



Status of Marine Mammals in the North Atlantic

THE FIN WHALE



This series of reports is intended to provide information on North Atlantic marine mammals suitable for the general reader. Reports are produced on species that have been considered by the NAMMCO Scientific Committee, and therefore reflect the views of the Scientific Committee of NAMMCO.

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FIN WHALE (*Balaenoptera physalus*)

The fin whale is a large baleen whale, second in size only to the blue whale. Fin whales have a small curved dorsal fin set about two-thirds of the way back along the body. They are dark grey to brownish black in colour along the top of the body, while the throat, belly and undersides of the flippers and tail flukes are white. The head is asymmetrically pigmented, with the white colouration extending up over the right lower jaw and inside the mouth cavity. The left side of the jaw is quite dark in contrast. It is not known why fin whales are coloured in this way, though there is some speculation that it may have something to do with their feeding strategy.

Fin whales have a long streamlined body, averaging about 21 m in length for adult males and 22.3 m for adult females in the Southern Hemisphere. They are slightly shorter in the north, averaging 19 m for males and 20.5 m for females (Martin 1990). Adult fin whales can weigh between 45 and 75 tonnes, depending on the time of year and their individual body condition.

The biology of fin whales sampled from the Icelandic catch has been studied between 1977 and 1989 (Lockyer and Sigurjónsson 1992). In this area a female fin whale first gives birth at an age between 7 and 12 years, and adult males reach sexual maturity at about 6-10 years of age. The age of sexual maturity for both sexes has varied significantly over time, possibly in response to food availability and/or hunting pressure. Calves are believed to be born at 2 to 3 year intervals. Calves nurse for 6-8 months and are weaned when they are 10 to 12 m in length. Mating and calving are thought to occur during the winter months, but no specific mating or calving “grounds” have been reported for fin whales. Several hybrids of fin and blue whales, some pregnant, have been recorded, and 5 genetically confirmed (Spilleart *et al.* 1991, Árnason *et al.* 1991, Bérubé and Aguilar 1998).

Fin whales are very fast swimmers, reportedly reaching speeds of 20 to 25 knots in the open ocean. Fin whales are more gregarious in behaviour than other baleen whales, and while individuals are commonly observed, they are often found either in pairs (as in mother and calf) or in small groups. Larger, loosely associated groups of 100 or more whales can be seen on the summer feeding grounds. The fin whale dives to a maximum of about 470 m and communicates using various moans, pulses, clicks, and grunts, as well as breaching.

Distribution and stock definition

The fin whale has a worldwide distribution, ranging in all oceans from tropical to polar regions. They are largely pelagic and are rarely seen in near-shore waters. They are migratory, and exhibit seasonal movements between lower latitudes in winter and high latitudes in summer. Some taxonomists classify fin whales from the Northern and Southern Hemispheres as two subspecies, *B.p. physalus* and *B.p. quoyi* respectively. There is generally considered to be at least 3 distinct worldwide populations: Southern Hemisphere, North Atlantic and North Pacific. These populations do not mix across the equator and are further subdivided genetically..

Within the North Atlantic, fin whale stocks have been only generally identified, based primarily on summer feeding concentrations of whales. Fin whales appear to return to the same feeding grounds year after year, and tagging studies have shown little relocation of whales outside of the summering stock areas in which they were tagged (IWC 1992). There is evidence from morphometric (body shape) (Jover 1991) and genetic (Daníelsdóttir *et al.* 1991, 1992, Bérubé *et al.* 1998) studies that there are several stocks of fin whales in the North Atlantic. In addition, it has recently been found that fin whales can be differentiated into regional groups by the sounds they make (Hatch and Clark 2004). However, at present there is not enough information to place boundaries around fin whale stocks with certainty. Current management is based on stock boundaries derived by the International Whaling Commission in 1977, based on the best available evidence at that time (Donovan 1991) (see Fig. 1). More recent evidence has not been contrary to this suggested stock delineation.

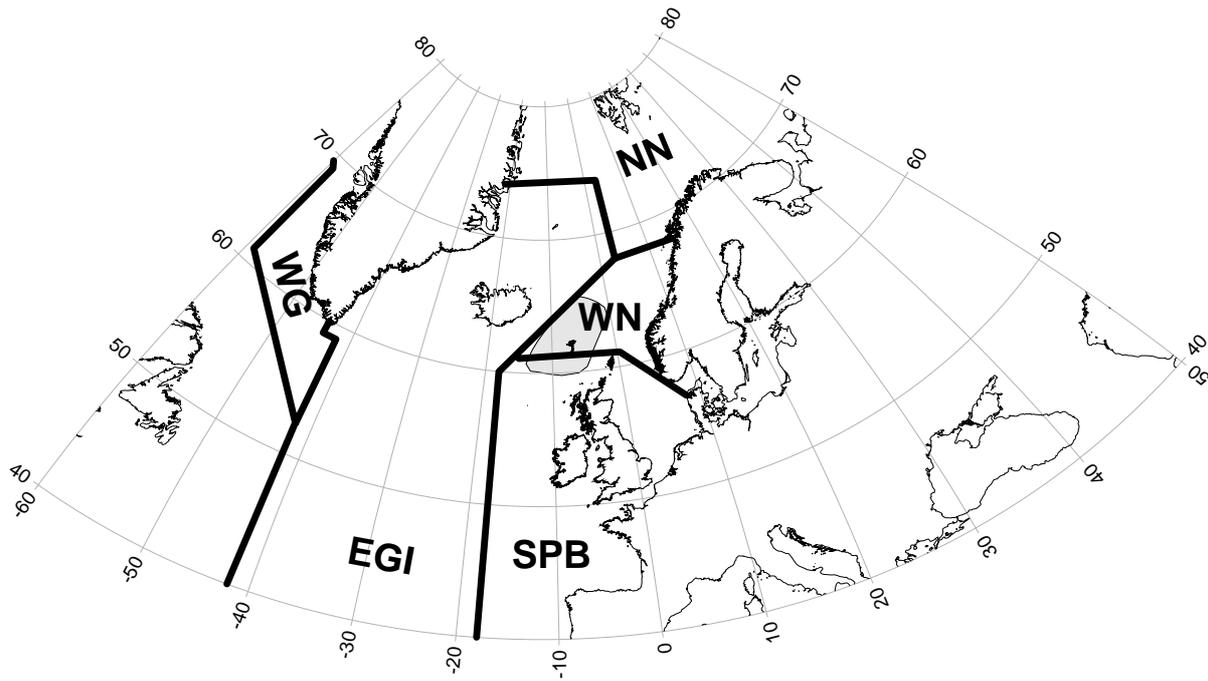


Fig. 1. Putative stock areas for fin whales in the Northeast and Central Atlantic. Adapted from Donovan (1991). The shaded area is the Faroe Exclusive Economic Zone. West Greenland (WG); East Greenland – Iceland (EGI); North Norway (NN); West Norway and Faroe Islands (WN); British Isles, Spain and Portugal (SPB).

Ecology

Like other large baleen whales, fin whales feed by “gulping” in large swarms of prey. Fin whales are known to have a broad diet including copepods, krill and pelagic fish such as capelin and juvenile herring (Martin 1990, Woodley and Gaskin 1996, Sigurjónsson and Víkingsson 1997, Flinn *et al.* 2002). Squid may also be eaten in some areas.

Feeding activity varies greatly by season due to variation in prey abundance. It is important for fin whales to build up energy reserves in the form of stored fat and blubber during the summer, since their prey may be less available in their wintering areas.

Fin whales have very few natural predators, due to their large size. Calves and even adults may occasionally be taken by killer whales.

Abundance and trends

The most recent large scale survey from which estimates are available, the North Atlantic Sightings Surveys (NASS), were conducted co-operatively by Norway, Iceland, the Faroe Islands (with participation from Greenland in 1987 and Spain in 1987 and 1989) in 1987, 1989, 1995 and 2001, and covered much of the North Atlantic north of 50° and west to Greenland. The surveys were conducted primarily from ships, but coastal Iceland (where few fin whales were found) and West Greenland were surveyed by plane. Some available abundance estimates by stock area (Fig. 1) are listed in Table 1. All estimates are probably underestimates, as the entire area of fin whale distribution was not covered in the surveys, and the estimates are not corrected for whales that were diving when the survey ship passed, or whales that were missed by the observers.

The area to the west of Iceland, between Iceland and East Greenland, in the East-Greenland-Iceland stock area, holds the most dense summer concentration of fin whales in the North Atlantic. Abundance estimates for this area appear to indicate an increasing trend, although the difference between the highest and lowest estimates is not statistically significant. Smaller numbers of fin whales are present off North Norway, where there is no indication of any trend in abundance. Numbers

appear to be relatively low off West Greenland, but it should be noted that the surveys there may not have covered the entire distribution area of fin whales. Estimates for other areas are either not available or have not been compiled by stock area.

STOCK	YEAR	SURVEY	ESTIMATE	cv	REFERENCE
East Greenland-Iceland	1988	NASS-87+89	15,614	0.18	IWC (1992)
	1995	NASS-95	18,932	0.16	NAMMCO (1998)
	2001	NASS-01	25,352	0.13	NAMMCO (2003)
North Norway	1995	NASS-95	4,487	0.23	Øien (2003)
	1996-2001	NILS-96-01	3,946	0.28	Øien (2004)
Faroe Islands EEZ	1987	NASS-87	319	0.41	NAMMCO (2004)
	1989	NASS-89	345	0.53	NAMMCO (2004)
	1995	NASS-95	413	0.31	NAMMCO (2004)
	2001	NASS-01	1,612	0.33	NAMMCO (2004)
West Greenland	1988	NASS-87+89	1,046	0.35	IWC (1992)

Table 1. Some abundance estimates for fin whales in the North Atlantic. EEZ- exclusive economic zone.

Current management and utilisation

The fin whale falls under the management jurisdiction of the International Whaling Commission (IWC) for those countries that are members. In 1986, the IWC instituted a temporary moratorium on commercial whaling. Greenland continues to hunt fin whales under “aboriginal subsistence” quotas, which do not fall under the moratorium. Iceland withdrew from the IWC in 1992, and rejoined in 2002 with a reservation against the moratorium, but has not harvested fin whales since 1989. No other country in the world presently has a directed harvest of fin whales (see Table 2).

Fin whales were heavily exploited in the modern whaling era, after the invention of the steam ship and explosive harpoon in the late 1800’s in Norway made it possible to catch them. Fin whale catches increased through the early 1900’s, and reached over 30,000 per year worldwide in the late 1950’s and early 1960’s (Tønnessen and Johnsen 1982, Martin 1990). Although the vast majority of these were taken in the Southern Hemisphere, the resource was also considerably depleted in the north. Whaling was banned in Norway in 1904, mainly because of a belief by fishermen that whales herded herring to the coast, thereby making them accessible to fishermen. However, by this time it was already obvious that stocks off northern Norway were severely depleted (Tønnessen and Johnsen 1982)

Norwegian companies established whaling stations in many areas of the North Atlantic after depleting whale stocks off their own coast (Tønnessen and Johnsen 1982). Whaling stations were established in Iceland, Spitsbergen, the Faroes, the Shetland Islands, Ireland and the Hebrides, and in Newfoundland. In all areas, the same scenario was repeated: a whaling station was established in a new area, followed by good catches and rapid expansion, followed by declining catches until whaling became unprofitable. In some areas this process took as little as 10 years. In most areas, the initial phase of whaling was over by 1920 (Tønnessen and Johnsen 1982).

Harvest was especially heavy around Iceland, and led to a noticeable decline in catch rates for fin whales there between 1901 and 1915. (IWC 1989, NAMMCO 2000). The situation was serious enough that it led to Iceland imposing a moratorium on whaling in Icelandic waters in 1915. When whaling resumed in 1935 west of Iceland the stock appeared to have recovered there, possibly through both natural population growth and immigration from other areas (NAMMCO 2000).

Year	Iceland	Greenland	Faroes	Spain	Total
1983	144	7	5	120	276
1984	167	10	2	102	281
1985	161	8	0	48	217
1986	76	9	0	0	85
1987	80	9	0	0	89
1988	68	9	0	0	77
1989	68	10	0	0	78
1990	0	19	0	0	19
1991	0	16	0	0	16
1992	0	22	0	0	22
1993	0	13	0	0	13
1994	0	20	0	0	20
1995	0	12	0	0	12
1996	0	19	0	0	19
1997	0	13	0	0	13
1998	0	11	0	0	11
1999	0	9	0	0	9
2000	0	7	0	0	7
2001	0	13	0	0	13
2002	0	6	0	0	6

Table 2. Recent catches of fin whales in the North Atlantic. Compiled from IWC and NAMMCO Annual Reports.

Fin whaling resumed in most areas after World War 2. In Norway and the Faroes, whaling continued until 1971 and 1984 respectively, when declining or variable catches and low prices made the operations unprofitable. Commercial whaling was discontinued in Iceland in 1986, because of the imposition of the IWC moratorium. During 1986-1989, fin whales were caught as a part of a scientific research programme (Table 2).

The only area in the world where fin whales are hunted today is West Greenland, under an IWC "subsistence whaling" quota of 19 fin whales per year. Recent harvests have been lower than the quota level (Table 2).

Threats

Some fin whales are killed accidentally in collisions with ship traffic, though there are no data available on the scale of this problem. Another potential threat is pollution of their habitat, for example an oil spill on their feeding grounds. Noise from seismic exploration, military activities and shipping could affect fin whales directly or by interfering with their communication, but the effects are not known (IWC 2005). Fin whales rarely become entangled in fishing gear.

Status and outlook

The North Atlantic Marine Mammal Commission has an ongoing program to conduct assessments of fin whale stocks in the North Atlantic. The Scientific Committee of NAMMCO began this process in 1999 (NAMMCO 2000), and to date has concentrated mainly on the East Greenland-Iceland stock and fin whales around the Faroe Islands. Future assessment efforts will be directed towards the North Norway stock area.

Fin whales around the Faroe Islands are part of the West Norway-Faroe Islands stock area (see Fig.

1), but the stock relationships of these whales are unclear (see above). Present summer abundance is relatively low in the area, and high catches were taken here in the past. If fin whales in this area comprise a separate stock, then they must be severely depleted (to 11% or less of initial numbers) (NAMMCO 2001, NAMMCO 2004). However, if these fin whales are part of another, larger stock, then the level of depletion would not be so great. There is some indication that they may be, as recently a single fin whale tagged with a satellite-linked transmitter near the Faroes moved south to the Bay of Biscay, then returned north to an area off northwest Ireland, between August and November (NAMMCO 2003). Also, there is a continuous distribution of fin whales between the Faroe Islands and eastern Iceland, indicating that they may be linked to the East Greenland-Iceland stock. Stock delineation remains the greatest problem for the assessment of fin whales in this and other areas (NAMMCO 2003).

For the East Greenland-Iceland stock area, recent surveys and modelling suggest that the stock is approaching or at its initial, pre-harvest abundance (NAMMCO 2000, 2003). Under very conservative assumptions about stock structure and the rate of population growth, it is very likely that the stock can maintain an annual harvest of about 150 whales. If catches were spread over a wider area than they were in the recent past, sustainable catches could probably be higher.

NAMMCO has not assessed the stock of fin whales off West Greenland. However the available abundance estimate is dated and the stock affiliations of fin whales in this area are uncertain. In 2004 the Scientific Committee of the IWC noted the urgent need for a new abundance estimate for this area (IWC 2005 in press).

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