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Cusk

by

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Distribution, Biology, and Management

The cusk, *Brosme brosme*, is a deepwater species that is distributed on both sides of the Atlantic Ocean on hard bottom areas. Although the stock structure is unknown, the greatest concentrations of cusk off the USA coast occur in the central part of the Gulf of Maine and extend onto the Western Scotian Shelf (Sosebee and Cadrin 2006, Harris et al. 2002) (Figure 19.1). Spawning occurs in spring and early summer; eggs rise to the surface where hatching and larval development occur. Juveniles move to the bottom at about 5 cm (2 in.) in length, where they become sedentary and rather solitary in habit. Individuals commonly attain lengths from 46-76 cm (18-30 in.) and weights from 2.3- 4.5 kg (5-10 lb). The major prey items of cusk in the Gulf of Maine are crustaceans, primarily toad crabs and pandalid shrimps (Collette and Klein-MacPhee 2002). Although little information is available for Gulf of Maine fish, cusk from the Scotian Shelf area are relatively slow growing and late maturing. Scotian Shelf cusk reach a maximum age greater than 14 years and attain sexual maturity by age 5 for males and age 7 for females (Oldham 1972).

The principal fishing gear used to catch cusk includes line trawls, otter trawls, gill nets, and longlines. Fish landed by these gear range in size from 35 cm (13.8 in.) to 110 cm (43.3 in.). Recreational fishing is insignificant and foreign catches are minor. The Canadian fishery was restricted to a bycatch quota of 1,000 mt during 1999-2002 and 750 mt in 2003 (DFO 2004). The U.S. fishery is not under management. In 2005, total combined U.S. and Canadian landings were 623 mt, 1 % less than in 2004.

The Fishery

Annual landings averaged about 2,300 during the late 1960s to early 1980s, peaked at 3,700 mt in 1982 and then declined to 1,600 mt in 1988. Landings increased to 3,100 mt in 1992 but subsequently declined to a record low of 623 mt in 2005 (Figure 19.2, Table 19.1). Prior to 1993, between 60% - 80% of the U.S. harvest was from the Gulf of Maine. During 1994-2003,

the U.S. accounted for 36% of the total landings. In 2005, U.S. landings were 96 mt, representing 15% of the total harvest.

Historically, otter trawls have accounted for between 50% and 87% of U.S. landings of cusk. During 1992-1994 and 1997-1998 the majority of U.S. landings were taken by bottom long-line gear, also known as line trawls. During 1999-2005, most U.S. cusk landings were taken by otter trawls and gill nets. The majority of Canadian landings of cusk are taken as bycatch in the longline fisheries (Harris *et al.* 2002).

Research Vessel Survey Indices

NEFSC autumn bottom trawl survey biomass indices of cusk have declined since the late 1960s (Figure 19.3). The biomass index reached a record low in 1998, increased through 2002, subsequently declined, and remains at a low value in 2005. The mean length of cusk caught in the autumn research survey has also declined, from an average of 62 cm during 1968-1987 to 49 cm during 1989-2005 (Figure 19.4).

Summary

Annual landings have generally declined since 1982, and survey biomass indices have generally declined since 1985. The ratio of landings to survey indices increased during 1988-1998, implying increased exploitation (Figure 19.5). Exploitation rates have subsequently declined. The stock is currently at a low biomass level.

Table 19.1. Recreational and commercial landings of Gulf of Maine cusk (thousand metric tons).

Category	1986-95 Average	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
U. S. Recreational	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Commercial											
United States	1.3	0.5	0.4	0.4	0.2	0.2	0.2	0.2	0.1	0.1	0.1
Canada	0.9	0.6	0.7	0.8	0.5	0.5	0.8	0.7	0.6	0.6	0.5
Other	-	-	-	-	-	-	-	-	-	-	-
Total Nominal Catch	2.2	1.1	1.1	1.2	0.7	0.7	1.0	0.9	0.7	0.7	0.6

For further information

Bigelow, H. B., and W. C. Schroeder. 1953. Fishes of the Gulf of Maine. Fish. Bull., U.S. Fish. Wildl. Serv. 74:53.

Collette, B. B., and G. Klein-MacPhee (eds.) 2002. Bigelow and Schroeder's Fishes of the Gulf of Maine. 3rd edition, 728 p.

DFO. 2004. Allowable Harm Assessment for Cusk in Atlantic Canada. DFO Can. Sci. Advis.

Sec. Stock Status Rep., 5 p.

Harris, L.E., P.A. Comeau, and D.S. Clark. 2002. Evaluation of cusk (*Brosme brosme*) in Canadian waters. CSAS Res. Doc. 2002/104, 66 p.

Oldham, W. S. 1972. Biology of Scotian Shelf cusk, *Brosme brosme*. ICNAF Res. Bull. 9:85-98.

Sosebee, K.A. and S.X.Cadrin. 2006. A historical perspective on the abundance and biomass of northeast demersal complex stocks from NMFS and Massachusetts inshore bottom trawl surveys, 1963-2002. NEFSC Res. Doc. 06-05. 200 p.

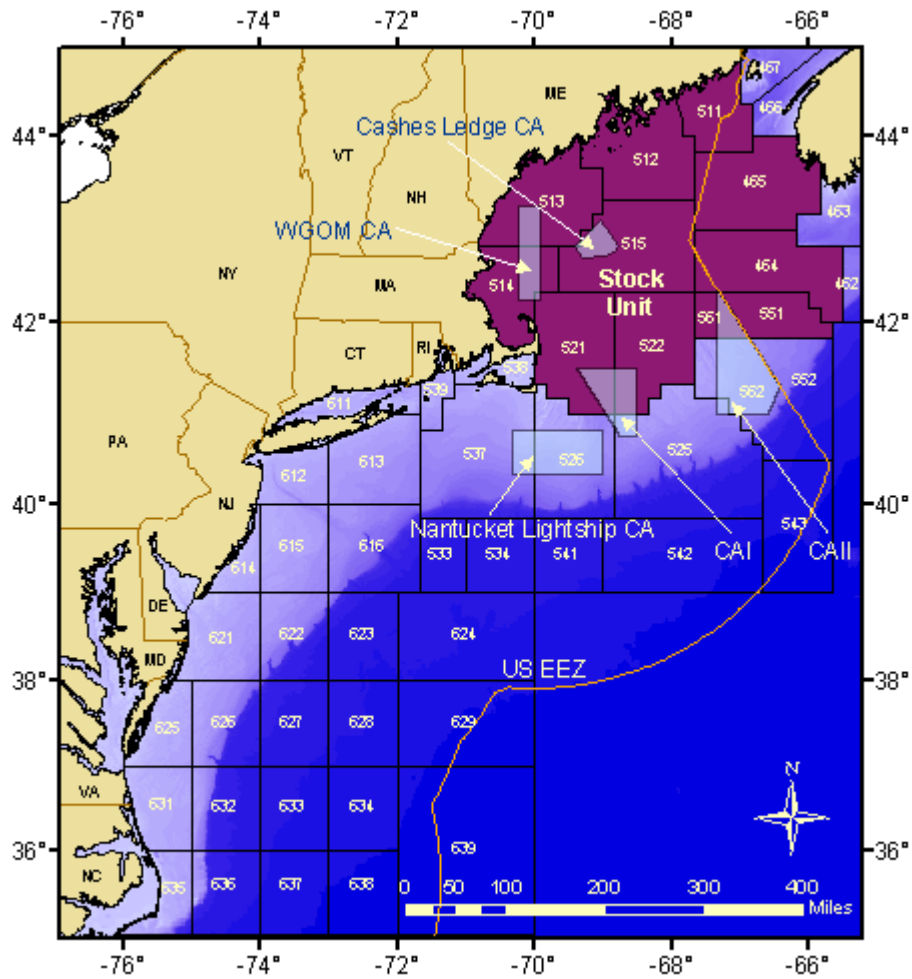


Figure 19.1. Statistical areas used to define the cusk stock.

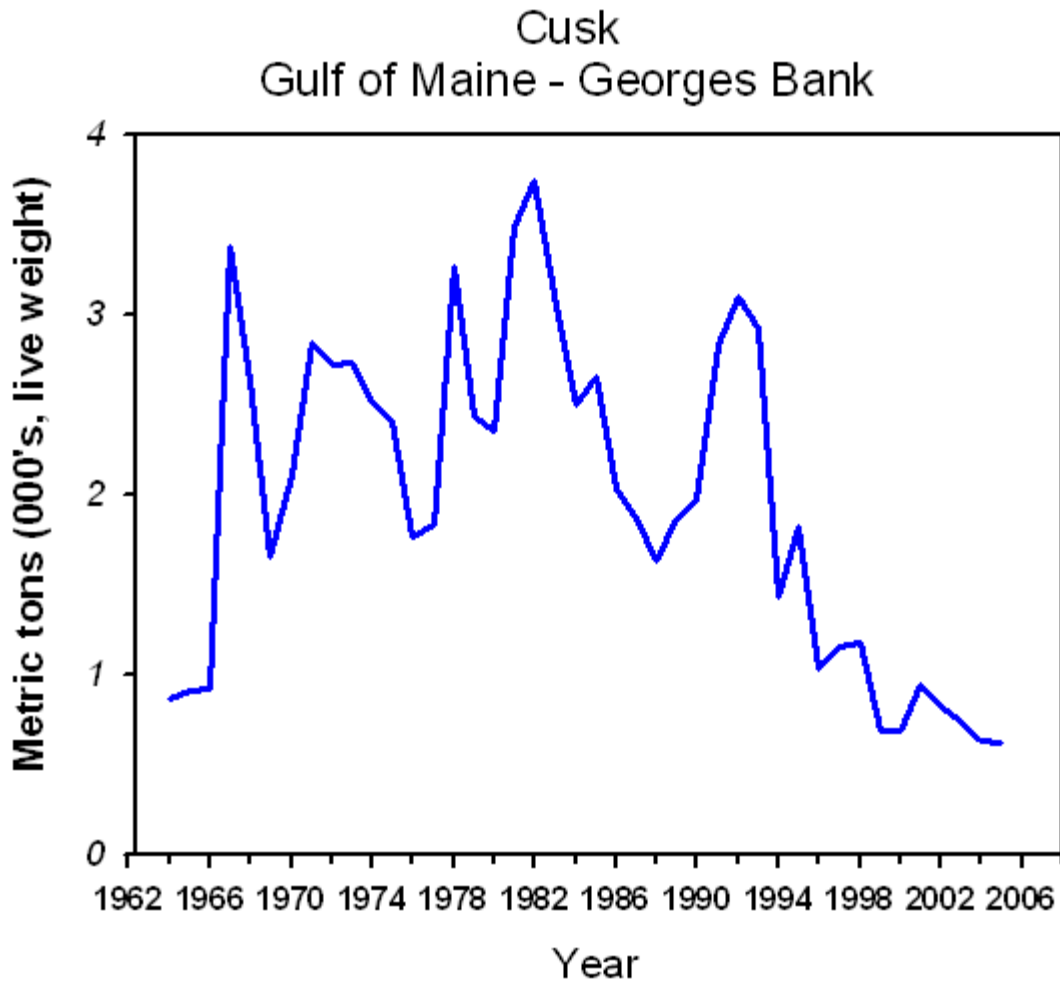


Figure 19.2. Total commercial landings of cusk from the Gulf of Maine-Georges Bank region, 1964-2005.

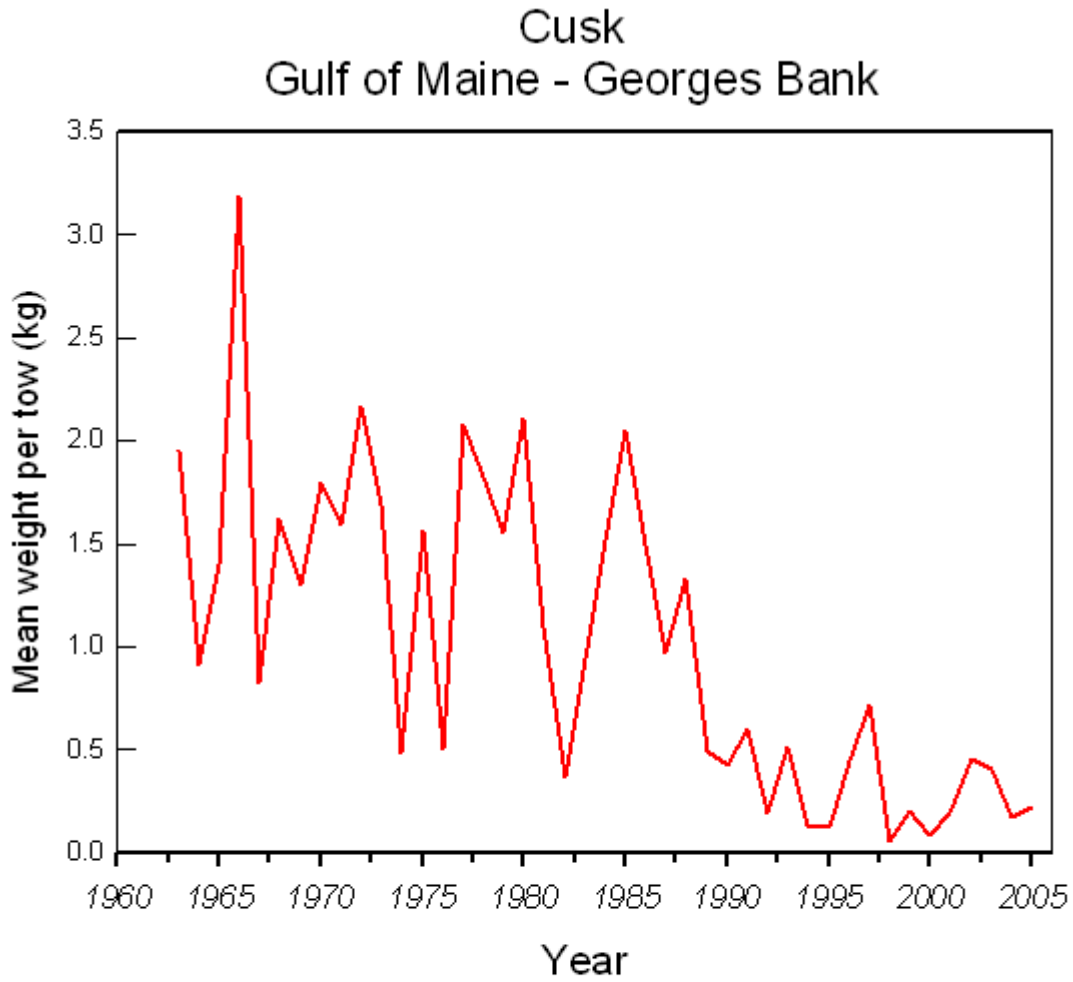


Figure 19.3. Biomass indices (stratified mean weight per tow) of cusk in NEFSC autumn bottom trawl research vessel surveys, 1963-2005.

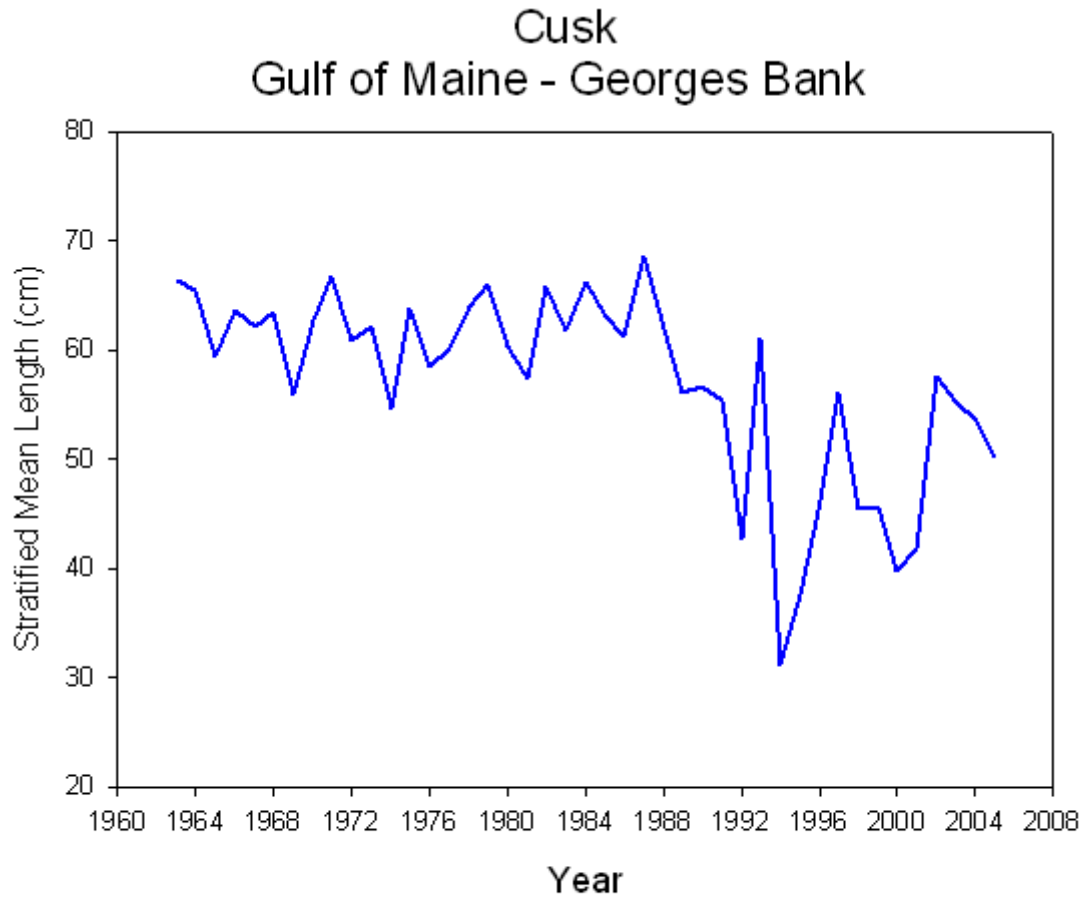


Figure 19.4. Stratified mean length (cm) of cusk in NEFSC autumn research vessel surveys, 1963-2005.

Cusk Gulf of Maine - Georges Bank

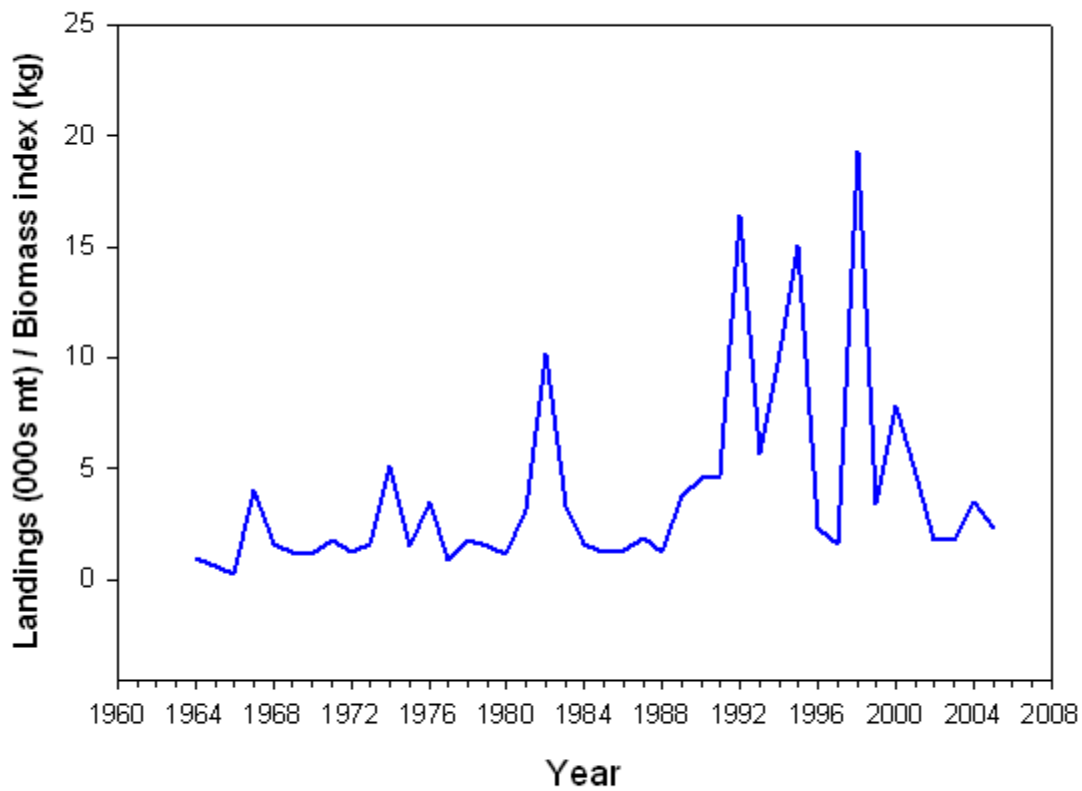


Figure 19.5. Ratio of landings / biomass index as an indicator of relative exploitation of cusk, 1964-2005.