

# PREDATION OF MESOPELAGIC FISH IN FAROESE WATERS

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## ABSTRACT

Mesopelagic fish (lanternfish, pearlsides and white barracudina) has no important as prey on the Faroese shelf and Faroe Bank. There was only found mesopelagic prey in a few stomachs of cod, haddock, and greenland halibut (19 of 10.882 stomachs). Conversely, salmon and saithe feed on lanternfish of the Faroese shelf and of the Faroe Bank. In total 3949 salmon stomachs and 5386 saithe stomachs are analyzed in Faroese waters. Four percent of the analyzed saithe had feed on lanternfish and 12 % of the analyzed salmon had feed on lanternfish. The predators that had feed on lanternfish were caught of the shelf and of the Faroe Bank (86 % of the saithe and 100 % of the salmon). When the saithe was divided into areas, 10 % had eaten lanternfish of the shelf and 2 % had feed on lanternfish on the shelf and Faroe Bank. White barracudina which mainly occurs below 200 m depth was preyed upon by saithe (6.7 %) and salmon (2.4 %) of the shelf and greenland halibut on the Faroe self (4 %). Pearlsides, which mainly occur in the epipelagic zone, was common prey for saithe on the shelf (2 %) and Faroe Bank (1.8 %) and for salmon of the shelf (12 %).

The saithe that were caught relative close to bottom feed on lanternfish more often when lanternfish were available and one saithe had eaten 27 lanternfish while the cod that feed in the same area and depth as saithe preferred to feed on blue whiting.

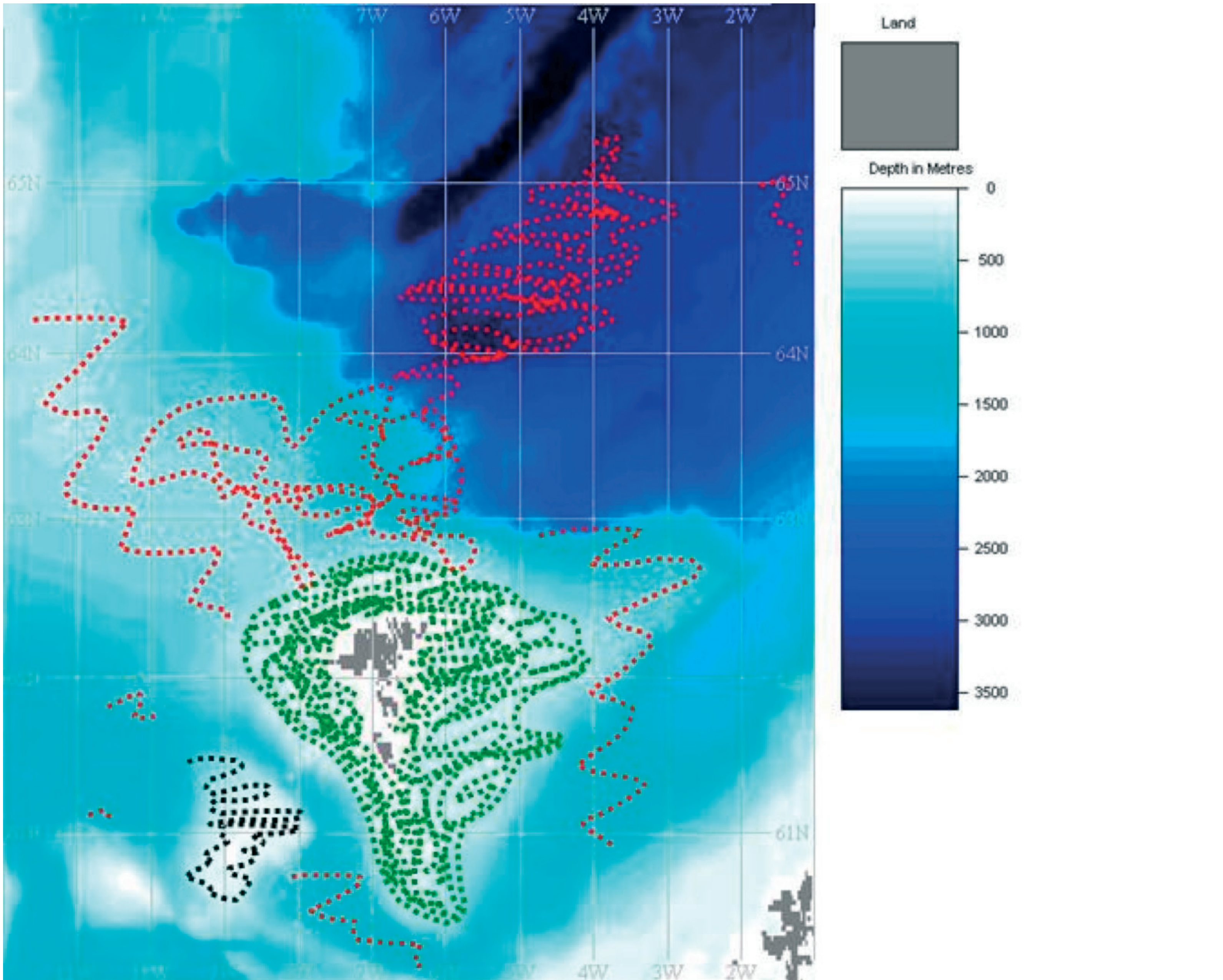
**Keywords:** *Notoscopelus kroeyerii*; *Benthosema glaciale*; white barracudinas; *Arctozenus risso*; pearlsides; *Maurolicus mülleri*; Lanternfish; mesopelagic; saithe; *Pollachius virens*; salmon; *Salmon Salar*; cod; *Gadus morhua*; Faroese waters; predation; prey

## RESULTS

Predator species	Area	Stomach samples	Stomachs containing		
			White barracudinas	Pearlsides	Lanternfish
Cod	The Faroe Shelf	5,599		3 (0.05)	4 (0.07)
	Faroe Bank	552			
	Off the Shelf	925	3 (0.32)		11 (1.19)
Haddock	The Faroe Shelf	5,153	1 (0.02)	3 (0.06)	4 (0.08)
	Faroe Bank	658			
	Off the Shelf	2			
Saithe	The Faroe Shelf	3,740	20 (0.53)	75 (2.00)	90 (2.41)
	Faroe Bank	495	2 (0.40)	9 (1.82)	7 (1.41)
	Off the Shelf	1,151	78 (6.78)	3 (0.26)	117 (10.16)
Greenland halibut	The Faroe Shelf	74	3 (4.05)		1 (1.35)
	Faroe Bank				
	Off the Shelf	363	1 (0.27)	1 (0.27)	5 (1.38)
Salmon	The Faroe Shelf				
	Faroe Bank				
	Off the Shelf	3,949	97 (2.46)	479 (12.13)	489 (12.38)
Other predators	The Faroe Shelf	56			
	Faroe Bank				
	Off the Shelf	419	3 (0.71)		4 (0.95)
Grand total	The Faroe Shelf	14,622	24 (0.16)	81 (0.55)	99 (0.68)
	Faroe Bank	1,705	2 (0.12)	9 (0.53)	7 (0.41)
	Off the Shelf	6,809	179 (2.63)	483 (2.69)	626 (9.19)

Stomachs sampled by FFL (1992 - 2005), and stomachs containing white barracudinas, pearlsides, and lanternfish (in general *Notoscopelus kroeyeri*, *Benthosema glaciale* and *Myctophum punctatum*) in Faroese waters. The numbers in parenthesis are the percentage of the prey prevalence in the area.

## MATERIALS AND METHODS

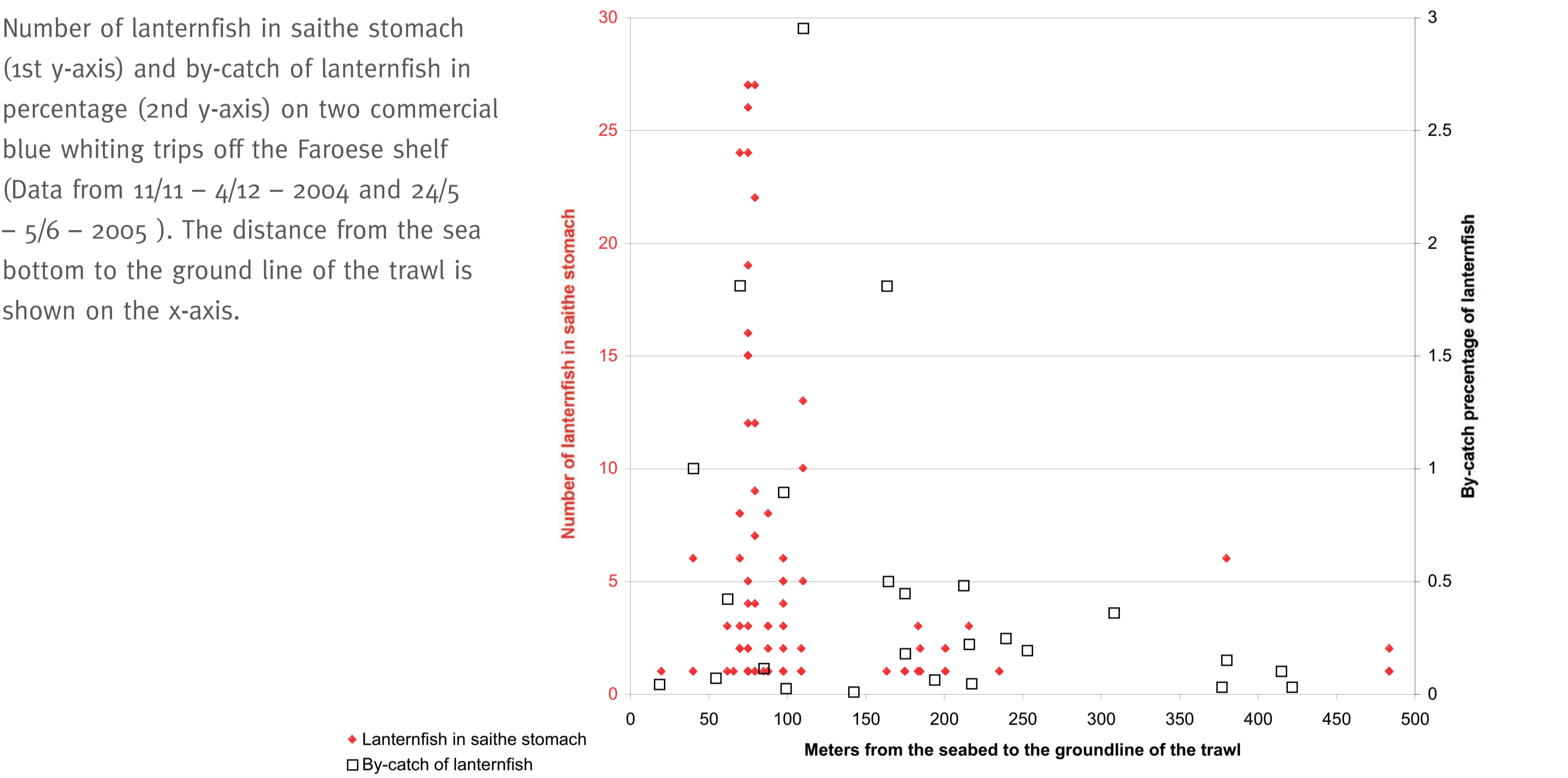


**SAMPLING AREAS:** Red dots are off the shelf, green dots are on the Faroese shelf and black dots are on Faroe Bank

## INTRODUCTION

The total global biomass, of mesopelagic fish, was in the 1970’s estimated by FAO to be one billion tonnes. To put this number into perspectives, it was at that time approximately 10 times the biomass of the total fish catch of the World. Therefore it could be anticipated that the knowledge about which fish species prey on mesopelagic fish was huge. However, the principal part of large commercial fish species forage on the shelf where mesopelagic fish are uncommon, and therefore the mesopelagic fish are preyed upon by larger pelagic fish that forage of the shelf like tuna, swordfish, salmon, and mackerel. As well as by sea mammals like beaked whale, brydes whale, dolphins, and seabirds like puffins, terns, and fulmar. North of the Faroe Islands the lanternfish *B. glaciale* is a common prey of puffin and fulmar which is in consistent with seabirds prey elsewhere when away from breeding areas. The *B. glaciale* caught north of the Faroes were younger than 3 years and thus occupies the epipelagic layer. Ecologists have argued that predators should prefer prey that yield more energy per unit handling time. The proximate lipid concentration and energy density of lanternfish, when the wax esters was excluded, has been analyzed to be twice as high per gram wet weight compared to e.g. mature capelin and even more for some other North Pacific forage fishes. Therefore it might be expected that larger pelagic predators that forage off the shelf would exhibit a greater preference for lanternfish when available.

The aims of this study were to estimate the prevalence of mesopelagic prey in Faroese waters and to discuss the mechanism off prey selection of the shelf.



In total 23,136 stomachs has been sampled and analyzed in Faroese waters from 1992 to 2005. The largest part of the samples had been taken on the Faroese shelf and Faroe Bank (70.6 %) while 29.4 % had been taken of shelf. It is apparent from the table that saithe and salmon do prey on the mesopelagic fish species and from the Figure above it can be seen that saithe have preference for lanternfish when presence. Cod, haddock and other predators do not have preference for the most common mesopelagic species.

### STOMACH SAMPLING

The stomach samples used in this study were collected by the salmon long-liner M/B “Polarlaks” in 1992 - 1993, the salmon long-liner M/B “Hvítiklettur” in 1993 – 1995. The Faroese research vessel “Magnus Heinason” in 1998 – 2005 and the blue whiting trawler M/B “Næraberg” in 2004 – 2005 by pelagic trawl. It is especially cod, haddock, and saithe on the shelf and Faroe Bank that is of special commercial and thus biological interest and sampled from late February trough early November by the FFL. Of the shelf, greenland halibut has been monitored in late Mai and early June, ocean perch, and deepwater redfish has been monitored in late September to early October. It has to be noted that apart from greenland halibut, ocean perch and deepwater redfish, it was mainly herring, and blue whiting which were investigated thoroughly in April – May, of shelf. Salmon and other species were investigated whenever there has been a project with focus on the specific fish species. This means that the stomach database at the FFL is excellent when investigating the main commercial fish species on the shelf and Faroe Bank, and sparse with time gaps when investigating fish off the shelf.

### STOMACH ANALYSIS

The stomach content was analyzed in different degree of specification in the sampling cruises. In this communication the prevalence of mesopelagic prey was of interest. Thus, the stomach samples of fish species that prey on mesopelagic species has been used.

#### ACKNOWLEDGEMENT

Thanks to the Faroese Fisheries Research Fund ([www.fvg.fo](http://www.fvg.fo)) for economical support.