Law of the Sea Convention (UNCLOS) of 10 December 1982. A fishery protection zone around Svalbard was established 15 June 1977, and the fishery zone around Jan Mayen was established 29 May 1980.

International and regional cooperation on fisheries and quota negotiations

Norway is currently a member of five Regional Fisheries Management Organisations (RFMOs), of which the North East Atlantic Fisheries Commission (NEAFC) and the Northwest Atlantic Fisheries Organization (NAFO) are the most important for Norway. RFMOs have grown in extent and importance in recent years, in part due to the increasing number of fisheries on the high seas, and the power given to them by the 1995 UN Fish Stock Agreement, and partly as they provide a platform for cooperation in combating IUU fishing.

The International Council for the Exploration of the Seas (ICES) plays a critical role in gathering and analysing information regarding the status of fish stocks and the provision of scientific advice on conservation measures. After ICES has given its quota recommendations, the quota negotiations between Norway and other states takes place. During the negotiations, the parties agree upon the TAC for each fish stock for the coming year, and how the TAC should be distributed between the parties. For most stocks of interest to Norway, assessments are made jointly with scientists from several countries under the aegis of ICES. Scientists from the ICES member countries work together on the collected stock data in annual working groups and develop advice through groups and advisory committees. The calculation tools are mathematical models and the choice of models depends on the stock characteristics and available data. The Norwegian input to these models is commonly based on both catch data and research data, including data from echosounder/acoustic surveys, research trawls, measurement of egg production and tagging/recapture studies of fish.

National fisheries management

After the international negotiations are finalized, the domestic regulation process for quota allocation begins. The Directorate of Fisheries first makes a proposal regarding how the Norwegian part of the TAC should be shared between various vessel groups and among the vessels within each group. The Directorate also suggests quotas for given periods as well as when fishing should start and end, and any additional measures such as maximum allowable bycatch limits, mesh size etc. The involvement of stakeholders in management decisions is acquired through the Advisory Meeting for Fisheries Regulations representing fishermen's associations, the fishing industries, trade unions, the Sami Parliament, the Directorate of Fisheries, local authorities, environmental organisations including WWF-Norway and other stakeholders (altogether twelve parties). The meeting reviews the proposals, gives recommendations to the Ministry of Fisheries and Coastal Affairs and secures the involvement and participation of stakeholders. Lastly, the Ministry of Fisheries and Coastal Affairs decides how the quotas should be shared between the vessels and sets the technical regulations for how the fishing should be carried out in the following year. There is no formal hearing process after the Advisory Meeting.

National quota regulations are established each year for a range of species. In addition there is a variety of technical regulations that restricts when, where and how fishing may occur. Such regulations are critical to conservation, and include prohibitions on discards of fish as well as flexible protected areas that can be closed for fisheries when undersized fish, or

species for which quotas are exhausted, prevails in catches.

The International Council for the Exploration of the Sea (ICES)

ICES is the organisation that coordinates and promotes marine research in the North Atlantic, including adjacent seas such as the Baltic and North Sea. ICES addressed the precautionary approach already in 1981, and it is now formally adopted in the organisations management advice. The concept of safe biological limits was introduced in ICES' work in the 1980s. The term is explicitly referred to in the UN Agreement on Straddling Fish Stocks: "Precautionary reference points should be stock-specific to account, inter alia, for the reproductive capacity, the resilience of each stock and the characteristics of fisheries exploiting the stock, as well as other sources of mortality and major sources of uncertainty".

ICES sets reference points for the levels of spawning stocks and fishing mortality to ensure that the stocks are harvested within safe biological limits. These reference points are based on statistical calculations using historical stock data. Precautionary reference points are used to allow for uncertainties in the calculations. ICES advice covers over 135 separate fish and shell fish stocks. The advice for each stock includes:

- An estimate of historical trends in landings, spawning stock biomass, recruitment and fishing mortality rate
- A description of the 'state of the stock' in relation to historical levels
- The likely medium term development of the stock using different rates of fishing mortality, and a short term forecast of spawning stock biomass and catch
- Proposals for TAC for the coming year, conservation measures such as closed areas and juvenile protection and possible technical measures that should be adopted

The Joint Norwegian-Russian Fisheries Commission

Norway and Russia share the stocks of NEA cod, NEA haddock, capelin and the king crab in the Barents Sea. The cooperation with Russia in the north is formalised in The Joint Norwegian-Russian Fisheries Commission. The two coastal states entered into a broader cooperation on fisheries management, and an agreement of 1975 established the Joint Norwegian-Russian Fisheries Commission.

The expressed objective of the commission is to promote sustainable exploitation of the cod stock and provide reasonable stability for the fishing industry and to establish routines for an increased collaboration between the control authorities for the two countries, including exchanging information regarding catch- and landing data (Stortingsmelding nr. 34).

Norway and Russia allow vessels from both nations to fish in each other's EEZ. In the 2005 session, the commission recognized the problem of illegal fishing of cod in the Barents Sea and established a new subcommittee to review the problem. Norwegian and Russian scientists collaborate on long-term strategies, catch regulations and ecosystem management. Within ICES, both Russian and Norwegian scientists work towards a joint understanding of models and input data, while the international quality control is provided by ICES (Marine Research News, No. 16, 2007).

THE NEA COD FISHERY

Northeast Arctic cod (*Gadus morhua* L.)

The cod population in the Barents Sea is in good condition and the stock is classified by ICES as having full reproductive capacity and being harvested sustainably (ICES 2008). The spawning stock biomass (SSB) has been above the precautionary level (B_{pa}) since 2002. Catches have been reduced from well above the fishing limit (F_{lim}) in 1999 to below the precautionary limit (F_{pa}) in 2007. The agreed management plan implies landings of 473.000 t in 2009 (maximum 10% change in TAC from 2008). This projection includes all landings and therefore the TAC must account for all unreported landings (ICES 2008).

The total quota for cod is divided between Norway, Russia and third countries. Over the last 60 years average annual catch has been 660.000 t. The cod fishery takes place throughout the year, but is most intense in the first half of the year, aiming at the migrating spawners and at immature fish that are feeding on spawning aggregations of capelin. In winter/spring the southern Barents Sea coastal areas are most important, while during autumn the area along the polar front, like the Bear Island – Hopen area is important. In the Norwegian fishery various gears are used, including bottom trawls, gillnets, longline, Danish seine and hand line. Other nations mainly use bottom trawl.

Northeast Arctic haddock (*Melanogrammus aeglefinus*)

The Northeast Arctic haddock stock is classified as having full reproductive capacity and being harvested sustainably (ICES 2008). The spawning stock (SSB) has been above precautionary level since 1990. Recruitment has been at or above average since 2000. The agreed management plan implies landings of 194 000 t in 2009 (maximum 25% change in TAC from 2008). This projection includes all landings and therefore the TAC must account for all unreported landings.

Haddock is harvested throughout the year. There is a directed trawl fishery for haddock and a directed and bycatch fishery with conventional gears, mostly longline. The total quota has increased from 150.000 t in 2007 to 155.000 t in 2008. The advice for 2008 was that the total catch should not exceed 130.000 t (Gjosaeter *et al.* 2008). The fishery for haddock is regulated by quotas, minimum catching size, a minimum mesh size in trawls and Danish seine, a maximum bycatch of undersized fish, maximum bycatch of non-target species, closure of areas with high density/catches of immature fish and other seasonal and area restrictions. Discarding is prohibited, but may be a problem.

Northeast Arctic saithe (*Pollachius virens*)

The saithe stock north of 62ºN is in good condition and ICES classifies the stock as having full reproductive capacity and to be harvested sustainable (ICES 2008). Catches are stable and have, since 1996, been below the precautionary limit. There are no explicit management objectives for this stock, but work is in progress on the development of a management strategy. The catch of NEA saithe is at present well above the long time average of about 160.000 t but the spawning stock is expected to decrease over the next years. Protective measures are minimum catching size, the use of sorting grid with minimum bar spacing in groundfish trawl, and minimum mesh size in trawl, Danish seine and gillnet. Discarding of commercial species is not allowed. Bycatch of saithe in other fisheries are covered by the total saithe quota, and bycatch of other commercial species in the saithe fisheries are landed and counted against the quota for each species. (Fisheries.no). On 1 March 1999, the minimum landing size was increased to 45 cm for trawl and conventional gears, and to 42 cm (north of Lofoten) and 40 cm (between 62ºN and Lofoten) for purse seine (ICES advice 2006). The Norwegian fisheries for northeast

Arctic saithe (ten in total) were MSC-certified as sustainable on 14 June 2008.

MEASURES IN THE FISHERY

This section describes the different measures used in the Norwegian groundfish fisheries. In a mixed species fisheries, like that in the Barents Sea for cod, haddock, saithe, redfish and Greenland halibut, it is impossible to catch the optimum size of all species at the same time (Kvamme 2005). Exploitation of fish stocks is dependent on effort, catchability and selectivity of gear used, as well as the fishermen's choice of time and fishing area. Knowledge of fishing gear selectivity is of fundamental importance when recommendations for harvest strategies are being made. The size composition of fish in commercial catches is influenced both by gear characteristics and fishing strategy. The size and species selection of fishing gear is influenced by the type of fishing gear, gear performance and characteristics, and the fishing area (Huse *et al*. 2000).

Sorting grids

The sorting grid is used to reduce the catches of juveniles in the Barents Sea without the widespread closures of fishing areas, especially in areas where juvenile and adult gadoids are mixed (Kvamme 2005). The sorting grid is mandatory in the cod and shrimp trawl in Norway's economic zones north of 62ºN also including the protection zone around Svalbard and the fishery zone around Jan Mayen (Kvamme 2005; ICES 2007).

A clear improvement has been demonstrated through reduced unwanted catch of fish under minimum catching size by using sorting grids (NOTAT 2001). A good example is the fishery for brown shrimp (*Crangon crangon*) in the North Sea. Due to the small mesh size used the catches also contain large amounts of bycatch. By using a sorting grid there was a reduction of >70% fish and 65% benthos in the catch. The commercial brown shrimp catch was reduced by 15%, but the cod-end catch consisted mainly of shrimps and required less sorting and the cod-end selectivity for shrimp increased (Polet 2002).

The mandatory use of sorting grid comes in addition to the ordinary mesh selection (NOU 2005). Actual mesh size of the bottom trawl codends has increased from about 80 mm and/or less in the 1950s to 110-120 mm in the 1960s, and since the early 1980s have been 125 and 135 mm in the Russian and Norwegian zones, respectively (Garrod 1967; Nakken 1994; Dingsoer 2001). The Minimum Landing Size (MLS) has been adjusted according to the minimum mesh size (Odd Nakken, IMR, pers. comm.).

Discard ban

Discards refer to that part of the catch, which is not retained on board during commercial fishing operations and is returned to the sea. Discarding may result from fishermen having no quota left for a given species, catching fish below minimum landing size, or highgrading the catch due to economical considerations. As well as being a waste of resources, discarding represents a loss to the productivity of fish stocks. As a consequence, Norway has introduced a discard ban on the most commercially important species, mostly to ensure that the actual fishing mortality is reflected in the landings (NOTAT 2001). This important discard ban was introduced in 1983 (Isaksen 1997) in the cod fishery. Today, ten more species (saithe, redfish, Greenland halibut, herring, mackerel, capelin, European smelt, whiting, blue whiting and monkfish) have been included (J melding 187-2007 §48). The discard ban is viewed as an important precautionary measure to reduce the possibility to release or discard fish. Fish that is dead or dying when released/discarded will not be written off of any quota. In an administrative context this ban provides a better control of the various fish stocks in relation to the given quota recommendations (Dagfinn Lilleng FKD, pers. comm.). The Coast Guard and the Directorate of Fisheries are

responsible for enforcing and controlling the discard ban.

Discarding of cod, haddock, and saithe is still thought to be significant in some periods although discarding is illegal in Norway and Russia. Data on discarding are scarce, but attempts to obtain better quantification continue. In May 2004, the Norwegian "discard commission" addressed the problem of discards in Norwegian fisheries and the following was recommended: Keeping the band on discard of commercial fish species; expanding the current system of closing areas with undersized fish; increasing the use of inspectors at sea; more control of fish vessels at sea and more control when landing fish (Fiskeridepartementet 2004)

Bycatch of cod in other fisheries are covered by the total cod quota. Bycatch of cod in the shrimp trawl fishery is minimised by use of sorting grids and by closing areas. Bycatch of other commercial species in the cod fisheries are landed and counted against the quota for each species. In Norway, the discard ban is combined with other measures such as temporary closure of sensitive areas, obligation to change fishing grounds when the mixture of fish below MLS exceeds given levels, and the requirements of improved gear selectivity (Isaksen *et al*. 1998).

Discarding is part of a larger whole, namely the problem of unwanted mortality caused by the fishery. In some fisheries discarding may be the major problem, whereas in others there may be other more important sources of unwanted mortality. Within the same fishery the challenges may also vary over time, depending on the age structure of stock(s) harvested, or due to changes in fishing technology (J melding 187-2007 § 48). At the time of writing, the Norwegian government does not favour a total discard ban for all species and points out that a ban is not the solution to all discard problems. The discard ban is now part of the management policy of Canada, Greenland, Iceland, the Faroe Islands, Norway and Russia. Estimates of discards are relatively few and the proportion of young fish discarded at sea has probably fluctuated with the size composition of the stock, with the market demand for small fish, and with the effective mesh size used.

According to the Sea-water Fisheries Act § 11, the discard ban regulation applies in general to illegally caught fish and shellfish. After § 11 the discard ban applies only to fish, but after § 2 the term fish also includes echinoderms, crustaceans and molluscs (NOU 2005).

J-melding 187-2007, chapter X

§ 48 Prohibition against discarding fish

1. In the internal waters, territorial sea and Economic Zone of Norway, it is prohibited to discard or release catches that are dead or dying or catches of the following fish species:
   Cod, haddock, saithe, redfish, mackerel, Norwegian spring-spawning herring, Trondheimsfjord herring, North Sea herring, greater argentine, capelin, Greenland halibut, whiting, blue whiting, angler (monkfish), shrimps, snow crabs.
2. In the fisheries for mackerel, Norwegian spring-spawning herring, North Sea herring and herring in the Skagerrak, and capelin, it is in addition prohibited to discard fish waste.
3. The regional offices of the Directorate of Fisheries may order that catches are to be hauled in.

Temporary and permanent closure of areas

In the 1980s, an area closure system was established in the Norwegian EEZ; areas that when the amount of fish below MLS in single catches exceeds 15% by numbers are closed to fishing (Nakken 1994; Isaksen 1997). In the cod and haddock fisheries areas are permanently closed for groundfish trawling if the mixture of undersized fish exceeds 15% by number. Purse seine areas for saithe are closed if the catches contain more than 10% by weight of saithe below MLS. If catches contain more than a certain percentage of undersized fish (30% for purse seine, 15% for other gears), the particular fishing ground is temporarily closed. The criteria for closing a fishing ground in Norway are mostly based on biological factors.

The procedure of closing sensitive areas has probably contributed substantially to the recovery of cod and haddock in the Barents Sea, and is today regarded as the single most important technical measure in this process (Isaksen *et al*. 1998). The closing and opening of sensitive areas are based on extensive surveillance by the authorities, and the fishermen are obliged to change fishing ground when their catches exceed certain limits of undersized fish in the catch (Kvamme 2005).

The Sea-water Fisheries Act § 4b sets the absolute prohibition against harvest on a particular species or a time limited prohibition in the form of seasonal closures. Such closures are normally used as a means to protect resources were quota limitations have not been set, e.g.

J-melding 187-2007, chapter X

§ 53 Prohibitions against trawling in specific periods and areas

(1) It is prohibited to fish using trawls in the following areas and during the following periods:

a) On Nordbanken and Oeverbanken, delimited by straight lines drawn between the following positions:

70°55'N 30°10.5'E (at the fishery limit)
71°12'N 30°43'E
70°45'N 31°50'E
70°34'N 31°29'E (at the fishery limit)

These regulations apply during the period 1 October – 1 March.

b) Jennegga-Malangsgrunnen delimited by straight lines down between the following positions:

68°50'N 13°50'E (at the fishery limit)
69°09'N 13°37'E
69°33'N 15°32'E
70°00'N 16°28'E
70°00'N 17°28'E (at the fishery limit)
in the period 20 October - 20 March.

c) Storegga delimited by straight lines down between the following positions:

63°00'N 05°15'E
63°00'N 04°53'E
63°27'N 05°24'E
63°27'N 05°48'E

crawfish and lobster. The Sea-water Fisheries Act § 4o prohibit and limit fishing around Norwegian coldwater coral reefs, and § 4h) sets the regulations regarding equipment, vessel and sizegroup catch time (NOU 2005).

J-melding 187-2007 §53 and §83-2008 include information regarding periodical and permanent closure of areas in relation to prohibition of trawling. The Directorate of Fisheries region Troms Surveillance service for fishing areas opens and closes fishing areas in cases where juveniles and small fish are concentrated in fish- and shrimp catches. In certain cases the Coast Guard can also request to establish closed areas if the mixture of small fish and juveniles exceeds the limits. The same procedures apply to reopening the areas when the mixture is within acceptable limits. Occasionally large parts of the Barents Sea can be closed, especially when fishing for shrimp. Closed areas are controlled by random sampling and past experience is used as a basis to decide whether a fishing area can be reopened (Dagfinn Lilleng, FKD, pers. comm.) (Appendix II).

Prohibition against fishing using trawl more than 12 nautical miles from the baselines (Trawl-free zones and flexible areas) is the current regulation (J-melding 187-2007, Chapter XI). All relevant paragraphs are in attachment III, and some examples are given in text box:

Protection of coral reefs in Norwegian waters

Norway was the first country to implement protection measures for cold-water corals in European waters. In Norway, especially large amounts of the cold-water coral Lophelia have been detected, including the world's largest known Lophelia-reef, the Rost-reef in Lofoten, Northern Norway.

Areas of damaged reefs have been detected, and according to the findings in 1998 it is highly probable that this damage was caused by fishing activity – most likely by trawlers. Consequently, in 1999, the Norwegian fisheries authorities established a regulation for the protection of cold-water coral reefs against damages due to fisheries pursuant to the Sea-water Fisheries Act and the Act related to the EEZ of Norway. The regulation prohibits intentional and negligent destruction of coral reefs, and requires precaution when fishing in the vicinity of known cold-water coral reefs. The regulation also gives special protection to particularly valuable coral reefs by banning the use of fishing gear which is dragged along the bottom and may come into contact with the reefs in the protected areas.

So far the following reefs have been given this kind of special protection; the Sula Reef (1999), Iverryggen Reef (2000), the Roest Reef (2003), Tisler and Fjellknausene Reef (2003). In addition, the world's shallowest known *Lophelia*-reef, Selligrunnen, has been temporary protected pursuant to the Norwegian Nature Conservation Act (2000). A 20 nautical mile zone around Bear Island and areas with corals are permanently closed for fishing.

J-melding 187-2007, Chapter XIII.

§ 66 Prohibition against fishing operations near coral reefs

(1) In order to protect coral reefs against damage as a result of fisheries activities and thus to contribute to sound resource management, for example by safeguarding reproduction and nursery areas for many fish species, special care must be shown during fishing operations near known coral reefs. Deliberate damage to such reefs is prohibited.

(2) Within the areas specified below, it is prohibited to carry out fishing operations using gear that is towed during fishing and that may touch the sea floor in this connection:

a) Sularevet, delimited by straight lines drawn between the following positions:

1. 64°18.0'N	007°53.0'E
2. 64°10.5'N	008°17.0'E
3. 63°52.5'N	007°51.5'E
4. 64°00.0'N	007°26.0'E

b) I verryggen, delimited by straight lines drawn between the following positions:

1. 64°50.0'N	009°00.0'E
2. 64°55.0'N	009°30.0'E
3. 65°10.0'N	009°30.0'E
4. 65°10.0'N	009°10.0'E

c) Roestrevet, delimited by straight lines drawn between the following positions:

1. 67°36.2'N	009°32.9'E
2. 67°33.8'N	009°40.2'E
3. 67°17.3'N	008°57.1'E
4. 67°19.8'N	008°49.5'E

d) Tisler, delimited by straight lines drawn between the following positions:

1. 59°00.15'N	010°57.20'E
2. 58°59.70'N	010°57.20'E
3. 58°59.25'N	010°59.10'E
4. 58°59.85'N	010°59.10'E

e) Fjellknausene, delimited by straight lines drawn between the following positions:

1. 59°04.00'N	010°44.00'E
2. 59°04.00'N	010°45.25'E
3. 59°03.15'N	010°45.25'E
4. 59°03.15'N	010°44.00'E

Minimum Landing Size

Norway has introduced a minimum *catching size* rather than a minimum *landing size*, and accordingly it should be *prohibited to fish* «illegal» bycatch, either by species or size. This is the main difference between the old NEAFC-regime, still in force in EU-waters, and the new system in Norwegian waters. The provisions of NEAFC stated that it should be prohibited to retain on board or to land «illegal» fish. This means that the fishing vessels under that regime are allowed to fish in any area, regardless of the amount of «illegal» bycatch brought onboard and discarded, either by size or species (Isaksen *et al*. 1998).

NEA cod: In addition to quota regulations there are regulations aiming at protecting young fish; The minimum catching size is 47 cm in Norwegian waters. If catches contain more than 15 per cent (by numbers) of undersized fish that particular fishing ground is temporarily closed

NEA haddock: The minimum catching size is 39 cm in the Russian economic zone and 44 cm in the Norwegian economic zone; both minimum catching sizes are used by respective fleets in the Svalbard area in accordance with the Svalbard Treaty from 1920.

NEA saithe: Minimum catching size is 45 cm in Norwegian waters for all gears except for the purse seine, where the minimum catching size is 42 cm north of Lofoten, (40 cm between Lofoten and 62º N and 35 cm for the first 3000 tonnes between 65º 30' N and 62º N).

Observers

Today, observers are not required in the Norwegian cod fishery (Dagfinn Lilleng, FKD, pers. comm.), despite the fact that observers were required in the past. In the NAFO-area of the Northwest Atlantic observers were required onboard vessels. The first grant for inspectors at sea came in 1999. In 2001 the grant was only sufficient for three observers (NOTAT 2001). Food and board was to be paid for by the vessel as well as communication equipment. The inspectors were appointed by the Surveillance service for fishing areas (NOU 2005).

Today, the opportunity to place observers on board in the majority of the cases is within the jurisdiction of the Surveillance, monitoring, observation and monitoring service for fishing grounds. To date there are three inspection positions. This is too few to achieve a visible effect over the vessels which already have inspectors on board. To date, the access to place observers on board is not used within regular harvesting in Norwegian waters, but this could change, especially as a result of increased international collaboration regarding such control activity.

CONTROL REGIME

Norwegian official landing statistics date back to 1866 for spawning cod (skrei) and back to about 1900 for total catches. Information on distribution, abundance, and biological characteristics for the various stages and age groups increased rapidly from 1950 owing to intensified scientific survey work. Systematic international scientific cooperation on stock monitoring started in 1958 when the ICES Arctic Fisheries Working Group was established; since the early 1960s as a stock assessment group at ICES. During the 1920s and particularly in the 1930s an offshore fishery, predominantly with trawl, developed in the Barents Sea. The expansion continued after a period of low fishing activity during World War II (1940-1945). Simultaneously the efficiency of the coastal fleet increased (Nakken 1994).

Norway has implemented comprehensive measures aimed at strengthening control of fishing activities at sea and the landing of fish. The fisheries regulations are enforced both at sea, when the fish is landed and when it is exported (NOU 2005). Both Norwegian and foreign fishing vessels are subject to stringent controls in all Norwegian waters. The Directorate of Fisheries, the Coast Guard and the sales associations are responsible for exercising resource control.

Control authorities

The Directorate of Fisheries controls Norwegian vessels in Norwegian and international waters and foreign vessels in Norwegian waters. The Directorate inspects activities on the fishing grounds and conducts land-based inspections of anyone who for business purposes, are in possession of fish intended for storage, transport or sale and of anyone in possession of documents concerning such fish. Upon the landing of catches, the landings data are checked against the fishing rights of the vessel. This task is performed by the fish sales organizations and the Directorate of Fisheries. The Directorate also performs physical inspections of landings. When irregularities are detected, whether at sea, upon landing or through later controls notifications of warning are issued, and the serious cases are referred to the courts.

Those who have intentionally or negligently violated regulations given or in support of this law/regulation, or contributed to this, are punished with fines or incarceration up to 6 months, see The Sea-water Fisheries Act §53 and §54.

The Coast Guard is the second organisation for resource control of fisheries in waters under Norwegian jurisdiction. The Coast Guard is constitutionally subordinated to the Ministry of Defence, and has its jurisdiction based on The Coast Guard Act. They inspect Norwegian vessels in Norwegian and international waters, and foreign vessels in Norwegian waters in accordance with international law. The Norwegian EEZ, the fishery zone around Jan Mayen and the protection zone around Svalbard have traditionally been, and still are, the Coast Guard's highest-priority task. On an annual basis, around three thousand Norwegian and foreign vessels have been inspected over the course of the past few years. The Coast Guard annually performs more than 1 800 inspections of Norwegian and foreign vessels operating in Norwegian waters. Vessels over 24 meters (15 meters for vessels from EU) are required to carry satellite transponders that permit their activities to be tracked 24 hours a day, all year around. More than 60 percent of the inspections concern foreign vessels. On average, ocean-going trawlers in Norwegian waters will find themselves inspected by the Coast Guard three or four times a year, while the conventional vessels of the ocean-going fleet can expect to be visited once or twice a year. The Coast Guard's resource control is directed mainly at the Norwegian and foreign ocean-going fishing fleet. Around 70 percent of the Coast Guard's resources are used on inspections; other tasks are in the areas of exercise of

sovereignty, search and rescue preparedness, ambulance service and assistance to the fishing fleet.

Resource control has, up until now, been directed largely at selected problem areas. Emphasis has been on checking that there is no fishing in areas that have been closed, and checking for illegal fishing in the border areas. Another important task is to ensure that catches are not falsely reported from zones and areas other than where they were actually made. Cross-loading of fish from foreign fishing vessels to other vessels in the Barents Sea is a priority focus area. Apart from certain seasonal fisheries, the Coast Guard's control of coastal fishing is limited. The control is often performed in collaboration with The Directorate of Fisheries.

The third body of direct control with fisheries in Norway is the **Sales Organisations**, whose jurisdiction is based on The Sea-water Fisheries Act. They carry out registration and control of catches and landings (quantity and species). All catches to be sold must be sold through the sales organisations. All landings must be weighed and recorded on the sales notes, which provide the basis for the control of quotas.

Resource control is directed at the entire production chain, from when the fish is caught in the sea, through its storage and sale to its export abroad. Once catches have been landed, the landing data are cross-checked against the fishing rights of the vessel. This task is performed by the fish sales organizations and the Directorate of Fisheries. In addition to the Coast Guard and the Directorate of Fisheries, control activity is also carried out by the fishermens own sales organisations. The sales organisations are responsible for collecting statistics in connection with first-hand sale of fish and fishproducts. The information is then transmitted to the Directorate of Fisheries. Statutory authorization to issue landings and contract note is found in Raafiskloven § 7 and The Sea-water Fisheries Act § 9a, however the information is controlled in agreement with The Sea-water Fisheries Act § 45 for the Directorate of Fisheries and The Sea-water Fisheries Act § 45a for the concerned sale organisation (NOU 2005).

Central control measures

In addition to the direct control carried out by the institutions mentioned, there are several mechanisms that are in place in order to secure compliance with law and regulations:

- **Satellite tracking** of all Norwegian vessels exceeding 24 m, regardless of their location. Foreign vessels in Norwegian waters exceeding 24 m and EU vessels exceeding 18 m are also tracked.
- All Norwegian vessels exceeding 13 m, and all foreign vessels fishing within Norway's EEZ are obliged to keep **catch log books**.
- According to the Sea-Water Fisheries Act, vessels exceeding 24 m shall keep **approved gross drawings** indicating the gross capacity of fish holds on board in cubic metres. This applies to Norwegian vessels everywhere, while for foreign vessels this applies in the EEZ of Norway and the Fisheries Zone around Jan Mayen.
- Reporting/port notifications for Norwegian vessels: Factory trawlers, beam trawlers and transhipment vessels shall **report on start of fishing**, send catch reports, transhipment reports, port notifications and end of fishing reports. This can be transmitted electronically or manually.
- All foreign vessels shall send start of fishing reports, catch reports, transhipment reports, port notifications, end of fishing reports and reports on reporting for control, (control point reports and landing notifications).
- Landing declaration/sales note: According to the Norwegian Sea-Water Fisheries Act, landing/sales

notes must be issued for all landings in Norway. It must be signed by both fisherman/seller and buyer. When Norwegian vessels are landing abroad, the responsible person on the vessel shall issue a landing note. The information on the landing/sales note provides the basis for the settling of vessel quotas.

- Licence to fish: All Norwegian vessels must be introduced in the register for fishing vessels in the Directorate of Fisheries, and in addition most vessels must have a special authorisation to fish. With respect to foreign vessels, all boats need a special access-licence to be admitted to engage in fishing operations or assist the fishing fleet.
- The catch log books/cargo log books are recorded in original with two copies of each side of the log book. All Norwegian cod trawlers and the larger shrimp trawlers, as well as all national vessels fishing outside Norwegian waters, must send one of the copies to the Directorate of Fisheries. Other Norwegian vessels have a duty to transmit data on request.
- The landing and sales data are collected by the sales organisations and forwarded electronically to the Directorate of Fisheries.
- The inspection data from the inspections by the Coast Guard are entered into a database.
- A database with an overview over ownership, fishing licenses and quotas of each individual vessel is maintained by the directorate. The database also contains a review over each vessel's landings. This database is public.
- Norway has concluded control agreements with the following countries: Canada, Denmark, France, The Faroe Islands, Germany, Greenland, Iceland, Ireland, Netherlands, Russia, Poland, Portugal, Sweden and UK. Data on landings are exchanged electronically.

The main thrust of these control agreements are exchange of information with respect to landings in each other harbours of vessels from the two respective states. The new generation of control agreements also includes the exchange of information with respect to landings of third country vessels. This expansion of the measures included in the control cooperation is the important new regulation aimed at addressing the IUU-challenge.

Inspection agreements

Norway's focus on developing cooperative resource control with other countries began in 1994. Since then Norway has signed inspection agreements with 16 nations. Norway has entered into cooperative agreements on resource control with the following nations:

Nation	Agreement signed	Revised agreement
Canada	09.01.95	
Faroe Islands	21.10.96	31.05.06 incl. 3rd countries
Greenland	04.03.05	
Iceland	17.06.99	19.06.06 incl. 3rd countries
Morocco	07.09.06 incl. 3rd countries	
Russia	17.11.00	28.10 05
EU:	MOU 04.10.06	
- Denmark	25.11.96	19.06.06 incl. 3rd countries
- France	16.07.99	
- Ireland	22.11.94	
- Lithuania	07.09.06 incl. 3rd countries	
- The Netherlands	09.09.98	
- Poland	01.02.03	
- Portugal	07.09.06 incl. 3rd countries	
- UK	03.02.99	19.06.06 incl. 3rd countries
- Sweden	03.06.97	19.06.06 incl. 3rd countries
- Germany	22.08.00	

Control at sea

The criteria for selecting inspection priorities, both at sea and on land, are based on a risk assessment analysis. The Coast Guard carries out the inspections at sea. Inspections of vessels within defined risk areas look at: juveniles, intermixture of undersized fish, bycatch, discards, fishing gear, satellite tracking device, catch log book and other similar factors. During these inspections, relevant documents and catches (both on deck and in the hold) are examined. These are then cross-checked against the data entered into the vessels log book which records the catch characteristics. Particular attention is paid to species type and species quantity.

Control of landings

- Inspection of landings compare and check relevant documents compared to the physical catch, including inspection of whether the catch has been correctly weighed. Furthermore, it is controlled that the correct quantity and species are entered into the landing/sales note, which is signed by both the captain and buyer.
- On the basis of control agreements with the country concerned, the Norwegian Directorate of Fisheries can request that landings from Norwegian vessels abroad are specially controlled and that the information on the inspections is forwarded to the Directorate of Fisheries.

- To sanction violations the Norwegian legal systems have provisions both for administrative and penal sanctions.
- Administrative sanctions can be applied on all Norwegian vessels, independent of where the infringements have taken place. Administrative sanctions include confiscating the portion of the catch value that exceeds the relevant quota allocation; the confiscation of illegal catches, and withdrawing fishing and/or fish buying licences.
- Penal sanctions are fines and/or imprisonment. There is an unlimited size on fines, and imprisonment can be for up to two years. According to international agreements, imprisonment can not be applied on foreign nationals. The confiscation of vessels, equipment, catch and fishing gear or the value thereof can also be applied.
- Criminal law reactions can be applied on Norwegian vessels, independent of where the infringements have taken place.

Resources dedicated to control and enforcement has largely been directed at selected problem areas. Emphasis has been placed on checking that no fishing is taking place in closed areas, and checking for illegal fishing in the border areas. Another important task is to ensure that catches are not reported from zones and areas other than where they were actually made. Consequently, the practice of cross-loading fish from foreign fishing vessels to other vessels in the Barents Sea is a priority attention area. Apart from certain seasonal fisheries, the Coast Guard's control of coastal fishing is limited. The control is often performed in collaboration with the Directorate of Fisheries.

Foreign vessels wanting to fish in areas subject to Norwegian fisheries jurisdiction must have a licence and are obliged to report their catches to the Directorate of Fisheries. The reporting obligation means that the vessels must report what catches they have made prior to entering the Norwegian zone. In addition, the vessels must report weekly what catches they have made. They must also report when they exit the Norwegian zone, and what catches they have taken onboard since their last report. When information regarding possible violation of fisheries rules arises, the group of inspectors will initiate control measures. This involves following up the case, and, if necessary, rapidly move to the port where the vessel is likely to be landed so the catch can be inspected.

The fisheries are controlled by inspections of the trawler fleet at sea, i.e. by a requirement of reporting to catch control points when entering and leaving the EEZs, Vessel Monitoring System (VMS) satellite tracking for some fleets, and by inspections of all fishing vessels when landing the fish. Keeping a detailed fishing logbook on-board is mandatory for most vessels, and large parts of the fleet report to the authorities on a daily basis (ICES 2007). Fishing vessels are required to report times, places and species to be cross-loaded, at least 24 hours prior to the cross-landing taking place. The receiving vessel shall, no later than one hour after the cross-landing, send a report on the cross-landing and, at least 2 hours prior to the landing of the catch, where it is to be landed. Vessels that receive catches at sea are subject to a satellite tracking obligation on the same line as fishing vessels. Vessels sailing under flags of convenience shall not be entitled to cross-load from the contracting parties' fishing vessels. The parties will let inspectors from the other party stay on board its vessel to carry out inspections of vessels carrying flag from the other party.

Norway is signing a steadily increasing number of fisheries agreements with other nations. The agreements are important contributions toward putting a stop to illegal fishing and reducing landings of illegal fish.

Norway also has agreements with EU, Russia, the Faroe Islands, Greenland and

Iceland regarding mutual tracking of fishing vessels in other EEZs. Norwegian vessels must also carry satellite transponders when fishing in the regulatory areas of the NEAFC and The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).

Port State Control applied to combat IUU fishing (under NEAFC 1 May 2007)

NEAFC is the body that manages other stocks in the North-east Atlantic apart from cod, saithe and capelin in the Barents Sea, such as blue whiting, atlanto-scandian herring and mackerel. NEAFC manages international waters outside national EEZs. NEAFC has implemented a comprehensive system for satellite tracking of fishing vessels in the North-east Atlantic. NEAFC Port State Control Regime applies to landings or transhipments (in ports of NEAFC's Contracting Parties (CPs)) of frozen fish, caught in the NEAFC Convention Area (CA) by foreign vessels. These controls were applied 1 May 2007. More information is available in the WWF Report from April 2008: *Illegal Fishing in Arctic Waters – catch of today gone tomorrow?*

CONCLUSIONS AND RECOMMENDATIONS

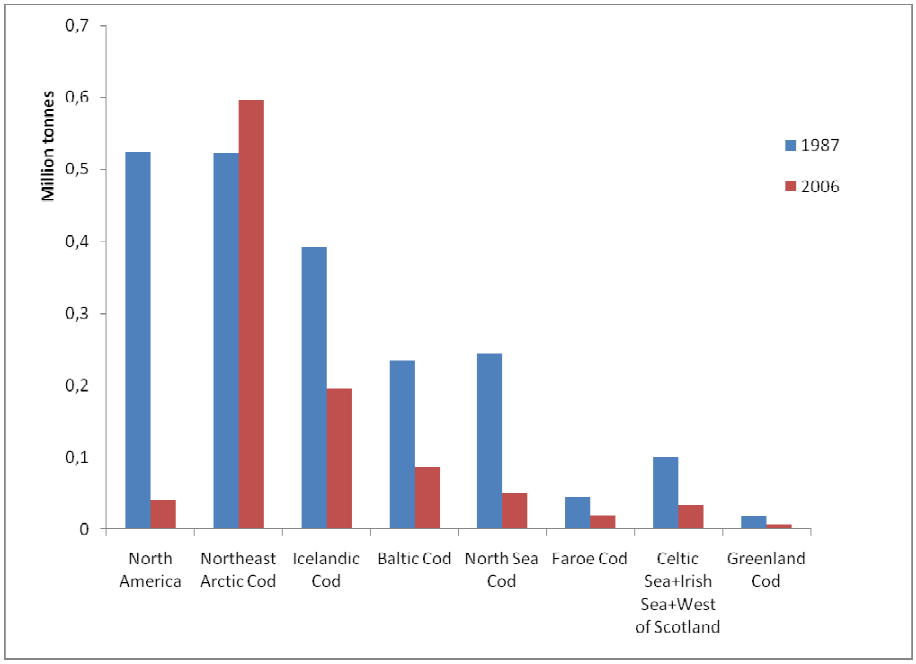
By no means is the Norwegian groundfish fisheries management system perfect, but it is significantly better than other similar fisheries in the Atlantic. Cod stocks in the North Atlantic, especially the Grand Banks and the North Sea, have been impacted heavily due to poor fisheries management and sustained excessive fishing pressure by modern fleets. The Barents Sea on the other hand holds the largest cod stock in the world - the North-East Arctic cod (NEA) - and this is one of Norway's key fisheries (Fig. 1).

The most important measures of success are:

- The procedure of closing sensitive areas such as spawning ground or areas with juvenile fish is considered the single most important conservation measure together with the discard ban.
- The discard ban
- The obligation to change fishing grounds when the mixture of fish below MLS exceeds given levels, and the requirements of improved gear selectivity).
- Obligatory use of sorting grid - A clear improvement has been demonstrated through the inclusion of sorting grids designed to reduce the unwanted catch of fish below MLS (NOTAT 2001).

As human induced climate change is affecting the oceans, there is an urgent need to find the best solutions for robust and sustainable fisheries management. A healthy fish stock should have a spawning biomass significantly over any precautionary levels and a good variety in age and stock structure. A healthy fishery should also be based on the principles of ecosystem management, ensuring that ecosystem functions and integrity is sustained. Efficient fisheries management can adapt to changing environmental factors and management challenges that all already present, and are likely to grow in the next decades.

Figure 1: Decline in North Atlantic cod stocks experienced between the years 1987 and 2006.



REFERENCES

Dagfinn Lilleng, The Directorate of Fisheries, Advisor for the Resource Department, development section, personal comment.

Dingsoer GE (2001) Estimation of discards in the commercial trawl fishery of north-east Arctic cod (*Gadus morhua* L.) and some effects on assessment. Master thesis. University of Bergen, Bergen, Norway. 86 pp.

Fisheries.no:
http://www.fisheries.no/marine_stocks/fish_stocks/saithe/marine_stocks_north_east_artic_saithe.htm

Fiskeridepartementet 2004, kommisjonen for tiltak mot utkast av fisk, rapport med anbefalinger, http://odin.dep.no/filarkiv/207039/Utkastkommisjonens_rapport.pdf

Garrod DJ (1967) Population dynamics of the Arcto-Norwegian cod. J Fish Res Board Can 24: 145-190.

Gjosaeter H, Huse G, Robberstad Y, Skogen M (2008) Havets ressurser og miljo 2008. Fisken og havet, saernr. 1-2008.

Huse I, Loekkeborg S, Soldal AV (2000) Relative selectivity in trawl, longline and gillnet fisheries for cod and haddock. ICES J Mar Sci 57: 1271-1282.

ICES (2006) AVIS DU CIEM, Books 1-10. Report of the ICES Advisory Committee of Fishery Management, Advisory Committee on the Marine Environment and Advisory Committee on Ecosystems (2006) Book 3, the Barents and Norwegian Seas,

ICES (2007) Report of the Arctic Fisheries Working Group 18-27 April 2007. ICES CM 2007/ACFM:16.417 pp.

ICES (2008) http://www.ices.dk/committe/acom/comwork/report/2008/2008/cod-arct.pdf

Isaksen B (1997) The Norwegian approach to reduce bycatch and avoid discards. In: Clucas I and James D (eds) Papers presented at the Technical Consultation on Reduction of Wastage in Fisheries. 28 October – 1 November 1996, Tokoy, Japan. FAO Fisheries Report (Rome) 547 (Suppl.): 89-93.

Isaksen B, Gamst K, Kalsvik K, Axelsen B (1998) Sammenligning av seleksjons- og brukeregenskapene hos Sort-X og enkelrist for topanels torsketraal. Forsoek utfoert om bord paa M/Tr. "Anny Kraemer" ved Bjoernoeya 15-28 August 1997. Institute of Marine Research, Bergen.

Kvamme C (2005) The north-east Atlantic cod (*Gadus morhua* L.) stock: Gear selectivity and the effects on yield and stock size of changes in exploitation pattern and level. PhD thesis, University of Bergen, Norway.

Marine Research News (2007) Fifty years of Norwegian-Russian scientific cooperation. No. 16, 2007-12-18.

Nakken O (1994) Causes of trends and fluctuations in the Arcto-Norwegian cod stock. ICES Mar Sci Symp 198: 212-228.

NOTAT (2001) Tiltak for aa styrke ressurskontrollen, 26 januar, Bergen, Norge.

NOU (2005) Norges Offentlige Utredninger (2005:10) Lov om forvaltning av viltlevende marine ressurser. Havressursloven: http://www.regjeringen.no/Rpub/NOU/20052005/010/PDFS/NOU200520050010000DDDPDFS.pdf

Personal comments: Odd Nakken, IMR, Bottomfish

Polet A (2002) Selectivity experiments with sorting grids in the North Sea brown shrimp (*Crangon crangon*) fishery. Fish Res: 54 (2) p. 217-233.

Roenning A, Burnett M, Esmark M. WWF-Norway (2008). *Illegal fishing in arctic waters, catch of the day, gone tomorrow?* Oslo, Norway.

Stortingsmelding nr. 34 (2007-2008) Om dei fiskeriavtalene Noreg har inngått med andre land for 2008 og fisket etter avtalane i 2006 og 2007.

UBC (2007) Evaluations of Compliance with the FAO (UN) Code of Conduct for Responsible Fisheries, UBC Fisheries Centre Research Reports, 2006 Volume 14 Number 2.

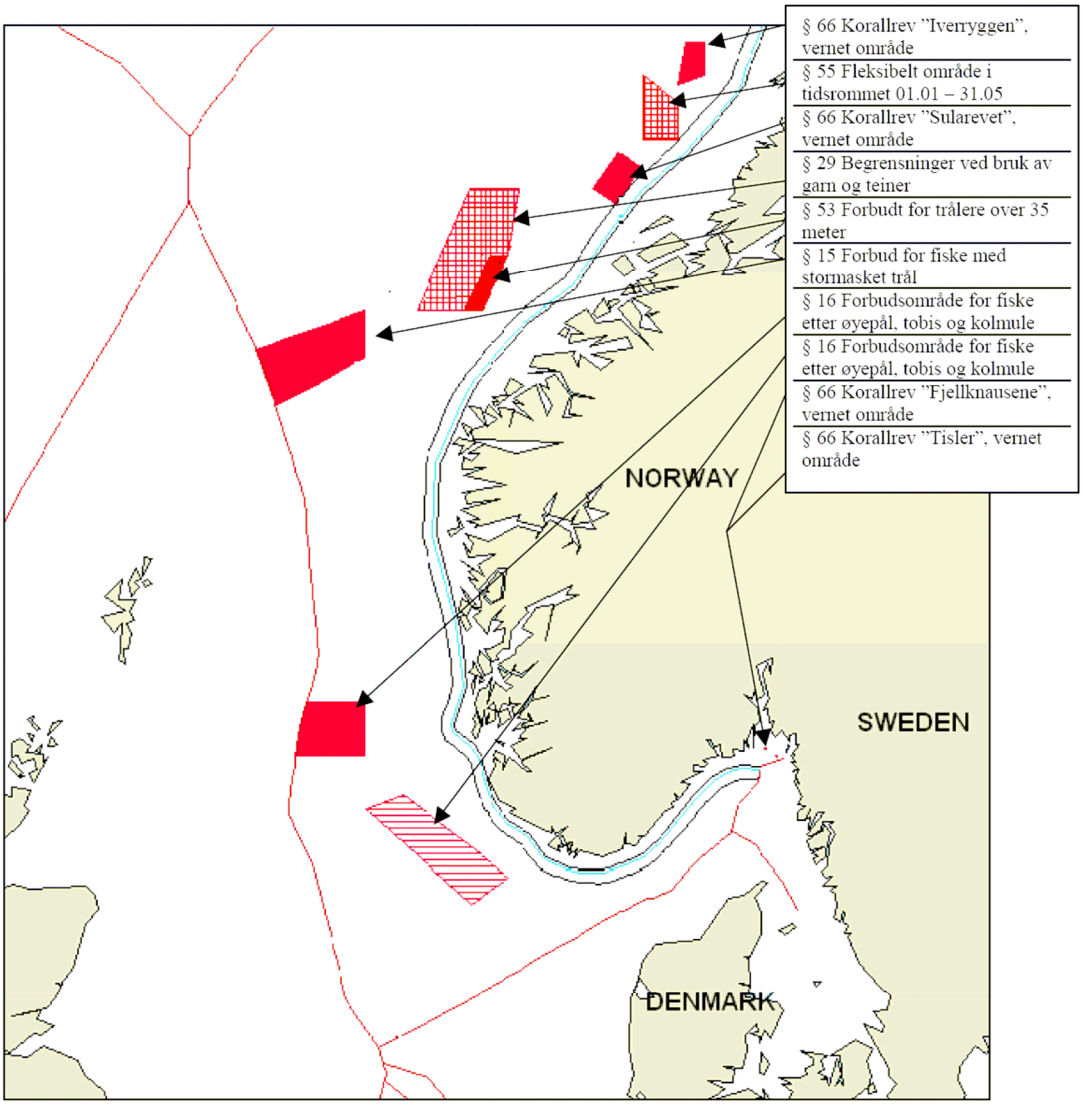
Appendix I

Different fishing zones

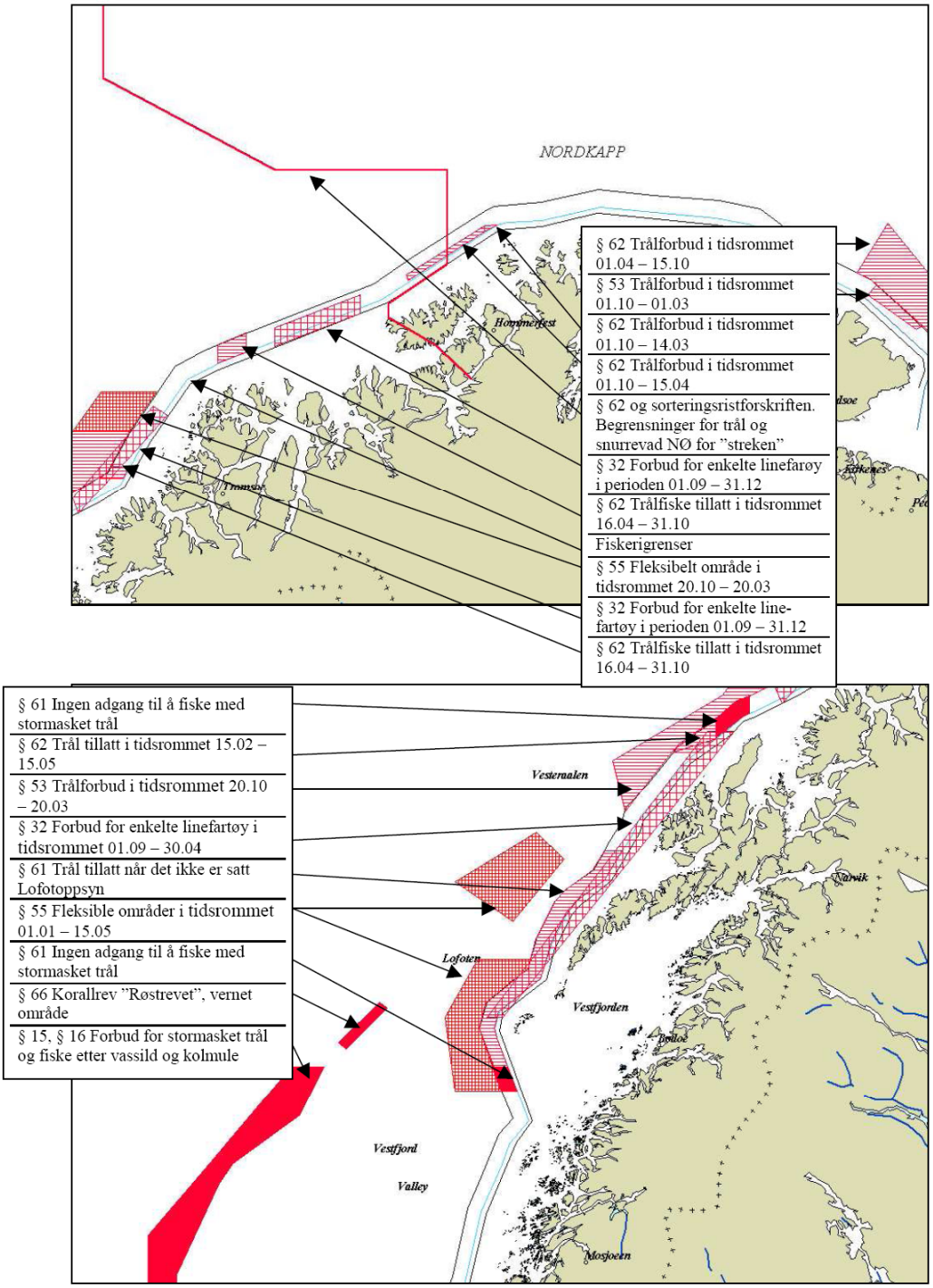
Appendix II Temporary and Permanently closed areas

Vedlegg til forskrift av 21. desember 2004 om utøvelse av fisket i sjøen

Tids- og områdebegrensede soner	Fleksible soner
Forbudsområder	Begrensninger ved bruk av garn, teiner eller liner



Vedlegg til forskrift av 21. desember 2004 om utøvelse av fisket i sjøen



Appendix III – Regulation text for closed areas

§ 54 Establishment of flexible areas

(1) The term flexible areas means delimited areas where fishing is regulated in specific periods by means of restrictions on or prohibition of fishing with particular gear in the whole of or parts of the area. In such areas, the number of vessels participating in the fishery may also be limited.

(2) In the Economic Zone of Norway, flexible areas may be established:

a) When there is a serious risk of gear conflicts because there is a large concentration of fishing vessels in an area or for some other reason.

b) When there is a need to provide fishermen using different types of gear with opportunities to fish within a particular area.

(3) Regulatory measures pursuant to the second paragraph, litra b, may only be implemented if this can be done without the measures having any substantial impact on fishing operations that are already in progress in the area using other types of gear. Regulatory measures may be maintained for the benefit of fishermen using fixed gear even if the vessels have left the fishing ground for a short period to land catches, bunker or because of bad weather conditions, etc.

§ 55 Time and area restrictions for establishing flexible areas.

The Directorate of Fisheries can establish flexible areas within the following areas and time periods:

a) On Jennegga-Malangsgrunnen delimited by straight lines drawn between the following positions:

70°00'N 17°28'E (at the fishery limit)
70°00'N 16°28'E
70°14'N 16°58'E
70°14'N 17°56'E (at the fishery limit)
during the period 20 October - 20 March.

b) On Moskenesgrunnen delimited by lines drawn between the following positions:

68°08'N 11°52'E
68°23'N 10°52'E
68°42'N 12°17'E
68°32'N 12°46'E
during the period 1 January - 15 May.

c) On Røstbanken delimited by straight lines drawn bewteen the following positions:

67°00'N 11°41'E (at the fishery limit)
67°00'N 10°52'E
67°30'N 10°41'E
67°53'N 11°15'E
67°53'N 12°10,5'E (at the fishery limit)
i during the period 1 January - 15 May. .

d) On Haltenbanken delimited by straight lines down between the following positions:

64°24'N 09°00'E (at the fishery limit)
64°42'N 09°00'E
64°55'N 08°20'E
64°24'N 08°20'E (at the fishery limit)
during the period 1 January – 31 January.

§ 56 Prior notification of regulatory measures

(1) Notification of decisions on regulatory measures, prohibitions against fishing or changes in prohibitions pursuant to sections 54 and 55 shall be given at least 12 hours before a regulatory measure, prohibition or change is implemented. Such notification shall be provided on specific radio frequencies or in another satisfactory manner.

(2) All fishing vessels in the area have a duty to listen to such radio frequencies as are mentioned in the first paragraph in order to receive necessary information on regulatory measures, etc.

(3) However, in special cases the Coast Guard may temporarily implement such regulatory measures as are mentioned in sections 54 and 55. Such temporary measures shall be confirmed by the

Directorate of Fisheries as soon as possible.

J-melding 187-2007, **Chapter XII**. Provisions concerning trawling within 12 nautical miles of the baselines off the Norwegian mainland:

§ 58 Trawling with small-meshed pelagic trawls within 12 nautical miles of the baselines

Vessels that have been allocated licences to trawl for Norwegian spring-spawning herring pursuant to section 2-20 of the Regulations of 13 October 2006 on special licences for certain types of fishing and hunting, may fish for Norwegian spring-spawning herring using small-meshed pelagic trawls within 12 nautical miles of the baselines. Furthermore, vessels that have been allocated licences to engage in trawling for capelin pursuant to section 2-22 of the above-mentioned regulations may fish for capelin using small-meshed pelagic trawls in the same area.

§ 59 Trawling with small-meshed bottom trawls in the area between four and 12 nautical miles from the baselines

(1) Vessels with a total length of less than 34 metres and whose gross tonnage is less than 250 according to the provisions of the 1947 Convention or less than 500 according to provisions of the 1969 Convention, may fish for greater argentine, grenadier and blue whiting using small-meshed bottom trawls in the area between six and 12 nautical miles from the baselines south of 67?10'N. Vessels such as are mentioned in the first sentence and that in addition to licences to trawl for greater argentine are entitled to fish for cod using conventional gear north of 62°N may in the period from 1 April to 30 September inclusive trawl for greater argentine with small-meshed bottom trawls between four and 12 nautical miles from the baselines in the area between 64?00'N and 67?10'N.

(2) Vessels whose tonnage was determined to be less than 250 according to the provisions of the 1947 Convention and that have a tonnage of more than 500 according to the provisions of the 1969 Convention, but that have not been rebuilt or modified in such a way as to increase their tonnage, may nevertheless fish using trawls in the area mentioned in the first paragraph. An application to do so must be sent to the Directorate of Fisheries, and a licence must be received from the Directorate before a vessel may start fishing. If a vessel is replaced or is rebuilt or modified in such a way that its tonnage is increased, the licence lapses.

Published by WWF-Norway

Publishing date October 31, 2008

Author
Lise Langaard, Nina Jensen and Maren Esmark

Responsible publisher
Maren Esmark, Head of Conservation Department, WWF-Norway

The publication is supported by
Seafood from Norway (Eksportutvalget for fisk), Aker Seafoods and Innovation Norway.

WWF Norway, Kr. Augustsgate 7A, Pb. 6784, St. Olavs Plass, 0130 Oslo, Norway

All WWFs publications are available at **www.wwf.no**.

WWF is working 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
- promoting the reduction of pollution and wasteful consumption

WWF-Norway
Kristian Augustsgt 7A
P.b. 6784 St. Olavs plass
0130 Oslo
Norway
Ph: 22 03 65 00

www.wwf.no
www.panda.org

WWF

for a living planet®