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Author(s): G Pilling, J Nichols, A H Hoel, A Hough, S Davies

Certification Report for

Norwegian Spring Spawning Herring Purse-Seine and Pelagic Trawl Fisheries

Client: Norges Sildesalgslag

Certification Body:
Moody Marine Ltd
Moody International Certification
Merlin House
Stanier Way
Wyvern Business Park
Derby. DE21 6BF
UK

Tel: +44 (0) 1633 401092
Fax: +44 (0) 1332 675020

Client Contact:
Knut Torgnes
Norges Sildesalgslag,
PO Box 7065
5020 Bergen
Norway

Tel: +47 55 54 95 00
Fax: +4755 54 95 66

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1 INTRODUCTION

This report sets out the results of the assessment of the Norwegian Spring Spawning Herring Fishery against the Marine Stewardship Council Principles and Criteria for Sustainable Fishing.

1.1 The Fishery Proposed for Certification

The MSC Guidelines to Certifiers specify that the unit of certification is "The fishery or fish stock (=biologically distinct unit) combined with the fishing method/gear and practice (=vessel(s) pursuing the fish of that stock)."

The fishery proposed for certification is therefore defined as:

Species:	Norwegian Spring Spawning Herring Fishery (*Clupea harengus*)
Geographical Area:	North East Atlantic, EEZ's of Norway, Russia, Iceland, EU and Faroe Islands. Jan Mayen Fisheries Zone and Svalbard Fisheries Protection Zone, International waters
Method of Capture:	i) Purse-Seine; ii) Pelagic Trawl
Stock	Norwegian Spring Spawning Herring
Management:	The main agreement for dividing and managing the TAC is the coastal states agreement between EU, Norway, Iceland, Faroes and Russia. The agreements are implemented in Norway under National management systems and advised by ICES.
Client Group:	Norwegian vessels only

As there are two gear types used, the assessment will need to consider two fisheries separately (i.e. two separate Units of Certification), although the assessments will take place simultaneously.

1.2 Report Structure and Assessment Process

The aims of the assessment are to determine the degree of compliance of the fishery with the Marine Stewardship Council (MSC) Principles and Criteria for Sustainable Fishing, as set out in Section 5.

This report firstly sets out:

- the background to the fishery under assessment
- the qualifications and experience of the team undertaking the assessment
- the standard used (MSC Principles and Criteria)
- stakeholder consultation carried out. Stakeholders include all those parties with an interest in the management of the fishery and include fishers, management bodies, scientists and Non-Governmental Organisations (NGO's)

Section 9 of the report sets out the methodology used to assess ('score') the fishery against the MSC Standard. The scoring table then sets out the Scoring Indicators adopted by the assessment team and Scoring Guidelines which aid the team in allocating scores to the fishery. The commentary in this table then sets out the position of the fishery in relation to these Scoring Indicators.

The intention of the earlier sections of the report is to provide the reader with background information to interpret the scoring commentary in context.

Finally, as a result of the scoring, the Certification Recommendation of the assessment team is presented, together with any conditions attached to certification.

In draft form, this report is subject to public scrutiny on the MSC website and critical review by appropriate, independent, scientists ('peer review'). The comments of these scientists are appended to the final report.

The report, containing the recommendation of the assessment team, any further stakeholder comments and the peer review comments is then considered by the Moody Marine Governing Board (a panel of experts independent of the assessment team). The Governing Board then make the final certification determination on behalf of Moody Marine.

It should be noted that, in response to comments by peer reviewers, stakeholders and the Moody Marine Governing Board, some points of clarification may be added to the final report.

1.3 Information sources used

Information used in the main assessment has been obtained from interviews and correspondence with stakeholders in the fisheries, notably:

I1. Client (Norges Sildesalgslag) and other Fishing Industry Representatives
I2. Directorate of Fisheries and Institute of Marine Research
I3. Ministry of Fisheries

Other information sources:

Published information and unpublished reports used during the assessment are:

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2 BACKGROUND TO THE FISHERY

2.1 Biology of the Target Species

The North Atlantic herring (Clupea harengus) is a pelagic species. The herring's unique habit is that it produces benthic eggs which are attached to a gravely substrate on the seabed. This points strongly to an evolutionary history in which herring spawned in rivers and estuaries and at some later date re-adapted to the marine environment. Burd and Howlett, (1974) found that the fecundity of North Sea autumn spawning herring was weight and age related and varied between approximately 10,000 and 150,000 eggs per female. This is a relatively low fecundity for teleosts, probably because, in evolutionary terms, the benthic egg is a potentially less hazardous phase of development compared with the planktonic egg of most other teleosts. Spawning typically occurs on coarse gravel (0.5-5 cm) to stone (8-15 cm) substrates and often on the crest of a ridge rather than in hollows.

Herring continue to be mainly planktonic feeders throughout their life history although there are numerous records of them taking small fish, such as herring and capelin larvae. Calanoid copepods, such as *Calanus, Pseudocalanus and Temora* and the Euphausids, *Meganyctiphanes* and *Thysanoessa* still form the major part of their diet during the spring and summer and are responsible for the very high fat content of the fish at this time.

In the past, herring age was determined by using the annual rings on the scales. However the growth rings on the otolith have proved more reliable for age determination and have been used for over 30 years (Molloy, 2006). Herring age is expressed as number of winter rings on the otolith rather than age in years as for most other teleost species where a nominal 1 January birth date is applied.

Herring stocks in the North Atlantic are divided into spring, summer and autumn spawners. The North Sea stocks spawn in the autumn, those around Iceland in the summer but those in the Baltic and off the Norwegian coast are spring spawners. In the Skaggerak, and parts of the eastern North Sea both spring and autumn spawners may be taken together in the catches. They can be separated by detailed analysis of the otolith structure from samples of the catch.

The Norwegian spring spawning herring (NSSH) is a highly migratory stock, now widely distributed throughout the NE Atlantic at various stages in its life history (Runnstrom, 1936; Rottingen, 1992). Compared with other herring these spring spawners have a high vertebral count, are a large size at age and have a large maximum size. No genetic differences have been found between NSSH from different spawning areas, and it is treated as a single stock.

A remarkable characteristic of this stock over the past century has been the large fluctuations in spawning stock biomass (SSB), (Devold, 1963; Dragesund and Ultang, 1978) and the changes in its pattern of migration affecting the location of feeding, spawning and over-wintering areas. From descriptions of the area of distribution of this stock in the 1930's and 1940's (Runnstrom, 1936; Devold, 1963) it can be seen that both the feeding grounds and the over-wintering areas were substantially larger then than they are today. The stock used larger areas of the Norwegian Sea for feeding and also spent the winters there (Devold, 1963). In the early years of the last century the stock was at a low level of around 2 million tonnes. By 1930 it had reached 14 million tonnes but decreased to around 10 million tonnes by 1940. With several abundant year classes in the 1930's the SSB rapidly increased to a record level of 16 million tonnes in 1945 (Toresen and Ostvedt, 2001). In the mid 1950's SSB was estimated at around 10 million tonnes, strongly influenced by the exceptionally large 1950 year class. Between 1955 and 1962 the adult stock steadily declined to about 3 million tonnes. There was a slight increase between 1963 and 1965 related to the strong 1959 year class but this was followed by a drastic decline from 1966 onwards. This was mainly attributable to the rapidly increasing fishing pressure on both juveniles and adults and also a lack of recruitment, The stock quickly declined to a collapsed state with the SSB reduced to below 50,000t by 1971 and remained at a low level through most of the1970's with very little spawning occurring. In the absence of fishing pressure the stock began a slow recovery from the late 1970's and through the 1980's greatly helped by some years of strong recruitment, in particular the 1983 year class. This recovery continued and SSB began to rapidly increase from the late 1980's to reach over 3 million tonnes by 1989. With further large year classes in 1990, 1991 and 1992 the SSB reached around 8 million tonnes by 1997 but with weaker year classes began to decline again to around 5 million tonnes by 2001. However with further good year classes in 1998, 1999, 2002 and 2004 the SSB rapidly increased again and is currently estimated at 10.3 million tonnes at spawning time in 2006. This is the highest estimate since the mid 1950's. The 2004 year class appears to be the biggest recorded for over 50 years and as a consequence the SSB is predicted to remain at around 10 million tonnes at least through to 2009.

Toresen and Ostvedt (2001) found that the long term changes in SSB were highly correlated with the mean annual temperature of the inflowing Atlantic water masses (through the Kola section) in the north-east Atlantic region. Furthermore, recruitment was positively correlated with average temperature in the Kola section in winter (January–April) indicating that environmental factors are governing the large scale fluctuations in this stock. The precise physical and biological mechanisms, for which temperature per se is likely only to be a proxy, are more difficult to define but may well be linked to changes in the distribution and abundance of food items and possibly to larval drift.

Over the past sixty years the spawning areas, over-wintering areas and migration routes have been subject to many unpredictable changes. For example at least six different over-wintering areas have been used during this period. These have varied from east of Iceland, the Norwegian fjords and since 2001 an area off the coast of Norway between Latitude $69^0$30'N and 72^0N.

In the 19th century and during the first half of the 20th century most of the spawning was located south of 60°N. From the late 1940's changes in migration led to a northwards shift in spawning locations and by the early 1960's spawning only occurred north of 62°N (Rottingen and Slotte, 2001). This pattern continued until the collapse of the stock in the late 1960's. With the depleted state of the stock the long migrations ceased and the whole life cycle was spent in the Norwegian coastal waters and fjords. Spawning then occurred mainly in the More area (Dragesund et al, 1980; Hamre,1990; Rottingen,1990). During the early period of rebuilding this pattern continued but with the recruitment of the big 1983 year class to the SSB in 1988 a new migration pattern was established for this stock (Rottingen, 1992). The essential elements were continued spawning in the More area, a migration to old feeding areas in the Norwegian Sea and migration to the Vesttfjorden area, in the north, to overwinter. Then in 1989 herring began to spawn again in the previously important areas south of Bergen after an absence of 30 years. This represented a sudden shift of over 300km to the south of the previous southern-most boundary of spawning. At present they spend the feeding season, April to August, covering large areas of the Norwegian Sea, but in September they gather in the Vestfjorden system to overwinter (ICES, 2006). From this area they begin their spawning migration south in mid-January covering varying diatances from Lofoten in the north to Lista in the south.

The spawning grounds are now distributed along 1500km of the coast from 58°N to 70°N. This coastal zone contains the suitable banks and shelf areas, with a stony or rocky bottom at depths of less than 250m (Runnstrom, 1941; Dragesund, 1970) which the herring requires for successful spawning. Traditionally the most important spawning areas are found from north to south at Lofoten, Traena, Sklinnabanken, Haltenbanken, Froyabanken and along the districts of More, Sogn and Rogaland (Slotte,2001).

The spawning migration begins in January and spawning occurs from February to mid April with the older, repeat spawners, 7yrs old and above, tending to spawn two to three weeks earlier than the younger fish (Slotte, 2001). In an examination of the factors influencing timing and location of spawning Slotte (2001) concluded that there was no evidence of 'homing' in this highly migratory stock. Instead he found evidence that the choice of spawning ground was linked to the condition of the fish with the individuals in the best condition migrating the furthest south from their over-wintering grounds. There is evidence that the larvae from the southernmost spawnings have a higher survival rate than those from further north.

The benthic eggs of the herring take about three weeks to hatch dependant on the temperature. The larvae on hatching are 6mm to 9mm long and are immediately planktonic. Their yolk sac lasts for a few days during which time they will begin to feed on phytoplankton and small planktonic animals. Their planktonic development lasts around three to four months before they metamorphose into '0' group fish. The larvae are subject to the north to north-east residual drift along the Norwegian coast which takes them to nursery areas along that coast, into the fjords and into the Barents Sea. The Barents Sea is currently the most important area for the juvenile herring although big year classes do spread into the Norwegian Sea where they grow faster and tend to mature a year earlier than in the Barents Sea. However there is an abundant food supply, limited predation and no targeted fishery in the Barents Sea and the area does form the basis for the large production potential of this stock. They remain in the Barents Sea for their first three years before moving to the richer feeding grounds in the north-east Norwegian Sea. They remain there for a further one to two years before returning to the coastal areas to spawn. After spawning the adults return to the rich feeding grounds in the Norwegian Sea where they remain until September / October.

The age of first maturity is 4-5 years but the proportion mature at age may vary from year to year dependent on year class strength and feeding conditions. Large year classes typically mature at a higher mean age due to density dependant factors. However the 2002 year class is an exception which has shown rapid growth and relatively early maturity. For an example 90% of the age 4 fish in the 2002 year class were mature compared with the normal 30% for this age.

2.2 History of the Fishery

The Norwegian Spring spawning (Atlanto-Scandian) stock is the largest herring stock in the world and the largest fish stock in the North Atlantic. Changes in its migration routes, spawning areas, huge fluctuations in recruitment and its recovery from near total collapse in the 1970's make this one of the most fascinating and scientifically challenging stocks in the world.

The history of the fishery is strongly linked to the large fluctuations in SSB, year class strength and the migratory changes which have occurred over the past century. The two periods of very high catches from 1954 to 1957 and 1964 to 1967 coincided with the very big year classes of 1950 and 1959 respectively. Figure 1 shows the total catch of adult herring over the period 1950 to 1970 by which time the landings had fallen to zero. The current fishery is almost exclusively for human consumption whereas prior to the collapse there were major fisheries for reduction to meal and oil including fisheries on juvenile herring.

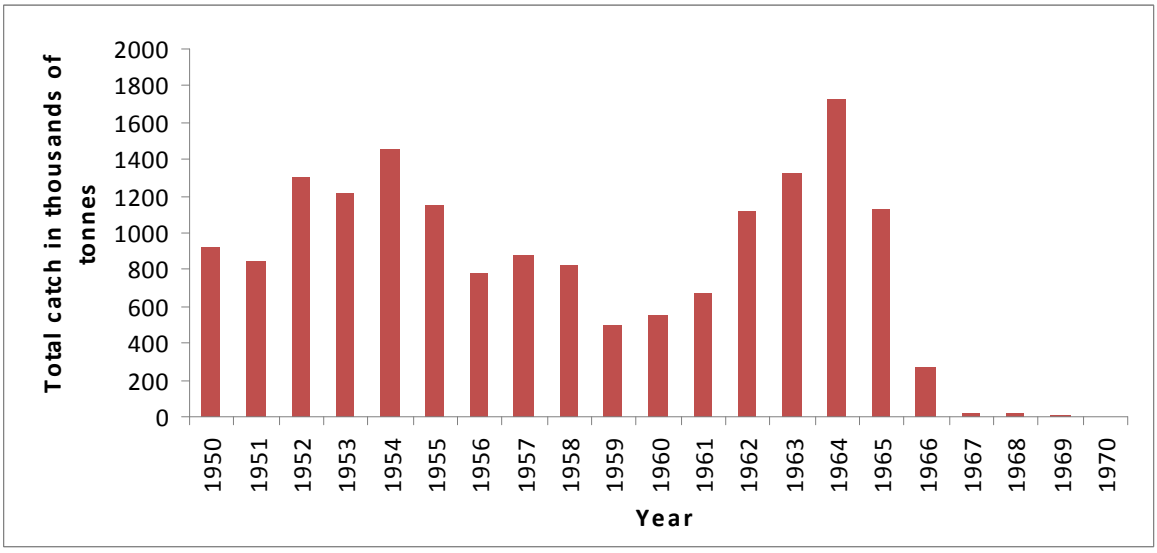

Figure: Total catch of adult Norwegian spring spawning herring, in thousands of tonnes over the period 1950 to 1970.

The introduction of the (Puretic) power block in the early 1960's had revolutionised the practice of purse seining. It enabled the rapid deployment and recovery of the net allowing the vessels to fish with greater safety on the high seas. The purse fishery was able to move safely away from the fjords to the open sea. As a consequence catching power and thus fishing effort increased dramatically and the annual catch soared. The drastic decline in the SSB from 1966, described in section 2.1 above, was accelerated by this rapid increase in the exploitation rate on both juveniles and adults over this period with landings reaching a peak of almost 2 million tonnes in 1966 declining rapidly to 712,000t by 1968 (ICES, 2007). The major cause of the decline was nevertheless the recruitment failure. There was practically no recruitment once the 1959 to 1961 year classes had fully recruited by 1966. The 1962 and the 1965 to 1968 year classes were very weak and although the 1963 and 1964 year classes were above average as '0' groups they did not survive to spawning because of the heavy fishing pressure on juveniles. The major factor in the recruitment failure and ultimate collapse of the adult stock over this period was the heavy exploitation of juvenile herring in the 'fat herring fishery'.

By 1970 the stock was classified as severely depleted. Between 1970 and 1972 no spawning herring were located on the spawning grounds, larval production was zero and a total ban on commercial herring fishing had been imposed.

Commercial exploitation re-started in 1989 with landings of around 100,000t. Total international landings then increased steadily during the 1990's. From 1992 the Norwegian fishery increased sharply but until 1994, that fishery was almost entirely confined to Norwegian coastal waters. During the summer of 1994 there were also catches in the offshore areas of the Norwegian Sea for the first time in 26 years. The geographical extent of this fishery increased in 1995, with nine nations participating and the total catch exceeding 900 000 t. The fishery expanded further in 1996 and the annual level of the fishery was in the order of 1.2–1.5 million t in the period 1996–2000 (Figure 2). Management regulations have restricted landings in recent years.

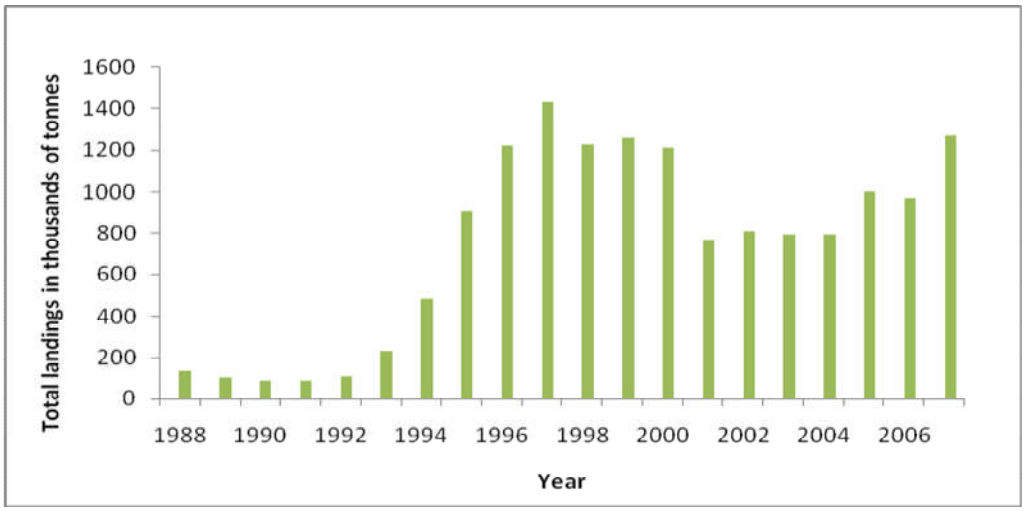

Figure 2. Total landings of adult Norwegian spring spawning herring, in thousands of tonnes over the period 1988 to 2007.

Between 2001 to 2004 landings reduced to around 800,000t then increased again to over 1 million tonnes in 2005. The recorded landings for 2006 are 970,000t. The TAC, which is expected to be fully taken in 2007, is 1.28 million tonnes (Catch 2007 = 1,266,993t)

The uptake of the Norwegian quota is closely monitored by Norges Sildesalgslag, the sales organisation through which all fish sales are processed. The catches are reported as they are taken and sold by auction whilst the vessel is still at sea. The reported catch is then delivered to the buyer where verification of the reported weight is made. Norges Sildesalgslag are responsible to the Ministry for monitoring individual vessel landings and their quota uptake and the national uptake of the quota. The information is updated on a daily basis and is immediately available and in the public domain via the official website. If over quota fish is landed then the proceeds form its sale are pooled for the benefit of the Industry as a whole. Funds thus generated may be used by Norges Sildesalgslag for example for control and monitoring purposes, for education and to assist the smaller coastal vessels to competitively market their catch. They are required to report on the use of such funds to the Ministry of Fisheries and Coastal Affairs.

Table 1: Annual landings of Norwegian Spring Spawning herring (tonnes) and SSB (tonnes) from 1950 to 2006. (Source: ICES)

Year	SSB	Landings	Year	SSB	Landings
1950	14,200000	933,000	1979	388,000	12,864
1951	12,500,000	1,278,400	1980	471,000	18,577
1952	10,900,000	1,254,800	1981	504,000	13,736
1953	9,350,000	1,090,600	1982	503,000	16,655
1954	8,660,000	1,644,500	1983	575,000	23,054
1955	9,270,000	1,359,800	1984	602,000	53,532

Year	SSB	Landings	Year	SSB	Landings
1956	10,900,000	1,659,400	1985	515,000	169,872
1957	9,650,000	1,319,500	1986	437,000	225,256
1958	8,690,000	986,600	1987	926,000	127,306
1959	7,180,000	1,111,100	1988	2,907,000	135,301
1960	5,850,000	1,101,800	1989	3,537,000	103,830
1961	4,390,000	830,100	1990	3,692,000	86,411
1962	3,440,000	848,600	1991	3,845,000	84,683
1963	2,670,000	984,500	1992	3,718,000	104,448
1964	2,530,000	1,281,800	1993	3,615,000	232,457
1965	3,060,000	1,547,700	1994	4,130,000	479,228
1966	2,800,000	1,955,000	1995	5,086,000	905,501
1967	1,470,000	1,677,200	1996	6,788,000	1,220,283
1968	344,000	712,200	1997	8,237,000	1,426,507
1969	145,000	67,800	1998	7,618,000	1,223,131
1970	71,000	62,300	1999	7,174,000	1,235,433
1971	32,000	21,100	2000	6,147,000	1,207,201
1972	16,000	13,161	2001	5,168,000	766,136
1973	85,000	7,017	2002	5,319,000	807,795
1974	91,000	7,619	2003	6,807,000	750,077
1975	79,000	13,713	2004	7,725,000	793,666
1976	138,000	10,436	2005	8,299,000	1,003,243
1977	286,000	22,706	2006	10,300,000	968,958
1978	358,000	19,824	2007		

2.2.1 Vessels and Gears

Two different gear types are being considered in this evaluation of the Norwegian spring spawning herring fishery:

- Purse seines
- Pelagic trawls

The Norwegian fishery for Norwegian spring spawning herring is carried out by many size categories of vessels. Of the total national quota approximately 50% is allocated to purse seiners, 10% to trawlers and 40% to smaller coastal purse seiners (ICES, 2007). According to Norges Sildesalgslag statistics, 113 seine vessels, 40 pelagic trawlers and 245 coastal purse seine vessels fished for Norwegian spring spawning herring in 2007.

On average about 57% of the Norwegian spring spawning herring catch originated from purse seiners, 12% from pelagic trawlers, and 31% from coastal purse seiners.

Purse Seine

Both small coastal vessels and larger offshore vessels operate purse seine gears. Industrial purse seine vessels are larger than 36m, with coastal purse seiners being smaller than 33m in length.

Within Norwegian regulations, protective measures include the prohibition of the use of drainage grids that can be used as sorting equipment in the water separator or chutes leading from the water separator (drainage system) in fisheries for herring and mackerel. Norwegian authorities also have the potential to close areas if information suggests that juvenile or bycatch levels within catches are above acceptable limits, or close fishing during the daytime. It is also prohibited to discard fish waste when fishing for mackerel, Norwegian spring-spawning herring, and North Sea herring.

Restrictions on the use of purse seines during the daytime can be put in place by the Directorate if there is a risk of killing herring unnecessarily.

Pelagic trawls
Pelagic trawl vessels operate offshore. These vessels are currently between 24 and 68m in length.

Within Norwegian regulations, protective measures include the prohibition of the use of drainage grids and graders in fisheries for herring and mackerel. Norwegian authorities also have the potential to close areas reactively if information suggests that juvenile or bycatch levels within catches are above acceptable limits. When fishing for Norwegian spring-spawning herring using small meshed trawls, bycatches of cod, haddock and saithe are prohibited. There are also spatial limitations on fishing areas.

2.3 Fishing Locations and Administrative boundaries

The ICES sub-Areas and Divisions in which the Norwegian Spring Spawning Herring are fished are shown on the Figure 3 below. They are found in ICES Divisions IIa, IVa and Vb. The Norwegian fishery takes place mainly in ICES Divisions IIa and IVa within the Norwegian Exclusive Economic Zone shown in Figure 4.

There are closed areas in the north-eastern part of the Norwegian Economic zone, in the fisheries protection zone around Svalbard and in the territorial and internal waters of Svalbard.

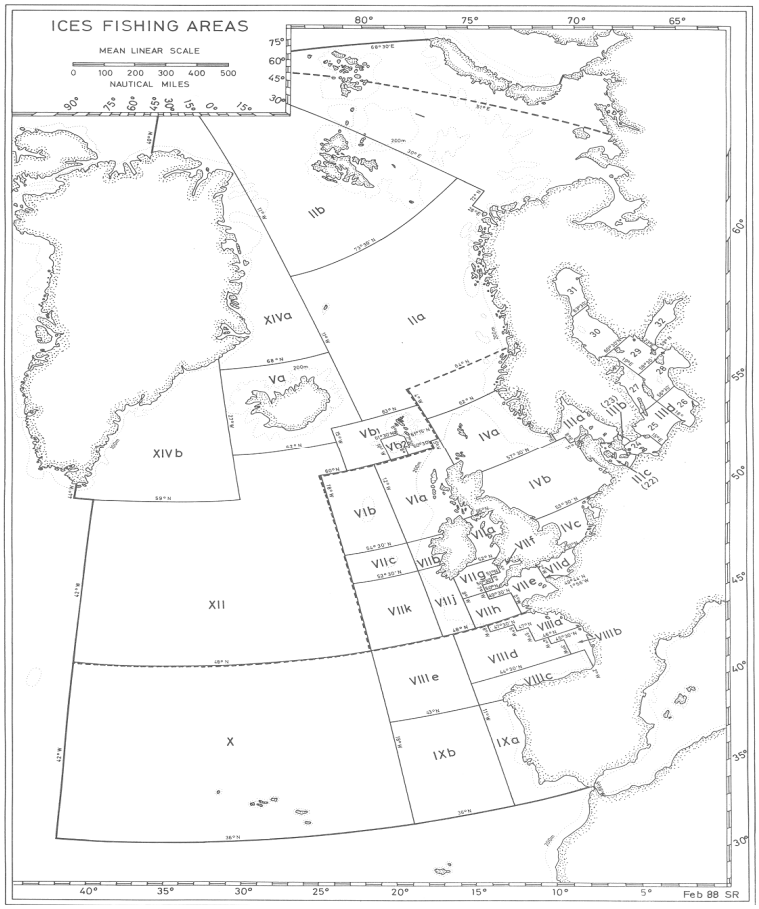

Figure 3. ICES Fishing Areas in the North Atlantic

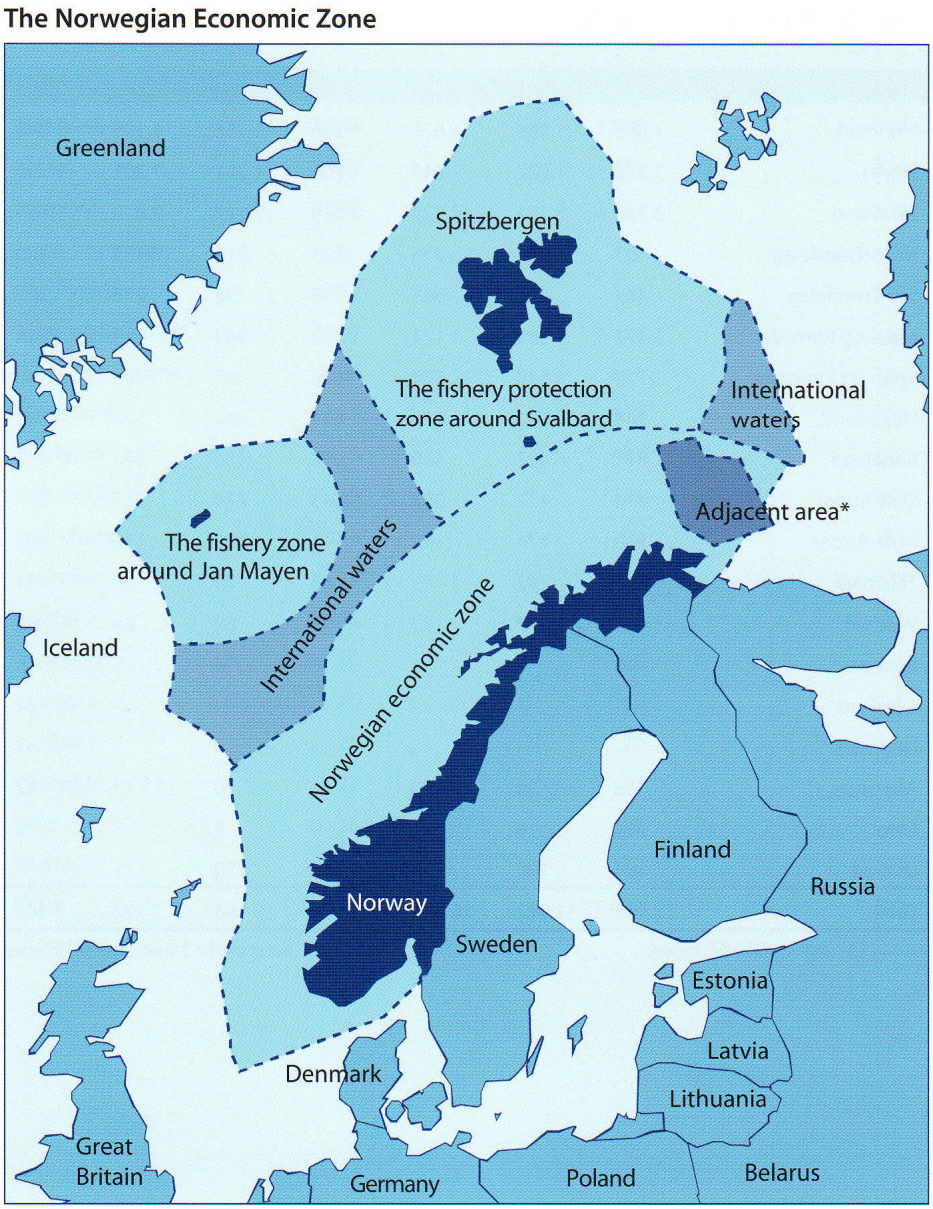

Figure 4. Chart showing the extent of the Norwegian Economic Zone and adjacent fishing areas where the Norwegian spring spawning herring are fished. (Source: Norwegian Ministry of Fisheries and Coastal Affairs)

The fisheries for Norwegian spring spawning herring take place in the waters of Norway, the EU, The Faroes, Iceland, and in international waters. In addition to the countries mentioned, also Russia is considered a coastal state relative to the stock, due to the large presence of juvenile herring in the Barents Sea. All member states in the European Union are subject to the Common Fisheries Policy, which effectively leaves the authority to manage fisheries with the Community. Norway´s fishery for NOSS herring essentially takes place in its EEZ and to the north of 62°N.

Following the growth of the NOSS herring stock, in the early 1990´s it became clear that its distribution would grow beyond Norwegian waters. By the mid-1990´s it was clear that in addition to Norway, also the EU, the Faroes, Iceland, and Russia considered themselves coastal states to NOSS herring. The stock also occurs in international waters beyond national jurisdiction, in the regulatory area of the Northeast Atlantic Fisheries Commission (NEAFC).

The coastal states negotiated an agreement effective from 1996 covering the entire geographical range of the NOSS herring stock. The agreement, which has been renewed annually except for the years 2002-2005, sets out the distribution of the TAC between the coastal states and sets aside a separate TAC for international waters to be managed by NEAFC. For 2008, the allocation of the 1,518 million ton TAC between countries is as follows:

Norway	61%
Iceland	14.51%
Russia	12.82%
EC	6.51%
Faroes	5.16%

The arrangement also provides for reciprocal fishing rights of NOSS herring between the countries. A long term management plan has been agreed to. In the North East Atlantic Fisheries Commission (NEAFC), a scheme for quota allocation for NOSS herring is agreed upon.

Management responsibilities are based on the international 5-party agreement and are defined within the three core areas of resource management: developing the knowledge base, preparing and implementing regulations, and enforcing them. Interactions are however not always effective in the sense of decisions being promptly followed up upon or abided by.

The knowledge base for resource management is developed by the marine scientific institutions of the countries that participate in the fisheries. There is cooperation on research planning, data collection, including joint research cruises, and the development of assessment models. This is the basis for the scientific advice for resource management provided by ICES. Additional scientific inputs on marine ecosystems issues are provided through other research institutions (universities etc.). The Institute for Marine Research (IMR) is an independent research institution with its own board. About half of its funding comes directly from the Ministry of fisheries and coastal affairs.

The management strategy and the overall TACs for the NOSS herring fisher as a whole are provided by the 6-party arrangement. In Norway, the overall responsibility for resource management resides with the Ministry of Fisheries and Coastal Affairs, which decides on policy and regulatory schemes. The Fisheries Directorate acts as a technical body preparing the secondary legislation containing regulations and implementing it. Interactions between the Ministry, Directorate and IMR appear to function well.

In Norway, enforcement of regulations is the responsibility of the Coast Guard (at sea), the Fisheries Directorate (near shore waters and upon landings) and the sales organizations (upon landings). These organisations have set procedures governing joint activities and meet regularly to coordinate actions.

2.4 Ecosystem Characteristics

The ecosystem approach has been agreed as a management principle in the Bergen Declaration from the 5th North Sea Conference and by the Norwegian Parliament in adopting the governmental white paper.

Knowledge of the ecosystem characteristics of the North East Arctic region can be divided into two

separate areas: the Barents Sea to Lofoten, and the remainder of the Norwegian Sea to the south of this area, combined with the area around the Faroes (ICES area Vb). According to ICES (2007), the main activities of the Norwegian fleet occurred north of 62°, in Norwegian waters, so this area is concentrated upon.

The characteristics of the marine ecosystem of the Barents Sea/Lofoten area are relatively well known. Numerous joint Norwegian/Russian ecosystem cruises have been performed in this area, examining oceanographic characteristics, as well as plankton, benthos, fish, bird and mammal distributions and abundance. Some of these data sets, particularly those examining temperature and salinity, for example, extend back to the 1930's. These surveys have underpinned the Barents Sea management plan of man's use of the environment (Report no.8 to the Storting, "Integrated Management of the Marine Environment of the Barents Sea and the Sea Areas off the Lofoten Islands"). This holistic study examined the variety of man's activities, including fishing, petroleum extraction, and maritime transport. As such, the plan aims to "provide a framework for the sustainable use of natural resources and goods derived from the Barents Sea and the sea areas off the Lofoten Islands, and at the same time maintain the structure, functioning and productivity of the ecosystems of the area".

The study of the ecosystem within the Norwegian Sea is the focus of a number of groups within the Institute of Marine Research (Bergen). Areas of research include habitats and their significance for ecology and biological diversity; the health of benthic communities; oceanographic variability and changes in the marine climate for the production, distribution and behaviour of marine organisms; the distribution of species and their trophic interactions, as well as knowledge of non-commercial species, and indicators for marine ecosystem-based management. The Faroese Fisheries Laboratory undertakes research on the Faroese ecosystem. Waters around the Faroe Islands are in the upper 500 m dominated by the North Atlantic current. Clockwise current systems create retention areas on the Faroe Plateau (Faroe shelf) and on the Faroe Bank. There has been observed a very clear relationship, from primary production to the higher trophic levels (including fish and seabirds), in the Faroe shelf ecosystem, and all trophic levels seem to respond quickly to variability in primary production in the ecosystem (Gaard et al. 2001).

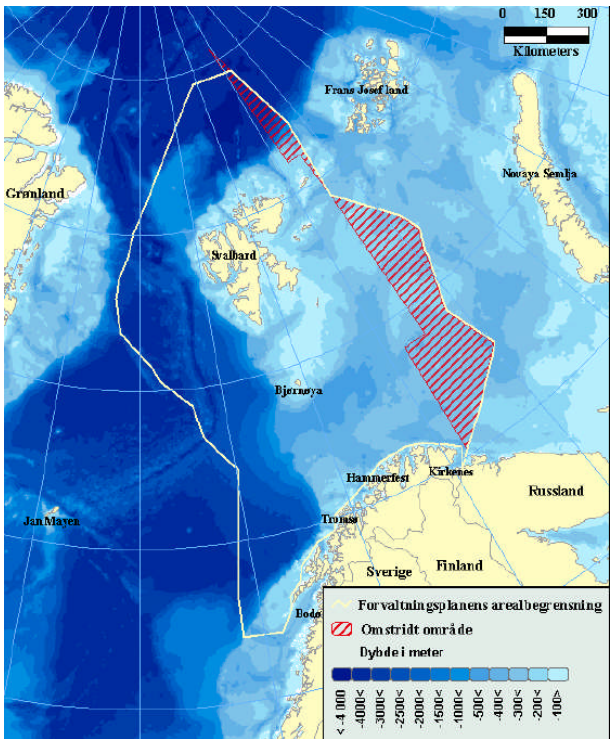

Figure 5. Chart of area considered within Barents Sea- Lofoten integrated management plan. Extracted from Utredning av konsekvenser av fiskeri i området Lofoten – Barentshavet (2004).

Through the underpinning work, key geographical areas have been identified that are important for biodiversity and biological production in the area, and where adverse impacts might persist for many years. Besides being important within the life history stages of key commercial fish species (e.g. spawning and nursery areas), several of the areas were also identified as important as breeding, moulting or wintering areas for seabird populations of international importance, such as the lesser black-backed gull (subspecies *Larus fuscus fuscus*), Steller's eider and Atlantic puffin (Stiansen et al. 2005). In addition, the areas identified include valuable and vulnerable habitats where the benthic fauna included species such as cold-water corals (the largest known cold-water coral reef is off Røst in the Lofoten Islands) and sponge communities. Unintentional negative impacts on these species "are to be reduced as much as possible by 2010".

On the basis of these studies, the most vulnerable areas within the region have been identified and oil and gas activities forbidden in these areas. So far, one purely marine protected area has been established under the Act: the Selligrunnen coral reef in the Trondheimsfjorden, which has been temporarily protected. An Official Norwegian Report (NOU 2004: 28) on an Act on the protection of the natural environment, landscape and biological diversity contains a proposal to extend the geographical scope for the protection of sea areas from 12 nautical miles to include the Norwegian continental shelf and Norway's exclusive economic zone. Five marine protected areas have been established under the fisheries legislation to protect coral reefs from damage caused by bottom trawling. These are the Sula Reef (1999), Iverryggen Reef (2000), the Røst Reef (2003), Tisler and Fjellknausene Reefs (2003). These areas protect these specific vulnerable species and habitats from disturbance. In addition, the world's shallowest known Lophelia-reef, Selligrunnen, rising up to 39 m depth below the surface, has been temporary conserved pursuant to the Norwegian Nature Conservation Act by the environmental authorities (2000) (www.fisheries.no/management_control/environmental_impact/coral_reefs.htm).

The MAREANO programme[1] aims to survey and perform basic studies of the seabed's physical, biological and chemical environment. This follows the Norwegian Government's go-ahead for the launch of a marine survey programme in the Lofoten - Barents Sea region in 2005. Following collection, the data will be entered into a database that will cover Norway's coastal and marine regions, increasing the information on ecologically important benthic communities such as coral reefs and sponges.

Large 3D hydrodynamic numeric models for the Barents Sea are run at both IMR and PINRO. Sub-models for phytoplankton and zooplankton are now implemented in some of the hydrodynamic models. However, strong assumptions within these models mean outputs must be viewed with caution.

The food for herring is zooplankton of which *Calanus finmarchicus* is the most important (ICES, 2007). As a result, Norwegian spring-spawning herring condition and recruitment levels are thought to be strongly affected by climatic variables, which influence their prey and relationships between the NAO, distribution/migration of Norwegian spring spawning herring and of zooplankton have been put forward, but not investigated.

The position of spring-spawning herring within the food web has been studied. In the Barents Sea, spring-spawning herring is a key prey item for cod, while spring-spawning herring preys on capelin larvae in particular (e.g. Wassmann et al. 2006), and increased population sizes may have contributed

[1] IMR web page

to capelin declines (e.g. Barrett, 2007). Capelin is an important food source for juvenile kittwake (*Rissa tridactyla*), and breeding success is notably lower in times of herring abundance (and reduced capelin abundance; Barrett, 2007). Herring is an important source of food for different marine mammal species. In the Norwegian Sea at least, killer whales are known to use herring as their major source for food. They are also food for minke whales in the Barents Sea. Skaug et al. (1997) estimated food consumption estimates for Minke whales. They noted that pelagic species (particularly herring) form key food species (see also Lindstrom et al. (1998) for harp seals). Herring has also been identified in the past as an important component of the diet of harbour porpoises in the North Sea (Santos et al., 2005). However, shifts in the diet of harbour porpoise from predation on clupeid fish (mainly herring *Clupea harengus*) to predation on sandeels and gadoid fish in this area might be related to the decline in herring stocks since the mid-1960s (Santos et al., 2003), and sandeels appear to remain a key dietary component for these mammals. These studies have placed spring-spawning herring within the food web of the Norwegian and Barents Seas and Faroe regions, and demonstrate that prey-switching can occur. Detailed mass-balance trophic models of the Barents and Norwegian Seas, as well as for Faroese waters, have also been developed using the Ecopath with Ecosim methodology. This allows the temporal and spatial simulation of alternative fishing and environmental change scenarios to be examined on ecosystem components, which include herring.

Unintended effects of the fishery on the ecosystem are considered as being small or absent (ICES 2007). Since herring is a major source of food for some populations of other species, as noted above, overfishing of the herring stock could affect these populations. This is presently not the case since the herring stock is very abundant and is exploited at a low rate. A large number of multispecies models have been developed for the different areas to examine ecosystem interactions between exploited species, but their practical use is relatively limited by their data intensive nature. However, these models have been used to look at fishery effects and fish/mammal interactions (e.g. Blanchard et al., 2002). Simpler models, which look at an aspect of the total ecosystem, include GADGET (www.hafro.is/gadget). This can model interactions between cod, herring, capelin and minke whale in the Barents Sea. This model is still being developed.

Further ecosystem studies by IMR have been recently launched on *Lagenorhynchus* dolphins, following a recommendation from the North Atlantic Marine Mammal Commission (NAMMCO). The study aims to explore the ecology of Atlantic white-sided dolphin *Lagenorhynchus acutus* and the white-beaked dolphin *Lagenorhynchus albirostris* to increase knowledge of the ecosystem dynamics, and investigate the exposure of mammalian top predators towards environmental contaminants and study effects on their health status. In addition to sightings, this programme involves the capture and post-mortem examination of specimens.

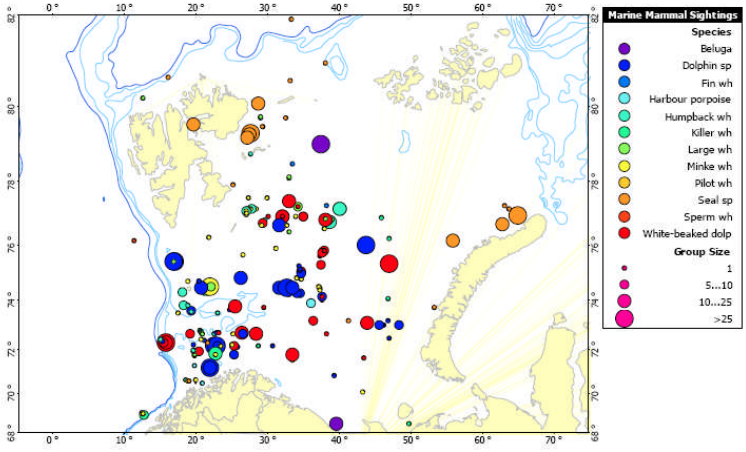

Figure 6. Distribution of marine mammals, data from “Johan Hjort”, “Smolensk”, “Nansen” and the PINRO airplane Arctica, August - October 2004.

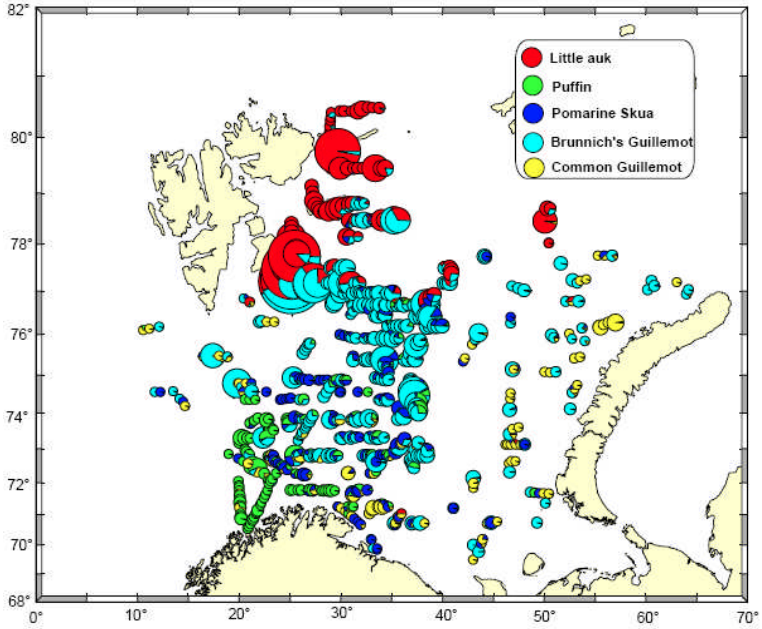

Figure 7. Observation of sea birds from ”F. Nansen” and “J. Hjort” during the period August-October.

While the Barents Sea/Lofoten management plan has been developed based upon the collation of a considerable range of data sources, the process for more southerly Norwegian Sea waters is less advanced. However, the Barents Sea/Lofoten plan stated “The Government also intends to start the preparation of similar management plans for the Norwegian Sea and the North Sea, using experience gained during the preparation of this management plan as a starting point”. This process is beginning, with the aim to present a white paper in Spring 2009. Work on a representative selection of marine habitats in Norwegian coastal waters (national marine protection plan) is also said to be well advanced, and proposals are expected to be ready for public consultation in 2007 so that protected areas can be established in 2008. In the second phase of the work on the marine protection plan (2007–2012), further areas will be protected and other adjustments made as necessary. Work also continues through relevant ICES Working Groups.

2.5 By-catch and Discard

Based upon Norwegian fisheries regulations, by-catch can be defined as the retained ‘incidental’ catch of non-target species (for the purpose of inspecting bycatch levels, Norwegian legislation Regulations amending the regulations relating to sea-water fisheries (140408) §40 notes “…a sample of at least 100 kg is considered to be representative of the composition of the catch”), and discard is a deliberately (or accidentally) abandoned part of the catch returned to the sea as a result of economic, legal, or personal considerations (ICES HAWG definition). Discarding of any part of the catch of specified species (listed below), as well as dead or dying individuals of any species, is illegal for all Norwegian vessels.

However, in this document we use the more standard definitions, where by-catch refers to the catch of non-target species (including birds, mammals and PET species), and discarding is the release of (generally dead) species to the sea. The impact of the fishery on sea mammal, seabird and other threatened, rare and iconic species that may form part of a by-catch/discard is examined in section 2.6.

Norwegian fisheries regulations (Regulation amending the regulations relating to sea-water fisheries, §48) notes that “In the internal waters, territorial sea and Economic Zone of Norway, it is prohibited to discard or release catches that are dead or dying [any species] or catches of the following fish

species":

a) Cod
b) Haddock
c) Saithe
d) Redfish
e) Mackerel
f) Norwegian spring-spawning herring
g) Trondheimsfjord herring
h) North Sea herring
i) Greater argentine
j) Capelin
k) Greenland halibut
l) Whiting
m) Blue whiting
n) Angler (monkfish)
o) Shrimps
p) Snow crabs
q) Halibut

When fishing for spring spawning herring, using small-meshed trawls, bycatch of cod, haddock and saithe are prohibited. All other by-catch species are retained on board, landed and the quantity set against the vessel and national quota for that species (see below). If the vessel has no quota for that species or has exhausted its quota then the proceeds of the sale are pooled by the sales organisation (Norges Sildesalgslag) for the general benefit of the fishing industry. It may be used for monitoring and control purposes and for marketing support for the small and disparate coastal vessel fleet. Norges Sildesalgslag are required to report on the use of the money to the Ministry of Fisheries and Coastal Affairs.

In fisheries targeting mackerel, Norwegian spring-spawning herring, North Sea herring, and herring in the Skagerrak specifically, and in fisheries targeting capelin, it is also prohibited for vessels to discard fish waste.

Regulations are developed on the minimum permissible size for spring spawning herring (25cm). However, an intermixture of up to 20% by number of undersized Norwegian spring-spawning herring is permitted in each catch.

Other protective measures are the prohibition of the use of drainage grids that can be used as sorting equipment in the water separator or chutes leading from the water separator (drainage system) in fisheries for herring and mackerel.

The purse seine fleet apparently occasionally slips catches of pelagic species. It is illegal to discard catch which is dead or dying. Full extent of discarding of commercial species is not well known because there is no observer programme in Norwegian waters, but inspection reports suggest that discarding, which is illegal, is rare. There are no statistics on the extent of catches and discarding of non-commercial species. Slippage is a potentially serious issue, since research suggests that once the purse seine has been pursed beyond a particular extent, caught fish will suffer total mortality post-slippage. The point at which this occurs has been the subject of IMR study, and management/industry discussions on the issue have occurred.

The ICES Assessment Working Group (ICES, 2007) reports that with the exception of the Faroes, no information was provided to them on by-catches in the fishery for NSS herring in 2006 (although this is available from the Norwegian fisheries department). The Faroese summer fishery for Norwegian

spring spawning herring north of the Faroes was hampered by large amounts of mackerel present in the same area and often mixed within the herring schools in the upper layers. In order to avoid by-catches of mackerel, the fishermen moved northwards to get clean catches of herring. The reason they avoided the by-catch was the low marketing value of mackerel in the summer months, the mackerel is too soft due to its high fat content. This would prevent the usually high income they get from mackerel if the quota was taken later in year, usually in the fourth quarter. As the by-catch of mackerel was subtracted from the individual vessel quotas, thus the by-catch is a result of legal activity.

Again in 2007 the Faroese vessels had to move northwards out of the Faroese area in August due to large quantities of mackerel northeast of the Iceland-Faroe Ridge. By-catch of mackerel in the Icelandic fishery for herring was also reported.

By-catch consists of the retained 'incidental' catch of non-target species and discard is a deliberately (or accidentally) abandoned part of the catch returned to the sea as a result of economic, legal, or personal considerations. This section also looks at the impact of the fishery on sea mammal, seabird and other threatened, rare and iconic species which may form part of a by-catch.

2.6 Interactions with threatened, Rare, Protected and Iconic Species

Norway has signed a number of conventions on species protection and management. The Convention on Biological Diversity sets out a general framework for these efforts, and proposals and decisions on which species should be given special protection are made under the regional and global nature conservation conventions, primarily the Bern, Bonn and CITES Conventions.

Norway's current Red List is from 2006. This list contains 3886 species, based upon an evaluated area of mainland Norway, Norwegian oceans and Svalbard (with searchable database for 2007 at (http://www.iucnredlist.org/search/search-basic). This list contains 21 marine species classed as extinct, endangered or vulnerable, including a number of whale and shark species. Key species include the blue skate (*Dipturus batis*) and Atlantic cod and haddock (classed as vulnerable). In addition to the species on the Red List, there are a number of species in the area for which Norway has a special responsibility. Bluefin tuna (*Thunnus thynnus*) was historically present within the area, but disappeared from the region in the early 1960s (MacKenzie and Myers, 2007). It should be noted that the Red List currently classifies this species as 'data deficient' (no assessment of extinction risk has been made), and the Red List notes "species listed in these categories should not be treated as if they were non-threatened, and it may be appropriate (especially for Data Deficient forms) to give them the same degree of protection as threatened taxa".

Endangered exploited species are reflected in annual regulations, for example limits on the exploitation of coastal cod, and regulations that stop fishing on species of importance to the ecosystem (e.g. capelin). Regulations appear more limited for those species caught as bycatch, although the ecosystem management plan for the Barents Sea indicates that, following the identification of species, regulations are being evaluated.

The importance of the life history and population trends of bird species within the ecosystem of the Barents Sea, and their links to human activity, is recognised in the BSMP White Paper. However, information with which to examine the bycatch of birds within fishing operations is incomplete; scattered information about bycatches of various species is available.

To address this information requirement, the Norwegian Government has contributed to the development of the SEAPOP (Seabird Population Management and Petroleum Operations) programme. This programme aims to improve knowledge of seabirds through studies of distribution and population size, in order to help distinguish between natural variations and anthropogenic

impacts. A new web-based mapping tool for seabirds in Norway is being established to make it easier to access up-to-date information. Several bird scaring devices has been tested for longlining, and a bird-scaring line has been found to reduces significantly bird by-catch.

Information can be drawn from related fisheries elsewhere. Gannets (*Morus bassanus*), which frequently dive at and around trawl nets, have been observed by Napier *et al*. (2002) entangled in fishing nets in the northern North Sea and NW Scotland (Scottish and Norwegian pelagic trawlers). Actual mortality rates of caught gannets have not been assessed in detail, and some have been observed alive after release from the gear. Seabird by-catch in the North Sea is considered to be comparatively rare compared to the NW Scotland where 1-3 birds may be caught per haul.

NAMMCO (the North Atlantic Marine Mammal Commission), along with IWC and ICES, have recommended that member countries, including Norway, should monitor and report by-catches of marine mammals and seabirds. For the coastal and inshore fisheries, vessel owners have provided information on effort, catch and by-catch over the period October-December 2005 (Bjorge et al., 2006), in return for financial compensation. These concentrated on gillnet and trap fisheries, and will be discussed within the sections on the relevant, rather than pelagic gears.Further information on some by-catches is also collected by the 'reference fleet' operating in Norwegian waters. The "reference fleet" consists of a representative group of vessels engaged in more comprehensive collection of data for research purposes.

Further information is available from work in other countries. During the last two centuries 27 marine mammal species have been recorded in Faroese waters: 7 pinniped and 20 cetacean species (Bloch et al., 2001). Although records of interactions with pelagic gears are not specifically noted in the area, it has been stated that "There is no significant by-catch of marine mammals in fishing gear" (Pedersen et al., 2004). The Sea Mammal Research Unit (SMRU) of St. Andrew's University in Scotland, has performed observer programmes to estimate the level of by-catch in UK pelagic fisheries. Over 400 trawling operations around the UK have been observed, with no cetacean by-catch being observed in the herring pelagic fishery in the North Sea (Northridge et al., 2007). Pierce et al. (2002) also reports no marine mammal by-catches in over 69 studied hauls (although a statistically limited sample size is noted), while pelagic fisheries studies (pelagic trawls in IVa and VIa) estimate bycatch events to be no more than five events per 100 hauls, and may well be considerably lower than this. There is also a temporal and geographic component, with incidental catches of cetaceans being most common in late-winter/early-spring in an area along the continental slope southwest of Ireland, for example (Morizur et al., 1999). Luque et al. (2006) also noted interactions between killer whales and commercial pelagic trawlers (Jan/Feb 2006), and examined data as far back as 2000, but no incidences of entanglement or contact with nets were noted.

Seal bycatch in pelagic trawls appears to be an issue to the northwest of the UK, and likely to be mainly grey seals (*Halichoerus grypus*, which are not considered threatened). Northridge (2003) observed 49 seals taken in 312 pelagic trawl tows throughout UK. By-catch rates in the North Sea are likely to be substantially less than off the NW Scottish coast, due to the distribution of this species. Luque et al. (2006) noted interactions between Scottish commercial trawlers and seals mainly during the herring fishery (June-Sept), when seals (species not provided) were caught in the pipe during pumping in six cases, with a total of 16 mortalities.

An extensive review of the bycatch of cetaceans in pelagic trawls was carried out for Greenpeace in 2004 (Ross and Isaacs, 2004), covering fisheries in the Celtic Sea, Bay of Biscay and SW Ireland. In all cases, the number of animals caught was low.

Bycatch of sharks are possible in the pelagic trawl fishery (Zeeberg et al., 2006), and such fisheries operating around the British Isles may encounter porbeagle *Lamna nasus*, blue shark *Prionace glauca*, thresher shark *Alopias vulpinus* and tope *Galeorhinus galeus* (J. Ellis, Cefas, pers comm.)"

Porbeagle are considered by the Red List to be 'vulnerable' at this time, while blue shark are considered 'lower risk/near threatened'. Hence monitoring of the Red List status of these species should continue during update assessments.

Pelagic Trawl
Little information is known on the catches of PET species in the Norwegian pelagic trawl fishery, which has the potential to accidentally catch marine mammals, and birds on hauling. In general the method is felt reasonably species-specific, but the lack of information to support this is a concern.

Purse Seine
Little information is known on the catches of PET species in the Norwegian purse seine fishery, which has the potential to accidentally catch both marine mammals and birds. In general the method is felt reasonably species-specific, and presents a relatively easy method to allow marine mammals to escape alive from the pursed net. However, there are incidences of marine mammals being caught within nets on initial pursing. However, the method of fishing allows these to be released relatively easily, before they damage equipment. Studies in purse seine fisheries (NAMMCO) have not identified any obvious interactions with marine mammals and, in general, the method is felt reasonably species-specific. The level of interaction is not known, however. Reports of seabird interactions with gear do not identify purse seines as having significant interaction with PET seabirds but records of interactions with PET fish species (notably skates and rays) is not established.

2.7 Other Fisheries Relevant to this Assessment

The Norwegian fleet is by far the major player in this fishery and has an allocation of over 60% of the total quota. The stock is fished by a total of twelve other countries each with either a national quota allocation (coastal states) or a share of the EU allocation of 6.51% of the quota.

The major participants are Iceland, The Russian Federation and The Faroes who, for 2008, have allocations of 14.51%, 12.82% and 5.16% of the quota, respectively. Their official recorded landings in 2006 were of 153,800t (Iceland), 121,000t (Russian Federation) and 65,000t (Faroe Islands). Within the EU; Denmark, The Netherlands, UK (Scotland) and Germany were the main participants in the fishery in 2006.

The Icelandic fishery is mainly by mid-water single and pair trawlers, with a few purse seiners, about 25 vessels in all. It occurs over a wide area of the north east Atlantic in ICES Divisions Va, Vb and IIa. In their autumn fishery east of Iceland a mixture of Icelandic summer spawners and Norwegian spring spawners are taken. The Russian fishery, which is entirely for human consumption, takes place in the Faroese and Norwegian EEZ's and is mainly a trawl fishery. The Faroese fleet consists 8 large and 3 smaller vessels mainly of mid-water pair and single trawlers with a few purse seiners. It takes place mainly in the Faroese and Icelandic zones in Divisions Va, Vb and IIa. The Irish fleet consists of 5 large mid-water trawlers, The Scottish fleet has 13 single and paired mid-water trawlers and the Netherlands fleet consists of just 4 large mid-water trawlers.

3 ADMINISTRATIVE CONTEXT

3.1 Legislation

Most of Norway´s fisheries, including NOSS herring, is based on stocks that are shared with other countries. The Norwegian quotas and other regulations resulting from the annual international negotiations with other countries are implemented through the domestic fisheries management system.

The basic legislation for regulation of Norwegian fisheries are the 1983 Saltwater Fisheries Act (Act of 3 June 1983 No 40) and the 1999 Act on Participation in fisheries (Act of 26 March 1999 No 15 concerning the right to participate in fisheries and hunting). These acts are the legal basis for the secondary legislation containing the actual regulatory provisions pertaining to fisheries. The participation act fundamentally deals with restrictions on access to fisheries, and is the basis for a number of licensing arrangements. The salt water fisheries act constitutes the legal basis for quota regulations and various technical regulations (see below). In addition, these laws contain the legal basis for regulations setting out decision-making procedures for fisheries management and the enforcement of regulations.

The legislation has evolved over time as a response to the developments in the industry and the need to regulate resource use, on the one hand, and in response to the developments in international ocean law on the other. The growing complexity of fisheries, a need to streamline and modernize legislation, along with increasing environmental awareness led to the establishment of a committee in 2003 to develop more modern ocean resources legislation. The committee submitted a draft of a new oceans resources law in 2005 (NOU 2005:10: Lov om forvaltning av viltlevende marine ressurser. Statens forvaltninstjeneste, Oslo). The new law was submitted to Parliament for adoption late in 2007 (Ot.prp. nr. 20 (2007-2008)), and adopted. by the Parliament in May 2008. It will enter into force in late 2008 or early 2009. Work is currently under way to develop the secondary legislation to implement the act..

The new Act builds on the acts mentioned above, and represents a modernization of fisheries legislation that also incorporates recent international developments in relevant international law. The need to take environmental concerns into account is an important aspect of the law.

A number of other laws are relevant to the regulation of fisheries, for example the legislation establishing the Economic Zone Act of 17 December 1976 No 91 on Norway's Economic Zone), and the Raw Fish Sales Act of 29 June 1951 No 31. The former provides the basis for Norwegian jurisdiction over fisheries. The latter sets up raw fish sales organizations controlled by fishers, and play an important role in regulating the execution of a fishery and in the control of landings.

The objectives of legislation is generally to provide the legal basis that the resources can be managed in a sustainable and responsible manner, to control and limit the access to fisheries in order to reduce overcapacity, and to enhance the economic efficiency of the industry.
Nowegian fisheries legislation is comprehensive and covers all aspects of the industry. With the adoption of the new Ocean Resources Act it will represent a very modern approach to resource management in line with recent developments in international law, emphasizing for example ecosystems-based management of living marine resources.

3.1.1 Regulation

The actual regulation of fisheries is contained in secondary legislation that is regularly updated by the Government and communicated to the industry through newspapers, the web and through the fishers´organizations. An important distinction is between *access* regulations specifying criteria for permission to participate in a fishery, *output* regulations that deals with the amount of fish that can be caught, and *technical* regulations specifying how a given fishery shall be executed. Some regulations are generic and pertain to all Norwegian waters and/or to all Norwegian fishing vessels flying the Norwegian flag. Other regulations are limited to certain geographic areas and/or gear types.

The complexity of the regulatory system and the regulations is a consequence of the complexity of the activity to be regulated: some 20 fish stocks are exploited, by some 7000 Norwegian fishing vessels (either full or part time). In addition about 1200 foreign fishing vessels are licensed to fish in Norwegian waters. The oceans under Norwegian jurisdiction are about 2,2 million square kilometers,

about six times the land area. Most important fish stocks, with the exception of Northeast Arctic saithe, are shared with other countries.

Norway has entered into agreements regarding joint fisheries management with all neighboring countries and the EU, and the annual TAC's for such shared fish stocks are arrived at through annual negotiations with these countries.

Regulations generally provides for the authorities (the Directorate) to stop a fishery when the quota is taken, and to modify the regulations so as to ensure its rational and appropriate execution. Catches and landings are monitored through a system that encompass almost all fisheries, including NOSS herring, and a fishery is stopped when quotas are taken.. Regulations also set out rules for penalties that apply in case of violation of regulations.

Access regulations are generally complex, with most vessels holding a number of licenses and participate in a number of fisheries. Almost all Norwegian fisheries are now closed, in the sense that access to them are regulated by licenses and permits. A major distinction is between licenses with no time restrictions, and annual permits to participate in a fishery. The former usually applies to larger vessels, while vessels fishing with conventional gears often have their access to a fishery regulated by annual permits that are renewed each year as long as there is a fishery and the permit holder has not violated the conditions it is granted on.

Output regulations in the form of fish quotas basically establish that fishing for a given fish stock is prohibited, except for those vessel groups that have explicit permission to fish. They give the total quota available to Norwegian vessels and the area the quota is to be taken in, and provide for detailed arrangements for how the quota is to be shared by participants in the fishery. There are different types of allocation arrangements.

The distinction between trawlers and vessels fishing with conventional gears is often referred to as trawlers vs coastal vessels, but the latter group contains many vessels that are ocean going. The conventional gears group contains vessels fishing with nets, Danish seine, handline and longline. Most vessels will participate in more than one fishery during the year.

Technical regulations are collected in one regulation ((Forskrift av 22. Desember 2004 nr 1878, updated annually). They include provisions for mesh size design and mesh size in trawls, restrictions on areas where such gears can be used, regulations concerning the construction of trawls and their use, restrictions on the use of conventional gear (purse seines, gill nets, longline and pots), bycatch regulations, minimum sizes, etc. In the NOSS herring fishery, there are for example prohibitions against fishing in with purse seine in daytime and regulations of bycathces when fishing with small-meshed trawls.

There is a prohibition on discards and release of catches that are dead or dying for a list of 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, and snow crabs). In the major pelagic fisheries there is in addition a ban on the discard of fish waste (Regulation amending the regulations relating to sea-water fisheries of 21 December 2006, para 48). For all groups of vessels, the regulations also include provisions on bycatch. In the NOSS herring fisheries, by-catches of cod, haddock and saithe are prohibited. In Skagerak there is also a prohibition of discarding of fish waste.

Technical regulations also include a number of closed areas and areas where special regulations apply (Forskrift av 22. Desember 2004 nr 1878 om utøvelse av fisket i sjøen.)

There is a general prohibition on the use of explosives in fisheries (Salt water fisheries act para 24).

The Raw Fish Act and the Salt Water Fisheries Act provides for a role for the sales organization in regulating fisheries. This is centred on a rational execution of a fishery, and by way of secondary legislation the sales organizations can for example establish weekly quotas for a given fishery, in order to prevent that too much is being fished in too short a time. The fish should remain in the ocean until there is capacity on shore to handle it.

The vessels allowed to participate in the Norwegian fishery for NOSS herring are divided into three main regulatory groups; purse seiners, trawlers and coastal vessels, the latter consisting of an "open" and a "closed" (less than 300m3 hold capacity) group. The coastal vessel groups fish with various types of gear. Regulations are established on an annual basis. The Norwegian quota is allocated to the purse seiners and mid-water trawlers according to the licensed capacity of each vessel. For the coastal vessels the quota is allocated according to their overall length (Sak 26/07 Reguleringsmøtet 5 og 18 juni 2007). All vessels have individual quotas.

3.2 Management Responsibilities and Interactions

As pointed out above, the management of the NOSS herring fishery is based on a 5-party international agreement that effectively covers the entire geographical range of the stock, including international waters through NEAFC. The work under this agreement is based upon scientific advice from the International Council for the Exploration of the Sea. The management responsibilities are defined within the three core areas of resource management: developing the knowledge base, preparing and implementing regulations, and enforcing them.

The overall responsibility for the management of the resources resides with the Minister of Fisheries. The Ministry of Fisheries and Coastal Affairs sets the policy for fisheries through reports to parliament that specify objectives for resource management and the measures to achieve those. Since most fish stocks are shared with other countries, and since Norway exports almost its entire production of fish, international relations is an important aspect of the work of the Ministry.

As regards Mackerel fisheries, the situation is very different in the North Sea and in the North. In the latter area, the stock is an exclusive Norwegian stock and resource management is decided on by Norway alone. The North Sea stock is shared with the EU, and the resource is managed jointly through annual negotiations on TAC's.

The point of departure for the international negotiations on TAC for different stocks and species is the scientific advice provided by the International Council for the Exploration of the Sea – ICES. ICES advice, which comes in the format of several options for TAC's with specified consequences for each, is developed in a comprehensive process where the Institute of Marine Research (IMR) plays an important role for stocks relevant to Norway. The mission of the IMR is to collect the data and develop the models necessary to provide scientific analysis and advice on the management of fish stocks in Norwegian waters. These activities are funded directly by the ministry. The IMR also engages in science that is not directly related to the provision of stock management advice, and in this case funding from the Norwegian Research Council, EU research programs and other is important.

The detailed work of developing regulations and implementing them after their approval by the Minister is the chief task of the Fisheries Directorate. The Directorate plays a key role in formulating the proposal for regulations and consulting with industry interests and others in this. The Directorate has 7 regional offices along the coast of Norway, and also plays an important role in the enforcement of fisheries regulation.

The Fisheries Directorate also has information function, to inform and advise fishers on the regulations of the industry. This is done by the web, newspapers, and radio messages.

In the development of proposals for regulations, the Fisheries directorate consults with the fishing industry and other stakeholders. A Regulatory Council, where industry associations dominated, was in 2006 replaced with an open regulatory meeting where any one interested can meet and have a say. Meeting documents are posted on the web. Representatives for the fishing industry consult among themselves in advance of meetings and generally the Norwegian Fisherman's Association, which consist of a number of fishers´ organizations as well as regional subsidiaries, has been able to agree to compromise solutions on most issues. When such compromises exist, the authorities will usually follow the stakeholder advice. A number of other organizations also participate in the regulatory meeting, representing among others environmental NGOs and indigenous people.

The 1938 Raw Fish Act provides for the establishment of fishermen's sales organizations (cooperatives) with control over the first hand sales of fish. These bodies can also play an important role in regulating fisheries, as well in the enforcement of fisheries regulations. Norges sildesalgslag covers the pelagic fisheries in the entire country, and also accepts landings from foreign vessels. 80 offshore purse seiners, 36 licensed trawlers, 445 coastal vessels in the closed group and 13 coastal vessels in the open group participate in the fishery in 2008 under the arrangements provided by Norges sildesalgslag. Fish are mostly sold by auctions.

3.3. Enforcement and control

The broad outline the enforcement system is that operations at sea are controlled by the Coast Guard and the Fisheries Directorate, while landings control are carried out by the sales organizations and the Fisheries Directorate.

The inspection activities of the Coast Guard in 2006 amounted to 2185 inspections in total, with 44 resulting in a report to the police and 27 an arrest. The inspections by the Fisheries Directorate itself, in ports and inshore amounted to 1850 inspections, with 155 reports to the police (statistics provided by the Fisheries Directorate).

In addition to landings controls, the sales organizations and the Fisheries Directorate also perform subsequent checks on statistics. The various bodies involved in enforcement in the North coordinate in several meetings annually. The role of sales organizations in the control system is to ensure that the transaction between fisher and buyer is according to the rules regulating that. All fish shall be weighed upon landing. All landings shall be reported.

The cornerstone of the control activities of raw fish sales organizations is the *contract note* (landing receipt), giving among other things the fish species, weight landed, and time of landing. 99% of the contract notes are completed and submitted electronically in almost real time, so aggregate landings data are updated continuously. About 200,000 forms are completed annually. When the data are submitted, the sales organization transfers them to the Fisheries Directorate.

The Directorate, in turn, checks these figures against the quotas that vessels have had allocated to them. Norges sildesalgslag has a comprehensive system for following up on catches and landings record, with all data available on their web site (http://www.sildelaget.no/default.aspx).

All vessels over 21 m in Norwegian waters are subject to satellite based monitoring,. In EU waters this applies to vessels above 15 meters. Automatic positioning signals are sent to the Fisheries Directorate every hour.

Following up on the National Audit Office review of the fisheries management system, the activities between the various agencies involved are now coordinated in annual meetings and based on risk analysis. This implies a strategic deployment of enforcement resources where they are considered

most effective in terms of improvement of the control system.

4 STOCK ASSESSMENT

4.1 Management Unit

Norwegian Spring Spawning herring occurring in the North East Atlantic within the Exclusive Economic Zones (EEZ's) of Norway, Russia, Iceland, EU and Faroe Islands. Also within The Jan Mayen Fisheries Zone and Svalbard Fisheries Protection Zone and in International waters (Figure 2)

4.2 Monitoring of Stock Status

The main catches in 2006 were taken by Norway (567,000 t), Russia (121,000 t), Iceland (157,000 t), EU (60,000 t), and Faroe Islands (63,000 t). (ICES, 2007) The fishery in general follows the migration of the stock closely as it moves from the wintering and spawning grounds along the Norwegian coast to the summer feeding grounds in the Faroese, Icelandic, Jan Mayen, Svalbard, and international areas. Due to limitations for some countries to enter the EEZs of other countries in 2005, the area of the fisheries does not necessarily depict the distribution of herring in the Norwegian Sea or the preferred fishing pattern if the fleets were given free access to any zone. A special feature of the summer fishery in 2005 and especially in 2006 was the prolonged fishery in the Faroese and Icelandic zone during summer up to late August, where the oldest age groups were present. The usual pattern has been that the fishery moved gradually northwards towards the Jan Mayen zone in June. A further new observation in recent years is the increasing presence of adult mackerel in the southern part of the Norwegian Sea which was found mixed with the herring (ICES, 2007).

The Working Group (ICES, 2007) noted an unaccounted mortality within the total international fishery and concluded that underreporting probably exists. It was not possible to assess the magnitude of these extra removals from the stock but, taking into account the large catches taken in recent years, the relative importance of such additional mortality is probably low. Therefore, no account has been taken of possible under-reporting since the 1993 assessment. Before 1994, when the stock and the quotas were much smaller, an estimated amount of unreported catch was added to the catch data used in the assessment.

It is unlikely that there is any underreporting of the catches in the Norwegian fishery. As noted in section 2.2 the uptake of the Norwegian quota is closely monitored by Norges Sildesalgslag and the catches are reported as they are taken and sold by auction whilst the vessel is still at sea.

The Working Group has no data to estimate possible discards of the herring although it is noted that the practice is illegal in the Norwegian, Russian and Faroese fleets. Although some discarding, through slippage, is known to occur in this fishery, it is not possible to assess its magnitude and an estimates have not been included in the assessment since 1994. In view of the large catches in this fishery the relative importance of slippage is likely to be low and it is considered to be a minor problem in terms of fishing mortality for assessment purposes. Up to 1994, when catches were considerably lower, an estimate of discards was included in the assessment.

The stock assessment relies heavily not only on the reliability of the catch data but also on adequate biological sampling of various parameters from the fishery. The international fishery is well sampled with 93% of the catch covered by the biological sampling programme. For EU countries there is a Directive which provides guidelines for sampling although no such guidelines exist for the other participating countries. The length and age composition of the stock is a vital assessment parameter and this is well covered, with an average of 95% of the catches sampled by all participating countries. Sampling in the 2006 fishery showed that the most abundant year classes in the catches were the

1998 year class (24%), followed by the 1999 and 2002 year classes (23% each). All other year classes, representing 30% of the catches, were minor by comparison.

With the exception of the 2002 year class maturity at age has remained the same over the past ten years. The growth rate of the 2002 year class was higher than normal because many of the juveniles remained in the Norwegian Sea where they grew quicker and matured earlier than in the normal juvenile areas in the Barents Sea.

Natural mortality for the assessment has remained the same for many years at 0.9 for ages 0 to 2 years and 0.15 for 3 years and older. Weight at age has shown a decreasing trend over recent years which may well be a density dependant effect.

The main problems with the assessment of the state of the stock are that it is dominated by a few large year classes. The catch and survey data tend to show a slow depletion of the year classes but this may be an artefact caused by changes in the migration and distribution of large year classes. Research vessel survey coverage can also be a problem because of the highly migratory nature of the stock and the unpredictable variations in migration routes and the location of feeding, spawning, over-wintering and juvenile areas. These factors can all affect the quality of the assessment.

Fishing mortality on adults (F), ages 5 to 14 years in the assessment, over the past 30 years has been relatively low compared with many other pelagic fisheries and North Sea herring in particular. With the exception of 1986 (F 1.074) and 1987 (F 0.404) it has remained generally well below F 0.2 over that period. The most recent assessment gives a fishing mortality in 2006 of F 0.102 compared with an F 0.099 in the previous year.

Retrospective analysis of the estimates of both SSB and F in the assessment do show considerable variation. However this is to be expected in such a large stock with a high yield. For example, compared to 2005, the SSB for 2006 is estimated to be about 16% higher and the fishing mortality in 2005 to be about 12% lower. In comparison to the forecast of the 2007 SSB in 2006, the prediction from the latest assessment, is 12% higher. The main difference in the estimate of the 2007 SSB in 2006 and the current estimate lies in higher estimates of three very strong year classes. The 1998 and 1999 year classes contribute 600,000 tonnes more while the 2002 year class contributes 800,000 tonnes more. The main source of data for the higher estimates of these strong year classes comes from the international survey on the feeding grounds in the Norwegian Sea. Last year the recruitment was estimated at age 0 this year's assessment is based on recruitment-at-age 1. These three year classes dominate the current spawning stock which was estimated around 8.3 million tonnes at spawning time in 2005 and 10.3 million tonnes in 2006. Figure 8 shows the SSB over the period 1988 to 2007 with a steady increase up to 1997 followed by a four year decline and then a steady increase to the present time. At F status quo (F 2005) the SSB is predicted to be 10.6 million tonnes in 2007 and at 10.3 million tonnes in 2008. The 2002 year class is estimated to be strong and will recruit to the fishery in 2006 and 2007. Preliminary indications show that the 2004 year class may also be strong.

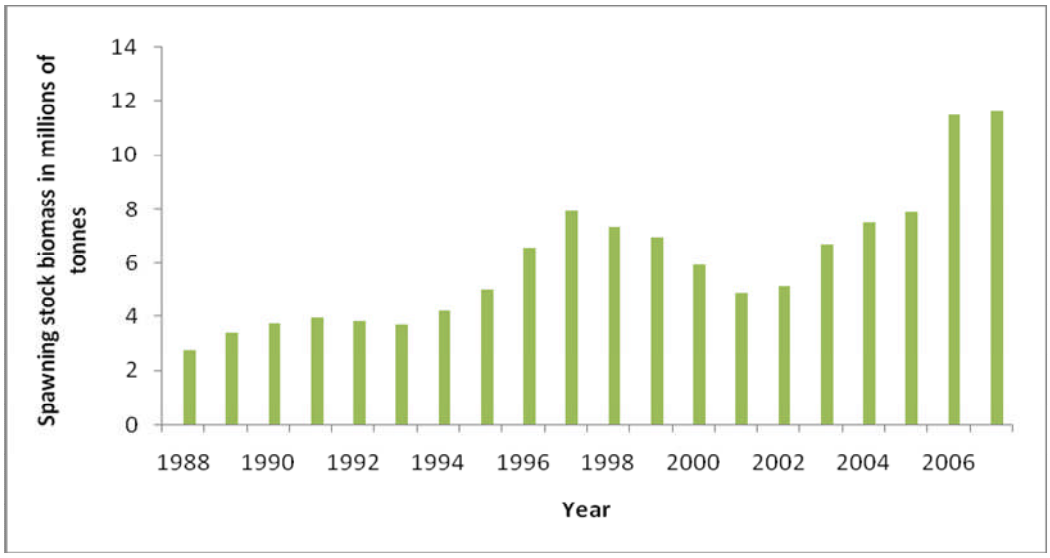

Figure 8. The spawning stock biomass, in millions of tonnes, of Norwegian spring spawning herring over the period 1988 to 2007

The ACFM considered that the absence of an international agreement on quota allocations from 2003 to 2005 had led to an escalation in the fishing mortality exerted on the stock, with the fisheries in 2005 ending close to 1 million tonnes, over 100 000 tonnes more than the TAC recommended under the long-term management plan (F=0.125).

As in years 2003–2005, there was also no agreement in 2006 between the Coastal States regarding the allocation of the quota. Quotas in 2006 were set unilaterally and in some countries quotas were raised during the year. The sum of the total national quotas for 2006 amounted to about 967,000 t which was not exceeded in the international fisheries. For 2007, the Coastal States agreed to set a TAC of 1.28 million tonnes.

In spite of some uncertainty in the assessment of this stock and there is no doubt that it is currently in an excellent state and that it is lightly exploited. It is classified as having full reproductive capacity and being harvested sustainably. The estimate of the spawning-stock biomass, although uncertain, is well above Bpa in 2007. Fishing mortality is well below Fpa. The spawning stock is now dominated by the strong 1998, 1999, and 2002 year classes. Surveys indicate that the 2003 year class is moderate, while the 2004 year class is also strong (comparable to the 1998 year class).

4.3 Management Advice

In 2007 (ICES, Advice 2007) ACFM stated that "Based on the most recent estimates of SSB and fishing mortality, ICES classifies the stock as having full reproductive capacity and being harvested sustainably. The estimate of the spawning stock biomass, although uncertain, is around 10.3 million t in 2006. Several good year classes contribute to the present spawning biomass: the spawning stock is now dominated by the strong 2002 year class, which matured early, as well as by the 1998 and 1999 year classes and surveys indicate that recruitment from the 2003 year class is moderate, while the 2004 year class is also strong (of the order of 1998 year class).

TAC’s for the whole fishery are set on the basis of the Coastal States Agreement between Norway, The Russian Federation, Iceland, Faroe Islands and the EU. The management plan implies maximum catches of 1,280,000 tonnes in 2007 which is expected to leave a spawning stock of 10.3 million tonnes in 2008.

Agreement has been reached between the five parties regarding the TAC for 2008, which will be 1.518.000 tonnes. The TAC shares of the parties were 6.51% for the European Community, 5.16% for Faroes, 14.51% for Iceland, 61% for Norway and 12.82% for the Russian Federation. As a result the Norwegian share of the quota for 2008 will be 926.000 tonnes.

ICES have agreed the following biomass (B) and fishing mortality (F) reference points for the stock: B_{lim} 2.5 million tonnes; B_{pa} 5 million tonnes; F_{lim} is not considered relevant for this stock; F_{pa} – F=0.15.

5 FISHERY MANAGEMENT:

5.1 Management Objectives

EU, Faroe Islands, Iceland, Norway, and Russia agreed in 1996 to implement a long-term management plan for Norwegian spring-spawning herring. The management plan was part of the international agreement on total quota setting and sharing of the quota during the years 1997–2002 (The Coastal States Agreement).. The plan consists of the following elements:

1) Every effort shall be made to maintain a level of Spawning Stock Biomass (SSB) greater than the critical level (Blim) of 2 500 000 t.

2) For the year 2001 and subsequent years, the Parties agreed to restrict their fishing on the basis of a TAC consistent with a fishing mortality rate of less than 0.125 for appropriate age groups as defined by ICES, unless future scientific advice requires modification of this fishing mortality rate.

3) Should the SSB fall below a reference point of 5 000 000 t (Bpa), the fishing mortality rate, referred under Paragraph 2, shall be adapted in the light of scientific estimates of the conditions to ensure a safe and rapid recovery of the SSB to a level in excess of 5 000 000 t. The basis for such an adaptation should be at least a linear reduction in the fishing mortality rate from 0.125 at Bpa (5 000 000 t) to 0.05 Blim (2 500 000 t).

4) The Parties shall, as appropriate, review and revise these management measures and strategies on the basis of any new advice provided by ICES.

ICES consider that the objectives of this agreement are consistent with the precautionary approach.

The target defined in the management plan is consistent with high long-term yield and has a low risk of depleting the production potential. The current long-term management plan is considered to be consistent with the precautionary approach.

5.2 Consultative Process

In the development of proposals for regulations, the Fisheries directorate consults with the fishing industry and other stakeholders.

A Regulatory Council, where industry associations dominated, was in 2006 replaced with an open regulatory meeting where any one interested can meet and have a say. Meeting documents are posted on the web. Representatives for the fishing industry consult among themselves in advance of meetings and generally the Norwegian Fisherman´s Association has been able to agree to compromise solutions on most issues among its constituent groups. When such compromises exist, the authorities will usually follow the stakeholder advice. During the last decade, also environmental NGOs and indigenous populations (Saami) have become active stakeholders in fisheries.

In addition to the consultation via the regulatory meetings, stakeholders have numerous other ways of interactions and influence with the government. The major fisheries organizations interact with the authorities on a regular basis through participation in delegations to international negotiations, written hearings on relevant issues where the Ministry seek the opinion of stakeholders (required by Norwegian law), direct meetings with the ministry, written communication and industry meetings where the authorities are represented.

The major organizations in the industry have fairly elaborate decision-making processes where much emphasis is laid on building consensus on difficult issues as allocation of quotas among different gear groups.

There is an industry newspaper with 3 weekly issues and a web site which also constitute important channels for communication within the industry as well as between the industry and the authorities. New regulations are published in these papers.

Reviews of the management system
Three sets of external reviews can be identified: first, the management system is subject to annual reviews by the parliament. The Ministry of Fisheries and Coastal Affairs has since 1995 presented annual reports to the Parliament (latest: Stortingsmelding 22 2005-2006: Om dei fiskeriavtalene Noreg har inngått med andre land for 2006 og fisket etter avtalane i 2004 og 2005) on the performance of the management system. Since most important fisheries are based on stocks shared with other countries, the emphasis on how the agreements with other countries are implemented.

Secondly, the National Audit Office, which performs regular checks on the performance of all public service in Norway, has recently (2004) done a study of the public management of the fisheries sector (Riksrevisjonen Dokument nr 3:13 (2003-2004): Riksrevisjonens undersøkelse av forvaltningen av ressursene).

Third, Norway reports on its implementation of the FAO Code of Conduct for Responsible Fisheries, which covers almost every aspect of fisheries management, to the FAO Committee of Fisheries (COFI) every second year. An important task for COFI is to review countries´ implementation of the Code.

In addition, the process of formulating scientific advice in ICES can be viewed as a scientific review of the data, methods and analyses of the Institute of Marine Research.

Internally, a regular, systematic review exists in the annual review by the Regulatory meeting (previously the Regulatory Council). Comprehensive review documents are posted on the website of the Fisheries Directorate before meetings. The meeting examines the experiences gained in the regulatory arrangements for the previous year. Additional internal reviews can be found in Reports to the Parliament where various aspects of the regulatory arrangements are examined as a basis for proposals for change of elements of for example quota arrangements.

6 STANDARD USED

The MSC Principles and Criteria for Sustainable Fisheries form the standard against which the fishery is assessed and are organised in terms of three principles. Principle 1 addresses the need to maintain the target stock at a sustainable level; Principle 2 addresses the need to maintain the ecosystem in which the target stock exists, and Principle 3 addresses the need for an effective fishery management system to fulfil Principles 1 and 2 and ensure compliance with national and international regulations. The Principles and their supporting Criteria are presented below.

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery. [2]:

Intent:
The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria:

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Intent:
The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria:

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.

2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.

3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

[2] The sequence in which the Principles and Criteria appear does not represent a ranking of their significance, but is rather intended to provide a logical guide to certifiers when assessing a fishery. The criteria by which the MSC Principles will be implemented will be reviewed and revised as appropriate in light of relevant new information, technologies and additional consultations

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. Demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process.

3. Be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings.

4. Observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability.

5. Incorporates an appropriate mechanism for the resolution of disputes arising within the system[3].

6. Provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing.

7. Act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty.

8. Incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion.

9. Require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted.

10. Specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:

[3] Outstanding disputes of substantial magnitude involving a significant number of interests will normally disqualify a fishery from certification.

a) setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
b) identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
c) providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
d) mechanisms in place to limit or close fisheries when designated catch limits are reached;
e) establishing no-take zones where appropriate.

11. Contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

B. Operational Criteria

Fishing operation shall:

12. Make use of fishing gear and practices designed to avoid the capture of non-target species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive.

13. Implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas.

14. Not use destructive fishing practices such as fishing with poisons or explosives;

15. Minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch etc.

16. Be conducted in compliance with the fishery management system and all legal and administrative requirements.

17. Assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

7 BACKGROUND TO THE EVALUATION

7.1 Evaluation team;

Evaluation leader: Dr Andrew Hough: Moody Marine Limited. Dr Hough has a PhD in marine ecology from the University of Wales, Bangor and fourteen years post-doctoral experience in commercial marine and coastal environmental management projects. He is manager of Moody Marine operations within Moody International Certification with particular responsibility for the implementation of MSC Certification procedures and development of MSC methodologies. Dr. Hough has acted as lead assessor on the majority of Moody Marine MSC pre assessments and main assessments.

Expert advisor: John Nichols. John Nichols is a retired UK government fisheries biologist with 42 years research experience in plankton ecosystems in the North Atlantic. He has been a member of ICES working groups on herring, mackerel, horse mackerel, sardine and anchovy assessments; and mackerel and horse mackerel egg surveys. He was also a member of ICES study groups on herring larval surveys and plankton sampling. He was scientist in charge of numerous research vessel surveys for fish stock assessment purposes. He has also recently taken part in assessments of the PFA North Sea Herring, Hastings Fleet Dover sole, herring and mackerel fisheries and SW mackerel fishery re-assessment with Moody Marine.

Expert advisor: Graham Pilling. Graham is Fisheries Biologist & Advisor with the Centre for Environment, Fisheries and Aquaculture Science, UK. His experience includes a review of the NMFS Gulf of Mexico red snapper stock assessment, a review of the NMFS Pacific hake stock assessment, development of a fisheries management plan for Lake Paliastomi, Republic of Georgia, review of bycatch in the US Atlantic pelagic longline fleet for the US National Marine Fisheries Service, and implementing review recommendations, growth parameter estimation and effect of fishing on the assessment and management of snappers and emperors in the Indian Ocean, including capacity building of local institutions to improve stock assessment techniques, assessment of squid and finfish resources on the Patagonian shelf, South Atlantic.

Expert advisor: Alf Håkon Hoel. Alf Håkon is currently Associate Professor, Department of Political Science at the University of Tromsø specialising in management regimes for living marine resources. His experience includes acting as a member of the National Committee on Environmental Research, the Programme on Biodiversity Research, Norwegian Research Council, advisor to the Royal Norwegian Ministry of Foreign Affairs on the management of living marine resources, member of the board of the Roald Amundsen Centre for Arctic Research, University of Tromsø, a member of the Norwegian delegation to the United Nations Conference on Straddling Fish Stocks and Highly Migratory Fish Stocks, vice-chair, National Committee of Polar Research, Norwegian Research Council, member of the Norwegian Research Council's committee on global change research, project leader for the Norwegian Research Council's study on research on Svalbard, FAO consultant on fisheries management issues, member of Norwegian delegation to FAO Fisheries Committee (COFI), member, Scientific Assessment Team, Arctic Climate Impact Assessment, member of the IUCN Working Group on Sustainable Use and a member of the Norwegian delegation to UN informal consultation process on oceans

7.2 Previous certification evaluations

The fishery has not been previously assessed against the MSC standard.

7.3 Inspections of the Fishery

Inspection of the fishery focused on the practicalities of fishing operations, the mechanisms and effectiveness of management agencies and the operation of the fleet. The landing and subsequent handling of fish was also investigated to determine the suitability of fish landed to enter into a subsequent chain of custody.

Meetings were held as follows. The key issues discussed have been identified for each meeting.

Name	Affiliation	Date	Key Issues
-Otto James-Olsen, FHL, -Magne Skjønhaug, Norway Pelagic AS, -Ivar Helge Melingen, Austevoll Fiskeindustri AS, -Oddvinn Sørhaug, Atlantic Pelagic - Knut Torgnes -Roald Oen	Fishing Industry	31.03.08	Fishing industry structures Fishing practices Fishery management
-Knut Torgnes -Roald Oen -Greta Langhelle -Johs. Nakken -Svanhild Rosnes Kambestad	Client – Norges Sildesalgslag	01.04.08	Fishing industry structures Fishing practices Fishery management Fishery science and management Ecosystem science and management
-Anne Marie Abotnes -Inger-Anne Arvesen -Snorri Palmason -Torbjørn Thorvik -Bjarne Schultz -Dankert Skagen -Knut Torgnes -Roald Oen	Directorate of Fisheries Institute of Marine Research	02.04.08	Fishery science and management Ecosystem science and management
Geir Lerbukt Nina Drange Anna Magnussøn	Ministry of Fisheries and Coastal Affairs	07.04.08	Fishery science and management Ecosystem science and management
Maren Esmark Nina Jensen	WWF- Norway	07.04.08	

8 STAKEHOLDER CONSULTATION

8.1 Stakeholder Consultation

An eventual total of 62 stakeholders were identified and consulted specifically by Moody Marine. Information was also made publicly available at the following stages of the assessment:

Date	Purpose	Media
31.01.2008	Notification of confirmation of assessment	Direct E-mail/letter Notification on MSC website Advertisement in press
	Notification of Assessment Team nominees	Direct E-mail Notification on MSC website
25.02.2008	Confirmation of Assessment Team	Direct E-mail Notification on MSC website
25.02.2008	Consultation on draft Scoring Indicators and Guideposts	Direct E-mail Notification on MSC website
29.02.2008	Notification of assessment visit and call for meeting requests	Direct E-mail Notification on MSC website
07.04.2008	Assessment visit	Meetings
04.06.2008	Notification of Proposed Peer Reviewers	Direct E-mail Notification on MSC website
27.2.2009	Notification of Draft Report	Direct E-mail Notification on MSC website
	Notification of Final Report	Direct E-mail Notification on MSC website

8.2 Stakeholder Issues

Feedback from stakeholders has helped greatly in the identification and final selection of the assessment team. Feedback was also received on the scoring indicators and guideposts.

9 OBSERVATIONS AND SCORING

9.1 Introduction to Scoring Methodology

The MSC Principles and Criteria set out the requirements of certified fishery. The certification methodology adopted by the MSC involves the interpretation of these Principles and Criteria into specific Scoring Criteria against which the performance of Fishery can be measured. Performance is determined on the basis of compliance with each Scoring Criterion.

The Scoring Criteria developed by the Moody Marine assessment team have been identified on the MSC website (Certification Performance Criteria and Scoring Guidelines). In order to make the assessment process as clear and transparent as possible, these identify the level of performance necessary to achieve 100, 80 (a pass score), and 60 scores for each Indicator.

These generic Scoring Indicators and Guideposts have been the subject of stakeholder consultation and have been confirmed or modified following this process based on the judgement of the assessment team. Prior to scoring, the Indicators are also 'weighted' in relative importance according to the nature of the fishery undergoing certification.

At the top level, no weightings are assigned in terms of each MSC Principle; a fishery must 'pass' each of Principles 1, 2 and 3 in order to achieve certification and these are of equal importance.

Within each Principle, Scoring Indicators are grouped in a hierarchy. Each level represents separate areas of important information (e.g. Indicator 1.1 requires a sufficient level of information on the target species and stock, 1.2 requires information on the effects of the fishery on the stock and so on).

At the level of Scoring Indicators, the performance of the fishery is assessed as a 'score'. In order for the fishery to achieve certification, an overall score of 80 is considered necessary for each of the three Principles, 100 represents surpassing of the performance necessary and 60 a measurable shortfall. As it is not considered possible to allocate precise scores, a scoring interval of five is therefore used in evaluations. As this represents a relatively crude level of scoring, weighted average scores are rounded to the nearest whole number.

Weights and scores for this Fishery are presented in the scoring table. Weights for criteria, sub-criteria and sub-sub criteria add to a total of 100 for each Principle or Scoring Indicator, Scores are allocated relative to the Scoring Guidelines.

9.2 Evaluation results

Observations are presented in the scoring table, together with any weighting applied to the Fishery and the scores allocated.

10 LIMIT OF IDENTIFICATION OF LANDINGS FROM THE FISHERY

Traceability

As detailed in Section 3, catches are recorded by the skipper and entered into vessel logbooks. These are subject to at-sea inspections by the Coastguard. In addition to landings controls, the sales organizations and the Fisheries Directorate also perform subsequent checks on statistics (this is relevant to all controls and is not limited to North sea herring or pelagic species). The various bodies involved in enforcement in the North coordinate in several meetings annually. The role of sales organizations in the control system is to ensure that the transaction between fisher and buyer is undertaken according to the relevant rules. In particular, all fish shall be weighed upon landing. All landings shall be reported.

The cornerstone of the control activities of raw fish sales organizations is the *contract note* (landing receipt), giving among other things the fish species, weight landed, and time of landing. 99% of the contract notes are completed and submitted electronically in almost real time, so aggregate landings data are updated continuously. When the data are submitted, the sales organization transfers them to the Fisheries Directorate. Traceability within the fishery is considered to be extremely well controlled.

At-Sea processing

Most fish is round frozen, but 2-4 vessels will undertake some filleting. Total at-sea processing in 2008 was 15,209 tonnes of spring-spawning herring. Due to regulations and fishing locations, it is expected that this product will be recorded with an appropriately high degree of accuracy.

Points of Landing

Product is landed into Norwegian ports where comprehensive inspection is provided, through Sales Organisations and the Directorate of Fisheries as described above. Product may also be landed into non-Norwegian ports. In such cases, landing information is transmitted to Norwegian Authorities who cooperate with National control bodies at points of landing to ensure that the information is correct.

Eligibility to enter Chain of Custody

Product may be sold through auction arranged by the sales organisation or directly. Chain of Custody should commence following sale. Regardless of which sales route is used, all product is recorded as described here. Product from the certified fishery is therefore eligible to enter future Chain of Custody.

Please note, the target eligibility date for product from the fishery (as and when certified) to bear the MSC label is confirmed as **31 August 2008**.

11 CERTIFICATION RECOMMENDATION

11.1 Certification recommendation

The Performance of the Norwegian Spring Spawning Herring Fishery in relation to MSC Principles 1, 2 and 3 is summarised below. Please note that the scores for the purse seine and pelagic trawl fishery were the same in this assessment. :

MSC Principle	Fishery Performance
Principle 1: Sustainability of Exploited Stock	Overall : 90 PASS
Principle 2: Maintenance of Ecosystem	Overall : 86 PASS
Principle 3: Effective Management System	Overall : 85 PASS

The fishery attained a score of 80 or more against each of the MSC Principles and did not score less than 60 against any MSC Criteria. It is therefore recommended that the NORWEGIAN SPRING SPAWNING HERRING PURSE-SEINE FISHERY and NORWEGIAN SPRING SPAWNING HERRING PELAGIC TRAWL FISHERY both be certified according to the Marine Stewardship Council Principles and Criteria for Sustainable Fisheries.

11.2 Scope of Certification

This assessment relates only to the fishery defined in Section 1.1 up to the point of landing as defined in Section 10.

Monitoring and control of fishing locations and methods is considered sufficient to ensure fish and fish products invoiced as such by the fishery originate from within the evaluated fishery.

11.3 Conditions or recommendations associated with certification

11.3.1 Conditions

The fishery attained a score below 80 against a number of Scoring Indicators. The assessment team has therefore set a number of conditions for continuing certification that the client is required to address. The conditions are applied to improve performance to at least the 80 level within a period set by the certification body but no longer than the term of the certification.

The conditions are associated with 2 key areas of performance of the fishery, each of which addresses a number of Scoring Indicators. Conditions, associated timescales and relevant Scoring Indicators are set out below.

Condition 1. Slippage

Action required: Reporting programmes should be initiated to provide comprehensive and verifiable estimates of the extent of discarding (notably slippage) of the target species and, as far as possible, by-catches. Information should be sufficient to allow statistically robust estimates of quantity, location and date and to allow an assessment of the impacts of slippage in relation to the distribution, ecology and abundance of the populations affected.

Timescale: Reporting program protocols should be designed and initiated within 1 year of certification and an initial evaluation of any potential impacts completed within 3 years of certification. Where mitigation measures are required to reduce or avoid impacts, these should be fully implemented within 5 years of certification.

Relevant Scoring Indicators: 1.1.2.1 & 3.B.6.1

Condition 2. By-catches

Action required: Sampling programmes should be initiated to provide statistically robust estimates of the by-catch of all species, including estimates of discards. Information should be sufficient to allow an assessment of the impacts of by-catches in relation to the distribution, ecology and abundance of the species and populations affected (commercial and non-commercial fish, mammals and birds).

The potential impact of non-target species removals on the populations affected and the wider ecosystem should be evaluated.

Where assessments of impacts on by-catches are shown to be significant, and for all species identified as PET, appropriate measures to reduce by-catches to acceptable and precautionary levels shall be developed and implemented.

Timescale: Sampling programmes should be designed and initiated within 12 months of certification and an initial evaluation of any potential impacts completed within 3 years of certification. Where mitigation measures are required to reduce or avoid impacts, these should be identified within 3 years of certification and fully implemented within 5 years of certification.

Relevant Scoring Indicators: 2.1.2.2, 2.2.1.2, 3A.3.4, 3B.1.1 & 3.B.6.1

12 APPENDICES

12.1 Appendix A: Scoring Tables

Principle 1		**A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery.**			**33.3**	**90**
1.1 *(MSC Criterion 1)*		**The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.**			**33.3**	**-**
1.1.1		There should be sufficient information on the target species and stock separation to allow the effects of the fishery on the stock to be evaluated.			**16.7**	**-**
1.1.1.1		Are the species readily identified as adults and juveniles?			**14.3**	100
60	Misidentification is possible and increases recording errors of catches, but this does not compromise monitoring to unacceptable levels. Methods to improve identification are under development.	Herring are easily identified at one year old by fishermen and researchers. The species tends to school separately and can sometimes be identified by both its behaviour and its sonar trace. There is, the potential for confusion in mixed catches of sprat and < 1 year-old herring but this is not considered to be a problem with this stock. Larval identification is straightforward, based on pre-anal myotome counts and is done by scientists. This is important as the stock assessment process uses information from larval surveys.	Nichols (pers comm) Norges Sildesalgslag (site visit) IMR Bergen (site visit)			
80	The target species is unlikely to be confused with any other species and is recorded appropriately.					
100	The species is readily identified by fishers and by regulators and is recorded appropriately.					

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.1.2		Is the life history of the species understood and the spawning and nursery areas described?		**14.3**	90
60	There are gaps in information but the basis of the life history is understood. Information is adequate to support a general population model, but some assumptions are required. There is some information on spawning and nursery areas.	The Norwegian spring spawning herring (NSSH) is a migratory stock, now widely distributed throughout the NE Atlantic at various stages in its life history. Compared with other herring these spring spawners have a high vertebral count, are a large size at age and have a large maximum size. No genetic differences have been found between NSSH from different spawning areas, and it is treated as a single stock. Some ecological interactions are well studied (e.g. herring/capelin/cod interactions) and are discussed under principle 2. Over the past sixty years the spawning areas and migration routes to and from them have been subject to many unpredictable changes. The spawning grounds are now distributed along 1500km of the coast from 58^{o}N to 70^{o}N. This coastal zone contains the suitable banks and shelf areas, with a stony or rocky bottom at depths of less than 250m (Runnstrom, 1941; Dragesund, 1970), which the herring requires for successful spawning. Traditionally the most important spawning areas are found from north to south at Lofoten, Traena, Sklinnabanken, Haltenbanken, Froyabanken and along the districts of More, Sogn and Rogaland (Slotte,2001). These are all very well researched and kept under constant observation and review, since changes have been seen in recent years. Nursery areas within the Barents Sea are also well described. Information is being used to support closed areas within the Norwegian EEZ.	Devold (1963) Runnstrom (1936) Rottingen and Slotte (2001) Hamre (1990) Dragesund et al (1980) Slotte (2001)		
80	The life history of the species is clearly documented and understood. Information is adequate to support an appropriate population model. Spawning and nursery areas are adequately well described.				
100	The life history of the species is clearly documented and understood including behaviour and ecological interactions. Spawning and nursery areas are sufficiently well documented to support closed area / seasons where this is deemed necessary.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

1.1.1.3		Is the geographical range of the target stock known and any seasonal migration described?		**14.3**	100
60	A management unit approximating the stock is used with some biological justification. This is based upon a sufficiently robust estimation of the geographical range of the target stock.	The stock assessment and management units are consistent with the distribution of the stock. Over the past sixty years the spawning areas, over-wintering areas and migration routes have been subject to many unpredictable changes. For example at least six different over-wintering areas have been used during this period. These have varied from east of Iceland, the Norwegian fjords and since 2001 an area off the coast of Norway between Latitude $69^0$30'N and 72^0N. Considerable changes in the seasonal migration routes, spawning, feeding and overwintering areas are kept under constant surveillance and review through numerous national and international research vessel surveys (e.g. acoustic, larval and young fish surveys) during the year. These surveys are well documented and encompass the overall distribution of the stock within a given year.	Runnstrom (1936) Rottingen and Slotte (2001) Rottingen (1992) ICES (2006) ICES (2007)		
80	A reliable estimate of the geographic range of the target stock is available including seasonal patterns of movement and availability. Stock assessment and management units are consistent with the majority distribution of the stock.				
100	The complete geographic range of the stock, including seasonal patterns of movement/availability, is estimated and documented and is kept under review.				

1.1.1.4		Is there information on fecundity and growth?		**14.3**	85
60	There is some appropriate information available on fecundity and growth.	Information on maturity and growth available from the Working Group report runs from 1950, although specific information goes back further than this. Whilst there is little current information related specifically to the fecundity in this stock, it is not an important issue in terms of the assessment. Growth patterns and annual changes are important and these are monitored closely both from research vessel data and catch sampling. Individual growth was characterised through the 1990's by large fluctuations related to condition. Condition declined from 1994 through to 1997 when it reached its lowest level over the observed period from 1935. Condition improved for a couple of years and then declined again from 2001 to 2005. These changes in condition are probably linked to changes in feeding areas and *Calanus* abundance linked to variation in the North Atlantic Oscillation. Changes in growth are linked to changes in the proportion mature at any age. This is closely monitored as it is an important factor in the assessment process.	ICES (2006) ICES (2007) Dragesund et al (1980)		
80	Reliable estimates are available of fecundity at size and/or weight and growth rates, and this information forms an adequate time series.				
100	There is comprehensive and reliable information on fecundity at size, growth rates, and length and weight at age, and these are monitored over time to detect trends and shifts.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

1.1.1.5		Is there an understanding of the relationship of recruitment to parental stock?		**14.3**	85
60	Indices of recruitment levels and recruiting ages, and corresponding spawning stock levels are available.	There is a comprehensive knowledge of the level of recruitment at age 1 year old, over the period 1950 to 2005. It has fluctuated between 0.77 billion and 302 billion 1 year olds, providing contrast for the stock recruitment relationship. Each year class can be related to its relevant spawning stock biomass estimate to produce a stock and recruitment relationship. However the dynamics of this migratory stock and changes in its migration routes and spawning areas over time, make it extremely difficult to interpret the S/R relationship or to use it for predictive purposes. There has been some success recently in using multiple linear regression models to incorporate climate and fish parameters into a predictive model for recruitment (WGNPBW, 2006). The model uses abundance of 3year old recruits versus an index of sea surface temperature in the Norwegian Sea. The model describes 80% of the variation in annual recruitment.	ICES (2006) ICES (2007) Dragesund (1970) Runnstrom (1941)		
80	Adequate estimates of recruitment and spawning stock are available. Sufficient years of data and contrast are available to establish a general relationship between stock and recruitment.				
100	The relationship between stock and recruitment is well understood with high statistical reliability.				

1.1.1.6		Is information collected on the abundance/density of the stock?		**14.3**	90
60	Either fishery dependent or fishery independent indices are available on the abundance of the stock biomass. Qualitative information exists on the appropriateness of the indices as proportional indicators of stock size.	There are a total of eight fishery independent surveys used in the assessment and four new surveys under consideration for future use. The surveys are designed to cover all the life history stages over the total area of distribution of the stock. Three of the surveys are acoustic surveys covering the periods February to March; November to December and a January survey which was discontinued in 1999 but is still used as an index for the 5 to 15+ age groups. An extensive international ecosystem survey of the Nordic Seas, in May, has been carried out since 2000 and provides an index of the 3+ age groups and is also being tested as a recruitment index. A second international ecosystem survey in the Barents sea in the autumn covers the juvenile distribution area and provides an abundance index of the 1 and 2 years old fish. Finally a larvae survey which has been carried out on the Norwegian shelf since 1981 provides a valuable age aggregated index of SSB. Tagging data has been used in the assessment in the past but has now been discontinued because of the low return rate. All the survey data is rigorously tested as part of the assessment process each year, using standard ICES methods, and in some cases the time series data are only partially used. Fishery dependent indices are generally not appropriate for a pelagic fishery of this type and none are used in the assessment process.	ICES (2006) ICES (2007)		
80	Fishery dependent and/or fishery independent indices are available on the abundance/density of the stock. Uncertainties have been analysed and any uncertainties reduced so as to allow trends to be determined from the indices. Indices are suitable to provide a high degree of confidence in the evaluation of stock abundance trends.				
100	Multiple fishery dependent and/or fishery independent indices are available on the abundance/density of the stock with sufficient time series to allow trends in abundance to be understood clearly. Where fishery independent surveys are used (for juveniles and/or adults) the design of the survey is statistically rigorous and robust, Indices are consistent and there is clear evidence that they are proportional to the stock size. Uncertainties have been fully analysed.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

1.1.1.7		Is information available on environmental influences on the stock dynamics?		**14.3**	85
60	Some relevant studies have been undertaken on the effects of biological and physical factors which could affect the stock (including natural mortality). Research is encouraged and ongoing.	The stock has been characterised over the years by major changes in the migration routes, overwintering, spawning and feeding areas. These changes have all been extensively studied in relation to the complex environmental factors which have contributed to them. The distribution of the stock throughout all life history stages covers a vast area of the North East Atlantic. The distribution and abundance of the main food species, (*Calanus*) has a major effect on the condition of herring. This has been linked to the average North Atlantic Oscillation Index for the period March /April. There are a number of studies on this issue. The areas chosen for spawning by the herrings are well known and documented. They cover a wide area but not all areas are used every year. The two international ecosystem surveys described in section 1.1.1.6 both gather environmental data concurrently and this is analysed in relation to the distribution and abundance of all the fish species surveyed. A recruitment model which links the abundance of 3 year old herring with annual changes in an index of sea surface temperature in the Norwegian Sea has now been developed and used in the assessment. The model describes 80% of the variation in recruitment (see section 1.1.1.5).	ICES (2006) ICES (2007) Toresen and Ostevdt (2001) Runnstrom (1941) Dragesund (1970)		
80	There is knowledge of biological and physical factors affecting distribution, survival and year class strength (including natural mortality). Some information is sufficiently robust for use in the stock assessment process.				
100	There is comprehensive knowledge of biological and physical factors affecting distribution, survival and year class strength (including natural mortality). Key information is sufficiently robust for use in the stock assessment process.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.2		There should be sufficient information on the fishery to allow its effects on the target stock to be evaluated		16.7	
1.1.2.1		Are all major sources of fishery related mortality recorded/ estimated, including landings, discards and incidental mortality?		**29.1**	75
60	Sufficient information is available on the fishery to allow accurate estimates to be made of landings, broken down as required for an evaluation to be made. Estimates of discards and incidental mortality are available.	The largest proportions of the total catch of herring are allocated to and taken by Norway (59%), Iceland (16%) and Russia (12%). The system for recording of catches by the Norwegian fleet is comprehensive and involves daily monitoring of individual vessels by a single sales organisation. This information is immediately within the public domain and is considered by the Working group to be very reliable. Landings by the other national fleets are also considered to well monitored and accurate. Russian vessels operating in Norwegian waters are required to report their catches to the Norwegian authorities. The working group do consider that there may be an unaccounted mortality caused by fishing operations and some under reporting of catches in this fishery although it is not possible to assess the magnitude of this. However they state that in relation to the large catches in recent years the impact on the assessment is likely to be very low and no adjustments to official landings have been made since 1994. Discarding in the Norwegian waters is illegal and there is no evidence of deliberate discarding by them. Any unaccounted for mortality could be the result of slippage by purse seiners or accidental loss which is not recorded. However, there is evidence that slippage of catch does occur within the Norwegian purse-seine fleet although the industry does not regard this as mortality and therefore not illegal and it is not recorded. Condition 1 has been raised to address this.	ICES (2006) ICES (2007) Norges Sildesalgslag (site visit) Fiskeridirektoratet Oslo (site visit) IMR Bergen (site visit)		
80	Landings are accurately recorded. Discards and incidental mortality are well estimated for the fishery.				
100	Landings, discards and incidental mortality are accurately estimated and monitored.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

1.1.2.2		Are fleet descriptions, fishing methods and gear types known throughout the fishery under assessment?		**24.4**	100
60	Significant fishing methods and gear types are known for the fishery with some information on geographical areas of use. Information is available on the size and composition of the fleets, but is not regularly updated.	The fleet descriptions for this fishery are extensive and updated on an annual basis by the assessment working group. The fishery involves both purse seiners and pelagic trawlers. The pelagic trawlers may be single or pair trawlers. The number and type of vessels participating in the fishery is reported, where available, for each country. For Norway, Iceland and the Faroes the landings are split and reported by vessel type, gear and vessel size. Knowledge of the Norwegian pelagic fleets participating in the herring fishery is extensive. There are observer programmes on some of the pelagic fleet (although percentage coverage may be relatively low) and at-sea inspections by the Coastguard are carried out. The numbers, type and size of the vessels in the Norwegian fleet is comprehensively detailed, and the Norges Sildesalgslag database is updated on a daily basis.	ICES (2006) ICES (2007) Norges Sildesalgslag (site visit) Fiskeridirektoratet Oslo (site visit) IMR Bergen (site visit)		
80	Significant fishing methods and gear types are known and information is available on the geographical areas of use. Recorded information is available on the size and composition of the fleets. This is reviewed and updated at appropriate intervals.				
100	All fishing methods and gear types employed in the fishery are known. *In-situ* observations are made of fishing practices. Comprehensive knowledge is recorded and regularly updated, on the size and composition of the fleets.				

1.1.2.3		Is gear selectivity known for the fishery?		**22.8**	85
60	Appropriate information is available on selectivity and qualitative changes in selectivity.	This is not an important element in relation to the management and protection of this herring stock. While changes would be identified through the stock assessment, there is no specific programme to monitor changes in gear selectivity. However, issues of gear selectivity are not critical in a largely mono-specific pelagic fishery.	ICES (2006) ICES (2007) Norges Sildesalgslag (site visit) IMR Bergen (site visit)		
80	Selectivities of gear types are well estimated by size. Information is sufficient to determine any changes in selectivity over time.				
100	Full selectivities have been accurately estimated for all gears, locations and times of fishing over time.				

1.1.2.4		Is the target species taken in other fisheries in the area that are not subject to this certification, and are such catches recorded or estimated?		**23.8**	80
60	There is an appropriate level of information relating to other fisheries in the area that are not subject to this certification, although these are not fully identified. The catches are estimated in the stock assessments. Levels of IUU fishing are estimated, but with some uncertainty.	Some NOSSH may be taken in the western mackerel fishery in Area IIa and in International waters and in the Blue whiting fisheries. Quantities are considered to be small and are landed and counted against the quota. Russian vessels operating in Norwegian waters are required to report their catches to the Norwegian Authorities. Some juveniles may be taken in fisheries in the Barents Sea. Though it is not clear how well these are recorded the quantity is considered to be small.	ICES (2006) ICES (2007) Norges Sildesalgslag (site visit) Fiskeridirektoratet Oslo (site visit) IMR Bergen (site visit)		
80	The main fisheries not subject to certification are identified. Significant catches of the target species (including IUU fishing) are either recorded or reliably estimated in the stock assessments in a precautionary manner.				
100	All fisheries (and other sources of human-induced mortality) in the area that are not subject to this certification are identified and monitored. All the catches are recorded and used in the stock assessment. Levels of IUU fishing are reliably estimated to be negligible.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

1.1.3		Appropriate reference levels have been developed for the stock			16.7	
1.1.3.1		Are there appropriate limit and precautionary reference points based on stock biomass and fishing mortality?			**100**	90
60	Generic limit and target reference points have been set based on justifiable and reasonable practice appropriate for the species category	Appropriate reference points for fishing mortality and biomass have been established and used since 1998. They are considered by ICES to be consistent with a Precautionary Approach. Bpa is 5,000,000t Blim is 2,500000t based on historic minimum biologically acceptable level (MBAL) Fpa is 0.25 and based on medium term simulations Flim is not considered relevant for this stock in the current situation. A target F of <0.125 has been set as an integral part of the management plan, current F is estimated at 0,102.	ICES (2006) ICES (2007) ICES (Advice 2007) IMR Bergen (site visit)			
80	Limit reference points (or some measure with similar intent and outcome) are set such that below this point there is a significant risk of impairing reproductive capacity. Target reference points are set such that the stock and/or fishing mortality is maintained at a level consistent with Bmsy (or some measure or surrogate with similar intent and outcome) or above. Reference points are appropriate for the stock and can be estimated.					
100	Limit reference point is set above the level below which there is an appreciable risk of impairing reproductive capacity following consideration of relevant precautionary issues. Target reference point is set such that the stock is maintained at a level consistent with BMSY (or some measure or surrogate with similar intent or outcome), or a higher level, and following consideration of relevant precautionary issues such as the ecological role of the stock. Reference points are appropriate for the stock and can be estimated					

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
1.1.4	**There is a well-defined and effective harvest strategy to manage the target stock.**		16.7	
1.1.4.1	12.1.1.1 Is there a mechanism in place to contain harvest as required?		**33.3**	90
60 Mechanisms are in place to monitor and (if necessary) reduce harvest, but do not fully contain harvest, or have not been tested. Measures provide a reasonable degree of confidence in stock management.	The primary control mechanism starts with the annual Coastal States Agreement on total quota. This is based on scientific advice from ICES ACOM followed by international negotiations involving Norway, Russia, Iceland, The Faroe Islands and the EU. These annual negotiations lead to an agreed TAC and allocation of that TAC to the participants. Uptake of the quota is monitored nationally and mechanisms are in place to close the fishery at a national and international level when total quota uptake has been reached In Norway the system is particularly well controlled through a single sales organisation which monitors catch by vessel on a daily basis. Quotas are allocated annually by vessel groups and then to individual vessels which have to be licensed to participate in the fishery. All vessels regardless of size are regulated by an individual quota.	ICES (2006) ICES (2007) Norges Sildesalgslag (site visit) Fiskeridirektoratet Oslo (site visit) IMR Bergen (site visit)		
80 Appropriate mechanisms are in place to contain harvest as and when required to maintain, or allow the target stock to return to, productive levels. These have been tested if/as appropriate for robustness against uncertainties in the assessment and management process.				
100 Mechanisms are in place to contain harvest as and when required to maintain (or allow the target stock to return to) productive levels. Measures are robust to uncertainty in data inputs or stock biology. Specific measures to demonstrate effectiveness are in place and their robustness has been examined against a wide range of uncertainties.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

1.1.4.2		Are clear, tested decision rules set out?		**33.3**	90
60	It can be demonstrated that decision making, though not documented, is logical and appropriate. Rules may not have not been tested, but appear appropriate for management.	Clear harvest control rules have been specified by ACFM for the management of this stock. The rule is strictly followed in the advice provided by ICES to the annual meeting of representatives of the Coastal states (see 1.1.4.1) which decides on and agrees quotas. The parties have also agreed to implement o long term management plan for this stock. The plan is consistent with the precautionary approach and is intended to constrain harvesting within safe biological limits and designed to provide sustainable fisheries. ICES considers the objectives of the agreement are consistent with the precautionary approach.	ICES (2006) ICES (2007) ICES (Advice, 2007) IMR Bergen (site visit)		
80	Clear decision making rules exist, are fully documented, but may not have been fully tested. Decision rules are reconciled with reference points and with data and assessment limitations.				
100	Clear, documented and tested decision rules are fully implemented and have been fully reconciled with reference points and the data and assessment limitations, and have been periodically evaluated.				

1.1.4.3		Are appropriate management tools specified to implement decisions in terms of input and/or output controls?		**33.3**	90
60	Management tools exist within the fishery under assessment to implement decisions of input and/or output controls although these are not developed for the specific fishery, or management tools are not fully developed, but are specifically related to the fishery. Some evidence exists to show that tools can be effective in achieving relevant management objectives.	There is no limit fishing mortality specified for this stock as it is currently not considered to be relevant. A precautionary approach fishing mortality of F= 0.15 and a target F within the management plan of F= 0.125 have been set. The fishing mortality has been below this target F since 2003. The main control mechanism is the annual allocation of quota via the Coastal States Agreement. Their decisions are based on ICES advice which in turn is based on the management plan, and is considered to be appropriate, precautionary and working well. Within the Norwegian herring fishery there are appropriate tools to implement all aspects of the management plan plus the additional tool of a complete ban on all discarding. Individual vessel quotas, daily reporting to a single management body, public availability of the information on a daily basis are all measures which ensure national compliance with all controls. The Norwegian management of their component of the fishery, through TAC, licensing and technical regulations, has been shown to be effective. Overshoots of quota in other components of the fishery are taken into account in the stock assessment of the following year. This will likely result in reductions in total TAC in the subsequent year on the basis of that assessment. The Norwegian component of that reduced TAC will, based on the historical evidence, be effectively managed using the tools available.	ICES (2006) ICES (2007) ICES (Advice, 2007) Norges Sildesalgslag (site visit) Fiskeridirektoratet Oslo (site visit) IMR Bergen (site visit)		
80	Management tools have been specified to implement decisions of input and/or output controls. These are generic although some attempt has been made to relate them to the specific fishery OR tools are lacking in some details but are specifically related to the fishery. Evidence exists to show clearly that tools are likely to be effective in achieving relevant management objectives.				
100	Management tools, appropriate to the species and fishery, have been specified to implement decisions of input and/or output controls. Tools are responsive, relevant and timely. Performance of the tools has been evaluated and evidence exists to show clearly that the tools have a high probability of achieving relevant management objectives.				

1.1.5		**There is a robust assessment of stocks.**			16.7	
1.1.5.1		Are assessment models used and are they appropriate to the biology of the target species and the type of fishery?			**20.0**	90
60	Robust assessment models are used. These are generic and do not account for specific characteristics of either the biology of the species or the nature of the fishery.	In the past a number of different models have been used by the assessment working group, Sea Star, ISVPA, TISVPA and Adapt. The assessment has been shown not to be particularly sensitive to the model used but is more sensitive to the choice of relevant data input. In 2007 (2006 assessment) only the Sea Star and TISVPA models were used mainly because of a lack of the relevant expertise at the working group. The annual assessment is independently reviewed and the models used are considered to be appropriate for this stock.	ICES (2006) ICES (2007) IMR Bergen (site visit).			
80	Assessment models are used. Major criteria are related to the species and/or the fishery, but there are some areas of the assessment that are generic.					
100	Assessment models are used and capture all major features appropriate to the biology of the species and the nature of the fishery and the nature of the management questions being asked.					

1.1.5.2		Does the assessment take into account major uncertainties in data and have assumptions been evaluated?		**20.0**	80
60	Major uncertainties are identified. Some attempt has been made to evaluate these in the assessment.	All the potential data sources are carefully examined each year. Sea Star is a maximum likelihood based model i.e. the probability of an observation is calculated using assumed error distributions where uncertainty parameters are estimated. In the case of the fishery independent data their performance is reviewed and indices weighted accordingly. In some cases periods of data are completely rejected. The most important data source is the landings data and these are considered to be very reliable in the context of the scale of the fishery. Discards through slippage are known to occur but their magnitude is not possible to assess and they are not included in the estimate of total catch. In view of the large catches in this fishery and the accuracy of targeting shoals, the relative importance of slippage is likely to be low and so is not expected to represent a major uncertainty in this assessment. The assessment therefore takes into account major uncertainties in the data and functional relationships. The most important assumptions have been evaluated and the consequences are known.	ICES (2006) ICES (2007) IMR Bergen (site visit)		
80	The assessment takes into account major uncertainties in the data and functional relationships. The most important assumptions have been evaluated and the consequences are known.				
100	The assessment addresses all significant uncertainties in the data and functional relationships and evaluates the assumptions in terms of scope, direction and bias relative to management-related quantities. The assessment model has been shown to meet sufficient levels of precision and accuracy to allow the management process to achieve its objectives.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.5.3		Are uncertainties and assumptions explored and reflected in management advice?		**20.0**	95
60	Major uncertainties are recognised and are reported in management advice, as well as possible implications of those uncertainties on the management advice.	The management advice from ICES to the parties in the Coastal States agreement is based on the annual report of the working group on the state of the stock. All the uncertainties and assumptions are explored by the working group and their conclusions independently reviewed for ACOM. The absolute estimate of SSB is known to be uncertain and the retrospective performance of the assessment is not very good although the trend is the same. However the numbers involved are so large that that the uncertainty becomes insignificant in terms of the annual advice and the stock is considered to be stable +/- 1 million tonnes. In the year 2006, it was said that the results of the assessment appear to be not very sensitive to the choice of the assessment model. The assessment appears to be more sensitive to the choice of the data used (1.1.5.1). Many sources of information are available which have contributed to the assessments in the past. The assessment carried out last year appeared to be in particular sensitive to: • use of tagging data; • exclusion of recent years in winter survey; • uncertainty in maturity parameters.	ICES (2006) ICES (2007) ICES (Advice, 2007) IMR Bergen (site visit)		
80	Major uncertainties and assumptions are addressed in the management advice and through the appropriate decision rules to address those limitations.				
100	All significant uncertainties and assumptions are addressed and reflected in the management advice, including appropriate decision rules.				

1.1.5.4		Does the assessment evaluate current stock status relative to reference points and make forecasts for the future?		**20.0**	90
60	The stock status is estimated relative to reference points.	Although the absolute estimates of SSB are uncertain it is known to well above Bpa and the fishing mortality is below both Fpa and the target F in the management plan. The assessment short- term forecast using standard ICES methodology and subsequent advice are all firmly embedded in the Management Plan which is entirely driven by the reference points. SSB is currently considered to be stable and estimated to within +/- 1 million tonnes.	ICES (2006) ICES (2007) ICES (Advice, 2007) IMR Bergen (site visit)		
80	The assessment makes an evaluation of the stock status relative to the reference points. Both short and medium term forecasts are made.				
100	The assessment makes a reliable probabilistic evaluation of the stock status relative to the reference points and projects these into the future over appropriate timescales.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

1.1.5.5		Does the assessment include the consequences of current harvest strategies?		**20.0**	90
60	The assessment makes an initial approximation of the consequences of current harvest strategies.	The forecast table provides a series of options which allow managers to see the short term implications of a range of actions in terms of setting the TAC for this fishery. The options are always presented in terms of multiples of F from zero F through to 1.25 times Fpa in the management plan. For each option there is a forecast of landings and consequent fishing mortality in the forecast year and an estimate of SSB in the following year Some uncertainties are explored in the assessment and projection model e.g. maturity and weight at age changes in future years.	ICES (2006) ICES (2007) ICES (Advice, 2007) IMR Bergen (site visit)		
80	The assessment includes a robust approximation of the consequences of current harvest strategies. Uncertainties in the model are considered in harvest strategy evaluations.				
100	The assessment includes the consequences of current harvest strategies, forecasts future consequences of these and evaluates stock trajectories under decision rules.				

1.1.6		**The stock(s) is/are at appropriate reference level(s).**		16.7	
1.1.6.1		Is the stock(s) at or above reference level for SSB? **[If below SG80 then Criterion 2 must be scored; if SG80 or above, then Criterion 1 is complete]**		54.5	100
60	The stock is likely to be above the limit reference level.	Yes, the SSB on 1st January 2007 was estimated to be 11.9 million tonnes. Following the management plan SSB is predicted to increase to 12.3 million tonnes by 2009. Bpa is 5 million tonnes and the stock has been above this level for over 10 years.	ICES (2007) ICES (Advice, 2007) IMR Bergen (site visit)		
80	The stock is likely to be above precautionary reference levels.				
100	The stock is significantly and consistently above appropriate reference level.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
1.1.6.2		Is the stock(s) at or above reference level for F ? **[If below SG80 then Criterion 2 must be scored; if SG80 or above, then Criterion 1 is complete]**		45.5	95
60	Fishing mortality is at or below the limit reference level.	Yes. Fpa for this stock is 0.15 with a management plan target F of 0.125. Fishing mortality in 2006 was 0.102 and has been below target F since 2003.	ICES (2007) ICES (Advice, 2007) IMR Bergen (site visit)		
80	Fishing mortality is below the precautionary reference level.				
100	Fishing mortality is significantly and consistently below the appropriate reference level.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
1.3 *(MSC Criterion 3)*	**Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.**		33.3	
1.3.1	**Fishing activity maintains the age, genetic structure or sex composition of the stock to a degree that does not impair reproductive capacity.**		100	
1.3.1.1	Is the age/sex/genetic structure of the stock monitored so as to detect any impairment of reproductive capacity?		**50.0**	90
60 There is some information available on the sub-population/sex/age structure of the stock, and the relationship of these to reproductive capacity. Some monitoring of sub-populations is available as necessary.	Scientific sampling of this international fishery is considered to be very good with 93% of the commercial catches covered by adequate sampling programmes. The international data from the sampling programmes are presented to the assessment working group for collation and evaluation annually. Any impairment of reproductive capacity would be quickly noted through the scientific sampling program by reduction in the number of year classes present in any area.	Dragesund and Ultang (1978) ICES (2006) ICES (2007) IMR Bergen (site visit)		
80 Estimates are available of the sex and size structure, based on adequate sampling and verification for this stock, and the relationship of these to reproductive capacity. Genetic or sub-population studies have been carried out as appropriate.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	There is comprehensive and reliable information on the sub-population/sex/age structure of the stock, and the relationship of these to reproductive capacity as well as evaluations of the implications of shifts in these parameters on productivity and management quantities. Population structure is well estimated with only insignificant errors. Genetic studies have been conducted.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
1.3.1.2	Does information indicate any changes in structure that would alter reproductive capacity?		**50.0**	90
60 Changes is stock structure have been detected but there is no evidence of negative effect on recruitment of the stock. Or potentially adverse changes in structure are identified and remedial measures are under consideration with an appropriate timescale for implementation.	Annual changes in age of maturity have been noted in the stock related to availability of food and changes in the migration patterns to feeding areas. These are not thought to have any impact on reproductive capacity for the stock and ICES currently classifies it as having full reproductive capacity. Studies have looked at historical data and identified changes in age of maturity during historical low stock sizes. However, following recovery age of maturity returned to historical levels.	Engelhard & Heino 2004- Maturity changes in Norwegian Spring Spawning Herring before, during and after a major population collapse. Fisheries research 66- p. 299-310 ICES (2007) ICES (Advice, 2007) IMR Bergen (site visit)		
80 Evidence exists that the fishery has not caused changes in stock structure that would affect recruitment. Or potentially adverse changes in structure are clearly identified and effective remedial measures are in place.				
100 Data strongly indicate a robust age, sex and genetic structure in the stock, such as would maintain reproductive capacity.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
Principle 2	**Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends**		**33.3**	86
2.1 *(MSC Criterion 1)*	**The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.**		33.3	-
2.1.1	**There is adequate understanding of ecosystem factors relevant to the distribution and life history strategy of the target species.**		19.2	-
2.1.1.1	Are the nature, sensitivity and distribution of habitats relevant to the fishing operations known?		**29.4**	95
60 Appropriate information exists but may not be comprehensive or up to date. The seasonal distribution of fishing operations is mapped. 80 Nature, sensitivity and distribution of all main habitats are known in adequate detail. Information is recent. The distribution of fishing operations is monitored.	Knowledge of the ecosystem characteristics of the North East Arctic region fished for NOSS herring can be divided into two separate areas: the Barents Sea to Lofoten, and the remainder of the Norwegian Sea to the south of this area and Faroese waters (ICES area Vb). The nature, sensitivity and the distribution of main and some related habitats relevant to the fishing operations are known in detail. Information is recent. The distribution of fishing operations and their effort is monitored, and an appropriate time series of information is available through IMR studies. The characteristics of the marine ecosystem of the Barents Sea/Lofoten area are relatively well known. Numerous joint Norwegian/Russian ecosystem cruises have been performed in this area, examining oceanographic characteristics, as well as plankton, benthos, fish, bird and mammal distributions and abundance. Some of these data sets, particularly those examining temperature and salinity, for example, extend back to the 1930s. These surveys underpin the Barents Sea Management Plan (BSMP; "Integrated Management of the Marine Environment of the Barents Sea and the Sea Areas off the Lofoten Islands"). Through the ecosystem management plan within the Barents Sea, the areas of vulnerable seabed habitat have been identified (habitat types are mapped both to the north and south of Lofoten) and assessed, including the determination of habitat sensitivity. Information is slightly less well advanced for the Norwegian Sea area, although particularly key vulnerable habitats (notably cold water corals and sponge communities) have been identified in detail have been identified and closed areas put in place to protect them. In addition, programmes are underway (e.g. MAREANO programme) to perform studies of the seabed's physical, biological and chemical environment, and identify further key areas in greater detail, while IMR research continues to increase already considerable knowledge of the region. The Ecosystem Management Plan exercise performed for the Barents Sea is expected to be expanded into the Norwegian Sea. Information is recent and ongoing for all areas (MAREANO and other programmes underway through IMR and Polar Institute). Work is also carried out in the waters around the Faroe Islands through the Faroese fisheries laboratory.	Fosså et al., 2002. Norwegian Ministry of the Environment Report No. 8 Stiansen et al., 2005. Stiansen, et al. 2006. Gaard et al. 2001		

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	The nature, sensitivity and the distribution of all habitats relevant to the fishing operations are known in detail. Information is recent. The distribution of fishing operations and their effort is monitored, and an appropriate time series of information is available.	Distribution of fishing vessel position (although not necessarily fishing effort, in particular in relation to specific habitat types) is recorded via vessel monitoring systems (VMS). In waters under the fishery jurisdiction of Norway, all vessels above 24 metres length are required to have and operate tracking equipment. This will be extended to cover all vessels above 21 metres from January 1st 2008, and all vessels above 15 metres from January 1st 2009. Currently, vessels over 13m record fishing positions in logbooks, vessels below 13m (inshore vessels) are not required to complete logbooks. However, all landing records record the grid-square within which catch is taken for all vessel sizes and relevant effort. The grid-square system has squares of finer spatial scale closer to the coast. Information is continually updated. The nature, sensitivity and the distribution of main and some related habitats relevant to the fishing operations are known in detail. Information is recent. The distribution of fishing operations and their effort is monitored, and an appropriate time series of information is available through IMR and ICES studies.			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.1.1.2		Is information available on the trophic position, status and relationships of the target species within the food web?		**35.3**	95
60	Key prey, predators and competitors are known.	NOSS herring migration is driven by food distribution. The main food of herring is zooplankton, of which *Calanus finmarchicus* is the most important, while appendicularians (*Oikopleura* spp.), amphipods (mainly *Parathemisto abissorum*), and euphausiids may also be important in particular areas. Cannibalism may also occur. The food web (primarily predator-prey relationships) related to herring has been well described, although these food webs are generally on a gross-scale. This includes quantitative information on herring as a prey at different life stages. Herring has also been identified as an important component of the diet of harbour porpoises and both killer and minke whales, while negative interactions between herring abundance and kittwake breeding success has been noted, due to negative interactions between herring and capelin abundance. Detailed mass-balance trophic models of the Barents and Norwegian Seas, as well as for Faroese waters, have also been developed using the Ecopath with Ecosim methodology. This allows the temporal and spatial simulation of alternative fishing and environmental change scenarios to be examined on ecosystem components, which include herring. Quantitative information is therefore available on the position and importance of the target species, and their relationships within the food web at most life stages.	Blanchard et al.(2002). Dommasnes et al. ICES (2007) Wassman et al., 2006 Lindstrøm et al. 1998 Prokopchuk and Sentyabov 2006 Barrett 2007 Folkow et al., (1997). Ugland et al., 1993. Cruz, 2005 Gaard et al. 2001		
80	Appropriate information is available on the position, relationships and importance of target species in the environment at key life stages.					
100	Quantitative information is available on the position and importance of the target species and their relationships within the food web at key life stages.					

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.1.3		Is there information on the potential for the ecosystem to recover from fishery related impacts?		**35.3**	90
60	Key elements of the functioning of the ecosystem, relevant to the fishery, are identified allowing some assessment of recovery potential.	The impact of commercial fishing on the spawning stock is studied through stock assessment, which has demonstrated that reductions in fishing effort allowed SSB to recover from low levels due to reductions in fishing mortality and some strong recruitment events. The impacts of this depletion on the ecosystem interactions have not, however, been examined fully. Further potential ecosystem impacts of fishing, namely physical disturbance (section 2.1.3.1), ghost fishing (section 2.1.3.2) and impacts on key vulnerable species (section 2.1.5) are considered elsewhere. Trophic impacts may be determined through ECOPATH/ECOSIM analysis. ICES (2007) noted, "Not much information is available on the impact of the herring fishery on the ecosystem. The fishery is entirely pelagic. There is little quantitative information on the non-commercial bycatches in the fisheries for herring but these are thought to be small. Therefore unintended effects of the fishery on the ecosystem are probably small or absent. Since herring is a major source of food for some populations of other species, overfishing of the herring stock could affect these populations. This is presently not the case since the herring stock is very abundant and is exploited at a low rate." However, negative interactions between herring abundance and capelin levels have been suggested, due to juvenile herring feeding on capelin larvae and juveniles, although this is not felt sufficient to drive capelin recruitment dynamics Benthic sensitivities are established, (notably for the Barents Sea through the BSMP, but also for the area south of Lofoten with reasonable detail), but unlikely to be an issue for the pelagic gears used. It is noted that a Management Plan for the Norwegian Sea is likely to be commissioned soon, which would standardise this knowledge across the whole Norwegian EEZ area	Blanchard et al. (2002) Dommasnes et al. ICES 2007 Huse and Toresen 2000 Cruz, 2005		
80	The main elements of the functioning of the ecosystem, relevant to the fishery, have been documented and are understood, allowing reasonable assessment of recovery potential.				
100	Detailed information is available on the potential for affected elements of the ecosystem to recover from fishery related impacts.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.1.2		**General risk factors are adequately determined.**		22.2	
2.1.2.1		Is information available on the nature and extent of the by-catch (capture of non-target species)?		**35.3**	
60	The main non-target species affected have been identified and qualitative information is available on significant by-catch.	Generally, targeted mid-water fisheries such as NOSS herring are virtually mono-specific. Nevertheless there is the potential, particularly with large mid-water trawls, to incur incidental captures of other species. ICES (2007) noted that no information was provided on bycatch in NOSS herring fisheries. However, the main by catch species noted by Norges Sildesalgslag were mackerel and horse mackerel, along with saithe and blue whiting. In related herring fisheries, bycatches of haddock, whiting, mackerel and horse mackerel have been noted. All these by-catch species would be re retained on board, landed and the quantity set against the vessel and national quota for that species. All by-catches of commercial species, namely those listed in Regulation 48, must be retained on board and will be counted against the quota for those species on landing. By-catch of non-commercial species is not recorded but is considered to be extremely low. On this basis the score is 90. The distribution and ecology of these by-catch species is very well established. **Purse seine** By catches of other species are less common in the purse seine fishery which tends to identify and target single species shoals. However small by catches of mackerel and horse mackerel may be taken, with saithe and blue whiting specifically noted by Norges Sildesalgslag, and haddock being found in related fisheries. These are counted against quotas. **Pelagic trawl** The most common by-catch species in related fisheries is mackerel and horse mackerel, with blue whiting specifically noted by Norges Sildesalgslag. Skippers are aiming to take a clean catch and in this context they benefit from modern developments of the multi frequency sonar systems. These bycatch are counted against quotas. Independent observations of by-catch in the Norwegian spring spawning herring fishery are limited. A study for a related (Scottish) pelagic trawler fishery estimated that the mean per haul percentage by-catch was 2.3%. This was very fishery-dependent, with bycatch levels in the Maatje herring fishery, for example, being only 0.6%. Mackerel was the main bycatch (1.6%), while haddock (0.6%) and both whiting and horse mackerel were also present in samples. These low levels of by-catch are supported by information collected at interview.	ICES (2007) Pierce et al., 2002 Norges Sildesalgslag interview Norges Sildesalgslag data Directorate of Fisheries and Institute of Marine Research interview	PS PT	90 90
80	Information is available on non-target species directly affected by the fishery including their distribution and/or ecology. Quantitative information is available on significant by-catch. If obtained by sampling, this is considered sufficient to provide adequate information.				
100	Information is available on all non-target species directly affected by the fishery including the distribution and ecology. Accurate records are kept on the nature and extent of all by-catch species including species size and sex composition.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.1.2.2		Is information available on the extent of discard and slippage (the proportion of the catch not landed)?		**35.3**	
60	Appropriate information is available of the extent of discarding and slippage, including an assessment of the main species represented.	PURSE SEINE & TRAWL: By-catches are very low as discussed above. However, slippage does occur and is likely to include by-catch species. The Norwegian purse seine fleet may occasionally slip catches of pelagic species, even though this is against regulations. Slippage is a potentially serious issue, since research suggests that once the purse seine has been pursed beyond a particular extent, caught fish will suffer total mortality post-slippage. The point at which this occurs has been the subject of IMR study, and management/industry discussions on the issue have occurred. While slippage is expected to be uncommon, appropriate information is not available to precisely derive estimates of its frequency or quantity. Estimates of slippage for the total international fishery have been developed within ICES working groups through observer programs and levels have declined since 2001. The full extent of discarding of commercial species is not well known because there is no observer programme in Norwegian waters, but inspection reports suggest that discarding is rare. There are no statistics on the extent of catches and discarding of non-commercial species. A number of direct-observer surveys have been conducted for herring pelagic trawl fisheries around Scotland. These studies were based on observation of 222 hauls catching 9,889 tonnes fish. The discard rate from pelagic trawlers of 6.6% was substantially higher than that from pursers (0.6%). Some discarding in the form of wastage (i.e. fish left meshed in the net or in the cod-end of trawls) was associated with almost all pelagic catches but the quantities of fish involved were low. From the study of Pierce et al. (2002), no non-commercial bycatch was identified in the catches of pelagic trawls by observers in either the herring or Maatje herring fisheries, suggesting a relatively clean fishery. However, it is difficult to extrapolate from this to the Norwegian fleet without considerable uncertainty. Condition 2 has been raised to address this.	Napier et al., 2002 Napier et al. 1999 Pierce et al., 2002 IMR interview Report from Norwegian Government to the Parliament –page 46 (Stortingsmelding 32 2006-2007),	PS PT	70 70
80	Appropriate information is available to allow estimates of discard and slippage to be calculated and interpreted.				
100	Accurate and verifiable information is available on the extent of all discards and slippage (by age/size), and the consequences of these. Or the entire catch is landed.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.1.2.3		Is information available on other unobserved fishing mortality on target or other species?		**29.4**	
60	Sources of potential unobserved mortality have been identified.	**Purse seine** The main source of unobserved mortality for purse seine vessels will be through the process of slippage. IMR has undertaken a study of the mortality rates of pelagic species slipped from different levels of net pursed levels, as well as observing the level of dead fish on the seabed subsequent to fishing operations, using submarines. The general perception is that once the net has been pursed to any degree, mortality is likely to be total. It is considered by Napier *et al*. that once caught in the net a significant proportion may die following release, largely though scale-loss and an increased susceptibility to predators. Mortality rates are therefore high. However, without improved knowledge of the level of slippage within the pelagic fishery, the actual levels of unobserved mortality cannot be quantitatively estimated to a high degree of certainty. **Pelagic trawls** Unobserved mortality will primarily be through subsequent mortality of those fish that escape through the trawl. Given the susceptibility of herring to mortality following pursing, mortality is likely to be high. Some studies have examined this for other herring species, suggesting that mortality may be twice as high as that assumed based upon the catch, or more (e.g. 91% mortality for small (<12cm) herring escaping from 26mm and 36mm mesh, after 14 days).	Napier et al. 1999 Efanov, 1981 Rahikainen et al., 2004 Misund and Beltestad 1995 Suuronen et al., 1996 IMR interview	PS PT	80 80
80	Information is available to allow estimates to be made of unobserved mortality.				
100	Information is available to allow quantitative estimates to be made.				

2.1.3		**There is adequate knowledge of the effects of gear-use on the receiving ecosystem and extent and type of gear losses.**		18.2	
2.1.3.1		Is there adequate knowledge of the physical impacts on the habitat due to use of gear?		**45.5**	
60	Main impacts of gear use on the habitat are identified including extent, timing and location of use.	The gear used principally affects the upper and middle water column. Impacts on the water column would be negligible and extremely short termed and reversible.	IMR web page	PS PT	90 90
80	All impacts of gear use on the habitat are adequately identified including extent, timing and location of use.	Compared to current demersal fishing and other anthropogenic sources of disturbance, impacts on sea bed from pelagic fishing gear are considered are considered negligible and transitory.			
100	The physical impacts on the habitat due to use of gear have been studied and quantified, including details of any irreversible changes.	All positions are recorded accurately through VMS and logbook/landing declaration records.			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.1.3.2		Is any gear lost during fishing operations and can 'ghost fishing' occur?		**54.5**	
60	Some recording of gear losses takes place and an assessment can be made of ecosystem impacts, including possible 'ghost fishing'.	**Purse seine** The loss of purse seine gear could result from the breaking of the main line. However, the fishing method means that both ends of the line would need to break, meaning a catastrophic failure of the gear, for it to be lost. This is therefore a very rare event, and is highly unlikely to occur. **Pelagic trawl** Gear loss can potentially be caused through either (i) an excessive catch (although this usually results in the cod-end bursting rather than loss of the trawl) or (ii) through the gear snagging on the bottom after an engine failure or some other power loss. Complete gear loss is very rare and all efforts to avoid it are taken, due to the expense of the gear itself. The ability of an abandoned trawl gear to continue to capture fish is limited as fishing effectiveness is only enabled by it working under powered tow. Under this scenario, some localised damage to benthic structures and communities may be possible through smothering.	DGFISH Report/2004/20	PS PT	90 90
80	There is knowledge of the type, quantity and location of gear lost during fishing operations. Estimates can be made on the extent of adverse effects, including 'ghost fishing'.				
100	There is detailed knowledge of the type, quantity and location of gear types lost during fishing operations. The impact of gear loss on habitat, target and non-target species has been well estimated or recorded.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.1.4		**Strategies have been developed within the fisheries management system to address and restrain any significant negative impacts of the fishery on the ecosystem**		18.9	
2.1.4.1		Are management strategies in place to address impact identification and avoidance/reduction?		**100**	
60	Management strategies include some appropriate consideration of ecosystem impact identification and avoidance/reduction, but may not be tested.	In general strategies are in place which would address significant impacts however there is no systematic review of sources of impact. For the Barents Sea a management plan is in place that integrates the management of different eco-system components. It is noted that a Norwegian sea management is in development and North Sea management plan would follow in future which would address these issues and raise the scores. Objectives for the sustainable precautionary management of herring are in place through the long term management plan agreed between EU, Faroe Islands, Iceland, Norway, and Russia, with associated controls and reference point levels. This agreement is perceived to be precautionary by ICES ACFM. Objectives for herring biomass are implemented through a TAC system. Under agreed advice from the ICES ACFM, a precautionary management regime resulted in the spawning stock biomass exceeding a precautionary biomass level in the mid 1990s and is considered to be harvested sustainably. Similar management objectives exist for the main by-catch species within the fishery as for herring. Discarding is prohibited in Norwegian fisheries, and levels of commercial species bycatch are counted against quota. Levels of non-commercial bycatch within the Norwegian fishery have not been studied in great detail, but bycatch in related fisheries can be identified through observer programme data and annual surveys (although commercial gear is not commonly used). However, levels of non-commercial bycatch have not been studied in detail and so their significance has not been evaluated nor strategies explicitly considered. Impacts on seabirds and PET species are examined separately (section 2.2.1). ICES's Northern Pelagic and Blue Whiting Fisheries Working Group (WGNPBW) has discussed the implications of changes in the spatial distribution of the species during feeding migrations in the Barents Sea, and the impact of environmental changes on growth and recruitment. **Purse seine** Within Norwegian regulations, protective measures include the prohibition of the use of drainage grids that can be used as sorting equipment in the water separator or chutes leading from the water separator (drainage system) in fisheries for herring and mackerel. Norwegian authorities also have the potential to close areas reactively if information suggests that juvenile or bycatch levels within catches are above	ACFM 2007 ICES 2007	PS PT	90 90
80	Management strategies are in place to detect and reduce ecosystem impacts, although these may not have been fully tested. These are designed to adequately protect key aspects of the ecosystem within main fishing areas.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	Management strategies are in place to monitor, detect and reduce impacts. These are designed to adequately protect ecosystems, habitats and populations of target and non-target species and keep impacts within determined acceptable levels.	acceptable limits, or close fishing during the daytime. It is also prohibited to discard fish waste when fishing for mackerel, Norwegian spring-spawning herring, North Sea herring and herring. Restrictions on the use of purse seines during the daytime can be put in place by the Directorate if there is a risk of killing herring unnecessarily. In turn, when fishing for Norwegian spring-spawning herring, bycatches of cod, haddock and saithe are prohibited. **Pelagic trawl** Within Norwegian regulations,protective measures include the prohibition of the use of drainage grids and graders in fisheries for herring and mackerel. Norwegian authorities also have the potential to close areas reactively if information suggests that juvenile or bycatch levels within catches are above acceptable limits. When fishing for Norwegian spring-spawning herring, bycatches of cod, haddock and saithe are prohibited. There are also spatial limitations on fishing areas.			

2.1.5		**Assessments of impacts associated with the fishery including the significance and risk of each impact, show no unacceptable impacts on the ecosystem structure and/or function, on habitats or on the populations of associated species.**		21.5	
2.1.5.1		Does the removal of target stocks have unacceptable impacts on ecosystem structure and function? **If there is evidence of depletion of non-target species, then Criteria 2.3 should also be addressed.**		**26.5**	
60	The removal of target stocks could lead to impacts upon ecological systems (applying the precautionary approach where necessary). A program is in development to identify these and, if appropriate, reduce these to acceptable, defined limits.	Herring larvae provide an important food component for a number of gadoids – thus the relative abundance of young herring may influence the recruitment of their main predators. The current status of the NOSS herring stock is likely to benefit those predators. However, the flexibility in predator- prey relationships, and opportunities for prey-switching, is less well known and are likely to increase uncertainty over the response of predators to diminished prey availability. However, ICES (2007) note "Not much information is available on the impact of the herring fishery on the ecosystem. The fishery is entirely pelagic. There is little quantitative information on the by-catches in the fisheries for herring but these are thought to be small. Therefore unintended effects of the fishery on the ecosystem are probably small or absent. Since herring is a major source of food for some populations of other species, overfishing of the herring stock could affect these populations. This is presently not the case since the herring stock is very abundant and is exploited at a low rate." Detailed mass-balance trophic models of the Barents and Norwegian Seas, as well as Faroese waters, have been developed using the Ecopath with Ecosim methodology. This allows the temporal and spatial simulation of alternative fishing and environmental change scenarios to be examined on ecosystem components, which include herring. **Purse seine** The fishery will have a negligible impact upon the structure and function of the pelagic habitat and no unacceptable impacts have been demonstrated for the benthic habitats. Capture of non-target species is at a very low level and these are subject to separate, specific, management measures. Therefore, sufficient information is available to examine the consequences of current removal levels on ecological systems, if not explicitly examined. **Pelagic trawl** The fishery will have a negligible impact upon the structure and function of the pelagic habitat and no unacceptable impacts have been demonstrated for the benthic habitats. Capture of non-target species is at a very low level and these are subject to separate, specific, management measures. Therefore, sufficient information is available to examine the consequences of current removal levels on ecological systems, if not explicitly examined.	Blanchard et al. 2002 ICES 2007 Norges Sildesalgslag interview	PS PT	90 90
80	Sufficient information is available on consequences of current levels of removal of target species to suggest no unacceptable impacts of the fishery on ecological systems within major fishing areas.				
100	The ecological consequences of current levels of removal of target stocks has been quantified and documented to be within acceptable, pre-determined, limits.				

2.1.5.2		Does the removal of non-target stocks have unacceptable impacts on ecosystem structure and function? **If there is evidence of depletion of non-target species, then Criteria 2.3 should also be addressed.**		**26.5**	
60	The removal of non-target stocks could lead to impacts upon ecological systems (applying the precautionary approach where necessary). A program is in development to identify these and, if appropriate, reduce these to acceptable, defined limits.	Commercial by-catch species are subject to separate detailed stock assessments and related to biological reference points. All by-catch of these species in the herring fishery is counted against relevant quotas.Regulations and management plans are in place to mitigate any impacts. Knowledge of the capture of other non-commercial non-target species remains limited, and the impacts on the population cannot be defined. Available information suggests by- catch levels are low and hence impacts on the eco-system would be expected to be low. The impacts on affected non commercial by-catch populations have not been determined but are not expected to be significant. **Purse seine** No unacceptable impacts have been identified due to the highly selective nature of the fishery. Capture of non-target commercial species is at a very low level and these are subject to separate, specific, management measures. Therefore, sufficient information is available to examine the consequences of current removal levels on ecological systems, if not explicitly examined. **Pelagic trawl** No unacceptable impacts have been identified due to the highly selective nature of the fishery. Capture of non-target commercial species is at a very low level and these are subject to separate, specific, management measures. Therefore, sufficient information is available to examine the consequences of current removal levels on ecological systems, if not explicitly examined.	Blanchard et al. 2002	PS PT	80 80
80	Sufficient information is available on consequences of current levels of removal of non-target species to suggest no unacceptable impacts of the fishery on ecological systems within major fishing areas.				
100	The ecological consequences of current levels of removal of non-target stocks has been quantified and documented to be within acceptable, pre-determined, limits.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.1.5.3		Does the fishery have unacceptable impacts on habitat structure? **(Management measures related to habitat are considered under Principle 3)**		**20.4**	
60	There is no evidence that the fishery is having unacceptable impacts, although the issue has not been directly studied.	**Purse Seine** The fishery will have negligible and transient impacts upon the structure and function of the pelagic habitat. Near-shore fishing off Norway is in relatively deep water, and benthic impacts are expected to be minimal. **Pelagic trawl** The fishery will have negligible and transient impacts upon the structure and function of the pelagic habitat. Near-shore fishing off Norway is in relatively deep water, and benthic impacts are expected to be minimal.	Norwegian Ministry of the Environment Report No. 8	PS PT	95 95
80	Appropriate information is available on the effects of the fishery on habitat structure. This does not indicate any unacceptable impacts.				
100	Effects on habitat structure are well documented and are within acceptable tested/justified limits.				

2.1.5.4		Are associated biological diversity, community structure and productivity affected to unacceptable levels? **If there is evidence of depletion of non-target species, then Criteria 2.3 should also be addressed.**		**26.5**	90
60	There is no evidence that the fishery is having unacceptable impacts, although the issue has not been directly studied.	Biological diversity, in terms of rare, protected or threatened species is considered in Section 2.2. The development of Ecopath/Ecosim ecosystem models for the Barents and Norwegian Seas, as well as Faroese waters, allow the overall community level impacts of the fishery to be determined. Herring, being one of the key planktivorous fish in the Barents Sea, are a key component of the ecosystem. While it is difficult to identify causal effects of herring abundance and that of other species in the food web, links have been drawn between NOSS herring abundance and capelin levels. It seems certain that small pelagic fish biomass – as a whole – will have a strong influence on trophic interactions. For example, interactions between herring and capelin may lead to marine mammals and birds foraging for alternative – and potentially reduced quality – prey when herring biomass is high. Current biomass levels of NOSS herring are unlikely to cause an issue. As discussed under Indicator 2.1.3.1, no significant impacts of the fishery upon benthic habitats or communities have been identified.	Blanchard et al. 2002 Barrett 2007 Cruz, 2005		
80	Appropriate information is available on the effects of the fishery on biological diversity, community structure and productivity. This does not indicate any unacceptable impacts.				
100	The effects of the fishery on biological diversity, community structure and productivity have been quantified and are within acceptable tested/justified limits.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score
2.2 *(MSC Criterion 2)*	**The fishery is conducted in a manner that does not threaten biological diversity (at the genetic, species or population levels and avoids or minimises mortality of, or injuries to endangered, threatened or protected species.**		33.3	
2.2.1	**Fishing is conducted in a manner, which does not have unacceptable impacts on recognised protected, endangered or threatened species.**		50.0	
2.2.1.1	Is there information on the presence and populations of protected, endangered or threatened (PET) species?		**33.3**	95
60 There is a program in place to identify protected, threatened and endangered species directly related to the fishery. There is periodic monitoring of the main population trends and status of protected, endangered and threatened species.	The taxa included within the IUCN Red List are "the bearers of genetic diversity and the building blocks of ecosystems, and information on their conservation status and distribution provides the foundation for making informed decisions about conserving biodiversity from local to global levels". Information available from the Norwegian red list indicates 21 marine species which are considered PET. The majority of PET species (but not necessarily all), which may directly or indirectly interact with the fishery, are identified. Populations are monitored and threats to populations, and measures necessary to promote conservation are identified. Critical habitats are understood. **Sea mammals**. IMR have a programme examining the ecology and ecosystem dynamics of *Lagenorhynchus* dolphins, following a recommendation from the North Atlantic Marine Mammal Commission (NAMMCO). The programme is investigating the exposure of mammalian top predators to environmental contaminants and is studying effects on their health status. In addition to sightings, this programme involves the capture and post-mortem examination of specimens. For the coastal and inshore fisheries, vessel owners have provided information on effort, catch and by-catch over the period October-December 2005, in return for financial compensation. These concentrated on gill net and trap fisheries. Work has also been performed by the Faroese Fisheries Laboratory and through UNEP studies on marine mammals. **Fish** A number of elasmobranch species are included in the Red List. However, information on the incidence of skates and rays as bycatch within the herring fisheries is not readily available. The ecosystem management plan for the Barents Sea indicates that, following the identification of vulnerable species, regulations will be evaluated. Pelagic sharks such as porbeagle are not currently classified as PET by the Red List, but their status on this list should be monitored over the period of certification. These species are considered within the ICES Working Group on elasmobranch species (WGEF). Bluefin tuna (*Thunnus thynnus*) is considered to be 'data deficient' by the Red List. Population levels of this species are considered within	Bekby, T. (2001) Bjørge et al. (2006) Fosså et al. 2002 Hovland et al. 2002 Stiansen et al. Norwegian Ministry of the Environment Report No. 8 IUCN http://www.iucnredlist.org/ Bloch et al. 2001 Pedersen et al. 2004		
80 Key protected, threatened and endangered species directly related to the fishery have been identified. The populations of key protected, threatened and endangered species directly related to the fishery are monitored on a regular basis.				

100	There is knowledge of all populations of protected species directly or indirectly related to the fishery including their dynamics. Regular monitoring of protected, endangered and threatened species is undertaken, supported by research programmes to assess threats and promote their conservation. The type and distribution of critical habitats have been identified.	the ICCAT assessment process. **Seabirds**. The BSMP White Paper notes the importance of the life history and population trends of bird species within the ecosystem of the Barents Sea. Information on bird bycatch within fisheries is incomplete, however. Scattered information about bycatches of various species is available. The Norwegian Government has also contributed to the development of the SEAPOP (Seabird Population Management and Petroleum Operations) programme **Other Species**. Surveys of the sea bed have identified a number of vulnerable species, including cold water corals, within the Northeast Arctic region. Oil and gas activities have been forbidden in key areas of the Barents Sea, as a result of the ecosystem management plan, and some marine protected areas have been established. More areas are under consideration for establishment in 2008. The BSMP also specifically lists Barents Sea species, which includes bowhead whale, lesser black-backed gull, guillemot and puffins as endangered or vulnerable according to IUCN criteria. Similar analyses will be undertaken for the NSMP.			

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.2.1.2		Are interactions of the fishery with such species adequately determined?		**33.3**	
60	The main interactions directly related to the fishery are known.	Pelagic gear operations have the potential to interact with both sea mammals and birds. There are several programmes of data collection and review in Norwegian Seas, particularly for marine mammals the NAMMCO annual reviews and for birds, studies and monitoring carried out by IMR specifically for the Norwegian and Barents Seas. **Sea mammals** While observations are not available directly from the Norwegian fleet, information on the incidence of interactions with marine mammals is available for other related fleets. Since 2000, the Sea Mammal Research Unit (SMRU) has carried out a number of surveys to estimate the level of bycatch of sea mammals in UK pelagic fisheries. SMRU, in collaboration with the Scottish Pelagic Fishermen's Association, placed observers on board thirteen UK vessels for a total of 190 days at sea, covering 206 trawling operations around the UK. In contrast with other pelagic trawl fisheries elsewhere in the Eastern Atlantic, to date no cetacean or seal bycatch has been observed by independent observers in the herring pelagic fishery in the North Sea. This is supported by observations made in UNEP reports on Faroese waters. Seal bycatch in pelagic trawls appears to be an issue to the northwest of the UK, and likely to be mainly grey seals (*Halichoerus grypus*, which are not considered threatened). Northridge (2003) observed 49 seals taken in 312 pelagic trawl tows throughout UK. By-catch rates in the North Sea are likely to be substantially less than off the NW Scottish coast, due to the distribution of this species. Work on bycatch in Scottish waters continues and will report in 2010. Luque et al. (2006) noted interactions between Scottish commercial trawlers and seals mainly during the herring fishery (June-Sept), when seals (species not provided) were caught in the pipe during pumping in six cases, with a total of 16 mortalities. UK observer programmes have monitored cetacean by-catch rates in pelagic trawl fisheries, which confirm that cetacean by-catch in the pelagic trawl fishery is negligible. It also reports that no by-catches of marine mammals were observed over 69 studies hauls and considers that the underlying rate for marine mammals in the pelagic fisheries studies (pelagic trawls in IVa and VIa) is low. However, there is no evidence that seal / cetacean catch is logged and reported to a third party. **Fish**. Elasmobranchs (sharks, skates and rays) are also not considered an issue for pelagic gears, although	IMR book on "The Norwegian Sea ecosystem" (2004) Northridge (2003) Northridge et al. (2007) Pierce et al., 2002 IUCN http://www.iucnredlist.org/ Pedersen et al. 2004 Morizur et al., 1999 http://www.scotland.gov.uk/Topics/Environment/Wildlife-Habitats/19887/20826 Luque et al., 2006	PS PT	75 75
80	Appropriate quantitative estimates are made of the effects of interactions directly related to the fishery.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	Reliable quantitative estimates are made of the interactions of all populations directly related to the fishery, and qualitative information is available on indirect impacts. Incidental mortalities are recorded and reported.	sharks may be occasionally caught in the North Sea. In other pelagic trawl fisheries, this is felt to be rare. Survival rates are reasonably expected to be high, with sharks being released during or after the cod-end is being emptied. Interactions of the fishery with bluefin tuna are anticipated to be extremely rare, and no evidence of interactions was identified in the available information. However, this does not mean that the event does not occur. **Seabirds**. Interactions of seabirds are anecdotally reported as being very rare, with occasional birds getting caught in nets (this being more an issue to the West of Scotland). Gannets (*Morus bassanus*), which frequently dive at and around trawl nets, have been observed by entangled in trawl nets in the northern North Sea and NW Scotland. Actual mortality rates of caught gannets have not been assessed in detail, and some have been observed alive after release from the gear. Seabird by-catch in the North Sea is considered to be comparatively rare compared to the NW Scotland where 1-3 birds may be caught per haul. However, data to confirm this are lacking. **Purse Seine** Little information is known on the catches of PET species in the Norwegian purse seine fishery, which has the potential to accidentally catch both marine mammals and birds. In general the method is felt reasonably species-specific. However, there are incidences of marine mammals being caught within nets on initial pursing. However, the method of fishing allows these to be released relatively easily, before they damage equipment. Studies in purse seine fisheries (NAMMCO) have not identified any obvious interactions with marine mammals and, in general, the method is felt reasonably species-specific. The level of interaction is not known, however. Reports of seabird interactions with gear do not identify purse seines as having significant interaction with PET seabirds but records of interactions with PET fish species is not established. **Pelagic trawl** Little information is known on the catches of PET species in the Norwegian pelagic trawl fishery, which has the potential to accidentally catch marine mammals, and birds on hauling. In general the method is felt reasonably species-specific, but the lack of information to support this is means no firm conclusion can yet be drawn. Condition 2 has been raised to address this.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
2.2.1.3		Do interactions pose an unacceptable risk to such species?		**33.3**	80
60	Known effects are within acceptable limits of national and international legislative requirements and are believed to create no biological threats to the species concerned.	Based upon the information available, the very low rates of interactions with the species discussed above suggests that the fishery does not pose a risk to protected, endangered or threatened species. ECOSIM modelling of indirect effects is possible, this suggests that there are no major trophic consequences (notably on cetaceans) of changing harvest rates of herring within the boundaries of established sustainable limits. There is no evidence of declines in marine mammal populations from current monitoring.	Bekby 2001 Blanchard et al. 2002 Cruz, 2005		
80	Critical interactions are well estimated. Available information suggests interactions are below a level at which PET species populations would be at risk.				
100	It is established that the direct and indirect effects of fishing on threatened and endangered species are within acceptable pre-defined limits.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

2.2.2		**Strategies have been developed within the fisheries management system to address and restrain any significant impacts of the fishery on protected, endangered or threatened species.**		50.0	
2.2.2.1		Are management objectives and accompanying strategies in place in relation to impact identification and avoidance/reduction?		**100**	90
60	Management systems are in place to address key areas of impact identification and avoidance/reduction.	Norway has ratified a number of conventions on species protection and management, including the Convention on Biological Diversity, Bern, Bonn and CITES Conventions, these establish overarching objectives for PET species conservation. The Norwegian Red List is updated regularly. Regulations for non-commercial fish by-catches appear more limited (including fish, mammals and birds). However, the ecosystem management plan for the Barents Sea indicates that, following the identification of affected species, regulations are being evaluated. There is also a division of IMR working on the development of technical measures to address by-catch etc. issues. In general, where there is an identified requirement for strategies to be enacted, appropriate actions appear to be put in place, including monitoring of potential interactions with PET species. For example, areas of cold water coral have been identified as an issue in Norwegian waters and then appropriate protection measures rapidly implemented and enforced. If issues relating to protected, endangered or threatened species are identified, various mechanisms have been developed to detect and reduce their impact. This includes Biodiversity Action Plans that provide plans for the protection of key and threatened species and habitats.	http://www.ascobans.org/		
80	Management objectives are set to detect and reduce impacts. Accompanying strategies are designed to adequately protect recognised protected, endangered or threatened species.				
100	Tested management objectives are set to detect and reduce impacts. Accompanying strategies are designed to adequately protect recognised protected, endangered or threatened species.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

Principle 3		**The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable**		**33.3**	85
3.A		**Management System Criteria**		50.0	-
3A.1 (*MSC Principle 3 Intent and Criterion 3*)		**A management system containing an institutional and operational framework exists with clear lines of responsibility.**		16.7	-
3A.1.1		Are organisations with management responsibility clearly defined including areas of responsibility and interactions?		**25.0**	90
60	Organisations with management responsibility are known. Responsibilities and interactions require clarification and occasional issues may arise.	Following the depletion of the NOSS herring stock in the late 1960s and early 1970´s, the stock was entirely within Norwegian waters for two decades and was rebuilt through a strict program that excluded fishers from other countries. Following the successful rebuilding of the stock, it started to migrate into international waters in the first half of the 1990s, thereby requiring an international regime to ensure proper regulation of the fishery. At the initiative of Norway, talks were launched in 1994 among the coastal states in the region, resulting in an agreement in 1996. The 1996 coastal state herring agreement involves Norway, Russia, Iceland, the Faroes and the EU. It fixed an allocation formula between the six parties and provided for cooperation on the setting of TACs. The fishery is one of the largest in the world, with TACs in the region of 1 million tons. The cooperation broke down, however in 2003, due to disagreement over quota allocation. The disagreements were reconciled, and from 2007 a new allocation arrangement was agreed to (stm 32). A small share of the TAC	St.meld. nr 32 (2006-2007) Sak 25/07 Reguleringsmøtet 5 og 18 juni 2007		
80	Organisations with management responsibility have been defined including key areas of responsibility and interaction. In general, interactions are effective and operate without serious difficulties.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
100	Organisations with management responsibility are clearly defined including all areas of responsibility and interaction. Interactions are demonstrably effective.	is set aside for international waters and is allocate by the Northeast Atlantic Fisheries Commission. The knowledge base for resource management is developed by the marine scientific institutions of the countries that participate in the fisheries. There is cooperation on research planning, data collection, including joint research cruises, and the development of assessment models. This is the basis for the scientific advice for resource management by ICES. Additional scientific inputs on marine ecosystems issues are provided through other research institutions (universities other research institutes). The IMR is an independent research institution with its own board. About half of its funding comes directly from the Ministry of fisheries and coastal affairs. In Norway, the overall responsibility for resource management resides with the Ministry of Fisheries and Coastal Affairs, which decides on policy and regulatory schemes. The Fisheries Directorate acts as a technical body preparing the secondary legislation containing regulations and implementing it. Interactions between the Ministry, Directorate and IMR appear to function well. The enforcement of regulations is the responsibility of the Coast Guard (at sea), the Fisheries Directorate (nearshore waters and upon landings) and the sales organizations (upon landings). These organisations have set procedures governing joint activities and meet regularly to coordinate actions.			

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.1.2		Is the management system consistent with the cultural context, scale and intensity of the fishery?		**25.0**	95
60	Inconsistencies arise in some key areas but a programme is in place to address these.	The management system in Norway is comprehensive and encompasses the entire NOSS herring fishery in Norwegian waters and those participating in it, including participation of fishers from other nations. Management is considered to be consistent with the cultural context, scale and intensity of the fishery.	I1, I2, I3		
80	The system is consistent with key elements of the cultural context, scale and intensity of the fishery.				
100	The system is entirely consistent with the cultural context, scale and intensity of the fishery.				

3A.1.3		Is the management system subject to internal review?		**25.0**	90
60	There are mechanisms in place to allow for internal review.	It is common practice for international fisheries cooperation to review the experience of previous years´ regulations and their implementation. In the bilateral cooperation between Norway and the EU, their annual meetings review developments in fisheries and their management over the past year. The management system at the domestic level in Norway is subject to several annual internal reviews. Regulatory meetings (2-3 per year) are hosted by the Directorate and attended by industry and other stakeholders. Significant preparatory documents are made available to stakeholders on the web prior to the meeting. At these meetings, the regulatory program – quota and technical regulations - (for each fishery individually, e.g. North Sea fisheries) that is implemented in any one year is subject to review by the Regulatory meeting the following year. Recommendations on modifications to regulation are proposed to the Ministry and subsequent decisions are subject to ongoing testing and monitoring. Regulations are also subject to continuous public debate and review. This applies to rules regulating access, output, and technical regulations. Data and assessment methodology is subject to continuous internal scientific review within ICES, with participation by scientists from many countries. Methodologies are subject to continuous development, such as ICES Study Group on Management Strategies (SGMAS). There is no established stock assessment quality control procedure within Norway, outside of the ICES framework.	Sak 25/07 Reguleringsmøtet 5 og 18 juni 2007		
80	The management system is subject to internal review at appropriate intervals.				
100	The management system is subject to regular and frequent internal review. This includes evidence that the assessment methodology has been evaluated extensively and that any recommended changes have been made. Monitoring and evaluation are ongoing and improvements quickly tested and implemented.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.1.4		Is the management system subject to external review?		**25.0**	90
60	There are mechanisms in place to allow for external review.	At the level of international or bilateral cooperation, no systematic reviews are performed. The 5-party agreement as well as the NEAFC has however been examined in some scientific publications, which can be said to constitute external reviews. Also, NEAFC has subjected itself to partly external performance review. Regular and frequent external review of regulations and enforcement aspects occurs annually (since 1995) through a report to Parliament addressing the outcomes of international agreements and their implementation in fisheries policy. The parliamentary committee review and comment upon the ministerial report and the minister will act on comments made. The management system at the domestic level in Norway is subject to thorough external review, although the depth of the review varies. Reviews apply to the scientific basis, regulatory approach as well as enforcement aspects. A major review of the management system was carried out by the National Audit Office in 2003-2004. This was a review of the effectiveness of the management system (in terms of resource management, capacity handling, enforcement and Ministerial management of subsidiary bodies – Directorate, IMR etc), and was reported to Parliament. The overall aim of these reviews is to ensure that the executive is achieving the overall policy objectives adopted by Parliament. The Institute of Marine Research has been subject to two major scientific reviews over the last decade or so by independent committees (one commissioned by the Research Council covering a number of institutions, one specifically commissioned by IMR itself). In additions, the research is published in scientific journals and is subject to regular peer review processes there. ICES includes external scientists in reviews of its methodologies on a regular basis. In particular, the management strategies for a number of stocks have been reviewed externally by ICES to confirm conformity with the precautionary approach. Norway reports bi-annually on the performance of its management system to the Committee of Fisheries of FAO, which reviews countries performance relative to the standards set in the 1995 FAO Code of Conduct for Responsible Fisheries.	Riksrevisjonen Dokument nr 3:13 (2003-2004) St.meld. nr 32 (2006-2007		
80	The management system is subject to external review at appropriate intervals.				
100	The management system is subject to regular and frequent external review. Monitoring and evaluation are ongoing and improvements quickly tested and implemented				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3 A.2 (*MSC Criteria 1, 2, 4*)		**The management system has a clear legal basis.**		16.7	
3A.2.1		Is the fishery consistent with International Conventions and Agreements?		**40.0**	100
60	The management system operates under relevant international conventions and agreements, but some management actions may be questionable in relation to the terms of these.	The OSS herring fisheries are subject to a management system that is basically compliant with relevant international conventions and agreements. The management system that builds on the 50 party agreement and NEAFC regulations are based on the 1982 Law of the Sea Convention, the fisheries-related provisions of which states that fisheries are to be managed sustainably, that they should be optimally used, and that states shall cooperate on the management of shared stocks. These provisions are basically complied with by the management system in question. The fisheries are managed according to the principles set out in the FAO Code of Conduct for Responsible Fisheries, which includes the application of a precautionary approach. Also, the requirements in the 1995 UN Fish Stocks Agreement regarding reference points and application of the precautionary approach are complied with for the NOSS herring fisheries. Norway has implemented actions against IUU fishing in accordance with the FAO Global Plan of Action against IUU fishing. The NOSS herring fisheries are generally considered to be consistent with relevant provisions of international nature conservation agreements. There are no controversial exemptions to international agreements.	St.meld. nr 32 (2006-2007) Ot.prp. nr. 20 (2007-2008)		
80	The management system is generally consistent with relevant international conventions and agreements. The management system does not operate under any controversial exemption to an international fisheries or environment-related agreement.				
100	The management system is demonstrably compliant with all relevant international conventions and agreements.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.2.2		Is the fishery consistent with national legislation?		**40.0**	95
60	The management system operates under relevant national legislation, but some management actions may be questionable in relation to the terms of these.	Fisheries in Norway are subject to comprehensive legislative/regulatory framework. The management system is demonstrably compliant with national legislation, and has a clear legal basis. Secondary legislation providing for actual regulations and enforcement provisions builds on overarching fisheries laws (notably the Participation Act and Saltwater Fisheries Act). These laws are in the process of being replaced with a new Oceans Resources Act, adopted by Parliament 8 May 2008. The new Act will enter into force when secondary legislation providing for its implementation has been developed, probably late 2008 or early 2009. The management system is subject to legal reviews in court cases, for example when regulations are contested by fishers or others. Such court cases usually result in the resource management being found to be consistent with legislation. There is an international coastal states agreement between Norway, Faroe Islands, Russia, Iceland and the EU within which the fishery operates.	St.meld. nr 32 (2006-2007)		
80	The management system makes consistent, good faith efforts to be consistent with relevant national legislation. Management organisations have not been found to be repeatedly in violation of national law.				
100	The management system is demonstrably compliant with all relevant national legislation.				

3A.2.3		Does the system observe the legal and customary rights of people dependent upon fishing?		**20.0**	100
60	The customary and legal rights of the people dependent upon fishing are known and no major conflicts have occurred.	Rights are clearly codified in the legislation concerning participation in fisheries. The legislation has been developed through legally based, democratic processes whereby draft legislation is prepared by expert committees with broad representation, also from various stakeholder groups. When the Ministry of Fisheries have prepared draft legislation, comprehensive written hearings are conducted and the results taken into consideration, before the new legislation is submitted to Parliament for adoption. The review of new legislation in parliamentary committees can be result in changes to what is proposed by Government.	Ot.prp. nr. 20 (2007-2008)		
80	The system observes the legal and customary rights of people dependent upon fishing but does not necessarily have a formal codified system.				
100	The system observes all legal and customary rights of people dependent upon fishing under a formal codified system.				

3A.3 *(MSC Criteria 2, 5, 7)*		**The management system includes strategies to meet objectives including consultative procedures and dispute resolutions.**			11.1	
3A.3.1		Does the management system contain clear short and long-term objectives?			**16.7**	90
60	Short and long-term resource and environment objectives are implicit within the management system	Long-term, overall goals for fisheries management are set out in legislation and in white papers to the Parliament. These objectives are based upon sustainable management, economic efficiency, regard for regional objectives (e.g. specification of landing points), as well as concern for work conditions and safety. Environmental objectives are also in place and observed, e.g. in relation to protection of coral reefs and geographically defined sea-based management plans (e.g. Barents Sea Management Plan and forthcoming plans for the Norwegian Sea and the North Sea). Ecological quality objectives are also developed through the OSPAR cooperation, but fully developed measures to measure environmental performance are not yet in place. The new Oceans Resources Act generally places more emphasis on environmental objectives. Enabling legislation to implement the Act is in the process of being prepared. Once effective this would lead to a higher score in the future. Long-term objectives for the management of NOSS herring ae set out in a management plan. Short-term objectives are represented by annual TACs, the performance against which can be measured on an annual basis. The TACs are based on ICES advice, which build on the precautionary approach. Specific environmental control measures are in place (e.g concerning prevention of discarding of many species and protection of coral areas), but do not yet fully address all potential interactions of the fisheries.	Ot.prp. nr. 20 (2007-2008) St.meld. nr 32 (2006-2007)		
80	The management system contains clear short and long-term resource and environment objectives.					
100	The management system contains clear and explicit short and long-term resource and environment objectives that can be measured by performance indicators.					

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.3.2		Do operational procedures exist for meeting objectives?		**16.7**	90
60	Operational procedures exist which are applied to the meeting of objectives.	At the international level, allocation of quotas is negotiated every year in the context of the the bilateral cooperation between Norway and the EU. At the domestic level in Norway, the national TAC's is allocated to fleet groups according to an elaborated distributional scheme based on vessel groups defined by gear and length of the vessels. Within each vessel group, the quota is allocated according to set procedures. Vessels record catches in logbooks, and catches and landings are recorded and checked against the quota of each vessel (where vessel quotas exist) and/or group quotas. The fisheries authorities can close a fishery where by-catch levels are too high (this is subject to continuous monitoring), or when the total quota for a particular group of vessels is reached. The procedures for doing so is well understood in the industry, and closure of areas in practice constitutes almost real-time management. Relevant environmental objectives are applied through regulation and enforcement activities as for fishery controls. Operational procedures exist although environmental procedures are less transparent and well tested than stock based procedures and this is reflected in the scoring. The regulations of fisheries activities are reviewed annually in the Regulatory Meeting, ensuring transparency of management operations and providing for testing and review of regulatory mechanisms. Regulations are clearly communicated to operatives and fishers are required to be aware of relevant regulations.	St.meld. nr 32 (2006-2007) Sak 25/07 Reguleringsmøtet 5 og 18 juni 2007		
80	Transparent operational procedures are applied to the meeting of objectives. These procedures can be shown to support the objectives.				
100	Operational procedures are transparent and clearly applied. There is a feedback mechanism testing effective application.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.3.3		Are there procedures for measuring performance relative to the objectives?		**16.7**	90
60	Operational procedures exist which can be used to measure performance relative to the objectives.	Performance relative to resource and fishery-related environmental objectives in Norway is closely monitored through landing records and enforcement of regulations. Through procedures, with cooperation between sales organizations and the Fisheries Directorate, exist for checking vessel landings against fishing rights. The overall performance of the management regime for the resource is measured annually by assessing the status of stocks. This is a tested procedure that is repeated annually under the purview of ICES, resulting in new stock assessments and scientific advice for the following year. Monitoring activity of overall ecosystem status is also carried out through comprehensive implementation of management plans (for now for the Barents Sea), Ministerial declarations (for North Sea) etc. IMR carry out ecosystem surveys annually and fishery independent stock surveys in cooperation with its counterpart in other countries. Some measures are difficult to fully enforce, however, such as the ban on discarding, which can influence the meeting of objectives. Also overfishing is measured by means of various methods and is included by ICES in the statistical material that constitutes the basis for scientific advice. The economic performance of the fleet (against the objective of economic efficiency) is monitored annually through a survey ("Lønnsomhetsundersøkelser" – profitability survey) of a representative sample of vessels in the fleet. Well tested procedures are applied by ICES to measure management performance against the biological objectives of management.	I1, I2, I3		
80	There are procedures used for measuring performance relative to the objectives.				
100	Tested procedures are used for regular measurement of performance relative to the objectives.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.3.4		Do procedures include for a precautionary approach in the absence of sufficient information?		**16.7**	75
60	Measures exist to implement a precautionary approach in the absence of sufficient information. There is some evidence that this is occurring.	The precautionary approach is formalised and implemented in the management of all major fish stocks in Norwegian fisheries, including North Sea herring. ICES advice is based on established precautionary and limit reference points. This is supported by an additionally precautionary management strategy, which would be applied should the stock fall below Blim. Some ecosystem interactions, such as by-catches of non-commercial species (an area where information is lacking in some respects), do not, however, appear to be constrained by formalised precautionary procedures. This is the reason for a score lower than 80. Condition 2 has been raised to address this.	I1, I2, I3		
80	Relevant procedures include for an appropriate precautionary approach in their development and application, in the absence of sufficient information.				
100	All procedures include for evaluation of uncertainty and application of precaution at an appropriate level.				

3A.3.5		Does the system include a consultative process including relevant and affected parties?		**16.7**	100
60	The system includes a consultative process including key stakeholders within the fishery.	The management system in Norway includes a comprehensive consultative process where stakeholders can have their say regarding the regulatory approach. The key arena for this is an open Regulatory meeting (previously the Regulatory Council) chaired by the Directorate of Fisheries, where the regulatory measures for the previous year are reviewed and proposals for regulatory measures the coming years are discussed. Meeting papers are posted on the web in advance of meetings. The meetings are open and all relevant stakeholders have an opportunity to attend and make representations. When new legislation is developed, comprehensive hearings are mandated by Norwegian law, providing the industry as well as other stakeholders with an opportunity to comment upon and influence new legislation. The views presented in commentary to draft legislation would be reflected in the Ministries comment to draft legislation presented to Parliament. Also, annual meetings of fishers´ organisations are important venues for presentation of science and policy developments and debate between fisheries and scientists and administrators. Stakeholders also have the opportunity to participate in preparatory meetings before the annual negotiations with other countries. Representatives from the fisheries organizations can also participate in the delegations to the talks. Decisions regarding management of the stocks thus specifically address stakeholder concerns.	Mikalsen, K. and S. Jentoft, 2003		
80	The system includes an appropriate consultative process including all main public and private stakeholders and can demonstrate consideration of representations made.				
100	The system includes an appropriate consultative process including all affected stakeholders. Decisions specifically discuss and/or address stakeholder concerns.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.3.6		Is there an appropriate mechanism for the resolution of disputes within the system?		**16.7**	100
60	Mechanisms are theoretically adequate but have not been consistently applied or tested.	Disputes can be resolved in the first instance by negotiations within the system (e.g. in preparations before or in regulatory meetings). Following representations, the Minister would make a decision on a particular issue. Further dispute could then be resolved through law. Disputes over resource allocation between groups in the industry are normally resolved within the industry, by way of negotiation of compromises in the Norwegian Fishers Union. For Northeast Arctic cod, the industry has negotiated a key for allocation of fishing rights between various vessel groups. More serious disputes between parties in the industry are also usually resolved in the courts. Legal systems have been well tested in this regard. Ultimately, any Norwegian citizen or organisation can take legal action to the court of the Council of Europe.	I1, I2, I3		
80	There is an appropriate and established mechanism for the resolution of disputes within the system.				
100	There is an appropriate and tested mechanism within the system for the documentation and resolution of disputes of varying magnitude.				

3A.4 *(MSC Criterion 6)*		**The management system operates in a manner appropriate to the objectives of the fishery.**		11.1	
3A.4.1		Does the system include subsidies that contribute to unsustainable fishing?		**50.0**	90
60	Subsidies exist that may contribute indirectly to unsustainable fishing. These are short-term and are in the process of being removed within acceptable timescales.	The system has no subsidies that contribute to unsustainable fishing or ecosystem degradation. Subsidies were terminated in 1990 through an agreement between the European Free Trade Area signatories, negotiated in preparation for the EEA agreement. There is some funding from within the fishery for the transportation of the landings of fish by small and disparate fleets to enable them to market their small catches. This is consistent with the scale and culture context of the fishery ref- 3A.1.2	I1, I2, I3		
80	The system is essentially free from subsidies that contribute to unsustainable fishing or ecosystem degradation.				
100	The system has no subsidies that contribute to unsustainable fishing or ecosystem degradation.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.4.2		Does the system include economic/social incentives that contribute to sustainable fishing?		**50.0**	90
60	Measures to allocate fishing opportunities and/or entry to the fishery, or other incentives, are generally supportive of achieving fishery objectives.	All major fisheries in Norway are closed, in the sense that access to the fishery is limited to vessels that have a permit to participate in the fishery. A system of sanctions is designed to deter illegal activities and promote sustainable fishing practices. Ultimately, temporal removal of permits, in the event of recurrent serious breaches of management requirements, provides an incentive to promote sustainable fishing. All quotas are allocated to specific groups of vessels. Quotas are allocated to vessels, or there is a maximum quota for what a single vessel can take of its group quota. In addition to the regulations of access and output, technical regulations also contribute to the achievement of the goals of fishery management: sustainable use and economic efficiency. Procedures to allow for a managed reduction in capacity are established and tested. Also ecosystem concerns are taken into account: the regulations prohibit fishing in areas with coral reefs with specified gear, allow for closing of areas with high levels of juvenile fish, and prevents discarding of specified species. Economic gain of landing quota overshoots is also removed (values are taken through the sales organizations). Overfishing and fishing in breach of regulations results in economic penalties. Such breaches are generally negatively considered within the industry. Over the last two decades the level of understanding for the need for resource conservation and effective measures to achieve that has increased much, and today fishers are generally supportive of government regulations, although they may disagree with their actual design and implementation. Also, the perception of fisheries as an environmental issue has brought fisheries under the attention of the “public eye”, which may also provide an incentive to sustainable fishing practices. These measures will indirectly contribute to sustainable fishing and ecosystem management.	Sak 26/07 Reguleringsmøtet 5 og 18 juni 2007 Forskrift av 22. Desember 2004 nr 1878 om utøvelse av fisket i sjøen		
80	Allocations of fishing opportunities and/or entry to the fishery, and/or other incentives, promote fishery and ecosystem management goals.				
100	The system has established economic and social incentives that contribute to sustainable fishing and ecosystem management.				

3A.5 *(MSC Criterion 8)*		**A research plan exists in line with the management system to address information needs.**		11.1	
3A.5.1		Have key research areas requiring further information been identified?		**33.3**	95
60	Some major areas requiring further research have been identified.	The Norwegian Research Council plays an important role in developing strategies for research in Norway in general, and have a number of research programs that are geared at following up on these. A number of research programs, where grants are awarded on the basis of competing project proposals, provide important contributions to the understanding of a number of aspects of fisheries management, including economic, political and social. More specifically to fisheries management, the strategic plan of the Institute of Marine Research, which is an independent body funded in part the Ministry of Fisheries and Coastal Affairs, points to critical areas for marine research for fisheries management. This is followed up upon with annual research plans that are developed in consultation with the Ministry. The Ministry review the issue of research needs in a relatively detailed manner in its annual budget propositions to the Parliament. On the basis of this, a detailed set of instructions on research priorities is communicated to the Institute of Marine Research. These priorities are arrived at in dialogue between the institute and the fisheries authorities. In general, the demands by management for scientific information that is relevant for the development of annual regulations tend to set the agenda for IMR research in this regard. Some areas of information do not, however, appear to have been fully addressed as yet, although these may well be recognised within the management agencies. Also, the fishing industry has its own research fund, funded by a levy on exports. These funds are governed by the industry itself and target more immediate applied research needs identified by the industry itself. Additionally research is undertaken by ICES with Norwegian co-operation and through EU funded research projects.	I1, I2, I3		
80	The key areas requiring further research have been identified.				
100	A comprehensive review of necessary information requirements has been undertaken.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3A.5.2		Is research planned/undertaken by the scientific advisers to meet the specific requirements of the management plan?		**33.3**	95
60	Research is planned for highest priority information needs.	Research is planned and undertaken to collect the data that are needed to perform stock assessments and provide scientific advice. There is a long-term commitment to fisheries research and related ecosystem science in the Research Council as well as in the Institute of Marine Research. Substantial resources are committed to this over time. The annual budget of the IMR is about USD 100 million. The activities of IMR are closely related to the needs of the management system, including routine research surveys etc and addressing more particular scientific questions related to management plans. The science funded by the Research Council is also directed towards both applied and developmental marine science. Clear research programmes are implemented to address the identified research requirements. Major fisheries, including NOSS herring, have substantial research time and resources committed to them in order to fulfill the needs of management for scientific based information.	http://www.imr.no/english/about_imr I1, I2, I3		
80	Research is planned and undertaken to provide necessary scientific support to the plan. There are demonstrable resources to allow implementation of the programme.				
100	There is an ongoing, funded, comprehensive and balanced research programme, linking research to the management plan.				

3A.5.3		Is relevant research carried out by other organizations (e.g. Universities) and is this taken into consideration?		**33.3**	95
60	The management system is aware of research carried out by other organisations and elements of this are taken into consideration.	Relevant research is also carried out by other organizations, and there is some coordination of activities between the researchers of the Institute of Marine Research and those at the universities and other research institutions both within and outside Norway. The use of research vessels is coordinated among institutions, and PhD students from universities often work in periods with the IMR. Relevant research is taken into account in management. Research Council plans and projects provide important platforms for cooperation between institutions. The Technical Institute in Trondheim undertakes a considerable amount of fisheries based technological research. Increasingly, research is executed through large plans and programs wherein a number of institutions participate, but with central coordination, tied in with management system requirements (e.g. MAREANO and BSMP). ICES also provides a forum for integration of research from a variety of sources. Norwegian researchers are fully engaged with ICES working groups and the ACFM.	I1, I2, I3		
80	Appropriate research carried out by other organisations is taken into consideration, although there is not necessarily any proactive co-ordination between organisations.				
100	Relevant research carried out by other organisations is taken into account for management considerations. This research is often co-ordinated with existing research plans of the management system.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.6 *(MSC Criteria 7, 9, 10)*		**The management system includes measures to achieve objectives for the stock**		11.1	
3A.6.1		Are the resource and effects of the fishery monitored?		**33.3**	90
60	A monitoring programme is in place that addresses some aspects of resource and effects and which can be extended.	The resource is closely monitored annually through fishery dependent and independent indices (as described under Principle 1). This includes the reference fleet which generates information on by-catches and associated species and is coordinated by research organisations. The recording of all effects may be compromised by the lack of quantitative information on slippage Logbook and/or landing records are kept at close geographical and temporal scales and are immediately transmitted to management and research organisations. VMS data etc is held by the Directorate, and data are available to research institutions and management bodies.	Presentations at Norges Sildesalgslag, the Institute of Marine Research and Fiskeridirektoratet 1-2 April 2008 I1, I2, I3		
80	A monitoring programme is in place that addresses all key aspects of resource and effects at appropriate intervals and results are recorded.				
100	The resource and effects of the fishery are closely monitored over appropriate geographical areas and time periods. Full records are kept of monitoring results and these are made available to relevant research and management bodies.				

3A.6.2		Are results evaluated against precautionary target and limit reference points?		**33.3**	100
60	Target and limit reference points exist and some level of evaluation against these is possible. These take account of the precautionary approach, but this may not be explicit.	Monitoring results are evaluated quantitatively within the stock assessment process, on an annual basis against the precautionary target and limit reference points within ICES.	I1, I2, I3		
80	Results of monitoring are regularly interpreted in relation to precautionary, target and limit reference points.				
100	Results of monitoring are quantitatively evaluated against precautionary target and limit reference points on a regular and timely basis.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.6.3		Do procedures exist for reductions in harvest in light of monitoring results and how quickly and effectively can these be implemented?		**33.3**	90
60	Appropriate procedures exist to reduce harvest. Programmes to link these with monitoring results are underway.	The fisheries are continuously monitored. At sea, a service for surveillance of the fisheries can close an area for fisheries should the amount of undersized fish or by-catch be to high on very short notice (hours). Such areas closures are frequently used. Areas are re-opened when by-catches and other incidences are at acceptable levels. Landings data, almost all of which are electronic, is transmitted to the Fisheries Directorate within few days. The authorities, and the sales organizations in their districts, therefore have almost real time overview over the development of fisheries and can stop them when quota limits are approached. This applies also to vessels in fisheries where vessel quotas are used. There are some variation between sales organizations in how they address the issue of control, but in the area of Norges Sildesalgslag, which covers the area where NOSS herring is fished in Norway, have a strict approach to control issues. In Norway well documented and tested procedures exist to implement changes in regulations rapidly.	Presentations at Norges Sildesalgslag and Fiskeridirektoratet 1-2 April 2008		
80	Appropriate procedures exist to reduce harvest in the light of monitoring results and provide for stock recovery to specified levels. Measures can be implemented speedily.				
100	Practical procedures exist to reduce harvest in light of monitoring results and provide for stock recovery to specified levels within specified time frames. There are well documented procedures to implement changes and these can be introduced with immediate effect.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.7*(MSC Criterion 10)*		**The management system includes measures to pursue objectives for the affected ecosystem.**		11.1	
3A.7.1		Are measures in place to address (avoid or minimise) significant environmental impacts?		**66.7**	85
60	Significant environmental impacts are known and measures are being applied to reduce key impacts.	The potential environmental impacts of Norwegian fisheries are well known, and as described in Section 2.1, a review of the environmental impacts of fishing has been carried out through various mechanisms such as ICES and OSPAR, and internal programmes within Norwegian institutions. A number of measures are in place to address environmental impacts of the fisheries. Notably, discarding of commercial by-catches is prohibited in the Norwegian fleet; larger vessels and mobile gear are excluded from inshore areas. Some areas of potential significance have not been fully investigated such as by-catches and potential impacts on PET species, as discussed under Sections 2.1 and 2.2. These measures are all subject to regular review and monitoring as to their effectiveness and are expected to be effective in avoiding or minimising impacts. The Norwegian spring spawning herring fishery is essentially a clean fishery with little impact on the environment. A number of measures are in place to address environmental impacts in fisheries are therefore not relevant for pelagic gears. Measures that apply to all fisheries, including NSSH, include prohibition of discarding of commercial by-catches, protection of areas of cold water coral communities, exclusion of larger vessels and mobile gear from inshore areas and retrieval programs for lost gear to prevent ghost fishing.	Presentations at Norges Sildesalgslag, the Institute of Marine Research and Fiskeridirektoratet 1-2 April 2008		
80	Environmental impacts are known. Measures are being applied to minimise all significant ones and there is evidence that the measures are working.				
100	Measures are in place to avoid all significant environmental impacts and are subject to monitoring and periodic review.				

3A.7.2		Are no take zones, Marine Protected Areas or closed areas for specific periods appropriate and, if so, are these established and enforced?		**33.3**	95
60	Suitability of no-take zones and/or closed areas / seasons has been reviewed against objective biological criteria. Plans are in place to implement some or all of these as appropriate.	No requirement for permanently closed areas specific to the herring resources has been identified. A network of proposed MPA's have been identified within Norwegian coastal waters for general conservation purposes to protect biodiversity (resulting from OSPAR). Closed areas to mobile gear are in force to protect areas with coral reefs and numerous permanent and temporary closures are put in place for specific gear in specific areas. With some exceptions, trawl gear are limited to the waters outside 12 nautical miles. Closed areas are also defined as follows: • The north-eastern part of the EEZ • In the fisheries protection zone around Svalbard • In the territorial and internal water of Svalbard • Closed areas in the economic zone of Norway	Forskrift av 22. Desember 2004 nr 1878 om utøvelse av fisket i sjøen.		
80	Suitability of no-take zones and closed areas / seasons has been reviewed and these have been or are currently being implemented and enforced if and where appropriate.				
100	No-take zones and closed areas / seasons are established and enforced if and where appropriate and, if implemented, the consequences are being monitored.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3 A.8 *(MSC Criterion 11)*		**There are control measures in place to ensure the management system is effectively implemented.**		11.1	
3A.8.1		Are information, instruction and/or training provided to fishery operatives in the aims and methods of the management system?		**33.3**	95
60	Mechanisms exist for the dissemination of information, instruction and training of fishery operatives. Implementation of these mechanisms may not be universally implemented.	Fishery operatives would in Norway in most cases be fishers, as the participation act requires vessel owners to be active fishers (loosely interpreted, so a land-based operative would also fall under the definition). Information on the management system and its functioning is communicated to fishery operatives in a number of ways. Generally, there is considerable interaction between the fishing industry and the authorities on a number of arenas as the Regulatory meeting, annual meetings of the fisheries organizations, preparations to international negotiations, hearings to documents preparing for new legislation or policy developments, etc. Generally, the level of understanding of how the management system works and the grounds for its structure and functions are high in the Norwegian fishing industry. This is important given the number and complexity of regulations applying to the fishery, and to a fishery operative it is actually an asset to be well informed about the management system, as this facilitates operations. Fishers therefore have a strong incentive to have comprehensive knowledge about the aims and methods of the management system. Information on regulations is communicated to operatives directly through Directorate and Sales Organisations, through Fishermen's organisations, through two fishery newspapers, radio broadcasts and the websites of the Directorate, Sales Organisations and Fishermen's Organisation. Fishers are considered to be well aware of the management requirements and regulations.	Presentations at Norges Sildesalgslag, the Institute of Marine Research and Fiskeridirektoratet 1-2 April 2008		
80	Information, instruction and training are provided to fishery operatives in the aims and methods of the management system allowing effective management of the system.				
100	Information, instruction and training are provided to fishery operatives in the aims and methods of the management system allowing effective management of the fishery and operatives demonstrate comprehensive knowledge of this information.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.8.2		Is surveillance and monitoring in place to ensure that requirements of the management system are complied with?		**33.3**	90
60	An enforcement system has been implemented; however, its effectiveness and/or compliance has not been fully demonstrated relative to conservation objectives.	A comprehensive enforcement scheme is in place, with inspections at sea as well as at landings. Also post-landing checks of reported landings against quotas are performed for each vessel. A key feature of the enforcement system is the risk-based approach, whereby comprehensive reviews are regularly undertaken to assess where enforcement resources are most effectively deployed. All vessels above 25 meters (currently, although this is to be extended to smaller vessels in future) are part of a satellite based vessel monitoring system. All vessels >13m are required to keep detailed logbooks, which are checked upon during inspections. Vessels < 13 meters have less detailed reporting requirements. The key document in landings control is the contract note, which is completed for each landing. The contract note contains a significant number of items of information relating to the landing. All contract notes are checked against the central register of landings in the Fisheries Directorate, and misreporting is therefore strictly controlled for. Almost all contract notes are submitted in electronic form. Misreporting is subject to strict penalties. There is generally a high degree of compliance with regulations, which, inter alia, prohibits slippage. Enforcement systems are in place involving Directorate staff in inshore waters and on landing. The Coastguard enforces regulations in offshore waters. Sales Organisations also have an enforcement role regarding landings, checking contract notes against vessel quotas. There is some variation among sales organizations as to participation in control activities. In the case of NOSS herring, most landings are in the area of Norges Sildesalgslag, which has a strict approach in this regard.	Presentations at Norges Sildesalgslag, the Institute of Marine Research and Fiskeridirektoratet 1-2 April 2008 Forskrift om endring av forskrift om satelittbasert overvåking av fiske- og fangstfartøys aktivitet		
80	An effective enforcement system has been implemented and there is an appropriate degree of control and compliance. Enforcement systems include measures to control misreporting.				
100	An effective enforcement system has been implemented and there is a high degree of control and compliance. Robust enforcement systems are in place to control misreporting.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3A.8.3		Can corrective actions be applied in the event of non-compliance and is there evidence of their effectiveness?		**33.3**	95
60	Mechanisms exist or are being developed which can be implemented or applied to deal with non-compliance.	In cases of non-compliance, a range of penalties can be applied by the authorities, with temporary loss of fishing license and heavy economic sanctions as the most severe measures. For minor infringements a series of warnings can be issued. Corrective actions are consistently applied and severe infractions are tried in the courts, which over time have developed a consistent practice in this regard. Corrective actions are well established, codified, understood and tested. Also, selected prosecutors are specifically trained for pursuing fisheries cases.	I1, I2, I3		
80	There are set measures that can be applied in the event of non-compliance although these may not be included in a formal or codified system. These have been tested if/as appropriate and have been shown to be effective.				
100	Agreed and tested corrective actions can be applied in the event of non-compliance.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3 B		**Operational Criteria**		50.0	
3B.1*(MSC Criterion 12)*		**There are measures that include practices to reduce impacts on non-target species and inadvertent impacts upon target species.**		18.1	
3B.1.1		Do measures, principally through the use of gear and other fishing practices, include avoidance of impacts on non-target species and inadvertent impacts upon target species? These would include by-catch, discard, slippage and high grading.		**100**	75
60	Appropriate measures have been implemented that are intended to reduce the major impacts on non-target species and inadvertent impacts on target species, but their effectiveness has not been demonstrated.	In all fisheries there is a ban on discarding which imposes penalties for discarding of specified commercial by-catch species and high-grading of the target species (but not all by-catch species). However, there is an indication that unrecorded slippage may take place within the Norwegian fleet. This would be and additional and avoidable source of mortality on the target stock. Minimum mesh sizes are specified, with strong enforcement and good compliance. For some gears, measures can be taken to avoid by-catches such as the avoidance of setting gillnets in areas of porpoise activity. There are closures of coastal waters to specific gear. In turn fishing with purse seine during the daytime maybe prohibited if there is a risk of killing herring unnecessarily. **L**evels of non-commercial by-catch have not been studied in detail but are expected to be extremely low. Hence measures have not been considered necessary for this fishery. Condition 2 has been raised to address this.	Forskrift av 22. Desember 2004 nr 1878 om utøvelse av fisket i sjøen.		75
80	Measures have been implemented as and when appropriate to avoid or reduce the major impacts on non-target species and inadvertent impacts on target species and there is evidence that they are having the desired effect.				
100	Measures have been implemented to avoid or reduce the major impacts on non-target species and inadvertent impacts on target species, and their effectiveness is clearly demonstrated.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3B.2 *(MSC Criterion 13)*		**There are systems in place that encourage fishing methods that minimise adverse impacts on habitat.**		18.1	
3B.2.1		Do fishing operations implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning or nursery areas?		**100**	100
60	Fishing operations use measures to reduce major impacts on habitat, especially in critical or sensitive zones such as spawning or nursery areas.	The fishery in operation is pelagic and would therefore not interact with benthic habitat.	I1, I2, I3		
80	There is evidence that fishing operations are effective in avoiding significant adverse effects on the environment, especially in critical or sensitive zones such as spawning or nursery areas.				
100	There is direct evidence that fishing operations implement appropriate methods to avoid significant adverse impacts on all habitats.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3B.3 *(MSC Criterion 14)*		**The management system incorporates measures that discourage destructive practices.**		2.2	
3B.3.1		Does the fishery employ destructive fishing practices (such as poisons or explosives)?		**100**	95
60	The fishery does not allow any such destructive fishing practices.	Destructive fishing practices, such as the use of explosives, are prohibited in Norwegian fisheries.	I1, I2, I3		
80	The fishery does not employ any such destructive fishing practices and enforcement is considered sufficient to prevent their use.				
100	The fishery does not employ any destructive fishing practices. There is a code of conduct for responsible fishing, prohibiting these, that is fully supported by fishers.				

3B.4 *(MSC Criterion 15)*		**The management system incorporate measures that reduce operational waste.**		18.1	
3B.4.1		Do measures exist to reduce operational waste?		**100**	90
60	Measures/facilities are in place to reduce sources of operational waste that are known to have detrimental environmental consequences, but further reductions may be possible.	Discarding is prohibited of specified species, and measures exist to reduce catches of juvenile fish. Six factory trawlers also have on-board meal plants. Garbage must be returned to shore and waste reception facilities are in place in ports. There is an obligation to retrieve lost gear, which also has economic benefits to fishers. This is supported by gear recovery programs. NOx emissions are under consideration with aview to control these through levies, contributing to research programmes to further address this issue. CO2 is also subject to a levy (refunded to date as Kyoto targets are considered to have been met through fleet reductions). Refrigerant gases are controlled by regulation (CFC's are not allowed). Fleet reductions have already accounted for many CFC and NOx reductions. Measures are put in place and/or supported by many fishers.	Forskrift av 22. Desember 2004 nr 1878 om utøvelse av fisket i sjøen.		
80	Measures/facilities are in place to reduce all sources of operational waste that are known to have detrimental environmental consequences, and there is evidence they are effective.				
100	Measures/facilities are in place to reduce all sources of operational waste that are known to have detrimental environmental consequences, and there is evidence they are effective and these measures are supported by the fishers.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3B.5 *(MSC Criterion 16)*		**Fishing operations are conducted in compliance with the management system and legal and administrative requirements.**		25.5	
3B.5.1		Are fishers aware of management system, legal and administrative requirements?		**33.3**	95
60	Fishers are aware of key management and legal requirements.	The 10.000 fishers in Norway are generally well aware of the various aspects of the management system and its legal requirements to conduct. Regulations are developed in close cooperation with the fishers´ organizations, and regulations are a very important operational parameter for fisheries. For that reason there is an intimate understanding of the rules that the industry is expected to play by. A lot of effort is put into communication of regulations to fishers: the Fisheries Directorate post them on their website and publish them in the industry newspaper that has three issues per week. Also the fishers´ organizations communicate regulations to their members. Regulations that are to apply immediately, as for example the closure of a fishery, are also communicated by the Norwegian broadcasting company in conjunction with news.	Presentations at Norges Sildesalgslag, the Institute of Marine Research and Fiskeridirektoratet 1-2 April 2008		
80	Fishers are aware of management and legal requirements upon them and are kept up to date with new developments.				
100	All fishers are aware of management legal requirements through a clearly documented and communicated mechanism such as a code of conduct.				

3B.5.2		Do fishers comply with management system, legal and administrative requirements?		**33.3**	85
60	Fishers appear generally to comply with requirements, but there is incomplete information on the actual extent of compliance.	The level of compliance is relatively high. Data from inspections at sea and upon landings indicate that the number of serious infractions is relatively low. The management system in general has a high level of legitimacy among fishers, and the need to manage resources through restrictions on access and execution of the fishery is well understood. On the other hand, the number of infractions is not insignificant, indicating that even though the need for management is well understood, rules are not always abided with, albeit with no indication of consistent violation.	Presentations at Norges Sildesalgslag, the Institute of Marine Research and Fiskeridirektoratet 1-2 April 2008		
80	Fishers appear compliant with relevant management and legal requirements and there are no indications of consistent violations.				
100	Fishers are fully compliant with, and fully supportive of, legal, and administrative requirements, such as through a code of conduct.				

INDICATORS AND GUIDEPOSTS		Comments	Audit Trace Ref.	Weight	Score
3B.5.3		What is the record of enforcement of regulations in the fishery: quota control, by-catch limits, MLS, mesh regulations and closed areas?		**33.3**	100
60	There is information on breaches of regulations and on corrective action to prevent or curtail.	The NSSH herring fisheries are strictly controlled. All vessels above 25 meters are obliged to carry satellite transponders, and this obligation will be extended to smaller vessels in the future. Operations at sea are subject to inspections by the Coast Guard, and near shore operations and landings are inspected by the Fisheries Directorate in cooperation with Norges sildesalgslag. Buyers of fish have to be recognized by the sales organization. Of coastguard inspections in 2006 (1,847 inspections), 44 (2%) were reported to the police and 21 involved bringing a vessel to port. In addition, 104 warnings were issued. These statistics include foreign vessels. Similar statistics are available from Directorate inspections in inshore waters and port inspections. In the context of Norwegian fisheries management it would however be misleading to focus on such statistics, as a risk-based approach is taken to enforcement. The various parties involved in enforcement coordinate their activities in several meetings annually. A risk-based approach to enforcement has brought a strategic approach is taken to what and where enforcement activities are to be directed. The target is areas where the effect of inspections and other enforcement activities is expected to be largest. In the event of infractions, there is a standard set of penal actions that apply, corresponding to the severity of the breaches.	Presentations at Norges Sildesalgslag, the Institute of Marine Research and Fiskeridirektoratet 1-2 April 2008 Forskrift om endring av forskrift om satelittbasert overvåking av fiske- og fangstfartøys aktivitet		
80	Evidence of rigorous monitoring of all the enforcement measures and evidence of effective actions taken in the event of breaches is available.				
100	Strong evidence of rigorous monitoring and control of the enforcement measures through for example satellite monitoring, shipboard observers and nominated landing ports. Strong evidence of firm and effective action taken in the event of breaches.				

INDICATORS AND GUIDEPOSTS	Comments	Audit Trace Ref.	Weight	Score

3B.6 *(MSC Criterion 17)*		**The management system involves fishers in data collection.**		18.1	
3B.6.1		Do fishery operatives assist in the collection of catch, discard and other relevant data?		**100**	75
60	Fishery operatives are involved in the collection of some catch, discard and other information.	Fishery operatives assist in the collection of data from the fisheries. All catches and landings are reported. Fishers may assist in identifying areas of high juvenile fish densities. With some variation according to the type of fishery, a number of data items are registered. Discards of specified commercial species are banned in Norway. However there appears no consistent fishery derived data on slippage of mackerel and other species and discarding of non-commercial species. A “reference fleet” consisting of a representative group of vessels is engaged in more comprehensive collection of data for research purposes. There were 5000 samples of herring taken by the reference fleets in 2005. Conditions 1& 2 have been raised to address this.	I1, I2, I3		
80	Fishery operatives are regularly involved in the collection and recording of relevant catch, discard and other information.				
100	Fishery operatives assist significantly in the collection and recording of all appropriate catch, discard and other information.				

12.2 Appendix B: Peer Review Reports

Peer Review Report 1

The background to the three fisheries has many common elements and there is considerable and inevitable overlap in the text of all three Moody Marine (MM) reports, and indeed there is overlap with the text of the recent reports on Norwegian haddock and cod longline fisheries that we reviewed recently. Equally, many of the points made by ourselves apply similarly to all three fisheries. Several points arose previously in our reviews of the reports on the longline fisheries and MM should take care that the same problems do not recur in future reports (e.g. the issue with definitions of by-catch and discards).

Of the three fisheries covered in the present set of reports, we have the fewest issues with the proposed certification of the Norwegian (AtlantoScandian) Spring Spawning Herring Fishery, which exploits a huge stock that currently appears to be in little danger – although, as with many pelagic fish species, this can change quite rapidly. The status of the other two stocks in consideration is more problematic. The mackerel stock is regarded by ICES as at risk and is being harvested unsustainably: this alone seems contrary to the rationale for certification. The autumn spawning herring fishery has arguably never been adequately managed (through no fault of the present clients) and the current proposal by ICES to abandon previously accepted biological reference points inspires little confidence that the situation will improve. We feel that the MSC certification scheme risks being brought into disrepute by offering certification to fisheries that are not currently demonstrably sustainable, even where no fault lies with the client.

Some common points on the fisheries and on the reporting:

1. All three fisheries seeking certification are part of large fisheries involving fleets from other countries and we again ask whether it is appropriate to certify this kind of fishery.
   Moody Marine: The process takes care of this in that Principle 1 looks at the whole stock and the effect of all the fisheries exploiting it whilst Principles 2 & 3 relate only to the unit of certification.
2. The Norwegian fishery management system is generally excellent, although the rate of inspection is low (see our reviews of the reports on the Norwegian long-line fisheries) and there are issues with underreporting of landings and the almost complete absence of adequate monitoring of by-catches and discards.
   Moody Marine: The team were convinced of the efficacy of the Norwegian management system during the site visit. We saw demonstrations of the real time monitoring of vessels activities and catches, and we spoke separately to enforcement officers and the ministry.
3. The research on the ecosystem involves lethal sampling of dolphins, something most consumers would probably regard as a highly unsuitable characteristic of an MSC certified fishery (regardless of whether this is the responsibility of the clients, which in this case it clearly isn´t).
4. The definitions of “by-catch” and “discards” used by MM in the reports continue to be troublesome. The idea that “by-catch” refers only to unwanted catch that is *retained* (e.g. page 23) is at odds with the usual use of the word and would imply, for example, that there is no such thing as marine mammal by-catch. The Norwegian law about discarding is described variously as forbidding all discarding, forbidding discarding of fish which would die if released, and forbidding the discarding only of certain specific species. These three definitions appear to be mutually exclusive so clarification is needed!
   Moody Marine: Definitions updated within report
5. Some parts of the text appear to have been constructed by cutting and pasting text from previous reports, and even text from ICES reports. Some sections, especially those on ecosystem studies, are notably disjointed. I think we would accept that the cut-and-paste approach is not in itself wrong, especially when one is re-using one’s own writing, but care really needs to be taken to harmonise style and make sure the sequence of material is logical.
   Moody Marine: point noted

6. Use of literature needs more care, at least in some sections. Some references appear more than once in the lists of citations. One of my own publications is mis-cited in all three reports. Pierce et al (2002) (not Pierce 2002) is a small-scale study (something explicit in its title) and its findings should not be extrapolated uncritically to wider areas. Our observation that cetacean by-catch events "occur no more than 5 times per 100 hauls" was a statement about the lack of statistical power associated with a sample of 69 hauls. If the marine mammal by-catch rate was actually this high, all marine mammal populations in the area would be in serious trouble! I would also query use of the Santos et al (2005) ICES paper as a source, since Santos & Pierce (2003) - a review paper from a journal –gives a fuller history of predation on herring by porpoises, something which seems to have been much more important in the past).
   Moody Marine: Checked and amended where appropriate
7. There are also various spelling mistakes and typographic errors (references appearing more than once in the reference list, varying font size, extra full stops, justified and unjustified text, figures split over two pages, etc) throughout. Figure legends are too brief to be informative.
   Moody Marine: Checked and amended where appropriate

Norwegian (AtlantoScandian) Spring Spawning Herring Fishery

General comments

The report on the Norwegian Spring Spawning Herring (NSSH) covers both the purse-seine and the pelagic trawl fisheries. It is noted that "there would be the need for two Units of Certification" since there are two types of gear involved. Although there are separate paragraphs for each gear throughout the text and notably in the indicator tables, the final scoring appears not to distinguish between the two. The certification of this fishery appears to be reasonably well justified, particularly on account of the healthy state of the stock, although the stock has declined - and recovered - in the past.

The background on the biology of the species and the history of the fishery is comprehensive and detailed with a wide use of a well-balanced combination of scientific papers, ICES reports and other grey literature to back up the information given. Nevertheless, the authors lose their way once they come into the ecosystem part of the report and these comments (positive and negative) can equally be applied to the other two reports. The ecosystem section starts by giving details of all the work being carried out on different ecosystem components but fails to address the position of spring spawning herring (SSH) in the system. There are several vague sentences, which imply that a substantial amount of work has been done without demonstrating that it is relevant to herring (e.g. "there has been observed a very clear relationship from primary production to the higher trophic levels", "These studies have placed spring-spawning herring within the foodweb of the Norwegian and Barents Seas and Faroe regions" "mass-balance trophic models … alternate fishing and environmental change scenarios to be examined on ecosystem components, which includes herring", "A large number of multispecies models have been developed to examine ecosystem interactions between exploited species"). We would not characterise GADGET as a "simpler model" or one that "looks at an aspect of the total ecosystem". GADGET concentrates on a number of prey-predator species most likely to have interactions with the target species (i.e. cod, minke whales, cod, herring) which is also the case for the MSVPA, IBMs, etc.

The deliberate killing of *Lagenorhynchus* spp to study their diet, biology and contaminant burden is mentioned here as a "further ecosystem study". Both white-beaked and white-sided dolphins are covered by the Bonn Convention, which we have raised in our previous reviews as a cause for concern. As we said previously, if this became widely known it would certainly not help the credibility of the MSC certification scheme.

The choice of figures to illustrate this section is not very informative: a map of the ICES areas, a map of the area covered by the management plan (which needs a better legend to indicate what the shaded area

means) and two maps of sightings of mammals and seabirds. A figure from the ICES report showing the variability in landings, SSB and recruitment over time would be more useful.
Moody Marine: legends added

The definition of "by-catch" given in the main text (i.e. that part of the unintended catch that is retained) contradicts the normal use of the term (i.e. unintended catch, regardless of whether it is retained or discarded), which is in any case apparently used elsewhere in the document and in the tables. It is stated in the text that "while fishing for SSH … by-catch of cod, haddock and saithe are prohibited" – which could be achieved probably only by not fishing in areas where other species occurred! Page 25 of the tables makes clear that ICES does not receive data on by-catches in the fishery but that the clients themselves acknowledge that by-catches include saithe (among other species) – which, according to the main text, is illegal.

The section on interactions with PET species presents insufficient detail on the studies which are used to extrapolate information on by-catches. Napier et al (2002) is cited but the gear in which the gannets were by-caught is not specified so it is not clear how relevant it is to the present case. There is a danger here of using information from different areas to infer on levels of by-catch, especially when based on small-scale studies. Information on observer coverage (and not just the number of hauls observed) is vital to put by-catches into perspective. On page 23, the report refers to a "reference fleet" collecting information on by-catches but does not explain what this reference fleet is. (The explanation finally appears on page 66 of the tables!)
Moody Marine: Further information has been added to the text on PET species.

With regards to the status of the stock, there is no doubt that SSH is at present at a healthy level and ICES considerers the stock to have full reproductive capability. There is a Management Plan in place to ensure its sustainable exploitation, with TACs being agreed upon by all nations involve in the fishery. In this section of the report the authors have taken full paragraphs, verbatim, from the relevant ICES WG report (WGWIDE). This results in the presence of text which, out of context, provides no useful information (e.g., on page 30, "… few large year classes which can cause problems with the estimation of certain parameters"). Moody Marine: This stock was not dealt with by the new WGWIDE until the WG was formed in 2008. I have not quoted direct from this report because it post dated the site visit and data collection. Useful and relevant sections from previous WG reports have been used. The piece of text quoted is referring to problem areas in the assessment caused by migration and distributional changes of large year classes and this has now been clarified within the text.

If the quotas are divided between gear types as follow: 50% purse seiners, 10% trawlers and 40% smaller coastal purse seiners (page 14), the fact than "on average about 57% of the SSH catch originated from purse seiners, 12% from pelagic trawlers ad 31% from coastal purse seiners" implies that both purse seiners and pelagic trawlers overfish their quotas. Related to this point, the authors could have introduced information on the shift in stock distribution, as data from research surveys have shown that the Norwegian SSH has stopped using the fjords for wintering and is now using the open waters areas. This has consequences for the fishery since it implies longer trips, fishing on less concentrated fish schools and a higher vulnerability to bad weather for the fishing vessels. This shift in distribution makes coastal vessels less likely to fish SSH and to use their quotas. Moody Marine: Historic and recent changes in migration and wintering areas are adequately covered in section 2.1. Small changes in annual uptake by different vessel types are the result of national arrangements, quota swaps etc.

On page 38 of the tables it is stated (based on results of ECOSIM modelling) that there would not be any major consequences for cetaceans of increasing the harvest of herring within the management plan limits. The next sentence states that "current low levels are of some concern" and we assume the authors refer to cetacean population numbers which are not known in detail at present. Has an ECOSIM model been run including current figures for cetacean populations in the area? More detail is needed when these kind of statements are given. Three references given for this section but one is not in the reference list and the only

one on ECOSIM is for the Faroe islands.

On page 61 of the tables section in, the score obtained for section 3B1.1 is not clear as the figures 100 and 75 both appear. Given the problem of slippage, that "level of non- commercial by-catch has not been studied in detail" and that "condition 2 has been raised to address this" we assume the "100" should not appear there. Moody Marine: The score is 75

Specific comments

Moody Marine : Typographical and grammatical amendments have been revised where appropriate

Peer Review Report 2

Moody Marine Assessment of Norges Sildesalgslag purse-seine and trawl

Norwegian Spring Spawning Herring Fishery

Overall Assessment

There are a few points in the text report that need revisiting and specific details that need to be reconsidered. It is possible that revised scores might affect the overall assessment but the effect of changes is likely to prove very marginal. Overall, the report and assessment is both fair and balanced and providing the few specific points are looked at and reconsidered I have no difficulty in supporting the recommendation for certification.

Client Report

The main body of the client report is very comprehensive and exceptionally detailed – arguably, unnecessarily so. This provides a very firm basis against which to review the analytical assessment against the MSC Principles. Nevertheless, there are a few points that are worth picking up.

In view of the great detail given throughout the Client Report, including §2.2 *History of the Fishery*, it is perhaps surprising that the authors did not identify the role played by the puretic (power) block c. 1960. Its introduction enabled rapid hauling of purse seine with concomitant safe operation at sea, away from the fjords for the first time. As a consequence, total NE Atlantic herring landings soared to almost 4 Mt followed by the inevitable collapse (see Norwegian paper in: Measurement of Fishing Effort. *Rapp. P.-v. Reun. Cons. Int. Explor. Mer*, 168 – cannot recall authors, but it might be Østvedt**)**.
Moody Marine: Information on the power block has now been added to the text

The section on §2.6 *Rare, Protected and Iconic Species* covers the usual suspects, birds, mammals and large elasmobranchs – including the blue (common) skate *Dipturus batis*. One assumes that the inclusion of large skates in a pelagic fishery assessment is to provide evidence of a job well done but the failure to make any reference to blue-fin tuna *Thunnus thynnus* is an unexpected omission from this section.

The Atlantic blue-fin tuna is listed as threatened by the IUCN. Between WW1 and WW2 there was a targeted sport fishery in the North Sea associated with the late summer-autumn herring fishery. Although the sport fishery was never revived following WW2, there was a

targeted Norwegian commercial fishery in the Northern North Sea until the late 1960s,[1] early 1970s, when the species ceased recruiting to the North Sea (for non-fishery reasons).[2] Despite the collapse of this fishery, they were taken, albeit rarely, in the UK SW mackerel purse-seine fishery (pers. obs). It would seem reasonable, therefore, to assume that the same might be true in northern North Sea pelagic fisheries and the specific question should be put to the client. If the occasional blue-fin tuna still reaches Norwegian waters it seems far more likely that they could be taken than skates and rays. Similarly, porbeagle shark (*Lamna nasus*) is probably more likely to be taken than blue shark (*Prionace glauca*). Moody Marine: Blue- fin tuna has now been considered and added to the text

The third paragraph in §3.2 Management Responsibilities and Interactions is ambiguous and confusing. It opens 'As regards Mackerel fisheries ---' and then states that 'the stock is an exclusive Norwegian stock'. Not wishing to put too fine a point on it, this is garbage and needs clarifying.

As a matter of interest, if not fact, the 'increasing presence of adult mackerel in the southern Norwegian North Sea' is not a 'new observation (§4.2 *Monitoring of Stock Status*). The mature mackerel went well into the Norwegian Sea in the mid 1970s when it was assumed to be a response to warm summers (see ICES Mackerel WG reports). Also, some (0 group) mackerel were always taken each year in the ICES-coordinated Barents Sea 0 group surveys at that time.[3] Moody Marine: This has been considered in report.

Condition 1

It is right and proper that everything should be done to encourage fishing practice that minimises the risk or need to slip catches in pelagic fisheries. Nevertheless, the proposition that skippers should be expected to record all instances of slipping and estimate the quantity involved is barely credible.

In the first instance, as was decided with respect to the UK mackerel fishery in the 1970s; if there is any restriction on slipping, there must always be a clause that allows a skipper to slip the catch if he believes the safety of his vessel is at risk. Unless there is an independent master mariner present at the time, who is to say the skipper was wrong or exaggerating when he invokes the 'safety' clause?

Even without other penalties, if slipped catches must be recorded and reported, such catches must be incorporated in future stock assessments. In other words, they will be treated exactly the same as landed catch except the skipper will gain no financial benefit from the catch. This being the case, skippers will seek to slip catches when there is least likelihood of being observed. Whilst this may be more problematic than in a mackerel fishery (where the dead fish sink immediately) herring have a physostome (i.e. open) swim bladder that retains relatively little gas, particularly if they have been compressed in a trawl, and tend to sink within minutes rather than hours.

Realistically, the emphasis of these two conditions should be placed on cooperation "with scientists in the investigation of slippage mortality by active support of research programmes and observer coverage".

Moody Marine: Yes, it is always accepted that there are instances where the skipper needs to slip a catch for safety reasons. There is no suggestion that reporting slipped catches will be set against the quota but the data would be welcomed and used by the ICES assessment WG. It may be possible to add a sentence to the condition which emphasises the requirement to cooperate with scientists in the investigation of the extent of slippage. Mortality through slippage of herring can be regarded as 100% so it is expected that there is limited value in research projects to look at mortality.

Condition 2

Slipped catches apart, bycatch and discarding are rarely a significant problem in pelagic fisheries and there should not be a problem in expecting skippers to record non-target species, particularly of PET species which one would expect to be a rare occurrence.

Other points are picked up in the review of scoring below. Although there are instances where the scores need to be looked at, and it is possible that revised scores might affect the overall assessment, the effect of changes are likely to be marginal. Overall, the report and assessment is both fair and balanced and providing the few specific points are looked at and reconsidered I have no difficulty in supporting the recommendation for certification.
Moody Marine: no comment

Principle 1

1.1.1.4 A very conservative score.
Moody Marine: All the GP 80 criteria are met but there is only some information on growth and feeding therefore a score of 85 is justified.

1.1.1.5 But this is gilding the lily. In all honesty, hand on heart, can we say more about S&R that justifies a score greater than 80? Moody Marine: All GP 80 criteria are met and there is some understanding of the relationship between SSB and recruitment through recent research. A score of 85 is certainly justified; we have reduced the score for this PI to 85 in light of reviewer comments.

1.1.1.7 We undoubtedly have ‘knowledge’ etc but I think we are rather more short of ‘comprehensive knowledge’ than 95 implies. We know that environmental variables influence recruitment and migration. We know that some specific variables correlate with some specific observations e.g. the effect of Kola cold water, but we are well short of ‘comprehensive knowledge and a score of 85, if not 80, would be more realistic. Moody Marine: accept a reduction to a score of 85 on the basis that the knowledge is sufficient to meet the GP 80 criteria and there are only some aspects of the GP 100 which are met.

1.1.4.1 There are certainly adequate measures in place to ‘contain’ landings but not ‘harvest’. The Client Report draws attention to the problems and uncertainties surrounding discards and slipping. Such practice may be prohibited but the report’s conditions acknowledge that it may be a (significant) problem. A score in excess of 80 seems too generous. Moody Marine: This concerns the mechanisms in place to control harvest not their effectiveness. There is an observer programme and a

comprehensive programme of enforcement boardings at sea. The score of 90 is considered to be justified.

1.1.5.2 If the uncertainties about slipping etc are sufficient to warrant stipulating a condition on the fishery, they must be sufficient to warrant inclusion in the assessment. Is this the case; do the assessments include and element of unreported catches? If not, the score is too high. If the score is justified, there is no need for the Condition concerning slippage. Moody Marine: We accept that the extent of slippage discarding is not known and it has not been included in the assessment process since 1994. The WG consider that the in view of the huge catch, the impact of discard mortality is likely to be small and regard it as a minor problem. Agree that the score could be reduced to 80 on this basis. We have added more explanation in the scoring comments to support the reduced score and further explanation into the report in section 4.2 paragraph 3.

Principle 2

2.1.2.1 Is the reference to the Scottish sampling programme relevant here. Were the Scottish observations made on a part of the NSS herring fishery or something completely different. If it was not on this stock, delete the text. Moody Marine: Text in the table amended to address this

2.1.2.2 As 2.1.2.1

If the concern is sufficiently great to justify this score, then the Condition is also justified but the high scores highlighted above in relation to slippage are not justified. On balance, surely one would expect by-catch slippage to be most likely other than when a clean catch of herring is taken.

If a trawler takes by-catch species, e.g. horse mackerel, is it all pumped aboard and then (illegally) pumped (dead) overboard or can the trawlers slip a catch without bringing it aboard? This should be specified. Moody Marine: Specified now, but we do not feel that this alters the scoring

2.1.5.4 The greater part of the comment provided deals with principles rather specifics. If a score of 90 is justified it must be based on specific knowledge and specific examples, not a broad reiteration of basic biological interactions. The information provided barely justifies a score of 80. Moody Marine: Given the Ecopath models available the team still feel this score is above 80.

2.2.1.1 No mention of pelagic PET fish – blue-fin tuna, porbeagle shark.
Moody Marine: added to the text

2.2.1.2 No mention of pelagic PET fish – blue-fin tuna, porbeagle shark.
Moody Marine: added to the text

Principle 3

3A.8.2 If everything in the garden was as rosy as this claims there would be no problems or concerns with respect to slipping and, or discarding. In view of concerns expressed earlier and the potential implications for overestimating SSB, a score of 90 is too high. Moody Marine: We feel the score is justified based upon the evaluation of the fishery at the particular time of assessment, particularly as slippage has been the subject of some dispute as to its effect on mortality. This issue has, however, been addressed under Principal 1.

12.3 Appendix C: Client Action Plan

Appendix - Client action plan

Norges Sildesalgslag (NSS) has drawn up the following action plan in response to the points raised in this assessment paying particular attention to the requirements laid down as conditions of this assessment, as well as the recommendations as shown in section 11 of the report.

Condition 1. Slippage

During the first year of application of this certificate, NSS, on behalf of its participating vessel owners/skippers, will enter into discussions with Directorate of Fisheries (DOF) staff and Institute of Marine Research (IMR) staff with a view to:

- drawing up and agreeing any necessary reporting formats for the recording of information on the nature and incidence of the slipping of catches

Within two years of certification, NSS will provide evidence of proactive support of research and observer monitoring of slippage.

Within three years, NSS will provide an initial evaluation of any potential impacts of the actions taken.

Condition 2. By-catches.

By the time of the first surveillance audit, NSS will provide the Certification Body with evidence that it has in co-operation with Norwegian Fishermen's Association and Directorate of Fisheries designed and initiated regular sampling programmes of Norwegian Spring Spawning Herring Fisheries catches to provide statistically robust estimates of the by-catch of all species.

Within three years, NSS will provide an initial evaluation of any potential impacts of the actions taken.

Agreed by Knut Torgnes on behalf of NSS

.....February 2009