

Strategy for sustainable harvesting of mesopelagic species



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Lanternfish

- Size distribution



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Silvery lightfish

- Size distribution



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Mesopelagic species-

The overall background:



- Throughout history sea mammals and species of fish at higher trophic levels have been caught
- The oceans cover almost 70 % of the surface of the earth and account for around 50 % of its biological production. However, only about 3 % of our food comes from the sea
- In the future a larger portion of our food will have to come from marine aquaculture
- An important, almost untapped source for marine feedstuffs is small, marine species at lower trophic level – mesopelagic fish, krill and zooplankton
- The biomass of species at lower trophic levels is huge, and outnumber the size of the fish stocks many times

Facts about mesopelagic species



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- Include a large number of different species of fish, zooplankton, squid, jellyfish
- Large resource, both globally and in the North Atlantic
- Small, i.e. 3-6 cm
- Migrates vertically between 200 and 1 000 m depth

- Vertical migration driven by light throughout the day
- Concentrations in «hot spots». Reykjanes Ridge may be the «hot spot» in the North-East Atlantic
- Gulf of Oman is a recognized «hot spot», there are probably other «hot spots» around the world

Norwegian research on mesopelagic species:



- In the Arabian sea (late 1970's, early 1980's)
- The Gulf of Oman (1992)
- Acoustic data (various cruises in the North Atlantic)
- Trawl hauls in the Norwegian sea (several cruises)
- Experimental fishing, Reykjanes Ridge (2016)

Catches in the North Atlantic:



- No landings are registered from Norwegian vessels
- Iceland reported more than 73 000 tonnes of silvery lightfish caught in the three year period 2009-2011 (small quantities after 2011)
- Russia reported more than 13 000 tonnes of lanternfish in 2001 and 2002 (small amounts in other years)

Knowledge gaps- Ecology/biology:



- More general biological knowledge about the stock(s) in the North-Atlantic. Sufficient knowledge will be the basis for future scientific advice on outtake/quotas etc.
- By-catch of commercial species like redfish, blue whiting and argentine
- May harm eggs and larvae of deep-water species



Knowledge gaps- Harvesting and processing of catch:

- Right type of vessel (size of vessels, equipment/machinery on board)
- More experiments to develop the best adapted gear (trawl)
- Locate «hot spots» where the fishing possibilities will be best
- Finding the best methods for processing and conserving the catch on board vessels

Sustainable management of mesopelagic species in Norway- Status and future challenges:



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- For some years experimental licences have been issued to Norwegian vessels, but little activity has taken place
- Currently: A very keen interest among vessel owners. A large number of experimental licences have been issued lately
- However, and more significantly: The number of commercial vessels which in the near future will participate in experimental fishing on the basis of experimental licences

- Important for further accumulation of knowledge: Experimental fishing on board commercial vessels to test gear/other equipment, locate concentrations of fish and conserve catches
- The Institute of Marine Research (IMR) will conduct more comprehensive research than before on mesopelagic species
- In mid-March a meeting will be held to discuss mesopelagic species, with an emphasis on future fishing possibilities and sustainable management
- Participants at this meeting: Fisheries managers, marine scientists, representatives of the fishing industry and other relevant stakeholders

Key factors for the future success or failure:



- Further accumulation of knowledge through systematic scientific research as well as experimental fishing by commercial vessels
- *However, the critical factor: Will harvesting of mesopelagic species in the course of some years become a profitable fishery for Norwegian vessel owners?*

1. Success



- Baseline: In a few years a lot of new knowledge is acquired, and the harvesting of mesopelagic species has developed into a profitable fishery:
 - The Norwegian Directorate of Fisheries will prepare a management plan for sustainable harvesting of mesopelagic species in the future
 - The purpose of the management plan: start managing mesopelagic species as an ordinary Norwegian fishery
 - A management plan will address a number of different issues of both national and international significance

- Some vital topics in a future management plan:
 - Total allowable catch (TAC)?
 - One TAC for each stock of mesopelagic species, for instance silvery lightfish? Or
 - A TAC for a combination of different stocks, for example covering both glacier lanternfish and silvery lightfish?

- A Norwegian TAC? Or
- A TAC including several coastal states in the North-Atlantic?
- An international approach will require comprehensive international cooperation
- A number of regulatory issues at the national level will have to be examined

2. Failure



- Baseline: In a few years our knowledge about mesopelagic species, including the challenges for sustainable management, has increased much. But the harvesting has not become a profitable fishery
 - What to do then for the Norwegian fisheries management: *Await new and realistic optimism concerning profitable utilization of this huge marine resource*



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Thank you for your
attention