

STARRY RAY – TINDASKATA

Amblyraja radiata

THE FISHERY AND LANDINGS

Starry ray is an abundant species in Icelandic waters and is a common bycatch in variety of fishing gears. The increased landings since the 1990s are related to an increased retention, compensating for a lower abundance of *D.batis* complex. Landings are mainly reported from the longline fishery (Figure 1). Reported landings have increased from 500 t in 2007 to more than 1700t in 2012. Thereafter, landings declined to 1250 t in 2016. A large proportion of the landings is for local consumption. Catches of starry ray are taken all around Iceland but mostly off W- and N- Iceland and within the Faxaflói area (Figure 2). There is a strong seasonality in landings; the majority of landings are reported from September to November each year.

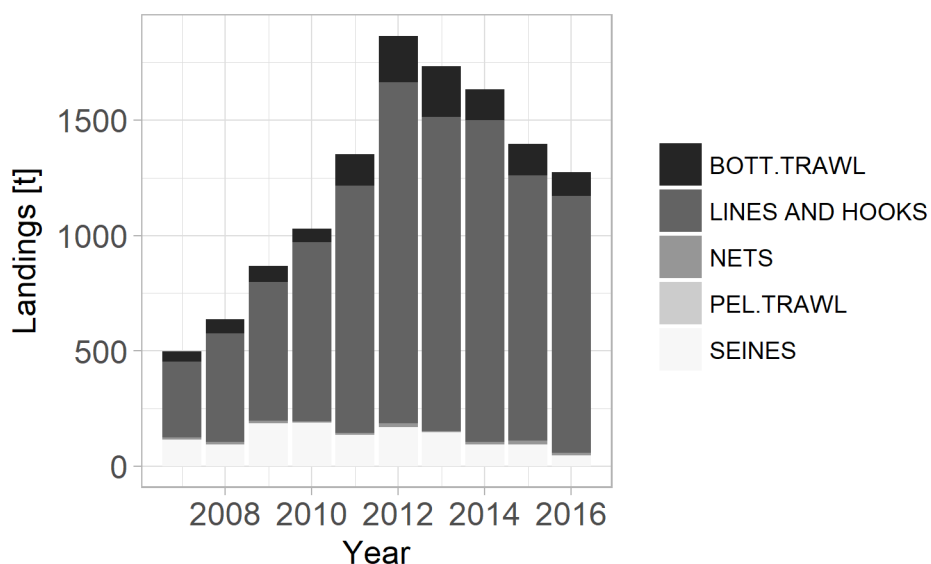


Figure 1. Starry ray. Landings by fishing gear.

Mynd 1. Tindaskata. Landanir skipt eftir veiðarfærum

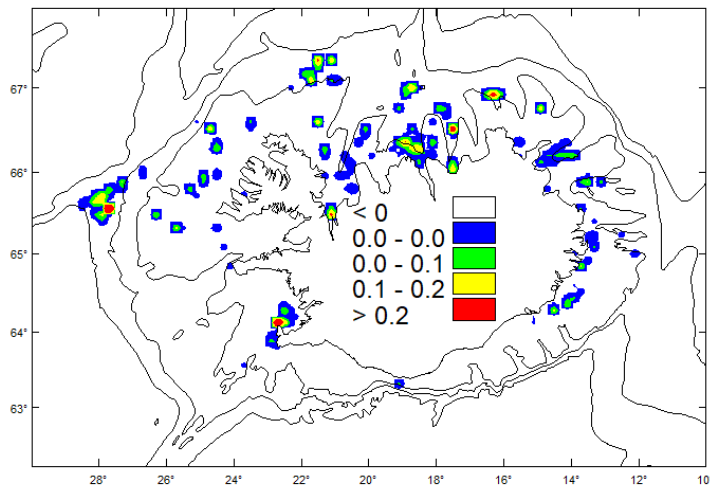


Figure 2. Starry ray. Geographical distribution of the Icelandic fishery in 2016.

Mynd 2. Tindaskata. Útbreiðsla veiða á Íslandsmiðum 2016 samkvæmt afladagbókum.

SURVEY DATA

DISTRIBUTION IN ANNUAL GROUND FISH SURVEYS

Starry ray is by far, the most abundant elasmobranch species in Icelandic waters, with a widespread distribution over the Icelandic shelf and upper slope. There is a seasonal difference in estimates of abundance and biomass of starry ray. In the spring survey (IS-SMB) starry ray is found at 86% of all stations taken in the survey but at about 50 % of stations taken during the autumn survey (IS-SMH) (Figure 3).

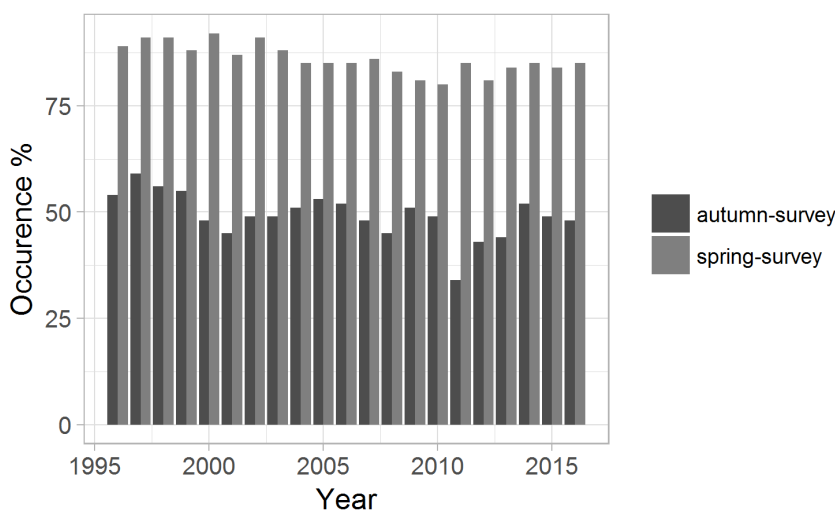


Figure 3. Starry ray. Frequency (occurrence at % stations) in spring survey (IS-SMB) and autumn survey (IS-SMH).

Mynd 3. Tindaskata. Tíðni tindaskötu (hlutfall af fjölda stöðva) í stofnmælingu að vori og stofnmælingu að hausti

In the spring survey there is a high abundance on the shelf off N-Iceland and in near-shore area in the south and southeast (Figure 4 a). In the autumn survey, the main distribution is on the shelf break and starry ray is almost absent from the southern area.

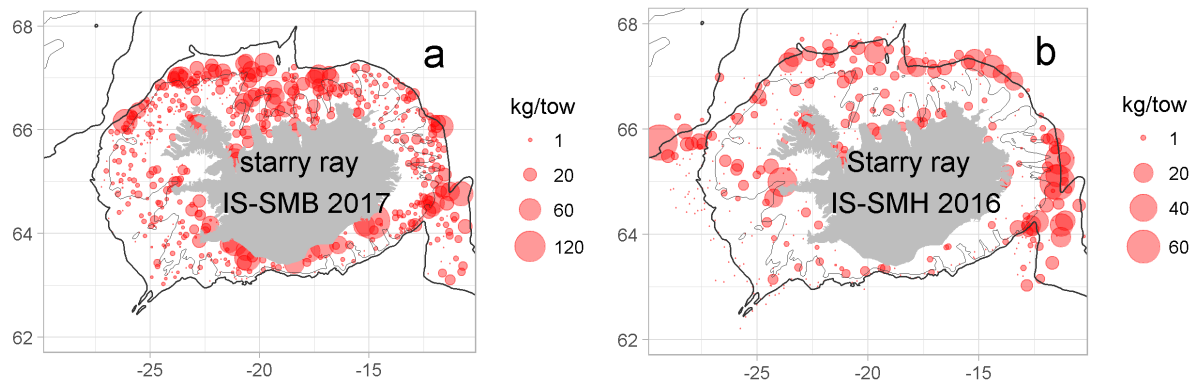


Figure 4. Starry ray Spatial distribution in a) the spring survey (IS-SMB) and b) the autumn survey (IS-SMH)

Figure 4. Tindaskata. Útbreiðsla í stofnmælingum botnfiska a) að vori 2017 og b) að hausti 2016.

In the spring survey starry ray is most abundant in the N and the NW (Figure 4a and Figure 5). Estimates of total biomass of starry ray have declined over the survey period (1985-2017) and is now half of the biomass reported from the 80's, mostly due to decline in the NW and the NE area (Figure 4). The proportion of biomass divided by area has remained relatively stable over the time period. In the autumn survey the total biomass is less than in the spring survey and the biomass is spread over a wider area than in the spring survey (Figure 6). In recent years the total estimated biomass has been under the long-term average but the decline is smaller than observed in the spring survey.

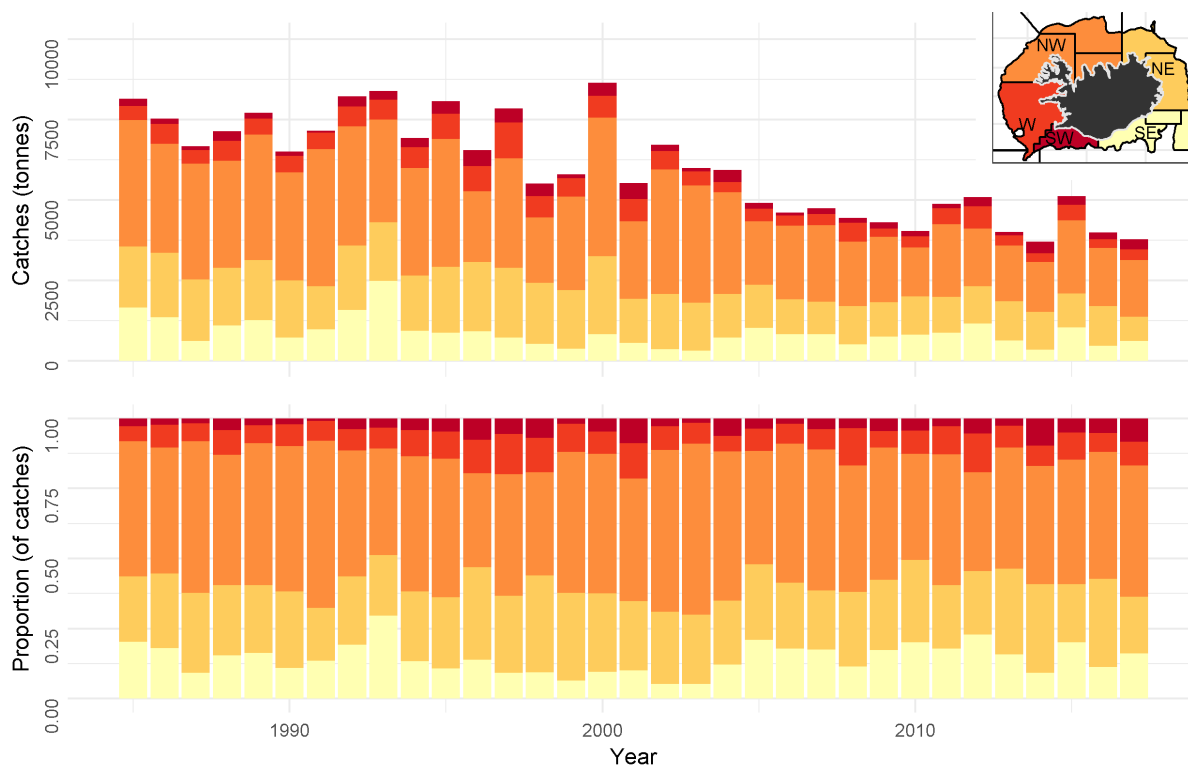


Figure 5. Starry ray. Spatial distribution of catch from the spring survey (IS-SMB) in 1985-2017.

Mynd 5. Tindaskata. Svæðaskipt útbreiðsla í stofnmælingu botnfiska að vori árin 1985-2017.

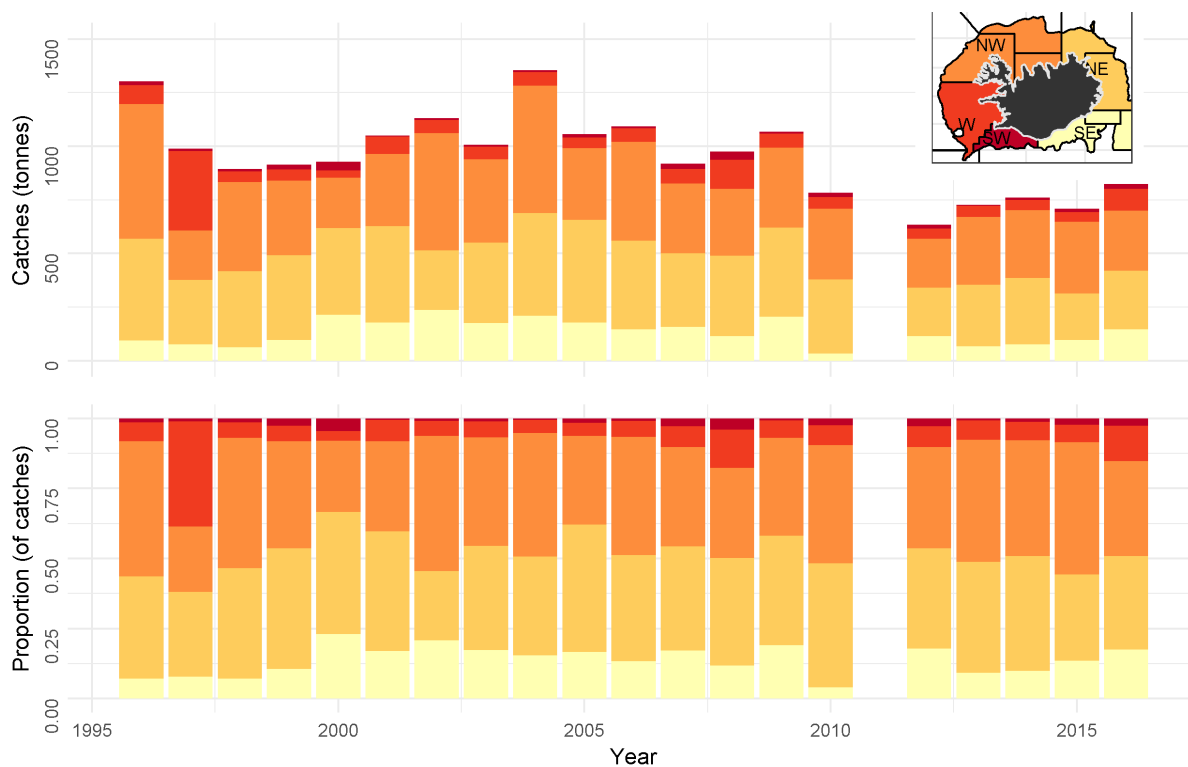


Figure 6. Starry ray. Spatial distribution of catch from the autumn survey (IS-SMH) 1996-2016.

Mynd 6. Tindaskata. Svæðaskipt útbreiðsla í stofnmælingu botnfiska að hausti 1996-2016.

LIFE HISTORY INFORMATION

As stated earlier starry ray is by far the most abundant elasmobranch species in Icelandic waters, with a widespread distribution over the Icelandic shelf and upper slope. Seasonal differences in distributional patterns have been noted, with starry ray much less abundant on the shelf during autumn survey than in spring survey and further being almost absent from the southern region in the autumn.

Anecdotal information suggests that starry ray undertakes seasonal migrations related to egg-laying activity. Recently, both surveys have started to sample data on egg case distribution but trawl survey data may provide useful information on catches of viable skate egg cases and/or nursery grounds.

Survey information on length distribution indicate the majority of specimens are <60 cm L_T . The mean length in spring survey is considerably smaller than mean length in the autumn survey (36.9 and 41.5 respectively). The proportion of larger fish decreases quite abruptly after reaching 50 cm L_T (Figure 7 and 8). In spring survey the mean length has decreased from 38 cm (1996) to 35 cm (2017) (Figure 6). On the other hand, in autumn survey the mean length has varied (from 38cm to 43 cm L_T) over the time period since 1996 without any specific direction (Figure 8).

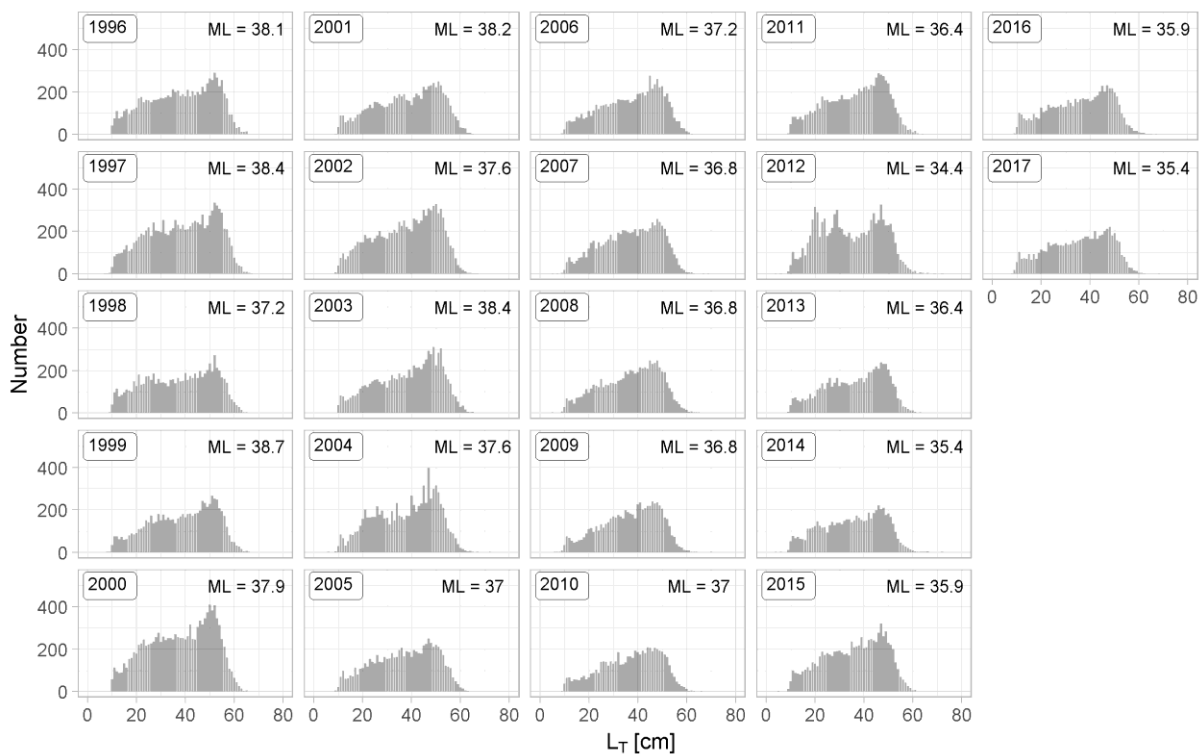


Figure 7. Starry ray. Length distributions in spring survey (IS-SMB) since 1996. Mean length (cm) is indicated for each year (upper, right).

Mynd 7. Tindaskata. Lengdardreifing úr stofnmælingu botnfiska að vori frá 1996.

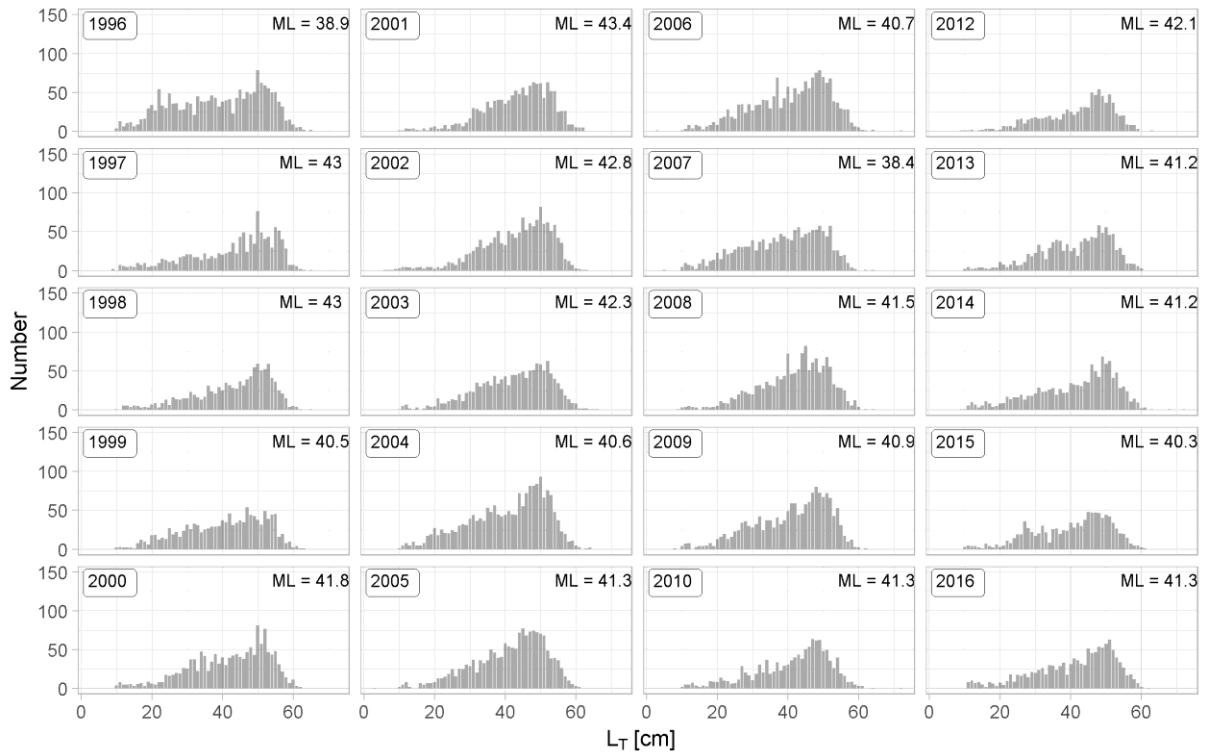


Figure 8. Starry ray. Length distributions in autumn survey (IS-SMH) since 1996. Mean length (cm) is indicated for each year (upper, right).

Mynd 7. Tindaskata. Lengdardreifing úr stofnmælingu botnfiska að hausti frá 1996.

The sex ratio is 1:1 in the spring survey but in the autumn survey ratio is skewed towards females (male female ratio 1:1.57). Males are on average larger than females (40.5 cm and 38.8 cm respectively).

Data on maturity is sampled in autumn survey allowing for calculations of maturity ogives. Length-at-50%-maturity (L_{50}) is 42.9 cm and 41.0 cm L_T for males and females respectively (Figure 9).

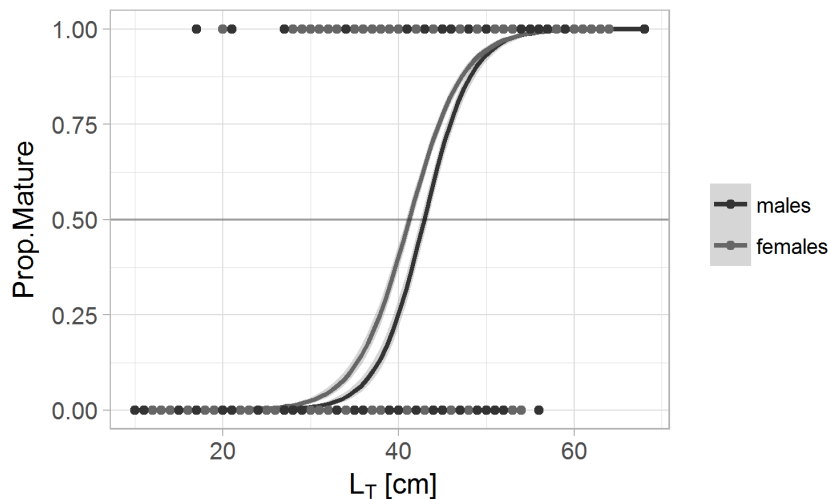


Figure 9. Starry ray. Length at maturity. Males: L_{50} = 42.9 cm T_L , L_{95} =51.1 cm T_L . Females: L_{50} =41.0 cm T_L , L_{95} =50.0 cm T_L .
Mynd 9. Lengd við kynþroska. Hængar: L_{50} = 42.9 cm T_L , L_{95} =51.1 cm T_L . Hrygnur: L_{50} =41.0 cm T_L , L_{95} =50.0 cm T_L .

Figure 10 shows both an index of juvenile abundance of starry ray smaller than 20cm, and trends in various biomass indices in the spring and autumn survey. Estimated biomass in IS-SMB has decreased from 20000 tonnes (average 1985-1997) to 15700 tonnes (average 1998-2016). Decreasing trend is in particularly prominent for large fish (>50cm) in years 1993-2008. Estimated biomass of juveniles (<20cm) appears to be stable despite large variations in years 2003-2013 and increasing trend since 2013 is noted.

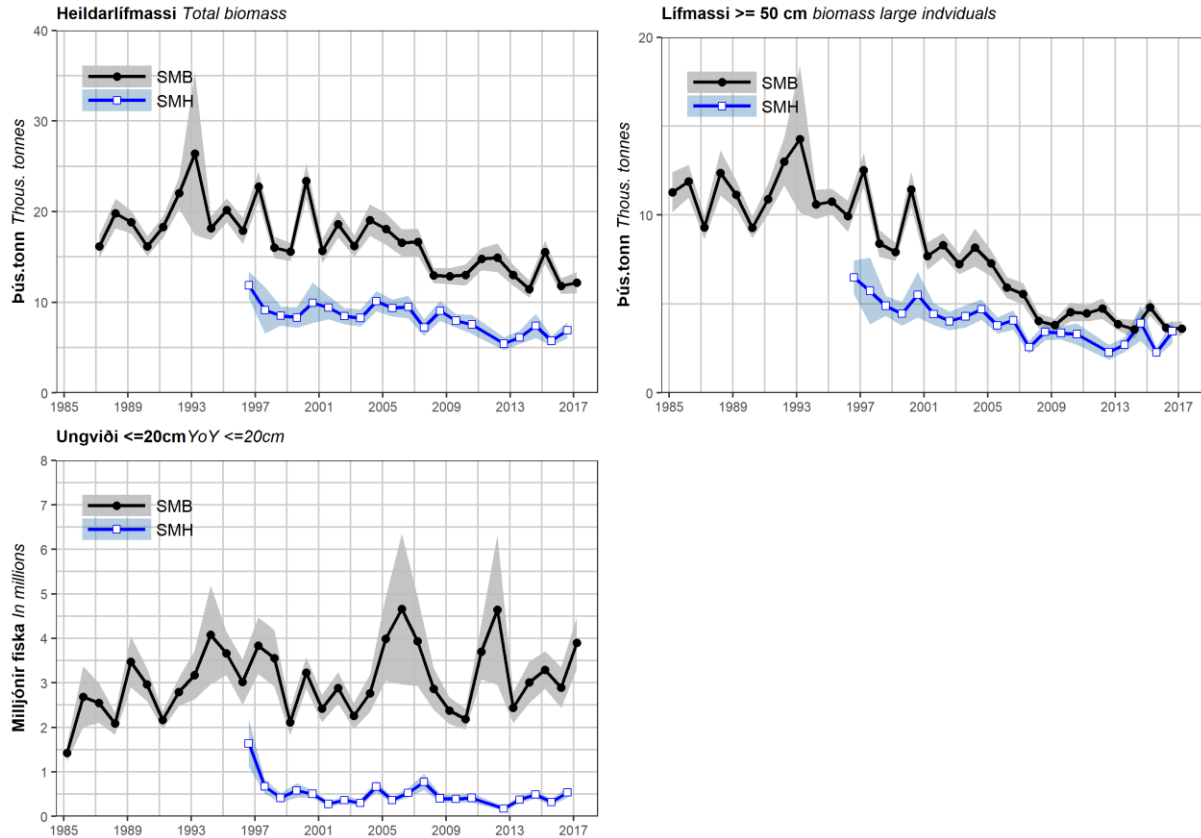


Figure 10. Starry ray. Biomass and abundance estimates showing total biomass (upper, left), biomass estimates of large individuals (upper, right) and juvenile abundance estimates (<20cm) (lower, left), from the spring survey (SMB, grey) and autumn survey (SMH, blue)

Mynd 10. Tindaskata. Afli, lífmassavísitala fiska stærri en 50cm og nýliðunarvísitala (<20cm) úr stofnmælingu botnfiska að vori (gráir ferlar) og úr stofnmælingu botnfiska að hausti (bláir ferlar).