

Supplementary Material

Diel vertical movements determine spatial interactions between cod, pelagic fish and krill on an Arctic shelf bank

Georg Skaret, Geir Odd Johansen, Espen Johnsen, Johanna Fall, Øyvind Fiksen, Göran Englund, Per Fauchald, Harald Gjøsæter, Gavin J. Macaulay, Edda Johannessen

Content

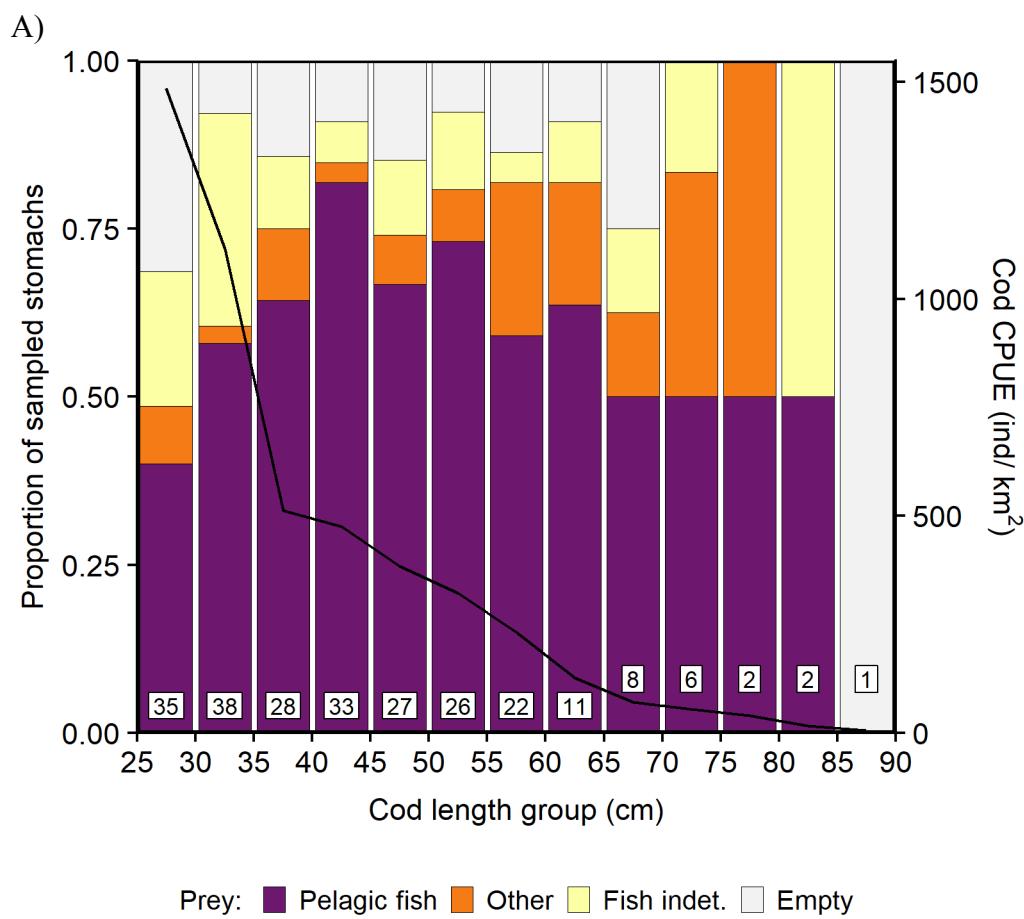
Table S1 Settings used for target tracking of acoustic data.

Fig. S1 A) Cod catch per unit effort by length group (line) and prey proportions by frequency of occurrence in cod stomachs (bars), B) Prey proportions by mass in cod stomachs. Stomach data from the same cod individuals are shown in A and B, but Figure A presents the data as proportion of stomachs containing each prey type, while Figure B presents it as proportions by mass. The number of individuals sampled in each length group is shown at the bottom of each bar in Figure A. See figure text for details on how prey proportions were calculated.

Fig. S2 Length distribution of all sampled pelagic fish and stomach contents of a subsample of pelagic fish

Table S1. Settings used for target tracking in the Large Scale Survey Software (LSSS; Korneliussen et al. 2016).

Setting	Parameter	Capelin	Cod
Platform	TrackerType	Broadband data	Broadband data
	Frequency (kHz)	120	120
	PlatformMotionType	Floating	Floating
Target detector settings	MinTS	-55	-36
	Pulse length determination level (dB)	6	6
	Min echo length (proportion of pulse duration)	0	0
	Max echo length (proportion of pulse duration)	2	2
	Max one way gain compensation (dB)	6	6
Target filtering settings	Max TS (dB re 1m ²)	-36	0
	Max alongship angle (°)	5	5
	Max athwartship angle (°)	5	5
Track initialisation settings	Initial gate function α_0 (°)	0.5	2.8
	Initial gate function β_0 (°)	0.5	2.8
	Initial gate function r_0 (m)	0.44	0.44
	Initial gate function I_0 (dB)	20	20
	Initiation min length (pings)	1	1
Track association settings	gate function α_G (°)	0.5	2.8
	gate function β_G (°)	0.5	2.8
	gate function r_G (m)	0.44	0.44
	gate function I_G (dB)	30	30
	Alpha estimator	0.5	0.5
	Beta estimator	0.5	0.5
	Max missing pings	8	8
Track acceptance settings	Max missing samples	5	5
	Max missing pings fraction	0.5	0.5
	Min track length (pings)	20	20
	Min sample to length fraction	2	2



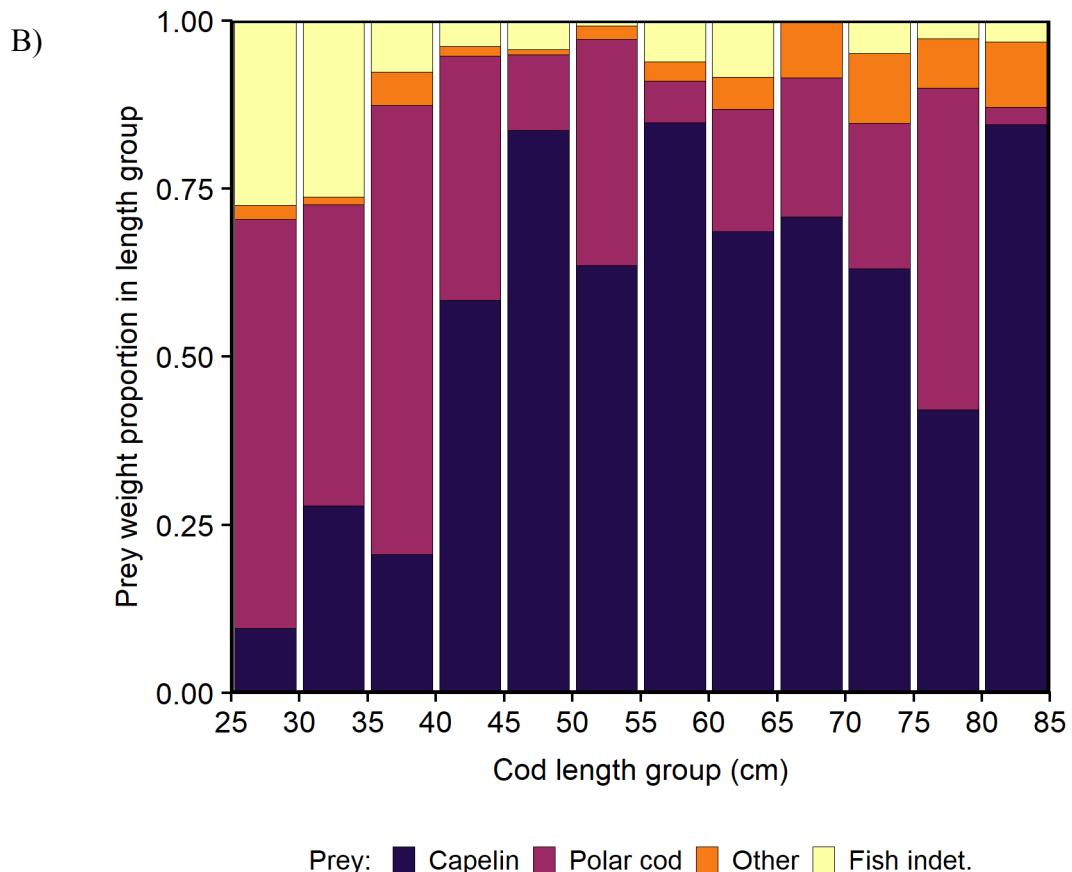


Figure S1. A) Cod catch per unit effort by length group (line) and prey proportions by frequency of occurrence in cod stomachs (bars). Stomachs containing more than one prey item were assigned the prey category of the dominant prey (by mass). The numbers at the foot of the bars mark the number of individuals sampled in each length group B) Prey proportions by mass in cod stomachs. The proportions were calculated as the total weight of each prey type across all stomachs in the length group divided by the total prey mass consumed by the length group. The “Other” group includes small demersal fish species, crustaceans, other benthic invertebrates, and unidentified prey.

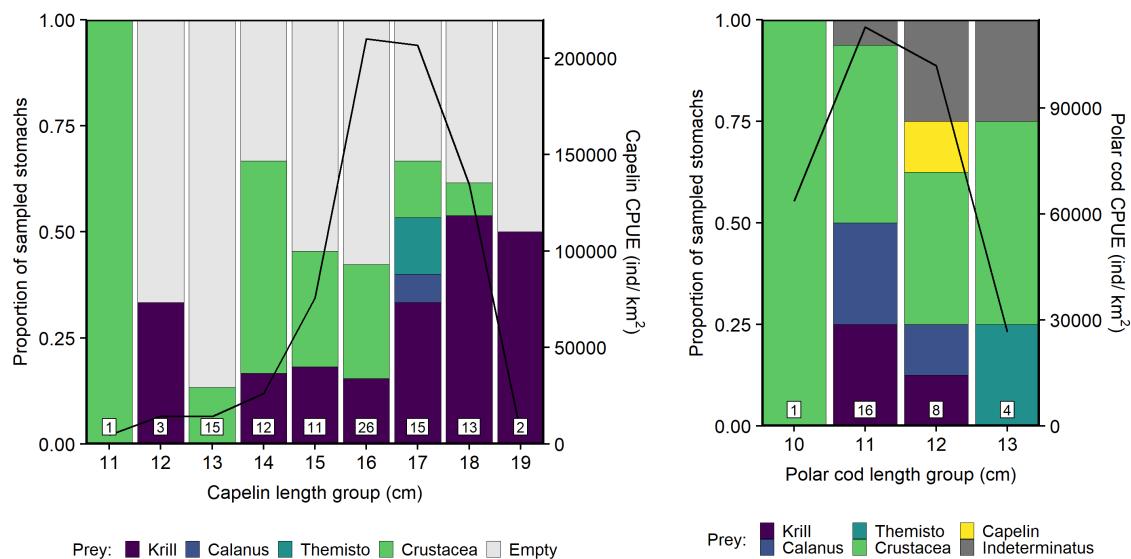


Figure S2. Length distribution of all pelagic fish and stomach contents of a subsample of (a) capelin and (b) polar cod from the pelagic trawls. The colours denote the proportion of subsampled stomachs (left axis) that contain a given prey item. Stomachs containing more than one prey item were assigned the prey category of the dominant prey (by mass). The black line (right axis) denotes swept area density for each length group of sampled fish. The numbers at the foot of the bars mark the number of sampled stomachs.

Reference

Korneliussen RJ, Heggelund Y, Macaulay GJ, Patel D, Johnsen E, Eliassen IK (2016) Acoustic identification of marine species using a feature library. Methods in Oceanography 17:187-205