

Stock Annex: Ling (*Molva molva*) in subareas 1 and 2 (Northeast Arctic)

Stock specific documentation of standard assessment procedures used by ICES.

Stock: Ling

Working Group: Working Group on Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP)

Created:

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Last updated: March 2011

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A. General

A.1. Stock definition

WGDEEP 2006 indicated: *‘There is currently no evidence of genetically distinct populations within the ICES area. However, ling at widely separated fishing grounds may still be sufficiently isolated to be considered management units, i.e. stocks, between which exchange of individuals is limited and has little effect on the structure and dynamics of each unit. It was suggested that Iceland (5.a), the Norwegian Coast (2), and the Faroes and Faroe Bank (5.b) have separate stocks, but that the existence of distinguishable stocks along the continental shelf west and north of the British Isles and the northern North Sea (Subareas 4, 6, 7 and 8) is less probable. Ling is one of the species included in a recently initiated Norwegian population structure study using molecular genetics, and new data may thus be expected in the future’*

A.2. Fishery

Ling has been fished in these Subareas for centuries, and the historical development is described in, e.g. Bergstad and Hareide (1996). In particular, the post-World War II increase in catch, because of a series of technical advances, is well documented. Currently the major fisheries in Subareas I and II are the Norwegian longline and gillnet fisheries, but there are also bycatches taken by other gears, i.e. trawls and handlines. Around 50% of the Norwegian landings are taken by longlines and 45% by gillnets, partly in the directed ling fisheries and partly as bycatch in fisheries for other groundfish. Other nations catch ling as bycatch in their trawl fisheries.

During the period 2000–2005 the landings varied between 6000 and 7000 tonnes, which are about the same catches as in the preceding decade. In 2007 and 2008 the landings increased to over 10 000 tonnes.

A.3. Ecosystem aspects

B. Data

B.1. Commercial catch

Full landings data are available from 1988 to present but it is thought that fisheries in some of these areas pre-date the time series. Incomplete landings data are available from Norwegian longline fisheries from 1889 onwards. Additional landings data from other areas may be available from 1950 onwards.

B.2. Biological

Length data for the Norwegian reference fleet in Subarea IIa have been routinely collected since 2002.

Considerable general information is available on the life history characteristics of this species.

B.3. Surveys

B.4. Commercial CPUE

Norway started in 2003 to collect and enter data from official logbooks into an electronic database and data are now available for the period 2000–2009. Vessels were selected that had a total landed catch of ling, tusk and blue ling exceeding 8 tonnes in a given year. The logbooks contain records of the daily catch, date, position, and number of hooks used per day. Cpue were calculated as the average total catch of ling per vessel (C), and the average number of hooks per set and per vessel (N) associated with these catches. Then, for each year and catch category, the estimated cpue for the entire fleet was determined as C/N . Thus the estimated cpue for each year and Subarea was the mean catch in kg per hook for the entire fleet.

The boats that provided logbooks are the primary sampling units, and C and N are both random variables. It follows that this is a ratio-type estimator, therefore the standard errors of the cpue estimates could be calculated as described in Cochran (1977, page 32). This cpue estimator is a weighted average, that is the more hooks a boat sets, the more influence it has on the estimate (Cochran, 1977). For comparison, an unweighted cpue series was also constructed (i.e. the average cpue per boat).

A standardised series will be developed in preparation for WGDEEP 2012.

B.5. Other relevant data**C. Assessment: data and method****D. Short-Term Projection****E. Medium-Term Projections**

Uncertainty models used:

F. Long-Term Projections

Model used:

Software used:

Maturity:

F and M before spawning:

Weight at age in the stock:

Weight at age in the catch:

Exploitation pattern:

Procedures used for splitting projected catches:

G. Biological Reference Points**H. Other Issues****H.1. Historical overview of previous assessment methods****I. References**