

HADDOCK - ÝSA

Melanogrammus aeglefinus

GENERAL INFORMATION

Haddock has been exploited for centuries in Icelandic waters. It is a gadoid species closely related to cod and has a distinctive black line along its white side, and a black spot above its pectoral fin. It is commonly found at depths between 50 to 150 m but has a range as deep as 300 m. Haddock in Icelandic waters is considered to be a single management unit.

Icelandic haddock is mostly limited to the Icelandic continental shelf and is mainly found on the southern, western and northern parts of the shelf area, but 0-group and juveniles from the stock are occasionally found in East Greenland waters. Apart from this, larval drifts links with other areas have not been found. The nearest area to the Icelandic were haddock are found in reasonable abundance are in shallow Faeroe waters, an area that constitutes as separate stock. The two grounds are separated by a wide and relatively deep ridge, an area where reporting of haddock catches is non-existent neither in commercial nor scientific fisheries. Information about stock structure (metapopulation) of haddock in Icelandic waters is limited, but it is unlikely to be as diverse as observed for cod.

FISHERY

The fishery for haddock in Icelandic waters has not changed substantially in recent years. Around 250 longlines annually report catches of haddock, around 60 trawlers and 40 demersal seiners. Most of haddock in Icelandic waters is caught by trawlers and the proportion caught by that gear has decreased since 1995 from around 70% and is currently around 45%. At the same time the proportion caught by longlines has increased from around 15% in 1995 - 2000 to 40 % in 2011–2017. Catches in demersal seine have varied less and have been at around 15% of Icelandic catches of haddock in Icelandic waters. Currently less than 2% of catches are taken by other vessel types, but historically up to 10% of total catches were by gillnetters, but since 2000 these catches have been low. (Table 2 and Figure 3). Most of the haddock caught in Icelandic waters by Icelandic vessels is caught at depths less than 200 m (Figure 2). The main fishing grounds for haddock in Icelandic waters, as observed from logbooks, are in the south, southwestern and western part of the Icelandic shelf (Figures 4 and 5). The main trend in the spatial distribution of haddock catches in Icelandic waters according to logbook entries is the increased proportion of catches caught in the north and northeast.

LANDING TRENDS

Landings of Icelandic haddock in 2017 are estimated to have been 37.06 thousand tonnes (Figure 1, Table 1). The landings in Icelandic waters have decreased from 100 thous. tonnes between 2005–2008, which historically was very near the maximum levels observed in the 1960's, to the current level which is slightly lower than observed between 1975 to early 2000's.

Foreign vessel landings were a considerable proportion of the landings, but since the expansion of the EEZ landings of foreign vessels are negligible. Currently most of the foreign catch is caught by Faeroese vessels, which in last year was 1355 tonnes, while Norwegian vessels land considerably less.

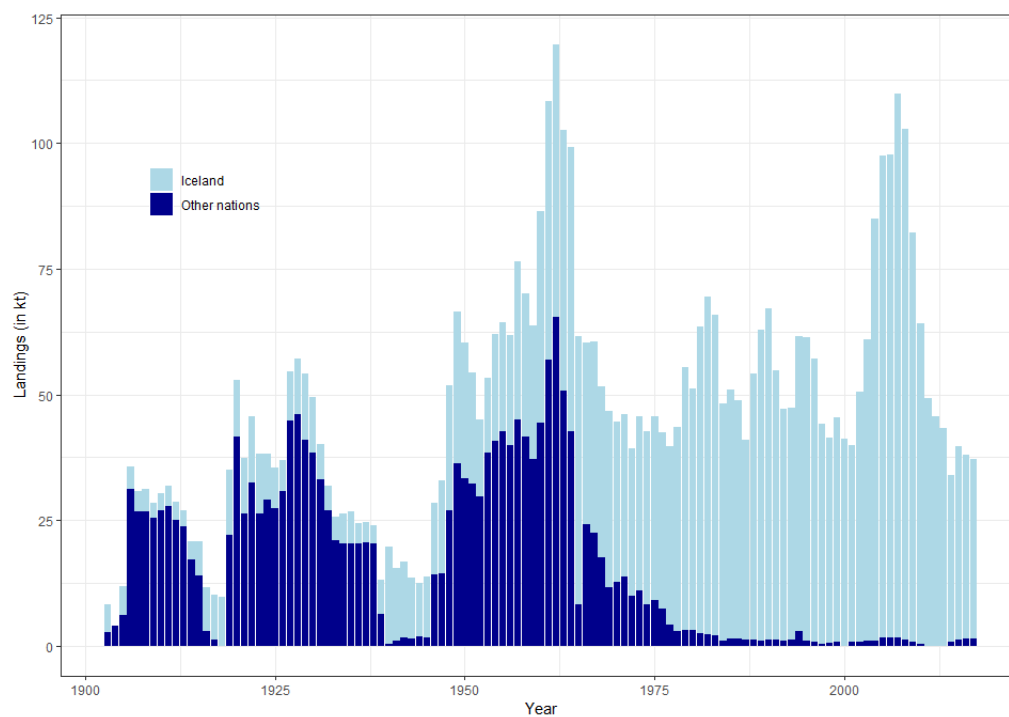


Figure 1. Haddock. Recorded landings 1905–2017.

Mynd 1. Ýsa. Skráður afli á árunum 1905 til 2017.

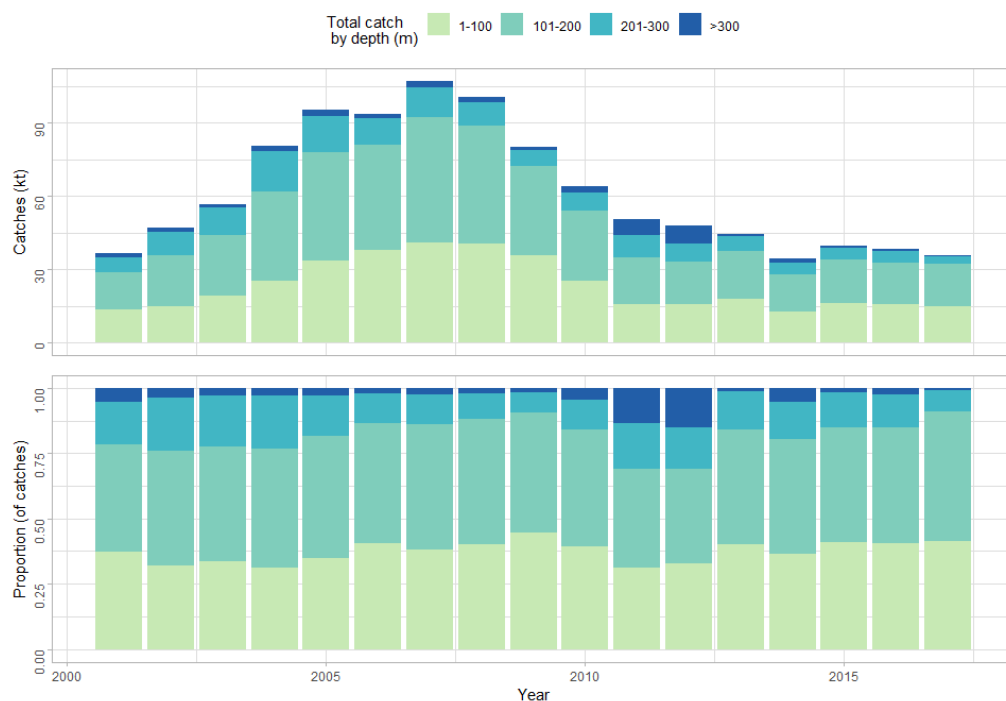


Figure 2. Haddock. Depth distribution of haddock catches from bottom trawls, longlines and demersal seine from Icelandic logbooks.

Mynd 2. Ýsa. Afli botnvörpu, línubáta og snurvoð samkvæmt afladagbókum, skipt eftir dýpi

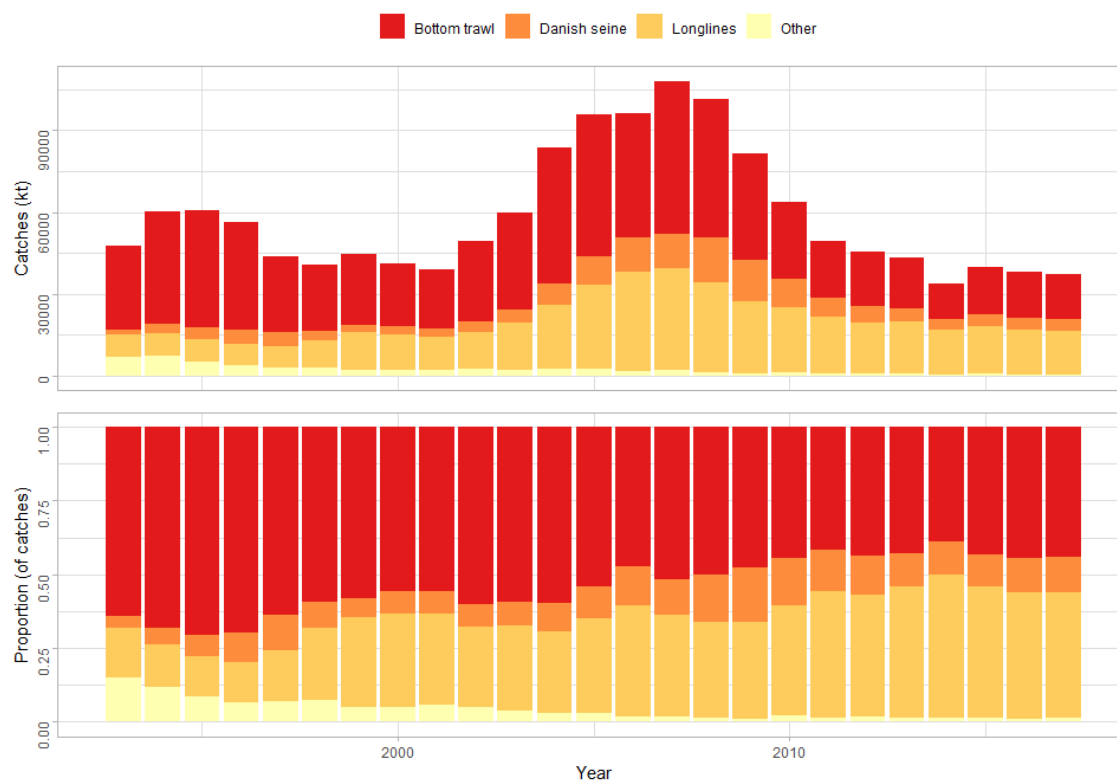


Figure 3. Haddock. Landings in tons and percent of total by gear and year.

Mynd 3. Ýsa. Landaður afli í tonnum og prósentum skipt eftir veiðarfærum.

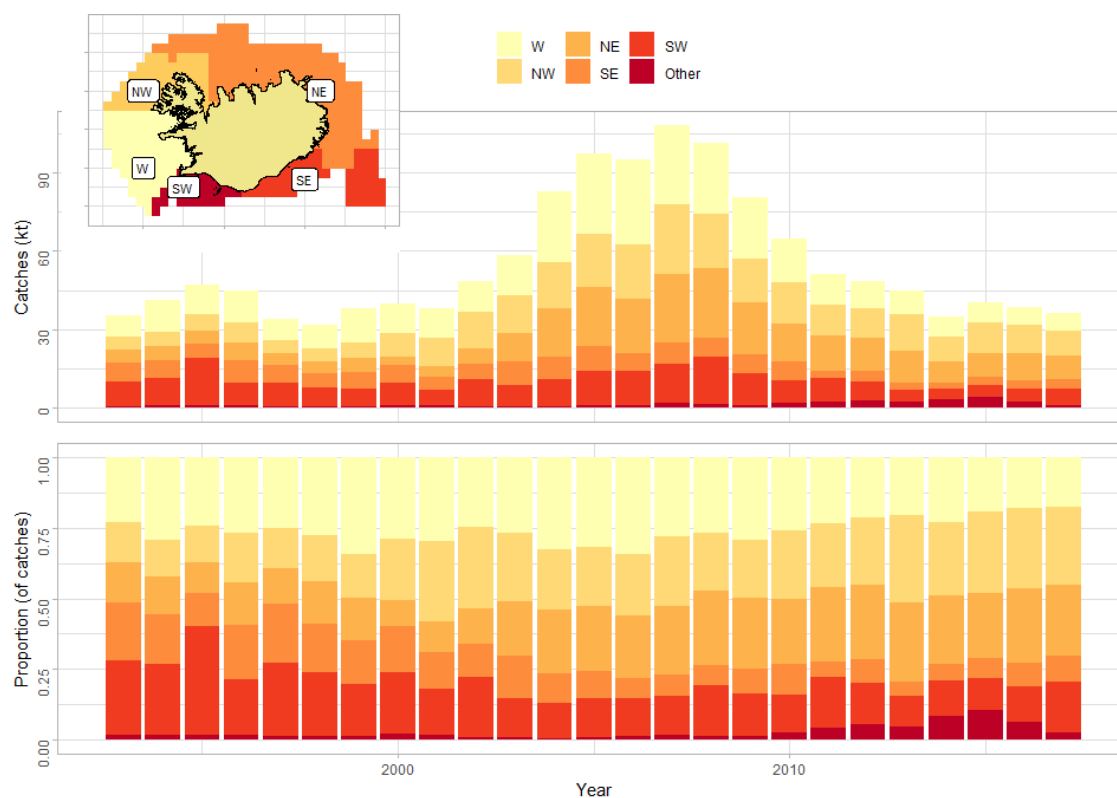


Figure 4. Haddock. Changes in spatial distribution of haddock catches as recorded in Icelandic logbooks.

Mynd 4. Ýsa. Breytingar í dreifingu afla eftir svæðum skv. afladagbókum.

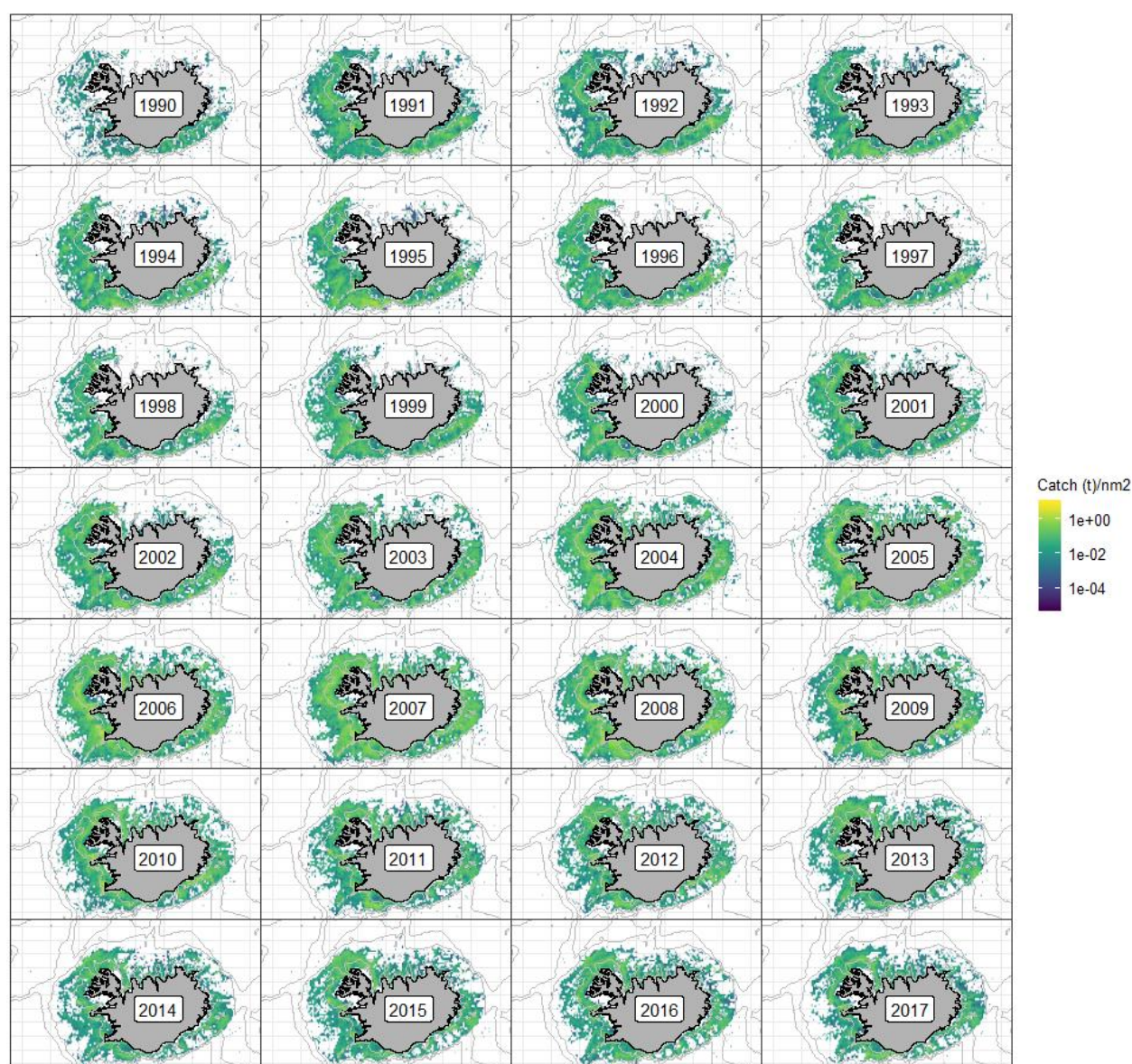


Figure 5. Haddock. Spatial distribution of catches by all gears.

Mynd 5. Ýsa. Dreifing afla úr afladagbókum fyrir öll veiðarfæri.

MANAGEMENT

The Icelandic Ministry of Industries and Innovation is responsible for management of the Icelandic fisheries and implementation of legislation. The Ministry issues regulations for commercial fishing for each fishing year (1 September–31 August), including an allocation of the TAC for each stock subject to such limitations. Haddock in Icelandic waters has been managed by TAC since the 1987. Landings have roughly followed the advice given by MRI/MFRI and the set TAC in all fishing years (Table 11). Since the 2001/2002 the catches have exceeded more than 5% the set TAC in five fishing years. The largest overshoot in landings in relation to advice/TAC was observed in the fishing year 2007/2008 when the landings of haddock exceeded the advice by 11%. The reasons for the implementation errors are related to the management system that allow for transfers of quota share between fishing years and conversion of TAC from one species to another. The TAC system does not include catches taken by Norway and the Faroe Islands by bilateral agreement.

The level of those catches is known in advance but has until recently not been taken into consideration by the Ministry when allocating TAC to Icelandic vessels. There is no minimum landing size for haddock

in Icelandic waters. There are agreements between Iceland, Norway and the Faroe Islands relating to a fishery of vessels in restricted areas within the Icelandic EEZ. Faroese vessels can fish 5600 t of demersal fish species in Icelandic waters which includes maximum 1200 tonnes of cod and 40 t of Atlantic halibut.

The effect of these species conversions and quota transfers is illustrated in Figure 6, illustrating that when the biomass of haddock was high in the years in 2002-2007, the net transfers to haddock from other species increased. This may in part be explained by shifts in distribution of haddock, as illustrated in Figure 5, as the fisheries that traditionally target the northern area had lower amounts of haddock in their quota portfolio. However, looking over a longer period, quota transfer towards/from haddock has on the average been close to zero. With the establishment of a management plan in 2013, the transfers between quota years have decreased substantially, while at the same time transfers from other species have increased. This can be attributed to high catchability of haddock, as demonstrated by high CPUE in recent years. The haddock quota may also be limiting in some mixed fisheries and that haddock could have been underestimated in last years could also contribute to transfer towards haddock.

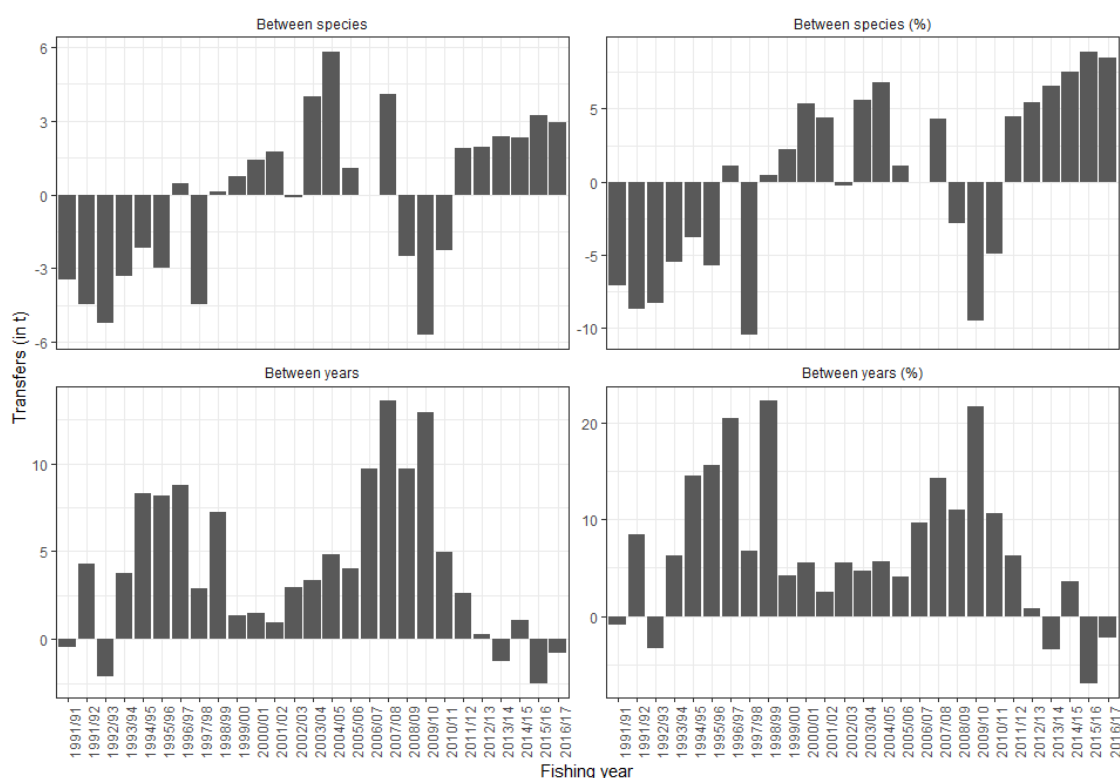


Figure 6. Haddock. Net transfers of quota to and from haddock in the Icelandic ITQ system by fishing year. Between species (upper): Positive values indicate a transfer of other species to haddock, but negative values indicate a transfer of haddock quota to other species. **Between years (lower):** Transfer of quota from given quota year to the next quota year.

Mynd 6. Ýsa. Nettó tilfærsla á kvóta eftir fiskveiðiárum. Tílfærsla milli tegunda (efri myndir): Jákvæð gildi tákna tilfærslu á kvóta annarra tegunda yfir á ýsu en neikvæð gildi tilfærslu ýsukvóta á aðrar tegundir. Tílfærsla milli ára (neðri myndir): Tílfærsla kvóta frá viðkomandi fiskveiðiári yfir á næsta fiskveiðiár.

DATA AVAILABLE

In general sampling is considered good from commercial catches from the main gears (demersal seines, longlines and trawls). The sampling does seem to cover the spatial distribution of catches. Similarly, sampling does seem to follow the temporal distribution of catches (see MRI 2012). The sampling coverage by gear in 2017 is shown in Figure 7.

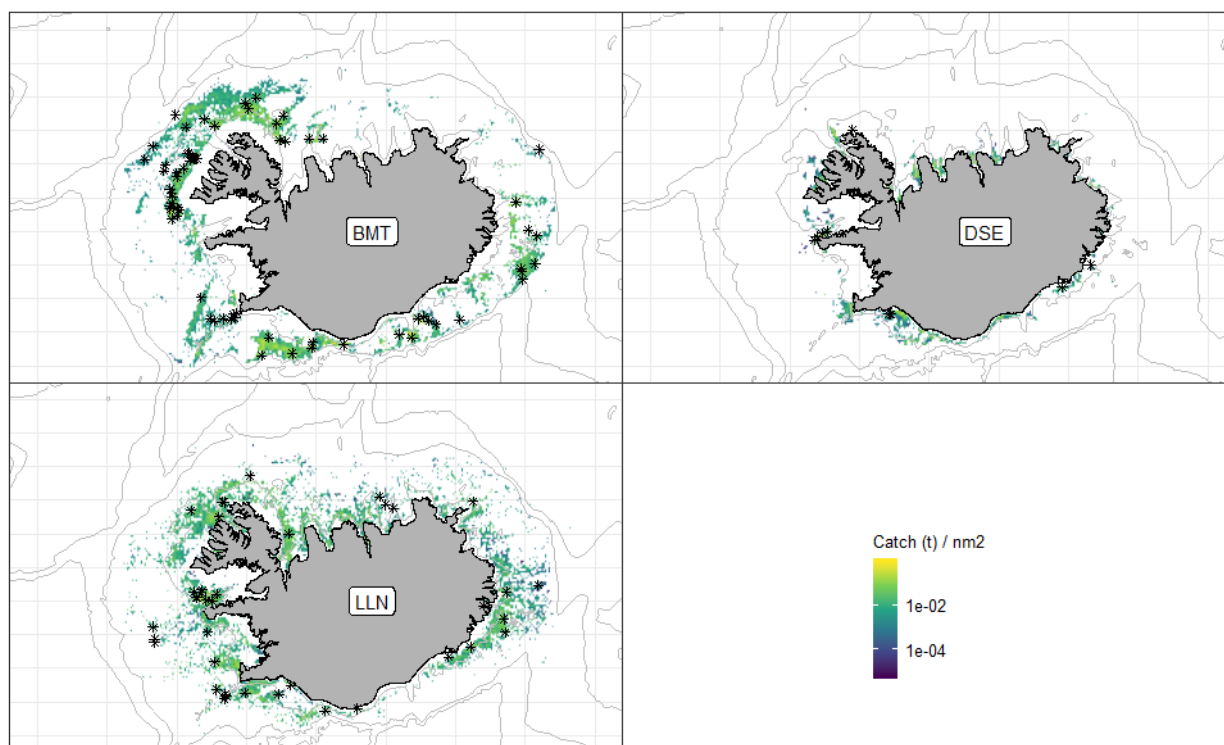


Figure 6. Haddock. Fishing grounds in 2017 as reported in logbooks (tiles) and positions of samples taken from landings (asterisks) by main gear types.

Mynd 7. Ýsa. Dreifing veiða árið 2017 skráð í afladagbækur eftir veiðarfærum. Staðsetning sýna úr afla er sýnd með stjörnu.

LANDINGS AND DISCARDS

All landings in Icelandic waters before 1982 are derived from the STATLANT database, and also all foreign landings in Icelandic waters to 2005. The years between 1982 and 1993 landings by Icelandic vessels were collected by the Fisheries Association of Iceland (Fiskifélagið). Landings after 1994 by Icelandic vessels are given by the Icelandic Directorate of Fisheries. Landings of foreign vessels (mainly Norwegian and Faroese vessels) are given by the Icelandic Coast Guard prior to 2014 but after 2014 this are also recorded by the Directorate. Discarding is banned by law in the Icelandic demersal fishery. Based on annual discards estimates since 2001, discard rates in the Icelandic fishery for haddock are estimated very low (<3% in either numbers or weight, see MFRI (2012) for further details) while historically discards may have been substantial in the early 1990s. Measures in the management system such as converting quota share from one species to another are used by the fleet to a large extent and this is thought to discourage discarding in mixed fisheries. A more detailed description of the management system can be found on <https://www.responsiblefisheries.is/seafood-industry/management-and-control-system/>.

LENGTH COMPOSITIONS

An overview of available length measurements from 5.a is given in Table 3. The bulk of the measurements are from the three main fleet segments, i.e. trawls, longlines and demersal seine. The number of available length measurements by gear has fluctuated in recent years in relation to the changes in the fleet composition.

Length distributions from the main fleet segments are shown in Figure 8.

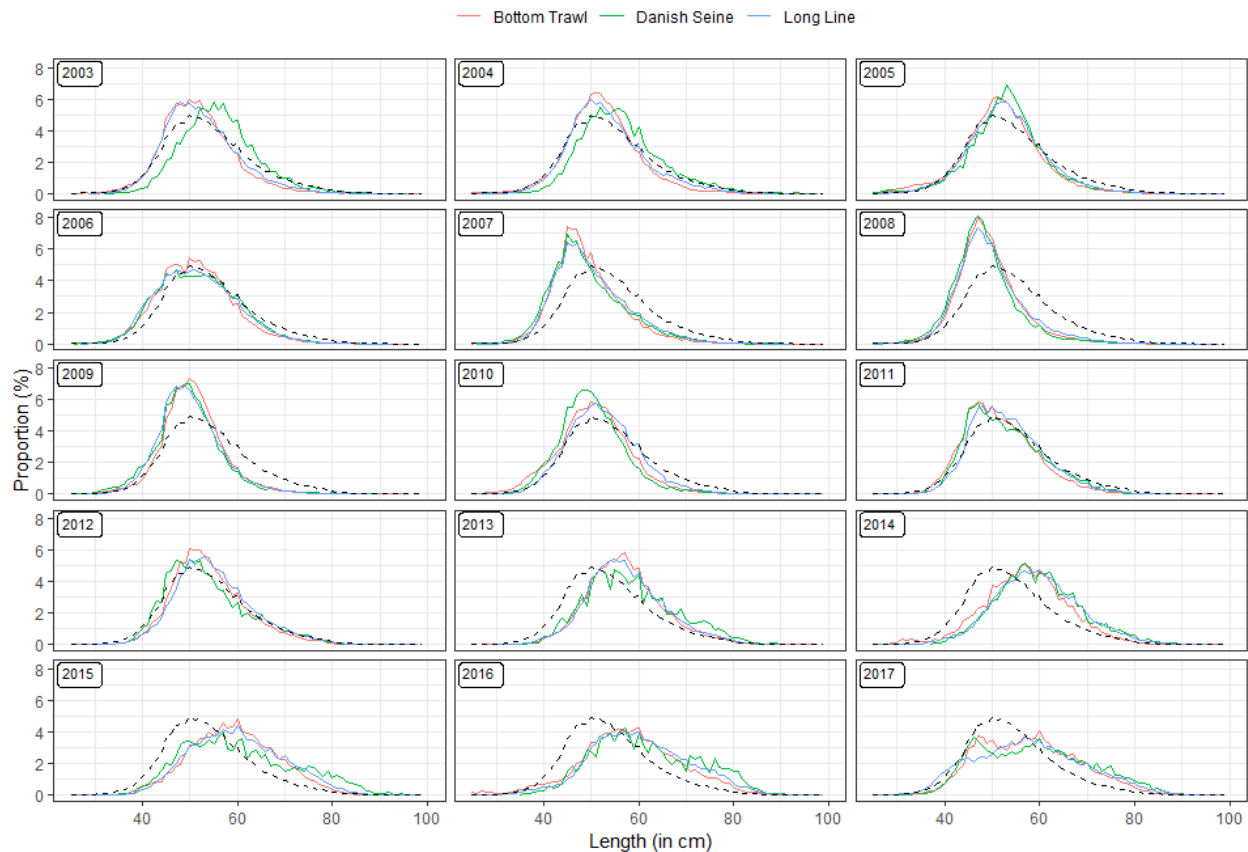


Figure 7. Haddock. Commercial length distributions by gear. Dashed line indicates the overall mean length distribution throughout the whole period.

Mynd 8. Ýsa. Lengdardreifingar úr afla eftir veiðarfærum skipt eftir árum. Brotalínan sýnir meðaltal fyrir allt tímabilið.

AGE COMPOSITIONS

Table 4 gives an overview of otolith sampling intensity by gear types in Icelandic waters. Catch in numbers-at-age is shown in Table 5 and Figure 9. The catches in 2017 mainly composed of relatively small year classes as the last above average year class, the 2008 year class, accounted for roughly 3% of the total catches. Older year classes contributed around 4% of total catches. So roughly 90% of the catch is from the small year classes 2008–2015, with the 2014 year class being the largest component (approx. 36.4%). The number of year classes contributing to the catches is unusually many; the result of low fishing mortality in recent years and the last large year class is 10 years old.

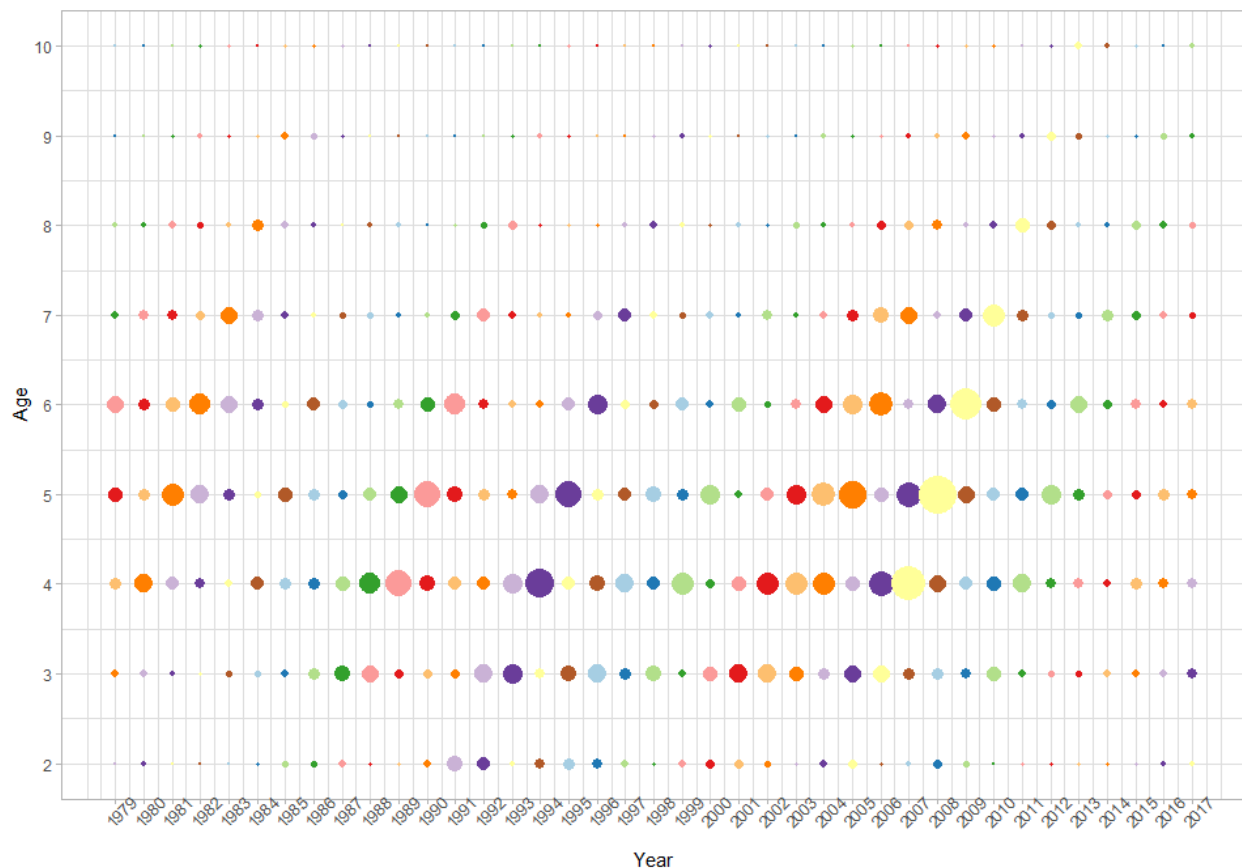


Figure 8. Haddock. Catch at age from the commercial fishery in Iceland waters. Bubble size is indicative of the absolute catch in numbers.

Mynd 9. Ýsa. Aldursgreindur ýsuafli á Íslandsmiðum. Hringtærð gefur til kynna heildarfjölda aldurshóps í fjölda.

WEIGHT AT AGE

Mean weight at age in the catch is shown in Table 6 and Figure 10. Mean weight at age in the stock is given in Table 7 and Figure 11. Those data are obtained from the groundfish survey in March and are also used as mean weight at age in the spawning stock. Both stock and catch weights have been increasing in recent years, after being very low when the stock was large between 2005 and 2009. Higher mean weight at age is most apparent for the younger haddock from the small cohorts (2008–2013), but mean weight of the old fish is now also average. Mean weight of the 2014 cohort was more lower than that of recent small year classes but above average for a large cohorts. Weight at age is predicted to increase for all age groups in the foreseeable future.



Figure 9 Haddock. Catch weights from the commercial fishery in Icelandic waters. Blue bars indicate observed numbers while red bars indicate predicted numbers.

Mynd 10. Ýsa. Aflþýngdir eftir aldri úr veiðum á Íslandsmiðum. Bláar línur gefa til kynna mælingar og rauðar spá um þróun þýngda.



Figure 10. Haddock. Stock weights from the March survey in Icelandic waters. Blue bars indicate observed numbers while red bars indicate predicted numbers.

Mynd 11. Ýsa. Stofnþyngdir úr vorralli Hafrannsóknastofnunar. Bláar línur gefa til kynna mælingar og rauðar spá um þróun þyngda.

MATURITY AT AGE

Maturity-at-age data are given in Table 8 and Figure 12. Those data are obtained from the groundfish survey in March. Maturity-at-age of the youngest age groups has been decreasing in recent years while mean weight at age has been increasing. The numbers for age 10 only apply to the spawning stock. Maturity by size has been decreasing and the most likely explanation is large proportion of those age groups north of Iceland where proportion mature has always been low.

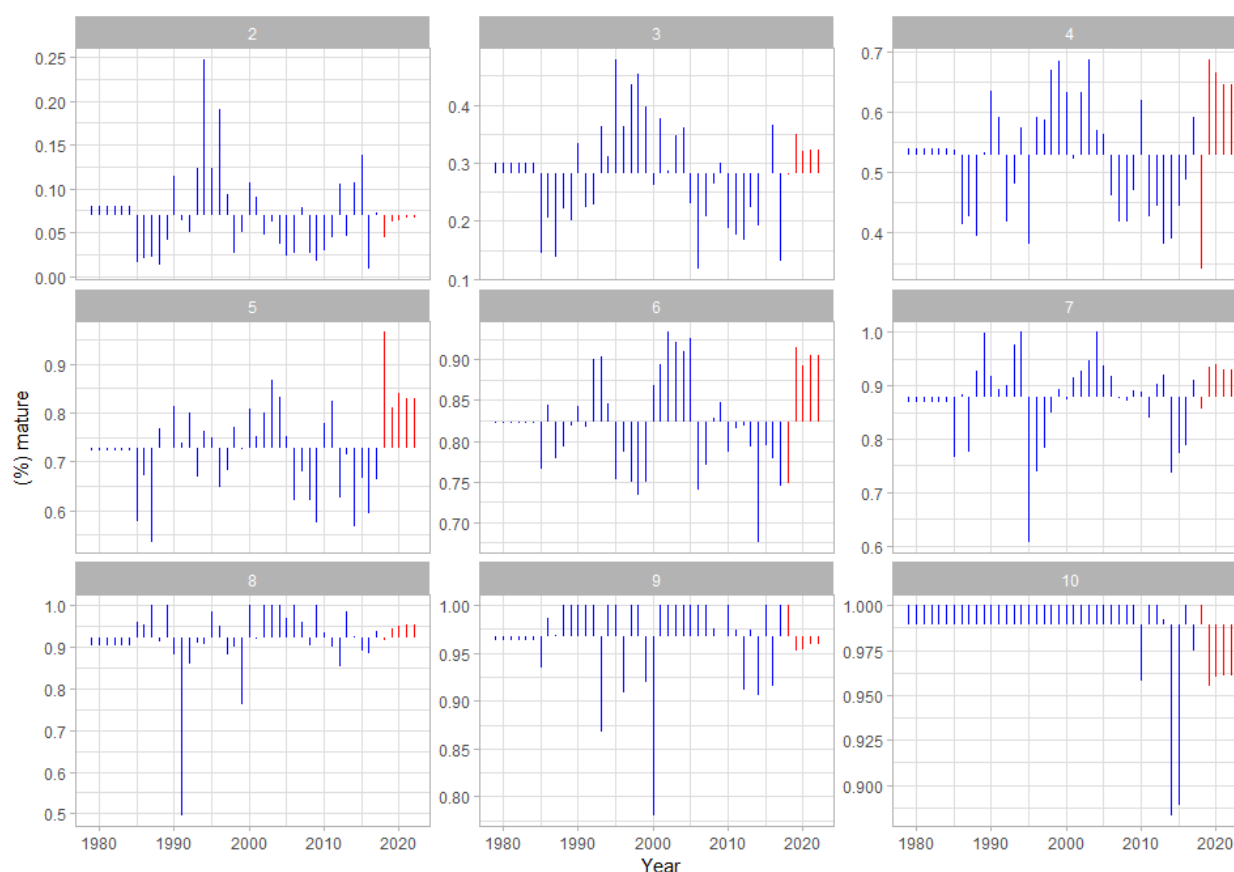


Figure 11. Haddock. Maturity-at-age in the survey. The red bars indicate predictions. The values are used to calculate the spawning stock.

Mynd 12. Ýsa. Kynþroskahlutfall eftir aldri úr vorralli Hafrannsóknastofnunar. Bláar línur gefa til kynna mælingar og rauðar spá um þróun kynþroskahlutfalls.

NATURAL MORTALITY

No information is available on natural mortality. For assessment and advisory purpose the natural mortality is set to 0.2 for all age groups.

CATCH, EFFORT AND SURVEY DATA

CATCH PER UNIT OF EFFORT AND EFFORT DATA FROM COMMERCIAL FISHERIES

Catch per unit of effort data (Figure 13) give somewhat different picture of the development of the stock than the surveys and assessment, much less increase after 2000 and much less decrease in recent years. The current assessment coupled with the relatively high CPUE, in recent years, confirms fisher's view that is now easier to catch haddock. The discrepancy observed between CPUE and stock size has not been explained, but a plausible explanation might be related to a couple reasons. Area inhabited by the stock increased so the density in the traditional fishing area did not increase in relation to the stock size. First when the stock was large slower growth lead to larger proportion of the stock below "fishable size" 45cm limiting the areas where large haddock could be caught without too much bycatch of small haddock. The opposite has happened in recent years, faster growth and poor recruitment lead to the fisheries not limited by small haddock. Bycatch issues, but haddock is often caught as bycatch or one of the species in mixed fisheries where the goal is certain mixture of species.

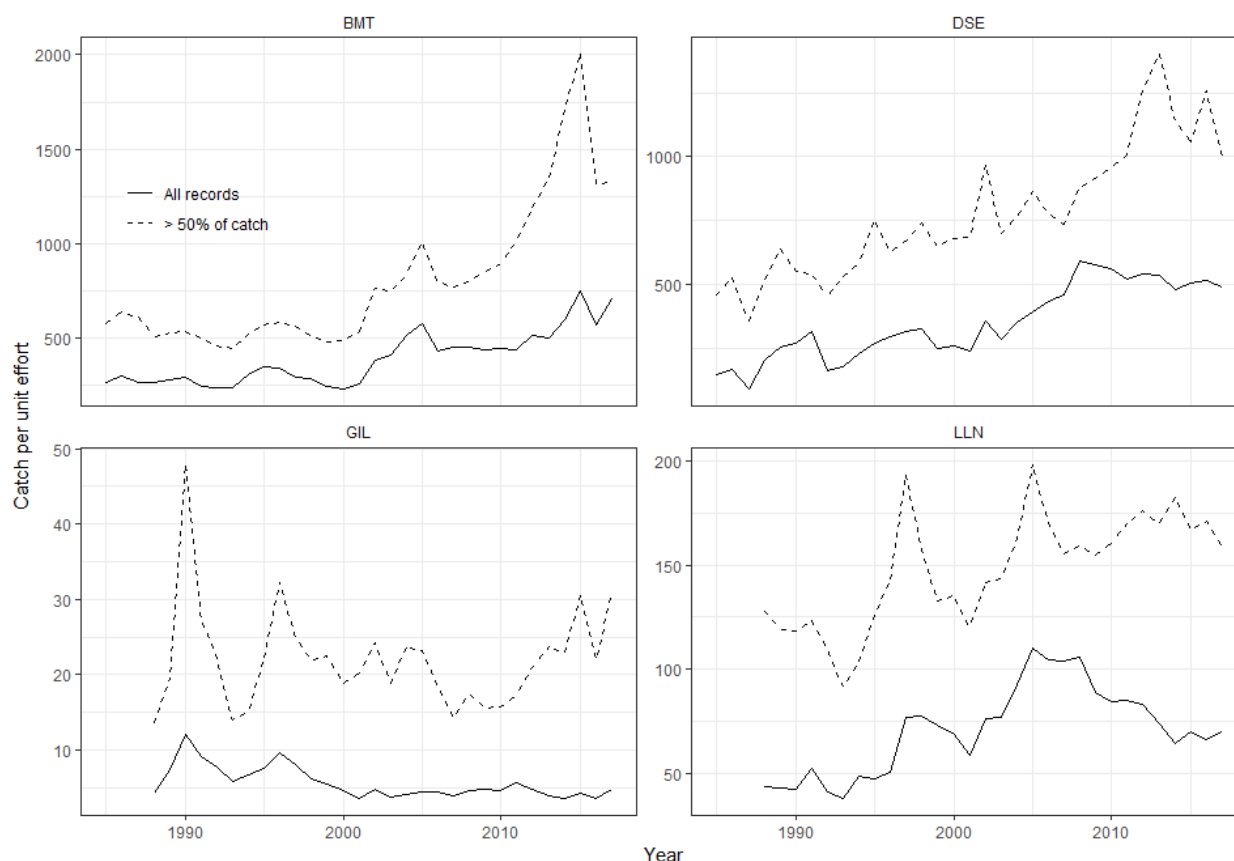


Figure 12. Haddock in Icelandic waters. Catch per unit of effort in the most important gear types. The dashed lines are based on locations where more than 50% of the catch is haddock and solid lines on all records where haddock is caught. A change occurred in the longline and gillnet fleet starting September 1999. Earlier only vessels larger than 10 BRT were required to return logbooks but later all vessels were required to return logbooks.

Mynd 13. Ýsa. Afli á sóknareiningu brotinn niður eftir helstu veiðarfæraflokkum. Brotalínur gefa til kynna afla á sóknareiningu þar sem meir en 50% aflans var ýsa en heilar línur allar færslur þar sem ýsa veiddist. Athugið að breyting átti sér stað í September 1999 þar sem öll skip voru skyldug til að skila inn afladagbók en fyrir þann tíma voru skip minni en 10 brúttólestir undanskilin þeirri skyldu.

ICELANDIC SURVEY DATA

The Icelandic spring groundfish survey, which has been conducted annually since 1985, covers the most important distribution area of the haddock fishery. In addition to the spring survey, an autumn survey in Icelandic waters was commenced in 1996 and expanded in 2000 to include deep water stations. The autumn survey has been conducted annual except for 2011 where a full autumn survey was not conducted in 2011. A detailed description of the Icelandic spring and autumn groundfish surveys is given in the Stock Annex. Figure 14 shows both a recruitment index and the trends in various biomass indices. Survey length distributions are shown in Figure 15 (abundance) and changes in spatial distribution in Figures 16 and 17.

Both surveys show much increase total biomass between 2002 and 2005 but considerable decrease from 2007–2010. The difference in perception of the stock between the surveys is that the autumn survey shows less contrast between periods of large and small stock. The 2015 estimate from the autumn survey exhibited substantially lower biomass compared to adjacent years. The contrast between the surveys appears to be starker when looking at the biomass of 60 cm and larger. The autumn survey index shows at downwards trend while the spring survey and upwards trend.

Age disaggregated indices from the March survey are given in Table 9 and indices from the autumn survey in Table 10. Abundance of age groups 3–7 in the 2016 March survey is low while age 9 is among the highest indices observed. The index of age 12 and 13 (2003 cohort) is much higher than seen before (large part of 11+ in the March survey), but that cohort will though not contribute much to the landings. Year classes 2008 and 2009 (age 8 and 7) are now close to average, mostly due to reduced fishing mortality in recent years but those year classes were originally small.

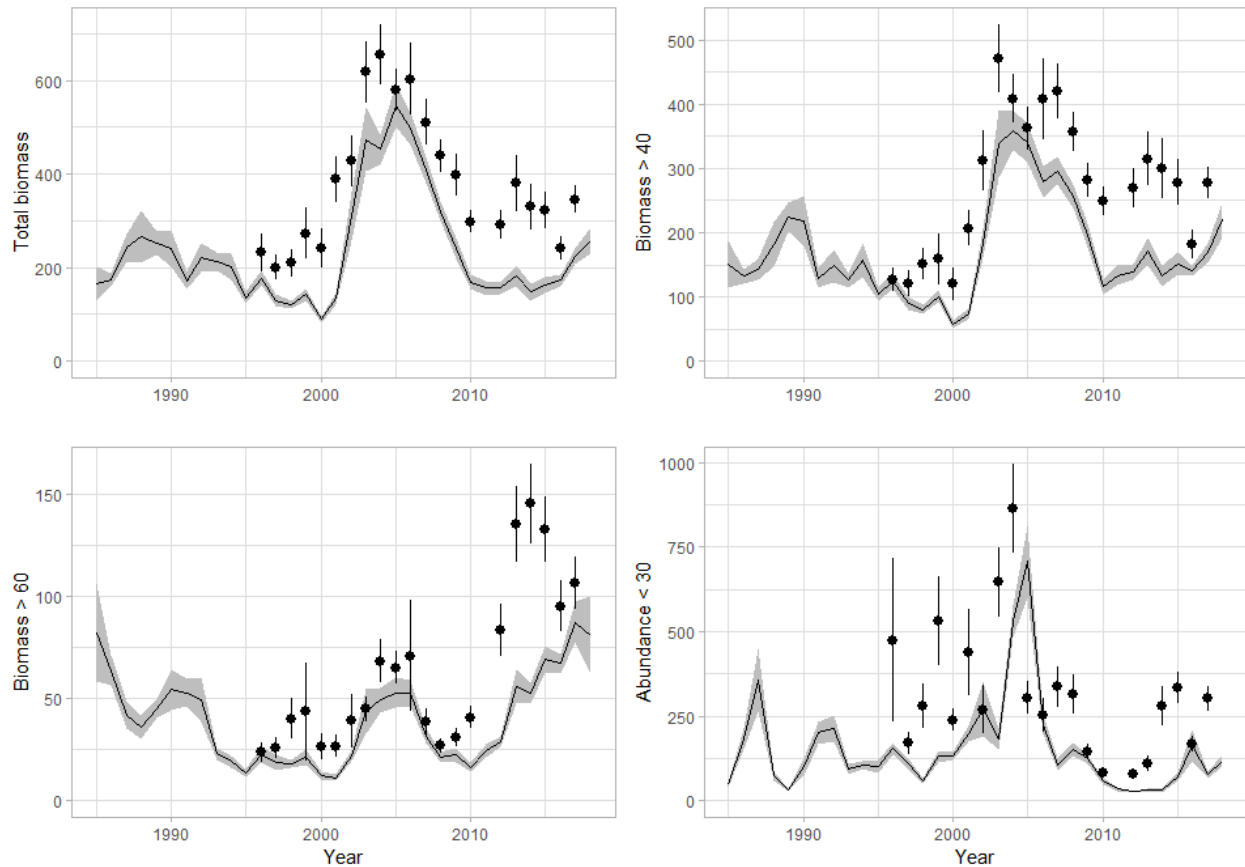


Figure 13 Haddock. Indices in the Spring Survey (March) 1985 and onwards (line shaded area) and the autumn survey (point ranges).

Mynd 14. Ýsa. Vísitölur úr stofnmælingum Hafrannsóknastofnunar. Vísitala úr vorralli er táknuð með heilli línu, þar sem skyggð svæði gefa til kynna óvissu í mælingum (staðalfrávik), og haustrallsvísitalan er táknuð með punktum, þar sem lóðréttar línur tákna óvissu.

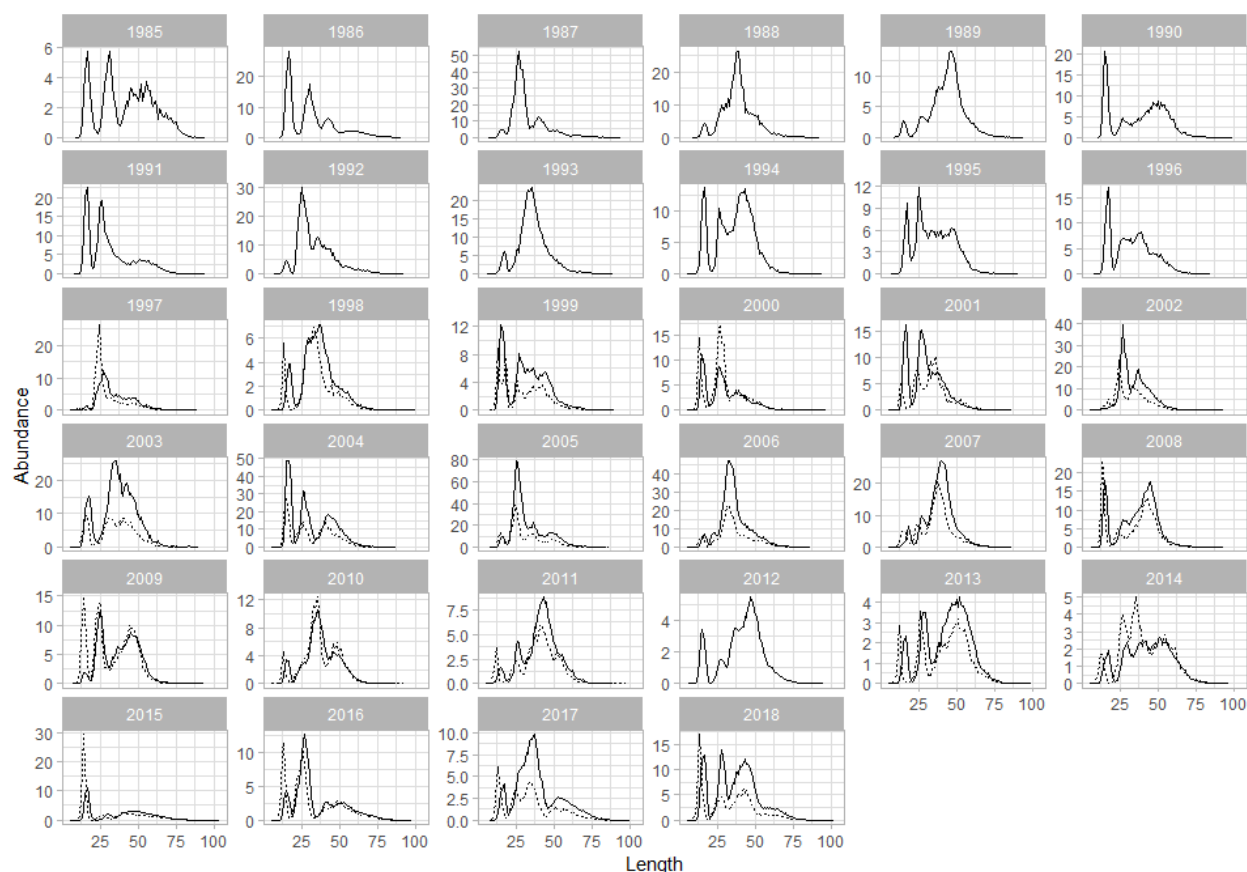


Figure 14. Haddock. Length disaggregated abundance indices from the spring survey (March) 1985 and onwards, and the Autumn survey from 1996 onwards (except for 2011).

Mynd 15. Ýsa. Lengdardreifingar úr árlegum stofnmælingum Hafrannsóknastofnunar. Heil lína sýnir mælingar úr vorralli, sem hófst 1985, en brotalínan sýnir mælingar úr haustralli, sem hófst 1996. Árið 2011 féll haustrallið niður.

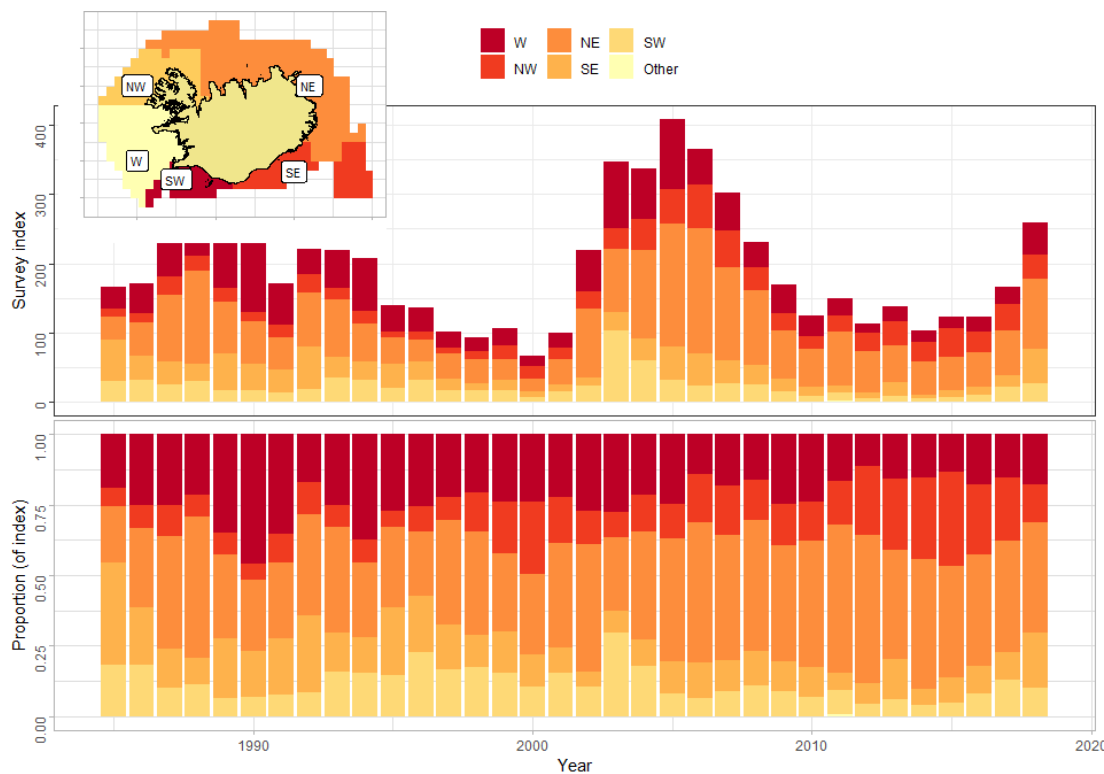


Figure 15. Haddock. Changes in spatial distribution of haddock in the March survey.

Mynd 16. Ýsa. Breytingar á dreifingu ýsu í vorralli Hafrannsóknastofnunar.



Figure 16. Haddock. Location of haddock in the March survey, bubble sizes are relative to catch sizes.

Mynd 17. Ýsa. Staðsetning ýsu í vorralli Hafrannsóknastofnunar. Punktastærð er í hlutfalli við afla í togi.

DATA ANALYSES

ANALYTICAL ASSESSMENT

The assessment of haddock is based on an ADAPT type model (Gavaris and Van Eeckhaute, 1998). This stock was last benchmarked in 2013 (WKROUND 2013), but the model had been used previously on an ad-hoc basis from 2007. A management plan for haddock in Icelandic waters based on this assessment was tested by ADGISAHA (2013) and subsequently implemented by the government of Iceland.

DATA USED BY THE ASSESSMENT

The final assessment has been based on an Adapt type model calibrated with indices from both the groundfish surveys in March and October using catch at age data as input. A full description of the preparation of the data used for tuning and as input is given in the stock annex (see ICES 2013a). The assessment model with all settings can be obtained at https://github.com/ices-taf/2018_had.27.5a.pp

DIAGNOSTICS

Plot of observed vs. predicted biomass from the surveys (Figure 19) indicates that historically the autumn survey biomass has been closer to prediction than corresponding values from the March survey where the contrast in observed biomass is more than predicted from the assessment. When the stock was small in 2000 and 2001, the March survey indicated considerably smaller stock while the autumn survey values were reasonably correct and from 2003-2007 the March survey overestimated the stock. The discrepancy appears to be in the largest age groups where the age indices autumn survey is overpredicted in recent

years, suggesting that older age groups observed in the March survey are not observed to the same degree in the October survey. Related to this, Figure 25 shows the estimated “catchability” and CV as a function of age for the surveys, showing that estimated CV is lower is generally lower for ages 2–6, whereas the CV increases faster by age for the autumn survey compared with the spring survey.

Residuals from the assessment model are positive for the most recent October survey but close to zero for the most recent March survey (Figures 18 and 19). The March surveys 2011–2015 are on the other hand below predictions. Similar thing seems to be happening in the fishery in 2012–2013 (Figure 13) so there is indication that the stock might be underestimated, or availability of haddock is unusually high.

MODEL RESULTS

The results of the assessment indicate that the stock decreased from 2008–2011 when large year classes disappeared from the stock and were replaced by smaller year classes (Figure 21). Since 2011 the rate of reduction has slowed down as fishing mortality has been low. Despite this the spawning stock has decreased more than the reference biomass as proportion mature by age/size has been decreasing. Fishing mortality is now estimated to be low and is in line with the overall goal of the HCR. The current assessment does indicate the bottom has been reached and the stock size is increase in the coming years.

The main features of the current assessment are the same as in the assessments 2011 to 2017. The current assessment indicates larger stock than the 2017 assessment (Figure 22). Most of the difference is explained by higher than predicted numbers-at-age (Figures 18 and 19). Similarly, the tendency has been to underestimate recruitment and stock size in recent years (Figure 22). The estimated Mohns’s ρ are within acceptable range or -0.246 for estimated recruitment, -0.0417 for SSB and 0.115 for fishing mortality.

Assessment in recent years has shown some difference between model runs where either of the two different tuning series, i.e. March and the October surveys, are omitted from the estimation. From 2004–2008 models calibrated with the October survey indicated smaller stock. In the last five years things have changed and models calibrated with the October survey indicate a better state of the stock (see Figure 20. This behaviour is in line with what is seen in the surveys where the contrast in biomass is higher in the March survey (Figure 14).

Estimated selection is illustrated in Figure 26, where substantial variations in selection at age is estimated by the model. Haddock in Icelandic waters has exhibited substantial density dependence in growth, as illustrated in Figure 27.

SHORT TERM PROJECTIONS

Prediction of weight at age in the stock, weight at age in the catches, maturity-at-age and selection has been similar since 2006 (WD #19 in 2006). The procedure is described in the advice part of the report of ADGISHA (Björnsson 2013) and in the stock annex. The procedure was changed in 2016 in such a way that instead of taking only last year’s value, average of last 2 values is used. Prediction of growth is a source of uncertainty for this stock. (Figures 24, and 27). In recent year’s growth has shown interannual variability without any pattern, indicating that short-term prediction should rather been based on average growth of last 2–3 years instead of only last year’s growth.

Mean weight and maturity-at-age in 2017 are available and are used to predict catch weights and selection at age (Figure 27). Growth in 2017 is predicted by the equation

$$\log\left(\frac{W_{a+1,y+1}}{W_{a,y}}\right) = \alpha + \beta \log(W_{a,y0}) + \delta_y$$

Where according to the stock annex the factor δ_y for the assessment year (Figure 27) is the average of the points estimates of the growth-factor in the two preceding years. Growth has been high but somewhat variable in recent years but was much less in when the stock was larger. Maturity, selection, catch weights at age and proportion of the biomass above 45 cm are then predicted from stock weights in 2018. When those values have been estimated the prediction is done by the same model as used in the assessment. The resulting projections of maturity and weight at age are shown in relevant figures, indicated with red.

The model works iteratively as the estimated TAC for the fishing year 2017/2018 has some effect of the biomass at the beginning of 2019, which the TAC is based on. Advice for the following fishing year (2019/2020) is predicted to be approximately 58 kt and is projected to remain at that level as the 2014 year-class will be fully recruited. The results from the short-term projections are shown in Figure 21.

MANAGEMENT CONSIDERATIONS

All the signs from commercial catch data and surveys indicate that haddock in Icelandic waters is at present in a good state. This is confirmed in the ADAPT assessment. Although the retrospective pattern the model predictions for the harvestable biomass for the coming fishing year (2018/2019) has increased by more than 10% from that which was predicted last year. There are differences in the perception of the state of stock in assessment based on either the spring or autumn survey with autumn survey indicating a larger stock. This difference has been apparent since 2009. The assessment this year projects a large increase in the reference biomass (B_{45cm+}) for 2019 compared with last year projections. This is due to an update in expected weight at age.

ADVICE 2018

MFRI and ICES advise that when the Icelandic management plan is applied, catches in the fishing year 2018/2019 should be no more than 57 982 tonnes.

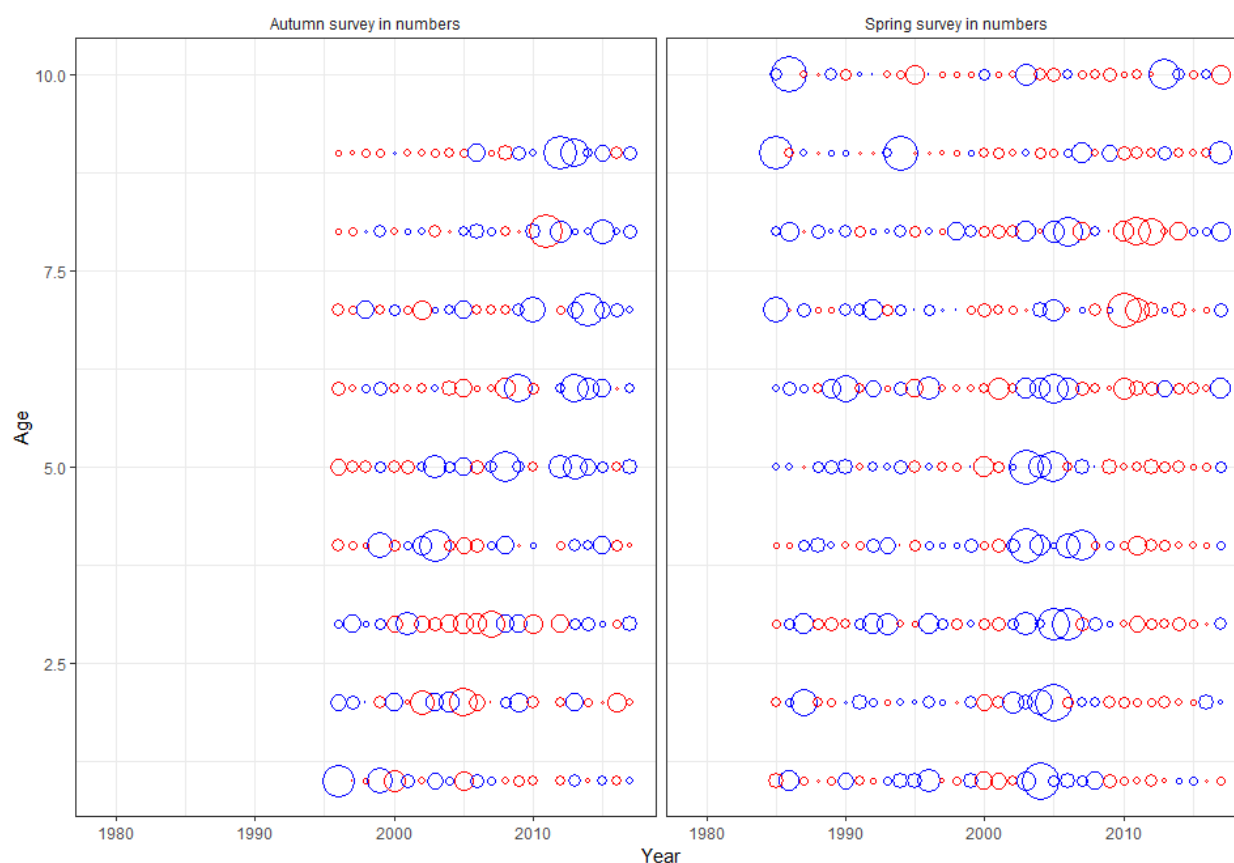


Figure 17. Haddock. Residuals from the fit to survey data from Adapt run based on the both the surveys. Red circles indicate negative residuals (observed < modelled), while blue positive. Residuals are proportional to the area of the circles.

Mynd 18. Ýsa. Leifar Adapt líkansins þegar úttak líkansins er borið saman við aldurskiptar vísitölur úr vor- og haustralli Hafrannsóknastofnunar. Rauðir hringir tákna neikvæðar leifar (mæligögn < spá líkans), en bláir jákvæðar leifar. Stærð hringja er í hlutfalli við stærð leifa.

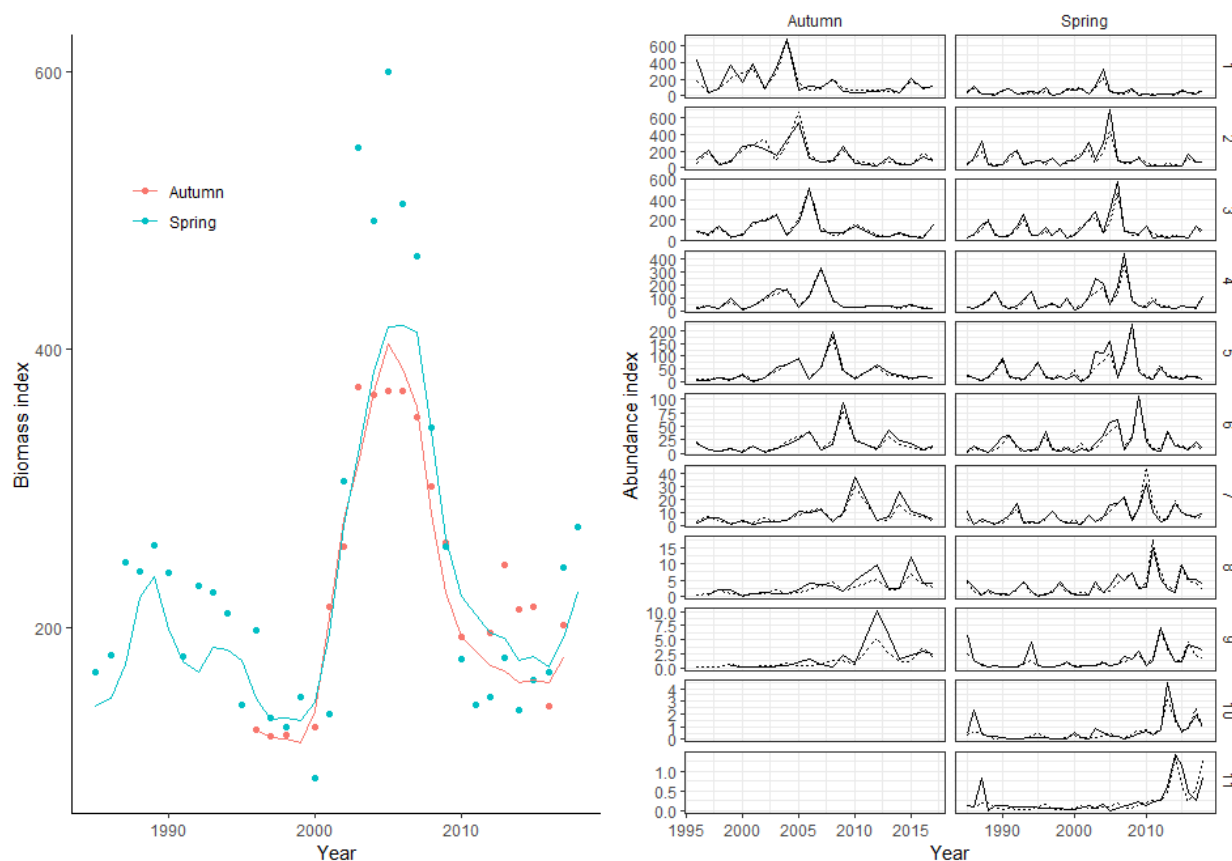


Figure 18. Haddock. Aggregated (left) and disaggregated by age (right) model fit to the biomass indices.

Mynd 19. Ýsa. Samanburður á spáðri heildarvísitölu (vinstri) og vísitölu skipt eftir aldri (hægri) úr stofnmatslíkani.

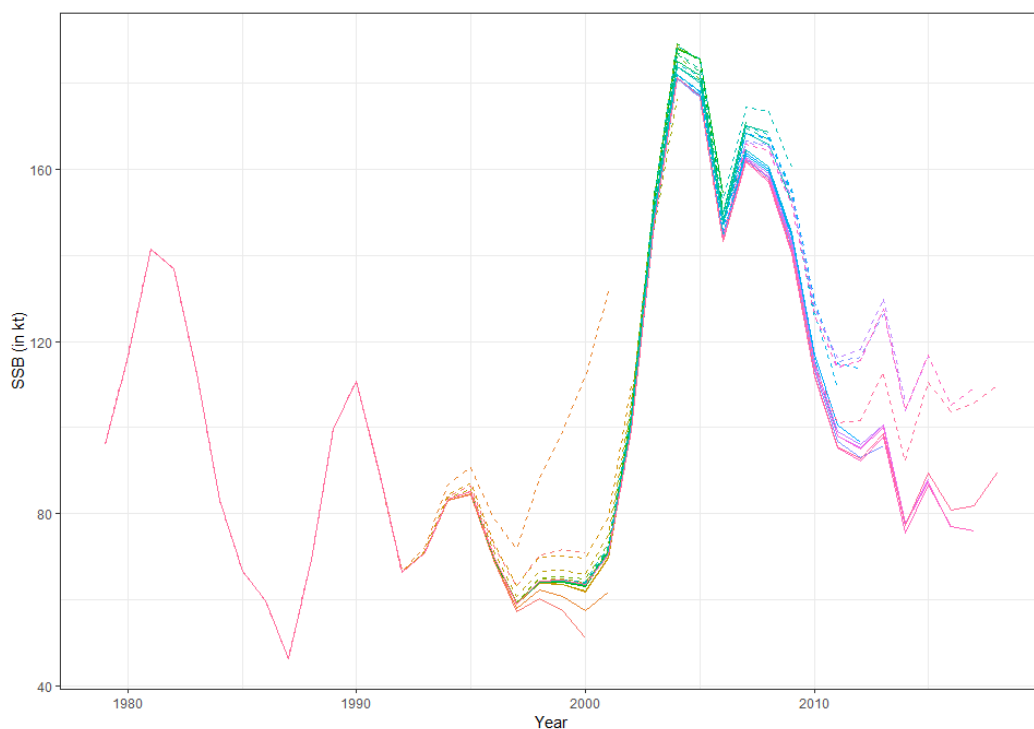


Figure 19. Haddock. Analytical retrospective estimates extended back to 2000 of the spawning stock biomass based on either both survey indices (solid lines) and only the autumn survey (dashed lines).

Mynd 20. Ýsa. Endurlitsgreining á mati á hrygningarstofni aftur til ársins 2000, annars vegar byggð á bæði haust og vorralli (heilar línur) og hins vegar aðeins vorralli (brotalínur).

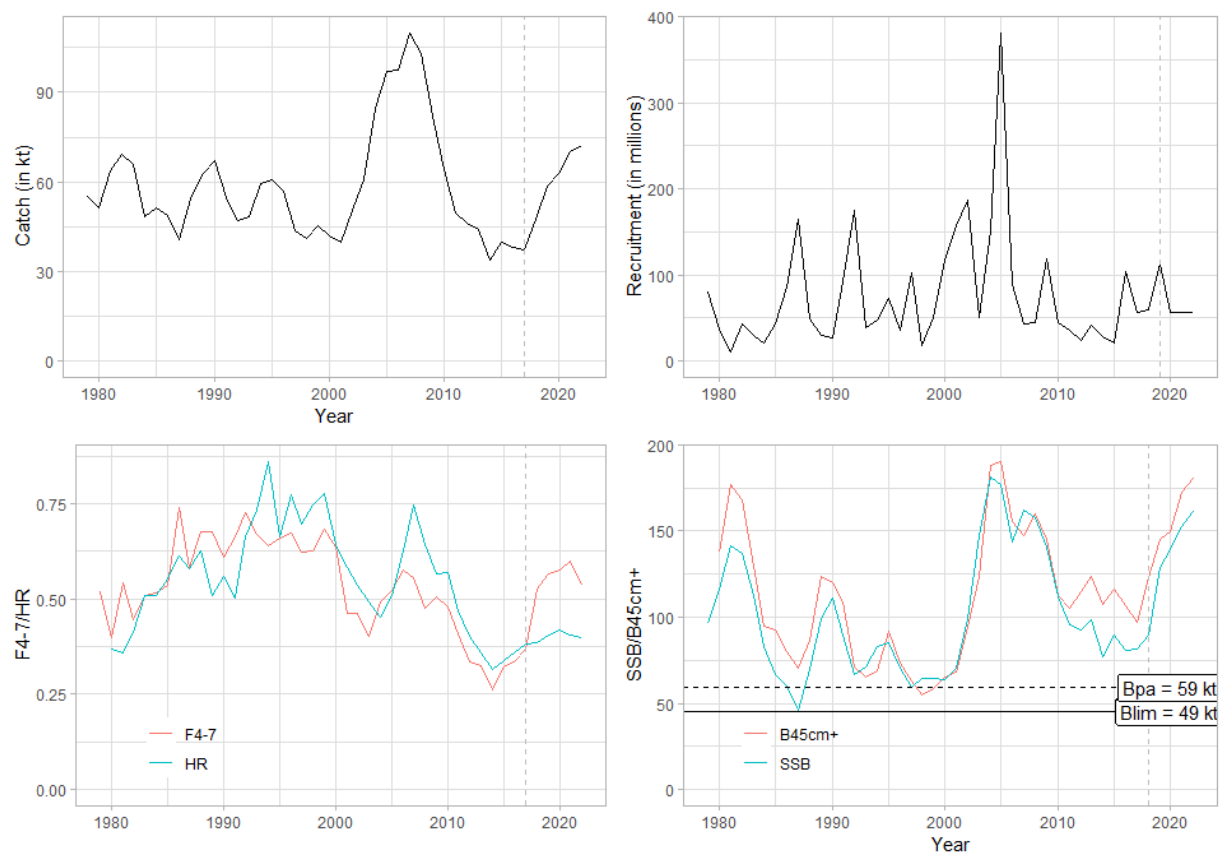


Figure 20. Haddock. Summary from assessment. Dashed vertical line indicates the prediction period.

Mynd 21. Ýsa. Samantekt stofnmats. Lóðrétt grá brotalína gefur til kynna spátímabil.

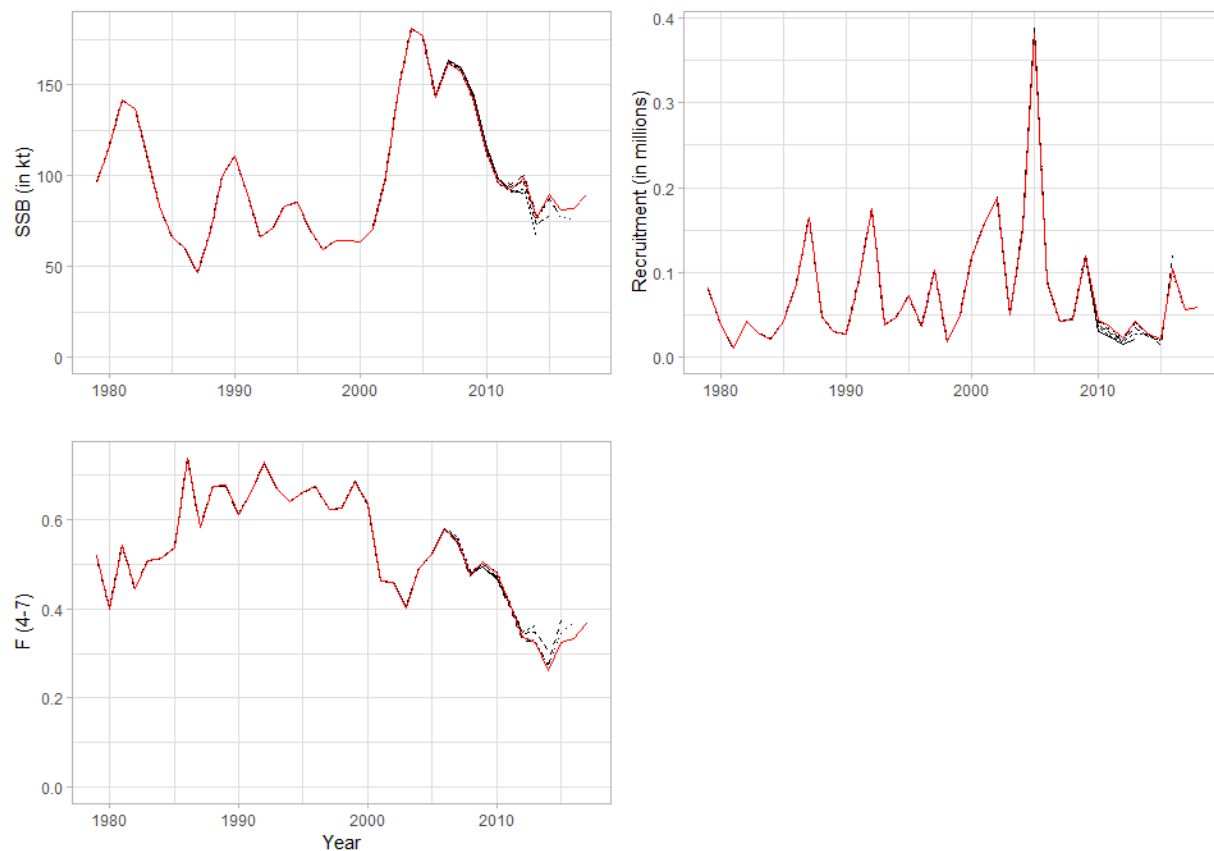


Figure 21. Haddock. Historical retrospective analysis of the assessment of haddock with a 5-year peel.

Mynd 22. Ýsa. Söguleg 5 ára endurlitsgreining á stofnmati ýsu.

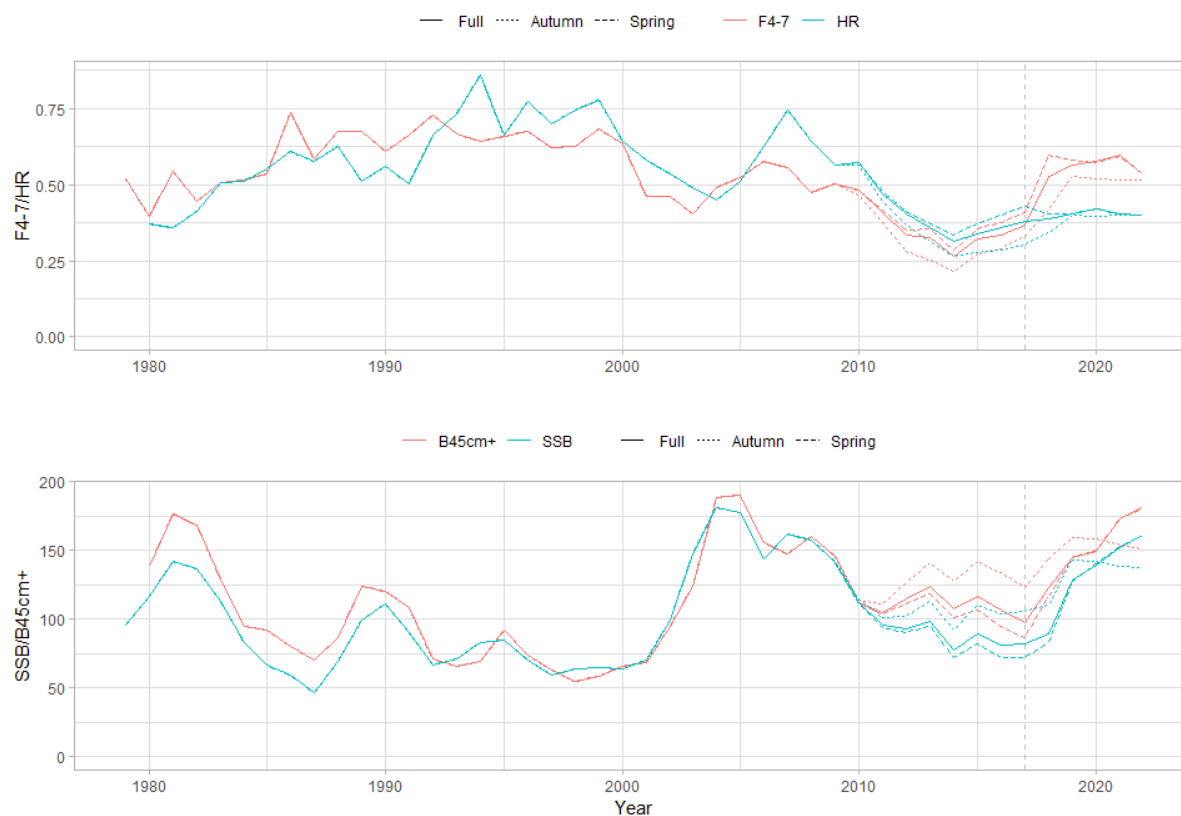


Figure 22. Haddock. Comparisons of assessment results where either the spring survey or the autumn survey is omitted from the estimation.

Mynd 23. Ýsa. Samanburður á stofnmatsniðurstöðum þar sem annaðhvort haustralli eða vorralli er sleppt.

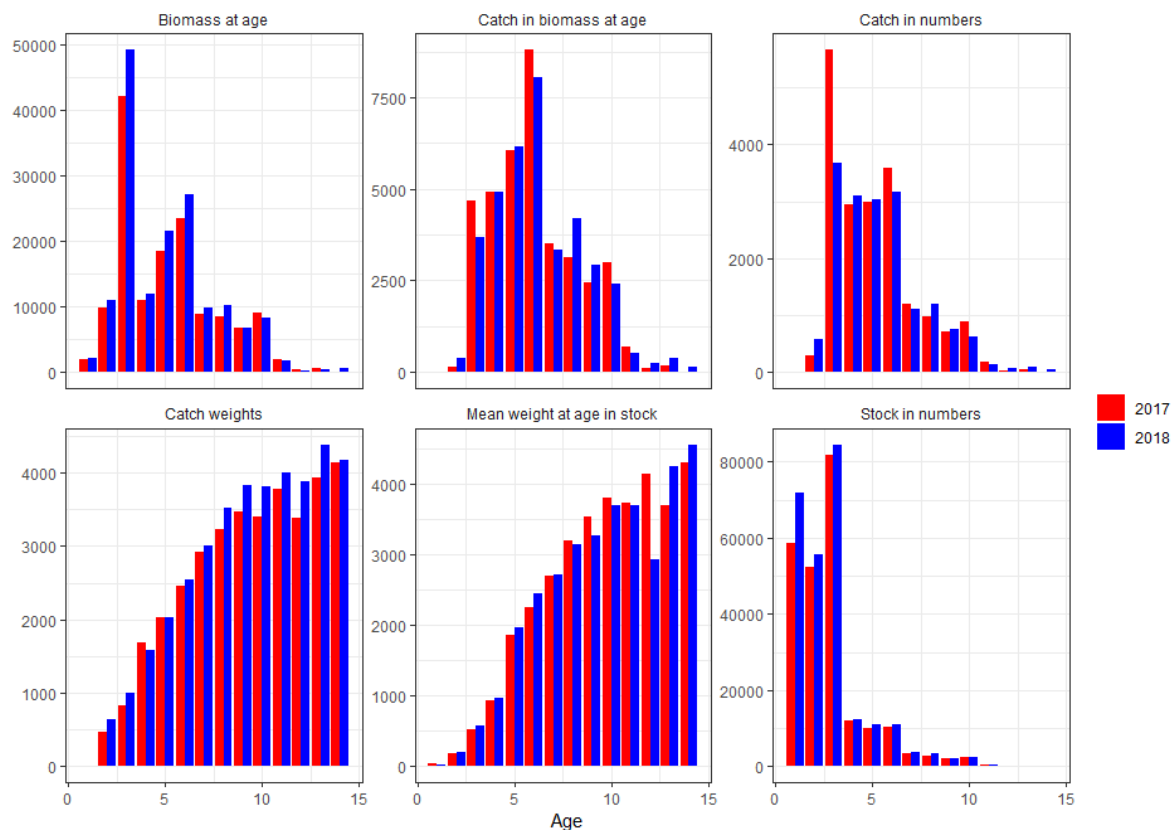


Figure 23. Haddock. Comparison of some of the results of 2018 assessment and the 2017 assessment predictions for 2017.

Mynd 24. Ýsa. Samanburður á niðurstöðum stofnmatsins 2018 og spá 2017 stofnmatsins fyrir árið 2017.

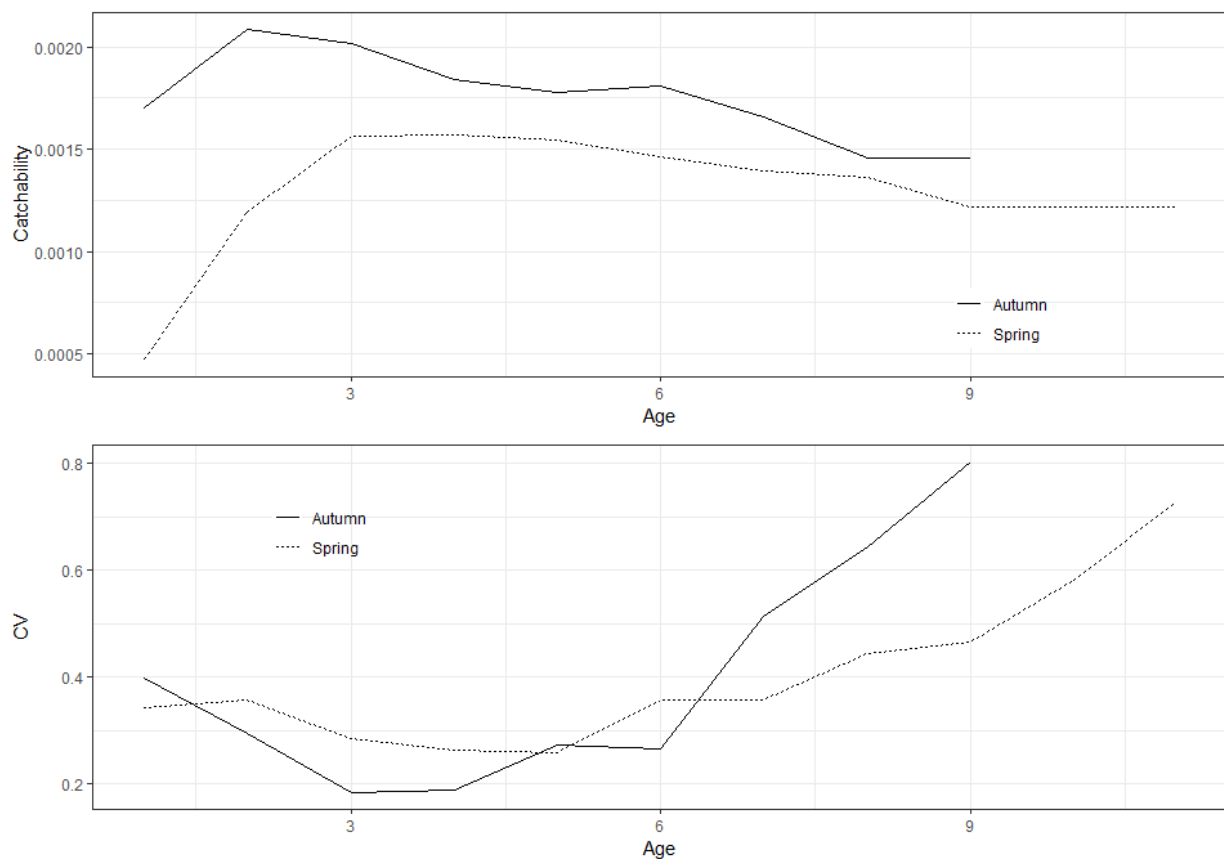


Figure 24. Haddock. Model estimates of survey catchability (top panel) and CV (bottom panel) at age by survey.

Mynd 25. Ýsa. Mat á veiðanleika í stofnmælingum (efri mynd) og frávíkstuðli (neðri myndi) eftir aldri og að vori og hausti.

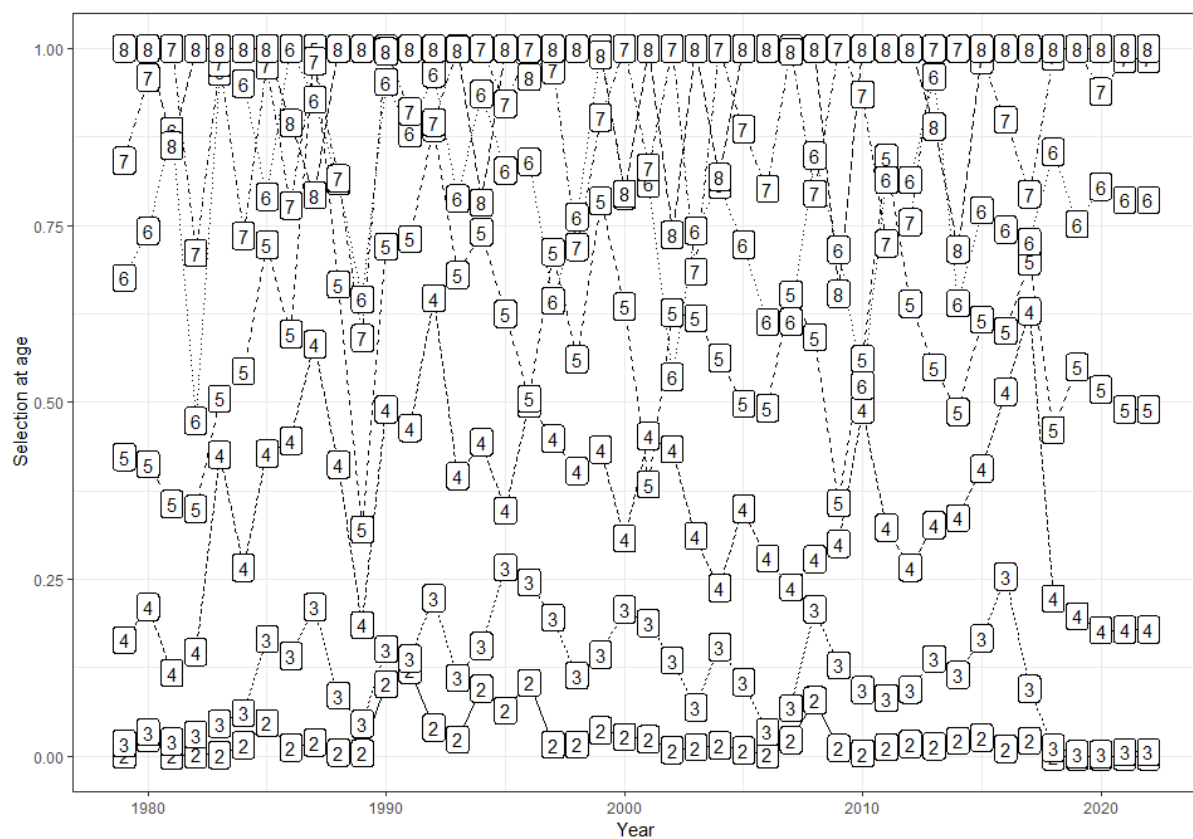


Figure 25. Haddock. Estimated selection at age by year.

Mynd 26. Ýsa. Metið veiðmynstur eftir aldri og ári.

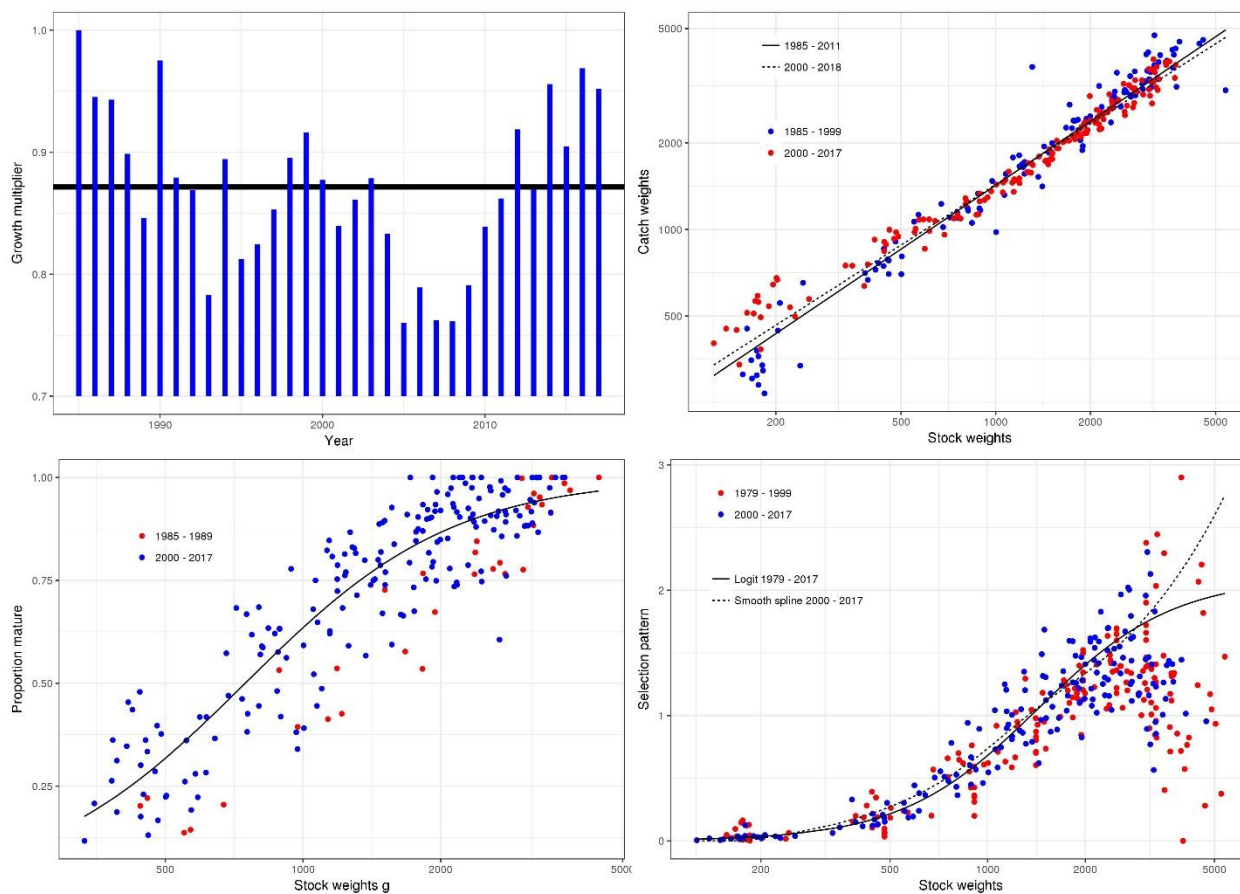


Figure 26. Haddock. Input data to prediction. Predictions are based on the period since 2000. Exponential of the year-factor (growth multiplier) as described in the text.

Mynd 27. Ýsa. Inntaksgögn fyrir vaxtarspá fyrir komandi fiskveiðiár. Spáin er byggð á gögnum frá árunum eftir 2000. Nánar lýsing er í texta.

Table 1. Haddock. Landings by nation, all figures are in tonnes.*Tafla 1. Ýsa. Landaður afli eftir þjóð, aflatölur eru í tonnum.*

YEAR	LANDINGS							
	Belgium	Faroe Islands	Germany	Greenland	Iceland	Norway	Russia	UK
1979	1010	2161			52152	11		
1980	1144	2029			47916	23		
1981	673	1839			61033	15		
1982	377	1982			66998	28		
1983	268	1783			63815	3		
1984	359	707			47167	3		
1985	391	987			49573	0		2
1986	257	1289			47335			
1987	238	1043			39751	1		
1988	352	797			52999	0		
1989	483	606			61715			
1990	595	603			65897			
1991	485	733			53491			
1992	361	757			46067			
1993	458	754			46231			
1994	271	915	1046	2	58677	13	492	173
1995		968	0		60424		2	57
1996		764			56317	4	17	0
1997		340			43717			
1998		513			40882			
1999		885			44523	18		0
2000		5			41229	4		1
2001		690			39101	56		
2002		847			49602	8		
2003		968			59991	1		51
2004		1125			83801	1		
2005		1515			95878	3		44
2006		1588			96130	4		
2007		1686		2	108181	11		
2008		1197			101680	11		
2009		824			81439	5		
2010		360			63869	8		
2011					49232			
2012					45711			
2013		41			43370			
2014		876			33048	11		
2015		1257			38393	15		
2016		1444			36648	8		
2017		1355			35695	11		

Table 2. Haddock. Number of Icelandic boats and catches by fleet segment participating in the haddock fishery.

Tafla 2. Ýsa. Fjöldi báta og afli eftir veiðarfærum.

YEAR	NUMBER OF BOATS			CATCHES				TOTAL CATCH
	<i>Bottom trawl</i>	<i>Demersal seine</i>	<i>Longlines</i>	<i>Bottom trawl</i>	<i>Demersal seine</i>	<i>Longlines</i>	<i>Other</i>	
1993	264	122	672	31989	1803	7779	6830	48401
1994	210	124	714	42619	3465	8127	6939	61150
1995	186	124	639	44146	4351	7992	5036	61525
1996	171	137	550	41465	5622	7595	3684	58366
1997	163	131	417	28923	5349	7496	2894	44662
1998	154	120	416	25188	3692	9757	2854	41491
1999	150	104	444	26732	2753	13327	2117	44929
2000	133	98	431	23465	3052	12724	1831	41072
2001	118	85	411	22252	3006	11614	2064	38936
2002	108	82	395	30227	3550	13291	2264	49332
2003	102	91	411	36385	4762	16966	2095	60208
2004	107	93	428	51261	8118	22687	2370	84436
2005	106	84	435	53236	10629	30188	2516	96569
2006	96	87	420	47038	12822	35602	1530	96992
2007	96	76	388	57355	12856	36504	1930	108645
2008	84	70	346	50908	16392	32409	1134	100843
2009	85	68	319	38831	15094	25994	727	80646
2010	77	58	270	28841	10126	23368	1235	63570
2011	72	52	268	20714	6827	20667	559	48767
2012	73	53	269	20210	6013	18296	785	45304
2013	76	51	263	18660	4922	18847	540	42969
2014	65	44	272	13229	3747	16045	437	33458
2015	63	47	255	17075	4299	17297	523	39194
2016	63	43	232	16906	4427	15987	361	37681
2017	67	43	217	16281	4512	15439	428	36660

Table 3. Haddock. Number of available length measurements and samples (tows) from Icelandic commercial catches.*Tafla 3. Ýsa. Fjöldi lengdarmælinga og sýna tekin úr afla íslenskra fiskiskipa, brotið niður eftir helstu veiðarfærum.*

YEAR	NUMBER OF LENGTH MEASUREMENTS/SAMPLES(TOWS)				
	<i>Bottom trawl</i>	<i>Demersal seine</i>	<i>Gillnets</i>	<i>Longline</i>	<i>Other</i>
2000	62409/326	3114/21	1353/11	12854/77	356/2
2001	69392/346	3900/24	3023/18	26610/151	3864/19
2002	83052/453	7644/47	2063/17	29578/196	1392/12
2003	70828/419	7066/47	2965/26	30259/203	1713/20
2004	82474/503	10201/74	1705/16	35405/252	785/12
2005	94529/514	14880/102	2426/25	53473/375	1778/18
2006	74451/416	29743/172	3395/35	75069/480	685/5
2007	101635/599	34293/196	3721/30	87705/499	1572/11
2008	82671/524	29062/177	3542/30	88912/570	378/4
2009	55862/347	34904/202	831/7	63816/406	658/6
2010	59118/330	19504/116	827/10	56743/344	229/4
2011	53239/278	8304/53	1350/9	43198/237	325/2
2012	41074/223	10174/104	1508/10	60838/302	3/1
2013	34131/198	2498/23	176/1	43132/237	560/4
2014	13529/79	3156/50	289/6	37035/217	
2015	26025/180	2811/87	125/1	41382/220	211/1
2016	21351/148	2531/123	333/3	37490/202	849/6
2017	23159/161	6305/39	375/2	42356/232	1367/7

Table 4. Haddock. Number of available age measurements and samples (tows) from Icelandic commercial catches.**Tafla 4. Ýsa. Fjöldi aldurgreininga og sýna úr afla íslenskra fiskiskipa.**

YEAR	NUMBER OF LENGTH MEASUREMENTS/SAMPLES(TOWS)				
	<i>Bottom trawl</i>	<i>Demersal seine</i>	<i>Gillnets</i>	<i>Longline</i>	<i>Other</i>
2000	62409/326	3114/21	1353/11	12854/77	356/2
2001	69392/346	3900/24	3023/18	26610/151	3864/19
2002	83052/453	7644/47	2063/17	29578/196	1392/12
2003	70828/419	7066/47	2965/26	30259/203	1713/20
2004	82474/503	10201/74	1705/16	35405/252	785/12
2005	94529/514	14880/102	2426/25	53473/375	1778/18
2006	74451/416	29743/172	3395/35	75069/480	685/5
2007	101635/599	34293/196	3721/30	87705/499	1572/11
2008	82671/524	29062/177	3542/30	88912/570	378/4
2009	55862/347	34904/202	831/7	63816/406	658/6
2010	59118/330	19504/116	827/10	56743/344	229/4
2011	53239/278	8304/53	1350/9	43198/237	325/2
2012	41074/223	10174/104	1508/10	60838/302	3/1
2013	34131/198	2498/23	176/1	43132/237	560/4
2014	13529/79	3156/50	289/6	37035/217	
2015	26025/180	2811/87	125/1	41382/220	211/1
2016	21351/148	2531/123	333/3	37490/202	849/6
2017	23159/161	6305/39	375/2	42356/232	1367/7

Table 5. Haddock. Catch at age from the commercial fishery in Icelandic waters.

Tafla 5. Ýsa. Aldursgreindur afli úr veiðum íslenskra fiskiskipa.

YEAR	AGE								
	2	3	4	5	6	7	8	9	10
1979	0.149	1.908	3.762	6.057	9.022	1.743	0.438	0.056	0.000
1980	0.595	1.385	11.481	4.298	3.798	3.732	0.544	0.091	0.032
1981	0.010	0.514	4.911	16.900	5.999	2.825	1.803	0.168	0.043
1982	0.107	0.245	3.149	10.851	14.049	2.068	1.000	0.725	0.169
1983	0.034	1.010	1.589	4.596	9.850	8.839	0.766	0.207	0.263
1984	0.241	1.069	4.946	1.341	4.772	3.742	4.076	0.238	0.058
1985	1.320	1.728	4.562	6.796	0.855	1.682	1.914	1.903	0.212
1986	1.012	4.223	4.068	4.686	5.139	0.494	0.796	0.897	0.344
1987	1.939	8.308	6.965	2.728	2.042	1.094	0.132	0.165	0.220
1988	0.237	9.831	15.164	5.824	1.304	1.084	0.609	0.066	0.089
1989	0.188	2.474	22.560	9.571	3.196	0.513	0.556	0.144	0.034
1990	1.857	2.415	8.628	23.611	6.331	0.816	0.150	0.067	0.045
1991	8.617	2.145	5.397	7.342	14.103	2.648	0.338	0.040	0.010
1992	5.405	10.693	5.721	4.610	3.691	5.209	0.999	0.120	0.010
1993	0.769	12.333	12.815	2.968	1.722	1.425	2.239	0.343	0.019
1994	3.198	3.343	28.258	10.682	1.469	0.726	0.358	0.647	0.093
1995	4.015	7.323	5.744	23.927	5.769	0.615	0.290	0.187	0.268
1996	3.090	10.552	7.639	4.468	12.896	2.346	0.208	0.079	0.060
1997	1.364	3.939	10.915	4.895	2.610	5.035	0.719	0.064	0.012
1998	0.279	8.257	5.667	7.856	2.418	1.422	1.897	0.261	0.017
1999	1.434	1.550	17.243	4.516	4.837	0.915	0.620	0.481	0.063
2000	2.659	6.317	2.352	13.615	1.945	1.706	0.324	0.222	0.176
2001	2.515	11.098	6.954	1.446	6.262	0.675	0.478	0.105	0.042
2002	1.082	10.434	15.998	5.099	1.131	3.149	0.262	0.169	0.042
2003	0.401	6.352	16.265	12.548	2.968	0.748	1.236	0.091	0.048
2004	1.597	4.063	17.652	19.358	8.871	1.940	0.471	0.489	0.092
2005	2.405	9.450	6.929	25.421	13.778	4.584	0.809	0.251	0.212
2006	0.241	10.038	21.246	6.646	18.840	7.600	2.180	0.323	0.093
2007	0.782	3.884	42.224	22.239	3.354	9.952	2.740	0.519	0.062
2008	2.316	4.508	9.706	53.022	11.014	1.717	3.033	0.815	0.167
2009	1.066	3.185	4.886	8.892	35.011	5.733	0.726	1.381	0.395
2010	0.121	6.032	7.061	4.806	6.766	17.503	1.874	0.354	0.412
2011	0.253	1.584	11.797	5.080	2.853	3.983	6.220	0.494	0.112
2012	0.196	1.322	3.421	13.107	2.223	1.231	2.480	2.662	0.241
2013	0.250	1.042	2.865	4.008	9.222	1.206	0.668	1.248	1.367
2014	0.238	1.478	1.751	2.725	2.737	4.742	0.447	0.387	0.586
2015	0.232	1.532	4.155	2.317	2.916	2.623	2.715	0.226	0.286
2016	0.481	1.773	3.437	4.130	1.727	1.953	1.420	1.293	0.113
2017	0.573	3.680	3.079	3.013	3.135	1.097	1.182	0.751	0.623

Table 6. Haddock. Catch weights from the commercial fishery in Icelandic waters.

Tafla 6. Ýsa. Aflapýngdir eftir aldri úr veiðum íslenskra fiskiskipa.

YEAR	AGE								
	2	3	4	5	6	7	8	9	10
1979	620	960	1410	2030	2910	3800	4560	4720	4000
1980	837	831	1306	2207	2738	3188	3843	4506	4615
1981	584	693	1081	1656	2283	3214	3409	4046	4898
1982	289	959	1455	1674	2351	3031	3481	3874	3952
1983	320	1006	1496	1921	2371	2873	3678	4265	4463
1984	691	1007	1544	2120	2514	3027	2940	3906	3941
1985	652	1125	1811	2260	2924	3547	3733	4039	4564
1986	336	1227	1780	2431	2771	3689	3820	4258	4436
1987	452	1064	1692	2408	3000	3565	4215	4502	3653
1988	362	780	1474	2217	2931	3529	3781	4467	4169
1989	323	857	1185	1996	2893	4066	3866	4734	5039
1990	269	700	1054	1562	2364	3414	4134	4946	4115
1991	288	699	979	1412	1887	2674	3135	4341	5243
1992	313	806	1167	1524	1950	2357	3075	4053	4674
1993	303	705	1333	1875	2386	2996	3059	3363	4047
1994	337	668	1019	1717	2391	2717	3280	3156	3154
1995	351	746	1096	1318	2044	2893	3049	3675	3119
1996	311	787	1187	1560	1849	2670	3510	3567	3686
1997	379	764	1163	1649	1943	2342	3020	3337	3508
1998	445	724	1147	1683	2250	2475	2834	3333	3275
1999	555	908	1101	1658	2216	2659	2928	3209	3534
2000	495	978	1333	1481	2119	2696	3307	3597	3734
2001	541	945	1456	1731	1832	2243	3020	3328	4715
2002	564	928	1253	1737	2219	2230	2911	3365	4078
2003	498	922	1283	1704	2274	2744	2635	2819	3289
2004	559	1006	1258	1579	2044	2809	3123	2945	3957
2005	339	886	1265	1506	1916	2323	3028	3211	2755
2006	402	749	1093	1495	1758	2163	2555	3054	3617
2007	510	748	988	1346	1840	2062	2350	2525	2408
2008	383	636	857	1125	1575	2149	2417	2802	2568
2009	452	841	960	1131	1352	1757	2364	2497	3070
2010	447	756	1092	1294	1448	1685	2188	2366	2657
2011	588	905	1122	1455	1688	1914	2094	2455	2919
2012	668	978	1222	1492	1903	2164	2366	2704	2765
2013	678	1084	1358	1675	2036	2400	2554	3097	3111
2014	536	1080	1433	1793	2121	2504	2624	3178	3272
2015	573	1084	1486	2011	2332	2823	3306	3258	3911
2016	513	1071	1590	2035	2607	2952	3616	3734	3679
2017	643	997	1587	2032	2546	3016	3518	3839	3817

Table 7. Haddock. Stock weights from the March survey in Icelandic waters.

Tafla 7. Ýsa. Stofnþyngdir úr vorralli Hafrannsóknastofnunar.

YEAR	AGE									
	1	2	3	4	5	6	7	8	9	10
1979	37	185	481	910	1409	1968	2496	3077	3300	4000
1980	37	185	481	910	1409	1968	2496	3077	3300	4615
1981	37	185	481	910	1409	1968	2496	3077	3300	4898
1982	37	185	481	910	1409	1968	2496	3077	3300	3952
1983	37	185	481	910	1409	1968	2496	3077	3300	4463
1984	37	185	481	910	1409	1968	2496	3077	3300	3941
1985	36	244	568	1187	1673	2371	2766	3197	3331	4564
1986	35	239	671	1134	1943	2399	3190	3293	3728	4436
1987	31	162	550	1216	1825	2605	3030	3642	3837	3653
1988	37	176	457	974	1830	2695	3102	3481	3318	4169
1989	26	182	441	887	1510	2380	3009	3499	3195	5039
1990	29	184	457	840	1234	1965	2675	3052	3267	4115
1991	31	176	501	1003	1406	1884	2496	3755	3653	5243
1992	28	157	503	894	1365	1891	2325	2936	3682	4674
1993	41	168	384	878	1492	1785	2562	2573	3266	4047
1994	33	181	392	680	1235	1766	1717	2977	2131	3154
1995	37	167	440	755	1065	1857	2689	5377	1306	3119
1996	41	174	453	813	1076	1477	2171	2426	4847	3686
1997	50	174	424	817	1221	1425	1915	2390	3692	3508
1998	41	203	415	753	1241	1747	1996	2342	3076	3275
1999	33	206	480	715	1189	1956	2366	2782	2922	3534
2000	29	179	552	889	1159	1767	2612	2917	3132	3734
2001	36	190	490	1056	1437	1509	2169	2765	3300	4715
2002	67	172	475	889	1460	1949	2137	1990	3709	4078
2003	40	230	412	801	1268	1873	3139	2343	3301	3289
2004	34	176	556	807	1282	1690	2454	3236	2942	3957
2005	40	153	448	920	1188	1564	2128	2808	2550	2755
2006	33	127	333	736	1145	1512	1944	2232	3272	3617
2007	48	170	350	615	1053	1514	1786	2073	2198	2408
2008	27	179	382	595	868	1295	1828	2201	2340	2568
2009	29	139	442	687	882	1141	1495	1920	2574	3070
2010	32	150	392	773	942	1190	1468	1829	2086	2730
2011	35	175	442	757	1129	1304	1583	1865	2107	3094
2012	28	202	482	801	1145	1480	1909	2072	2353	2350
2013	33	201	589	967	1312	1710	1999	2265	2764	2709
2014	36	222	570	1005	1372	1751	2141	2298	2653	3104
2015	32	255	614	1073	1637	1926	2452	2774	3170	3173
2016	29	162	642	1099	1564	2094	2296	3068	3481	3248
2017	34	196	459	1258	1657	2168	2780	3205	3564	3462

Table 8. Haddock. Sexual maturity-at-age in the stock (from the March survey).

Tafla 8. Ýsa. Hlutfall kynþroska ýsu eftir aldri úr vorralli Hafrannsóknastofnunar.

YEAR	AGE									
	2	3	4	5	6	7	8	9	10	11
1979	0.080	0.301	0.539	0.722	0.821	0.868	0.904	0.963	1.000	1.000
1980	0.080	0.301	0.539	0.722	0.821	0.868	0.904	0.963	1.000	1.000
1981	0.080	0.301	0.539	0.722	0.821	0.868	0.904	0.963	1.000	1.000
1982	0.080	0.301	0.539	0.722	0.821	0.868	0.904	0.963	1.000	1.000
1983	0.080	0.301	0.539	0.722	0.821	0.868	0.904	0.963	1.000	1.000
1984	0.080	0.301	0.539	0.722	0.821	0.868	0.904	0.963	1.000	1.000
1985	0.016	0.144	0.536	0.577	0.765	0.766	0.961	0.934	1.000	1.000
1986	0.021	0.205	0.413	0.673	0.845	0.884	0.952	0.986	1.000	1.000
1987	0.022	0.137	0.426	0.535	0.778	0.776	1.000	0.969	1.000	1.000
1988	0.013	0.221	0.394	0.767	0.793	0.928	0.914	1.000	1.000	1.000
1989	0.041	0.202	0.532	0.727	0.818	0.998	1.000	1.000	1.000	1.000
1990	0.114	0.334	0.634	0.814	0.843	0.918	0.882	1.000	1.000	1.000
1991	0.063	0.224	0.592	0.739	0.817	0.894	0.495	1.000	1.000	1.000
1992	0.050	0.227	0.419	0.799	0.901	0.901	0.858	1.000	1.000	1.000
1993	0.124	0.362	0.481	0.670	0.904	0.977	0.908	0.867	1.000	1.000
1994	0.248	0.312	0.573	0.762	0.846	1.000	0.907	1.000	1.000	1.000
1995	0.124	0.479	0.382	0.750	0.753	0.606	0.985	1.000	1.000	1.000
1996	0.191	0.362	0.590	0.648	0.787	0.739	0.949	0.908	1.000	1.000
1997	0.093	0.436	0.587	0.683	0.750	0.783	0.880	1.000	1.000	1.000
1998	0.026	0.454	0.668	0.770	0.733	0.849	0.899	1.000	1.000	1.000
1999	0.050	0.397	0.683	0.724	0.749	0.892	0.761	0.920	1.000	1.000
2000	0.107	0.261	0.632	0.808	0.868	0.873	1.000	0.780	1.000	1.000
2001	0.091	0.377	0.522	0.753	0.895	0.916	0.918	1.000	1.000	1.000
2002	0.047	0.286	0.633	0.800	0.934	0.928	1.000	1.000	1.000	1.000
2003	0.062	0.347	0.685	0.867	0.922	0.946	1.000	1.000	1.000	1.000
2004	0.037	0.361	0.570	0.831	0.910	1.000	1.000	1.000	1.000	1.000
2005	0.024	0.230	0.562	0.753	0.927	0.936	0.968	1.000	1.000	1.000
2006	0.027	0.117	0.462	0.621	0.739	0.918	1.000	1.000	1.000	1.000
2007	0.078	0.208	0.418	0.680	0.770	0.875	0.959	1.000	1.000	1.000
2008	0.027	0.263	0.418	0.621	0.828	0.870	0.904	0.975	1.000	1.000
2009	0.017	0.301	0.470	0.576	0.847	0.891	1.000	0.968	1.000	1.000
2010	0.029	0.187	0.618	0.778	0.787	0.887	0.934	1.000	0.958	1.000
2011	0.045	0.176	0.426	0.823	0.816	0.838	0.899	0.974	1.000	1.000
2012	0.106	0.167	0.445	0.627	0.819	0.903	0.852	0.911	1.000	1.000
2013	0.046	0.223	0.381	0.714	0.793	0.920	0.986	0.974	0.992	0.945
2014	0.107	0.192	0.391	0.567	0.675	0.735	0.925	0.906	0.883	1.000
2015	0.138	0.283	0.445	0.667	0.795	0.772	0.892	1.000	0.889	1.000
2016	0.008	0.366	0.487	0.594	0.779	0.787	0.883	0.915	1.000	1.000
2017	0.073	0.131	0.591	0.664	0.745	0.910	0.939	1.000	0.975	1.000

Table 9. Haddock. Age disaggregated survey indices from the groundfish survey in March.

Tafla 9. Ýsa. Aldurskipt vísitala úr vorralli Hafrannsóknastofnunar.

YEAR	AGE									
	1	2	3	4	5	6	7	8	9	10
1985	29.91	32.25	17.67	23.26	26.30	3.72	11.01	4.88	5.69	0.50
1986	122.05	110.13	61.02	13.38	16.87	13.60	1.00	2.81	1.27	2.35
1987	21.49	324.64	148.07	44.68	7.77	7.53	4.77	0.40	0.62	0.44
1988	15.72	40.00	184.62	90.03	23.12	1.36	2.21	1.79	0.16	0.23
1989	10.45	23.09	40.59	145.62	45.09	12.91	0.79	0.81	0.42	0.28
1990	71.90	31.75	26.68	38.63	92.14	30.75	3.43	0.88	0.23	0.00
1991	88.46	146.96	42.89	17.87	20.20	32.76	7.59	0.31	0.10	0.08
1992	18.23	210.42	139.76	35.52	16.87	13.76	16.31	2.22	0.18	0.07
1993	30.66	39.06	251.81	88.66	11.37	3.89	1.68	4.50	0.89	0.00
1994	58.86	61.76	40.53	143.12	42.34	6.93	2.89	1.44	4.47	0.17
1995	37.07	84.74	47.17	19.83	69.87	7.69	1.31	0.12	0.34	0.00
1996	96.55	66.77	121.30	37.19	19.78	41.09	5.85	0.60	0.13	0.13
1997	8.41	122.60	51.08	53.10	10.80	7.28	10.85	1.34	0.07	0.03
1998	23.04	18.71	110.21	28.45	23.28	4.89	3.49	4.52	0.34	0.00
1999	80.92	86.14	25.79	98.86	12.99	9.88	1.43	1.78	1.04	0.09
2000	60.41	88.73	43.92	8.33	24.82	3.12	1.58	0.40	0.15	0.52
2001	81.03	153.29	116.21	21.70	4.03	10.45	0.89	0.55	0.00	0.10
2002	20.68	304.47	198.83	110.43	22.88	3.45	7.40	0.30	0.30	0.08
2003	112.22	97.95	283.79	247.07	115.13	18.26	2.60	4.57	0.49	0.84
2004	324.37	290.43	70.82	208.73	110.14	34.31	6.85	1.26	0.83	0.00
2005	57.55	693.57	288.64	44.58	157.39	57.69	15.78	3.36	0.32	0.26
2006	39.87	78.50	575.82	181.71	19.34	63.24	16.54	6.80	0.70	0.29
2007	34.23	65.13	89.00	437.40	85.58	7.84	21.32	4.67	2.13	0.07
2008	88.16	67.60	71.12	75.02	220.74	29.75	3.51	7.42	1.63	0.27
2009	10.54	110.79	53.20	41.11	42.02	105.22	12.77	2.19	3.04	0.43
2010	15.25	27.69	137.03	29.60	18.10	20.48	31.38	2.90	0.46	0.68
2011	8.76	27.46	24.34	76.75	13.96	5.88	9.40	14.89	1.22	0.31
2012	12.33	14.76	31.18	27.15	58.16	5.22	2.92	5.28	6.85	0.79
2013	13.93	23.05	19.60	22.66	22.27	41.50	4.76	2.49	3.78	4.47
2014	14.15	24.53	30.12	17.71	16.42	14.77	16.42	1.33	1.05	1.67
2015	62.08	19.53	26.50	34.10	12.62	11.11	9.57	9.85	1.16	0.56
2016	29.85	162.26	23.56	22.10	22.24	7.17	7.27	5.05	4.19	0.93
2017	26.67	66.65	140.89	23.02	20.29	22.02	6.41	5.06	3.54	1.92
2018	64.02	75.96	81.93	106.11	13.25	9.69	9.12	3.77	3.18	1.08

Table 10 Haddock. Age disaggregated survey indices from the groundfish survey in October.

Tafla 10. Ýsa. Aldursskipt vísitala úr haustralli Hafrannsóknastofnunar.

YEAR	AGE									
	1	2	3	4	5	6	7	8	9	10
1985	29.91	32.25	17.67	23.26	26.30	3.72	11.01	4.88	5.69	0.50
1986	122.05	110.13	61.02	13.38	16.87	13.60	1.00	2.81	1.27	2.35
1987	21.49	324.64	148.07	44.68	7.77	7.53	4.77	0.40	0.62	0.44
1988	15.72	40.00	184.62	90.03	23.12	1.36	2.21	1.79	0.16	0.23
1989	10.45	23.09	40.59	145.62	45.09	12.91	0.79	0.81	0.42	0.28
1990	71.90	31.75	26.68	38.63	92.14	30.75	3.43	0.88	0.23	0.00
1991	88.46	146.96	42.89	17.87	20.20	32.76	7.59	0.31	0.10	0.08
1992	18.23	210.42	139.76	35.52	16.87	13.76	16.31	2.22	0.18	0.07
1993	30.66	39.06	251.81	88.66	11.37	3.89	1.68	4.50	0.89	0.00
1994	58.86	61.76	40.53	143.12	42.34	6.93	2.89	1.44	4.47	0.17
1995	37.07	84.74	47.17	19.83	69.87	7.69	1.31	0.12	0.34	0.00
1996	96.55	66.77	121.30	37.19	19.78	41.09	5.85	0.60	0.13	0.13
1997	8.41	122.60	51.08	53.10	10.80	7.28	10.85	1.34	0.07	0.03
1998	23.04	18.71	110.21	28.45	23.28	4.89	3.49	4.52	0.34	0.00
1999	80.92	86.14	25.79	98.86	12.99	9.88	1.43	1.78	1.04	0.09
2000	60.41	88.73	43.92	8.33	24.82	3.12	1.58	0.40	0.15	0.52
2001	81.03	153.29	116.21	21.70	4.03	10.45	0.89	0.55	0.00	0.10
2002	20.68	304.47	198.83	110.43	22.88	3.45	7.40	0.30	0.30	0.08
2003	112.22	97.95	283.79	247.07	115.13	18.26	2.60	4.57	0.49	0.84
2004	324.37	290.43	70.82	208.73	110.14	34.31	6.85	1.26	0.83	0.00
2005	57.55	693.57	288.64	44.58	157.39	57.69	15.78	3.36	0.32	0.26
2006	39.87	78.50	575.82	181.71	19.34	63.24	16.54	6.80	0.70	0.29
2007	34.23	65.13	89.00	437.40	85.58	7.84	21.32	4.67	2.13	0.07
2008	88.16	67.60	71.12	75.02	220.74	29.75	3.51	7.42	1.63	0.27
2009	10.54	110.79	53.20	41.11	42.02	105.22	12.77	2.19	3.04	0.43
2010	15.25	27.69	137.03	29.60	18.10	20.48	31.38	2.90	0.46	0.68
2011	8.76	27.46	24.34	76.75	13.96	5.88	9.40	14.89	1.22	0.31
2012	12.33	14.76	31.18	27.15	58.16	5.22	2.92	5.28	6.85	0.79
2013	13.93	23.05	19.60	22.66	22.27	41.50	4.76	2.49	3.78	4.47
2014	14.15	24.53	30.12	17.71	16.42	14.77	16.42	1.33	1.05	1.67
2015	62.08	19.53	26.50	34.10	12.62	11.11	9.57	9.85	1.16	0.56
2016	29.85	162.26	23.56	22.10	22.24	7.17	7.27	5.05	4.19	0.93
2017	26.67	66.65	140.89	23.02	20.29	22.02	6.41	5.06	3.54	1.92
2018	64.02	75.96	81.93	106.11	13.25	9.69	9.12	3.77	3.18	1.08

Table 11 Haddock. Advice, national TAC, and official landings. All weights are in tonnes.**Tafla 11 Ýsa. Ráðgjöf, aflamark íslenskra stjórnvalda og landaður afli. Allar þyngdir eru í tonnum.**

YEAR	<i>ICES advice</i>	<i>Advised catch</i>	<i>Agreed TAC</i>	<i>Fishing year catches</i>	<i>Calendar year catches</i>
1987*	National advice	< 50000	60000		40760
1988*	National advice	< 60000	65000		54204
1989*	National advice	< 60000	65000		62885
1990*	National advice	< 60000	65000		67198
1991**	National advice	< 38000	48000		54692
1991/1992	National advice	< 50000	50000	48123	47121
1992/1993	National advice	< 60000	65000	47255	48123
1993/1994	National advice	< 65000	65000	58443	59502
1994/1995	National advice	< 65000	65000	60829	60884
1995/1996	National advice	< 55000	60000	53972	56890
1996/1997	National advice	< 40000	45000	49764	43764
1997/1998	National advice	< 40000	45000	37811	41192
1998/1999	National advice	< 35000	35000	45146	45411
1999/2000	F reduced below F_{med}	< 35000	35000	41150	42105
2000/2001	F reduced below provis. F_{pa}	< 31000	30000	39143	39654
2001/2002	F reduced below provis. F_{pa}	< 30000	41000	41069	50498
2002/2003	F reduced below provis. F_{pa}	< 55000	55000	55269	60883
2003/2004	F reduced below provis. F_{pa}	< 75000	75000	77916	84828
2004/2005	F reduced below provis. F_{pa}	< 97000	90000	96617	97225
2005/2006	F reduced below provis. F_{pa}	< 110000	105000	99926	97614
2006/2007	F reduced below provis. F_{pa}	< 112000	105000	99763	109966
2007/2008	F reduced below provis. F_{pa}	< 120000	100000	109810	102872
2008/2009	F reduced below 0.35	< 83000	93000	88617	82045
2009/2010	F reduced below 0.35	< 57000	63000	67579	64169
2010/2011	F reduced below 0.35	< 51000	50000	50042	49433
2011/2012	F reduced below 0.35	< 42000	45000	49179	46208
2012/2013	F reduced below 0.35	< 32000	36000	40512	44097
2013/2014	TAC $0.4 \times B_{45+cm,2014}$	< 38000	38000	39628	33900
2014/2015	TAC $0.4 \times B_{45+cm,2015}$	< 30400	30400	36656	39646
2015/2016	TAC $0.4 \times B_{45+cm,2016}$	< 36400	36400	40117	38109
2016/2017	TAC $0.4 \times B_{45+cm,2017}$	< 34600	34600	36340	37062
2017/2018	TAC $0.4 \times B_{45+CM,2018}$	< 41390	41390		

* Calendar year.

** January to August.