

DAB – SANDKOLI

Limanda limanda

GENERAL INFORMATION

Dab is found in shallow waters all around Iceland, but in greatest quantity off the southwest coast. It is a demersal species on a sandy or muddy substrate, occurring at depths ranging from the intertidal zone down to 150 meters but most commonly at 20-40 m.

Females grow larger than males; only a small proportion of males become larger than 30 cm long, about the same proportion of females grow larger than 35 cm. Size at sexual maturity differs considerably between the sexes. At the length of 12 cm about half the males have reached maturity, but females reach that level at 22 cm length.

THE FISHERY

Main fishing grounds for dab are in the west and southwest of Iceland, with smaller fishing grounds in the southeast and several fjords in the north.

Demersal seine is the main fishing gear for dab in Iceland, while a small proportion of the catch is taken in demersal trawl, gillnets and longline. Dab fishing grounds in 2010-2018, as reported by mandatory logbooks are shown on Figure 1.

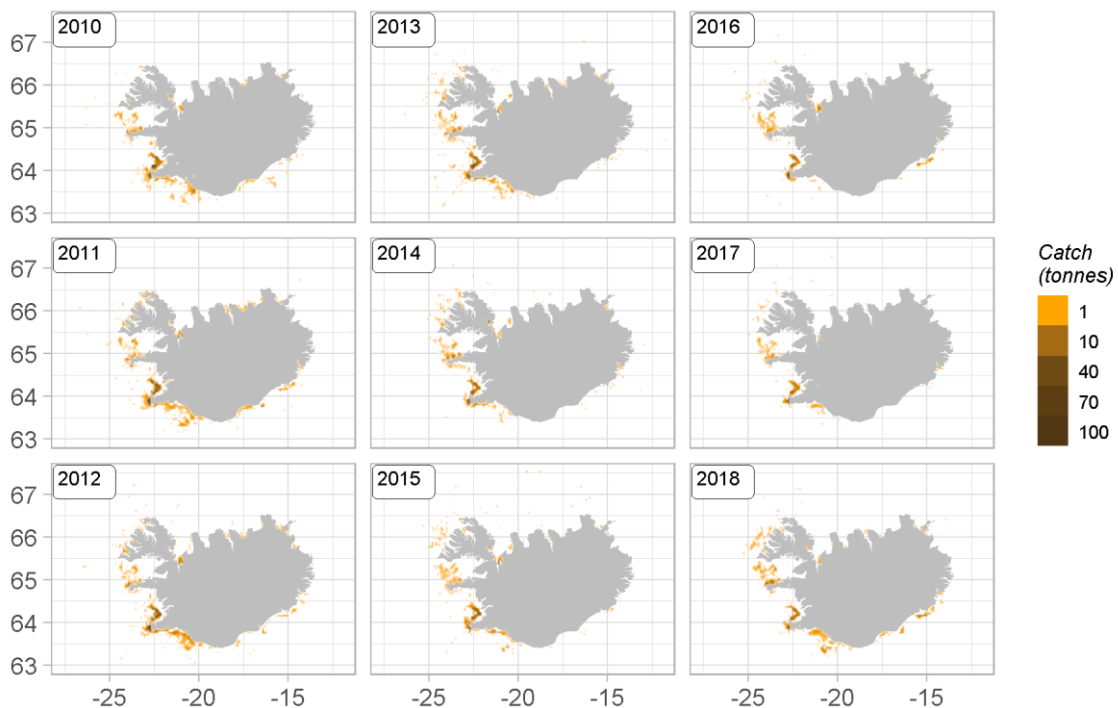


Figure 1. Dab. Geographical distribution of the Icelandic fishery since 2010. Reported catch from logbooks.

Mynd 1. Sandkoli. Útbreiðsla veiða á Íslandsmiðum frá 2010 samkvæmt aflagabókum.

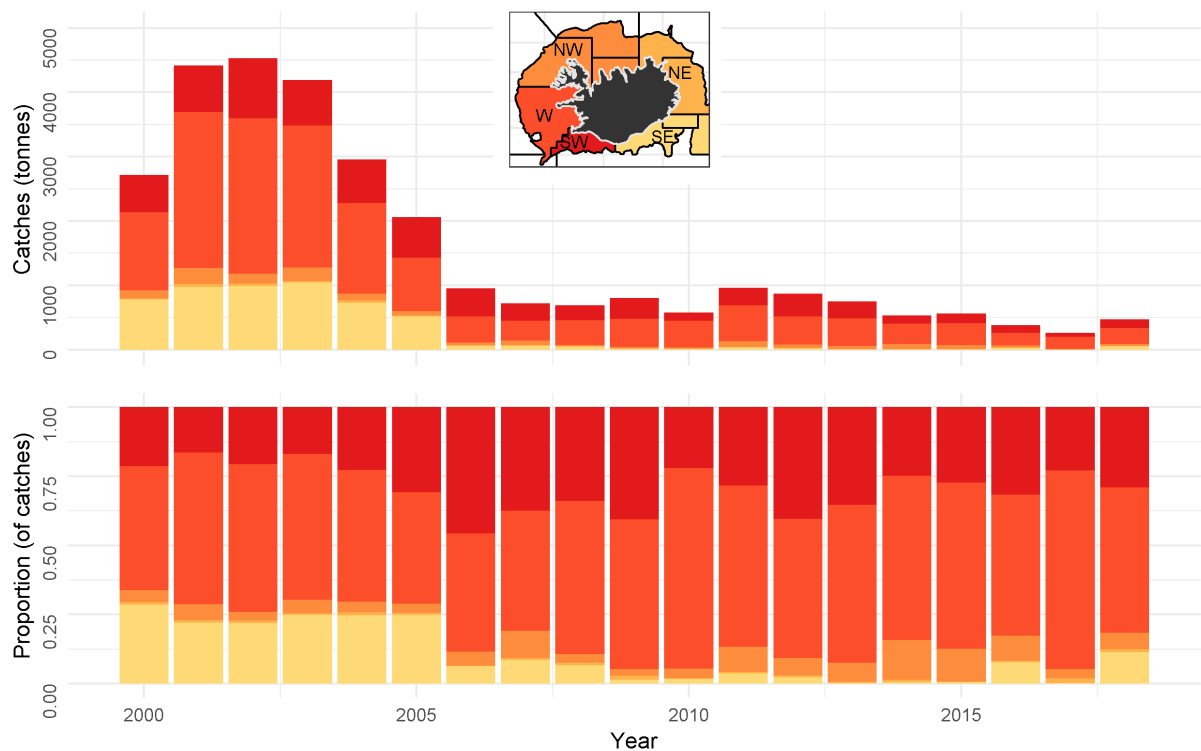


Figure 2. Dab. Spatial distribution of the Icelandic fishery by fishing area from 2000-2018. All gears combined.

Mynd 2. Sandkoli. Útbreiðsla veiða við Ísland árin 2000-2018. Öll veiðarfæri samanlagt.

Since 2000, the main fishing grounds of dab have been in the southwestern and western part of the Icelandic shelf (Figure 2) according to logbook entries. Before 2005, around 20-30% of the catch was taken in the southeast area, compared to 0-10% after 2005, suggesting a shift in the fishing distribution or distribution of the stock.

Dab is caught in relatively shallow water, with most of the catch (60-80%) taken between 21-80 meters depth (Figure 3).

Dab is mainly caught in demersal seine or around 95% of all catch (Figure 4). This proportion has been very stable through the years, as well as the amount caught in other gear (demersal trawl, longline and gillnets) with around 4% of the catch. Since 2000, the number of seiners reporting annual catches over 1000 kg of dab in total have decreased. (Table 1).

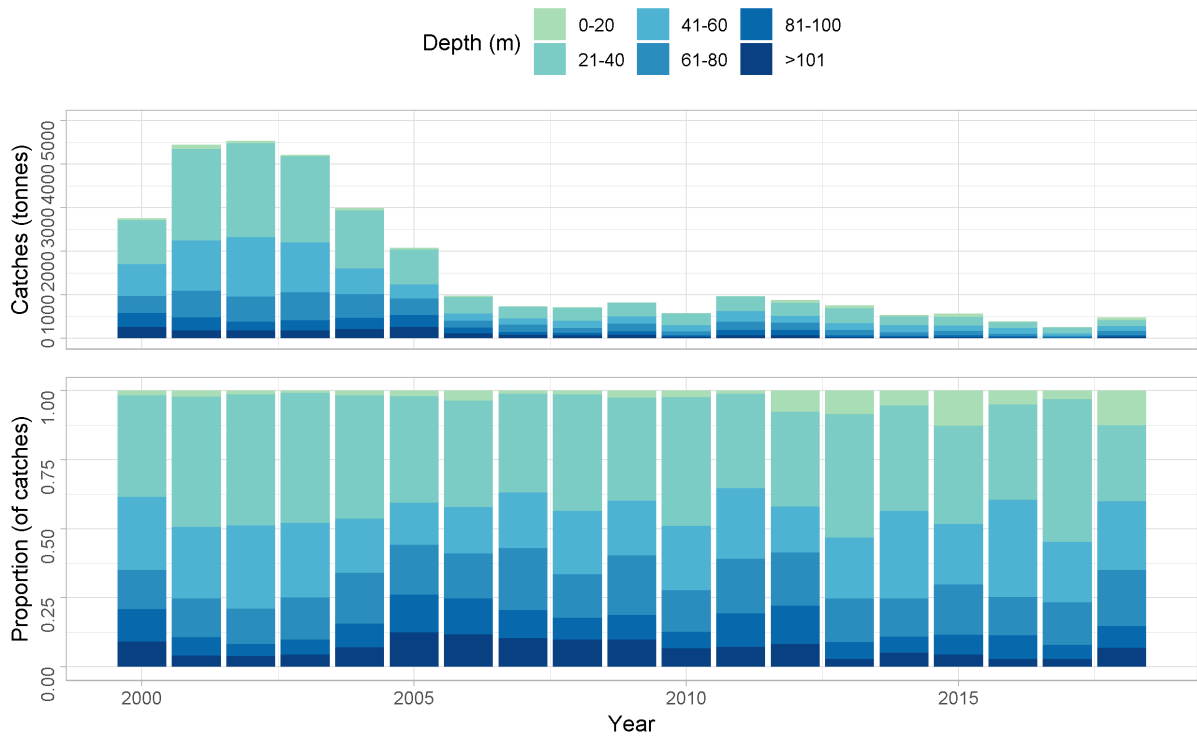


Figure 3. Dab. Depth distribution of catches according to logbooks.

Mynd 3. Sandkoli. Afli samkvæmt afladagbókum, skipt eftir dýpi.

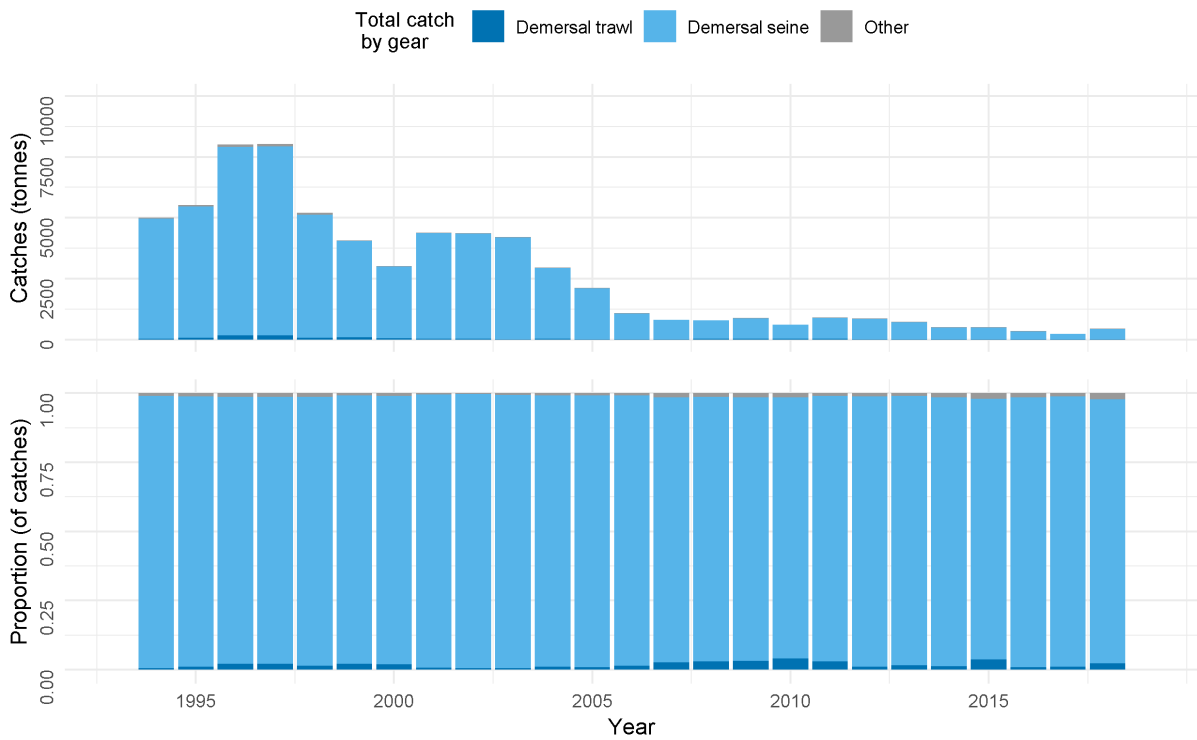


Figure 4. Dab. Total catch (landings) by fishing gear since 2000.

Mynd 4. Sandkoli. Landaður afli eftir veiðarfærum frá árinu 2000.

Table 1. Dab. Number of Icelandic vessels landing 1000 kg or more of dab, and all landed catch divided by gear type.

Tafla 1. Sandkoli. Fjöldi íslenskra skipa sem landað hafa 1000 kg eða meira af sandkóla og allur landaður afli eftir veiðarfærum.

YEAR	NUMBER OF VESSELS		CATCHES (TONNES)		
	<i>Seiners</i>	<i>Other</i>	<i>Demersal seine</i>	<i>Other</i>	<i>Sum</i>
2000	62	10	2948	64	3012
2001	67	7	4322	53	4375
2002	67	7	4323	35	4358
2003	73	7	4165	48	4213
2004	72	11	2894	60	2954
2005	53	10	2079	35	2114
2006	43	6	1055	24	1079
2007	44	7	777	33	810
2008	35	9	754	38	792
2009	35	8	838	45	883
2010	35	8	574	38	612
2011	36	8	866	37	903
2012	36	4	840	19	859
2013	33	4	690	18	708
2014	28	2	490	15	505
2015	20	5	472	28	500
2016	19	1	330	8	338
2017	13	1	226	5	231
2018	26	6	424	21	445

CATCH PER UNIT EFFORT (CPUE) AND EFFORT.

CPUE estimates of dab in Icelandic waters are not considered representative of stock abundance as changes in fleet composition, technical improvements and differences in gear setup among other things have not been accounted for when estimating CPUE.

Non-standardised estimate of CPUE in demersal seine (kg/set) is calculated as the average weight of dab in sets in which dab was more than 10% of the catch. According to logbooks, dab CPUE decreased rapidly from around 500 kg per set in 2002 to less than 200 kg per set in 2007. However, since 2008 CPUE gradually increased and was over 300 kg per set in 2015 and 2016 before it settled at 250 kg per set in 2017 and 2018 (Figure 5).

Total fishing effort for dab in demersal seine is estimated as the number of sets where dab was more than 10% of the total catch. The fishing effort has been decreasing almost continuously since 2003, increasing slightly in 2018, after a historically low effort in 2017 (Figure 5).

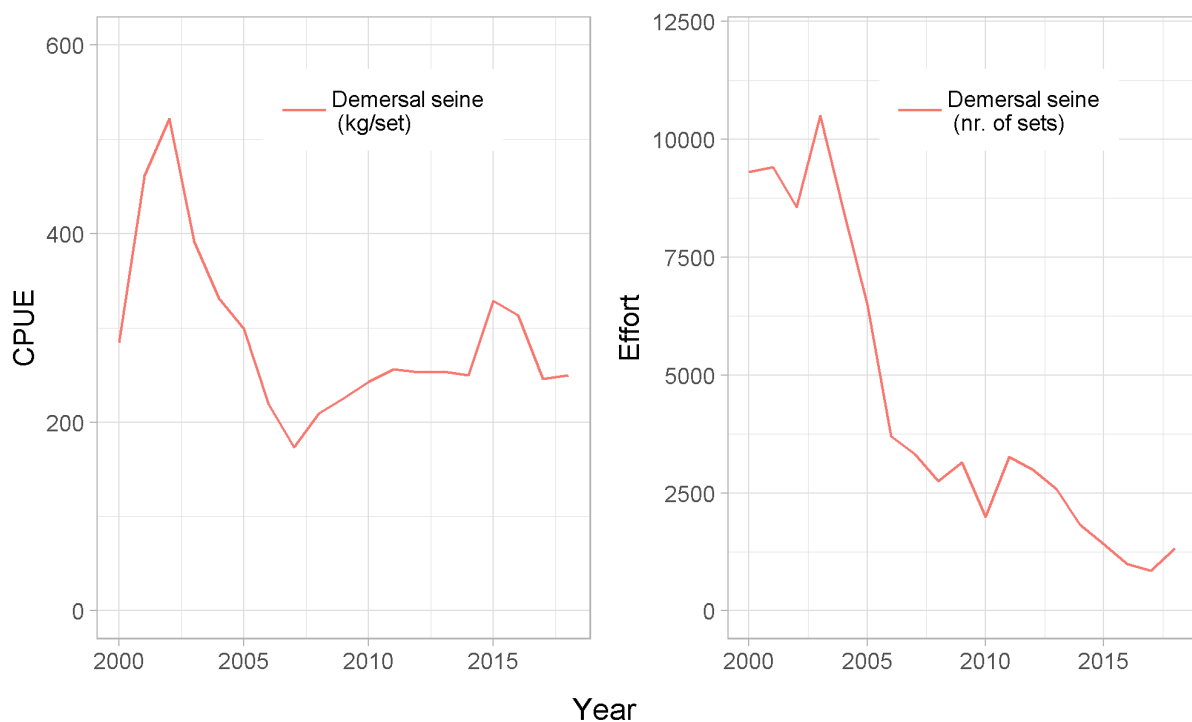


Figure 5. Dab. Non-standardised estimate of CPUE (left) and fishing effort (right) from demersal seine (kg/set or nr. of sets).

Mynd 5. Sandkoli. Afli á sóknareiningu (vinstri) og sókn (hægri) með dragnót (kg í kasti eða fjöldi kasta).

AGE DISTRIBUTION OF LANDED DAB

Annually 300-500 otoliths are collected from commercial catches of dab, except for last year when only 100 otoliths were collected (Table 2, Figure 6). All samples are from demersal seine. The commercial catch consists mainly of 4-6 year old dab, and fish older than 8 years old are rarely seen in the fishery (Figure 7).

Table 2. Dab. Number of samples and aged otoliths from landed catch.

Tafla 2. Sandkoli. Fjöldi sýna og aldursgreindra fiska úr lönduðum afla.

Year	Demersal seine	
	Samples	Otoliths
2010	7	350
2011	10	500
2012	10	500
2013	6	300
2014	13	500
2015	15	525
2016	9	350
2017	4	100
2018	6	200

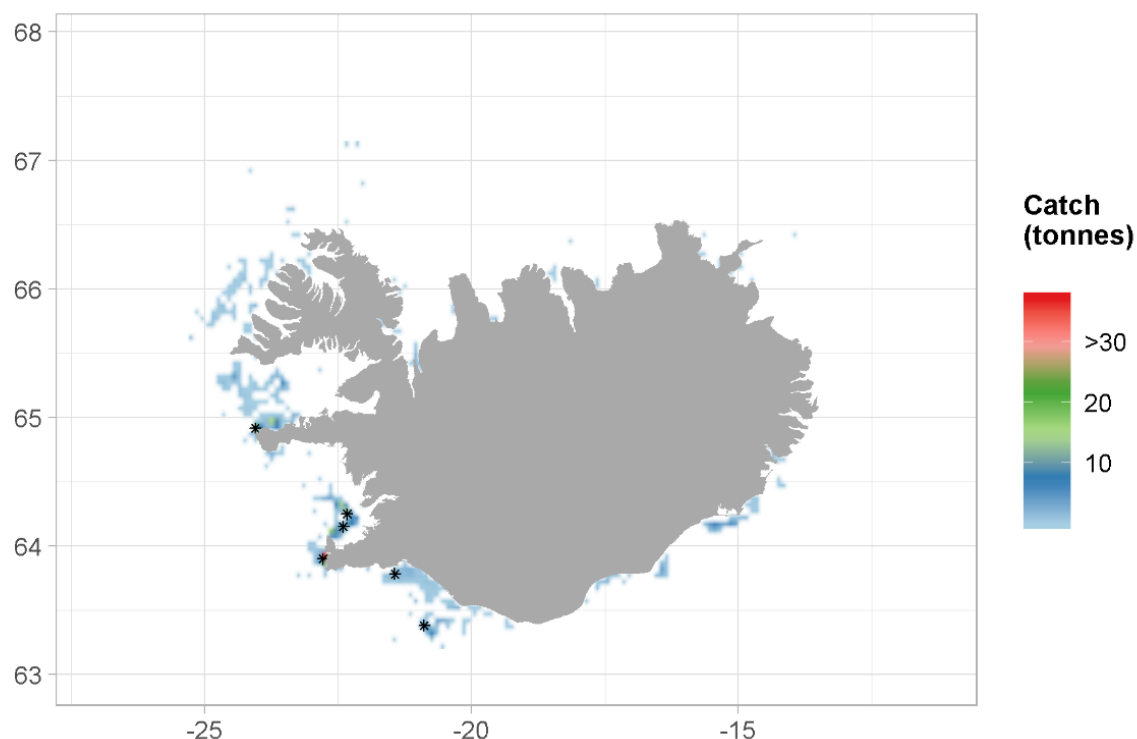


Figure 6. Dab. Fishing grounds in 2018 as reported in logbooks (colours) and positions of samples taken from landings (asterisks).

Mynd 6. Sandkoli. Veiðisvæði við Ísland árið 2018 samkvæmt afladagbókum (litir) og staðsetningar sýna úr lönduðum afla (stjörnur).

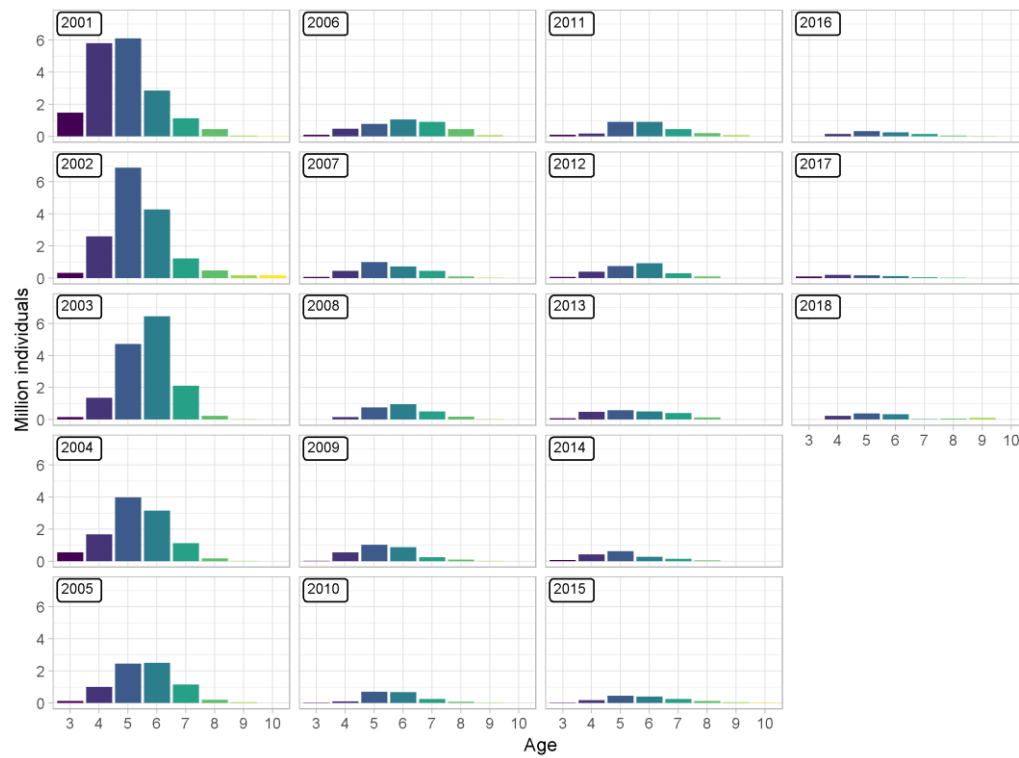


Figure 7. Dab. Estimated age distribution of landed catch based on landings and otoliths collected from landed catch.

Mynd 7. Sandkoli. Áætluð aldursdreifing landaðs afla byggð á aldursgreiningum á fiskum úr afla.

LENGTH DISTRIBUTION OF LANDED DAB

For the years 1993-2001, the average length of dab in samples from landed catch was 28.5-29.7 cm, lowest in 2001. From 2001, the average length increased each year to 2010 when the average length was 31.8 cm. In the years that follow, the average length has been around 31-33 cm (Figure 8).

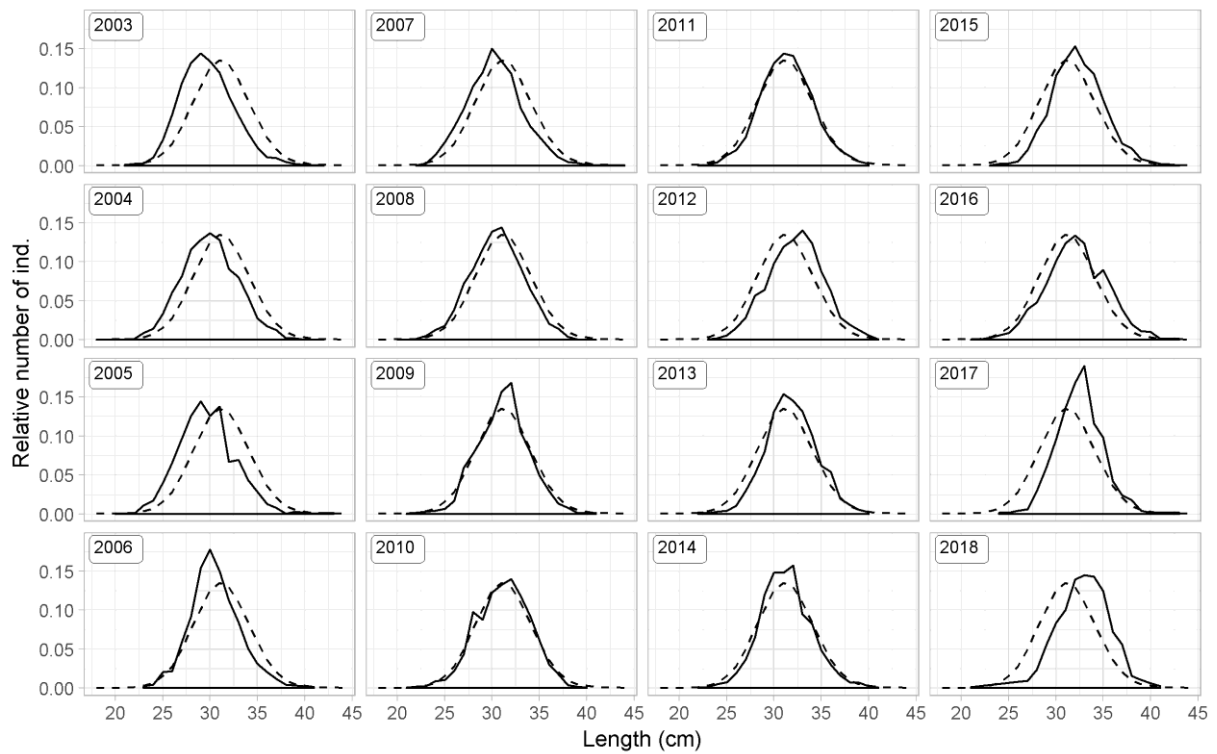


Figure 8. Dab. Length distributions from landed catch. The dotted line represents the mean length for all years.

Mynd 8. Sandkoli. Lengdardreifing aflasýna frá árinu 2002 með meðallengdardreifingu fyrir öll árin (punktalína).

SURVEY DATA

The Icelandic spring groundfish survey (hereafter spring survey, IS-SMB), which has been conducted annually in March since 1985, covers the most important distribution area of the dab fishery. In addition, the Icelandic autumn groundfish survey (hereafter autumn survey, IS-SMH) was commenced in 1996. However, a full autumn survey was not conducted in 2011 due to a labour dispute. The spring survey is considered to measure changes in abundance/biomass better than the autumn survey. It does not, however, adequately cover the main recruitment grounds for dab as recruitment takes place in shallow water in habitats unsuitable for demersal trawling. In addition to the spring and autumn surveys, a designated flatfish survey with beam trawl was started in 2016 and expanded in 2017 to cover most of the recruitment grounds of dab and other flatfish species. It will potentially be used for stock assessment of dab in the future.

Figure 9, shows both a recruitment index based on abundance of dab smaller than 20 cm, and trends in various biomass indices. In the spring survey, total biomass index and the biomass index for dab larger than 25 cm (harvestable part of the stock) have been quite low since 2006, following high indices in 2001-2003 (Figure 9).

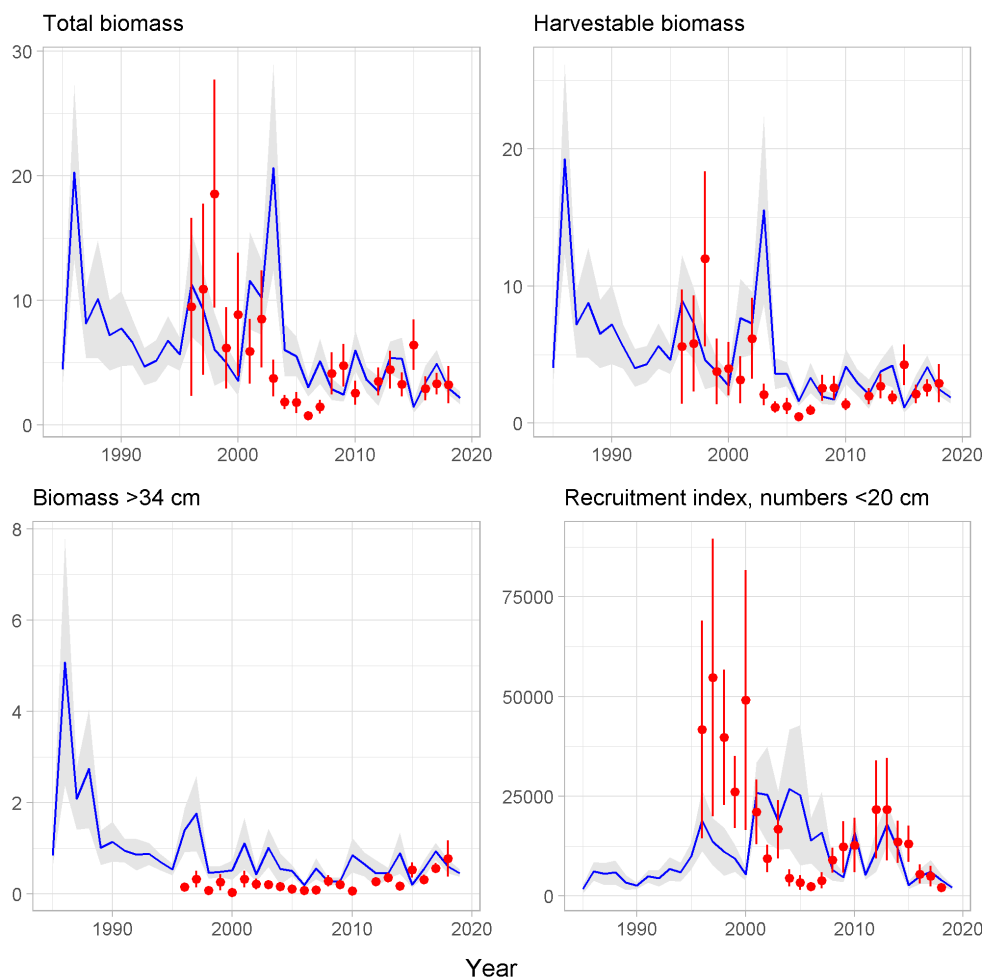


Figure 9. Dab total biomass indices (upper left) and harvestable biomass indices (>25 cm) (upper, right), biomass indices of larger individuals (>34cm) (lower left) and juvenile abundance indices (<20 cm) (lower right) from the spring survey (blue) from 1985 and autumn survey (red) from 1996, along with the standard deviation.

Mynd 9. Stofnvísitala sandkola (efri til vinstri), vísitala veiðistofns (25 cm og stærri, efri til hægri) og vísitala stærri einstaklinga (34 cm og stærri, neðri til vinstri) og nýliðunarsímtala (neðri til hægri), úr stofnmælingu botnfiska að vori (blátt) frá árinu 1985 og hausti (rautt) frá árinu 1996, ásamt staðalfrávik.

The first two years of the spring survey, the average length of dab in measured samples was 28.2 cm (Figure 10). After that the average length declined almost each year until 2001 when it was 24 cm. After some fluctuation in the years that followed, it again reached this low value in 2012 and 2013. Since 2013 the average length has gradually been increasing and was 26.5 cm in 2019. Data from the autumn survey tells a similar story, with a marked increase in average size of dab in most recent years (Figure 11).

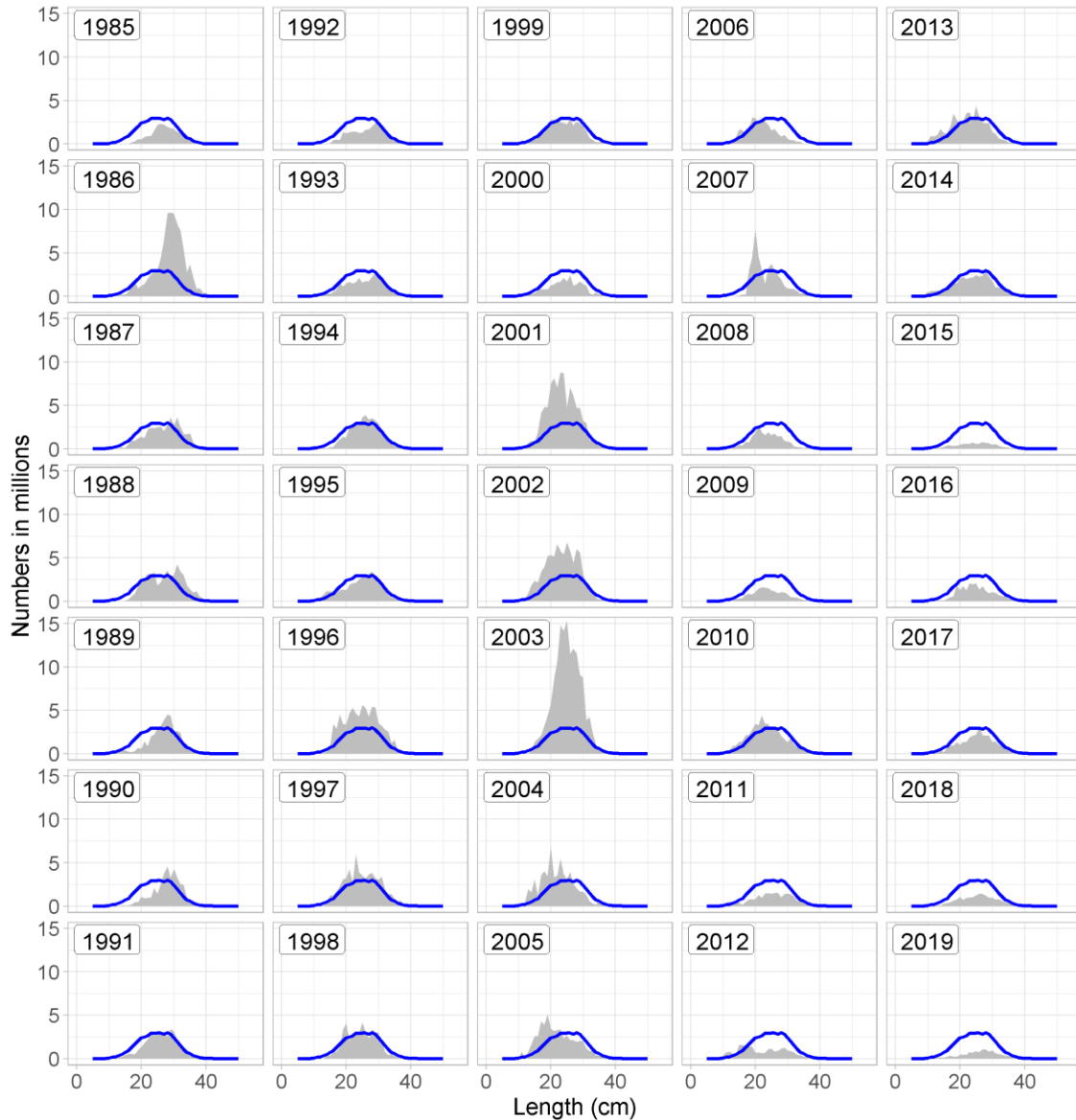


Figure 10. Dab. Length disaggregated abundance indices from the spring survey. The blue line shows the mean for all years.

Mynd 10. Sandkoli. Lengdarskiptar vísitölur úr stofnmælingu botnfiska að vori frá 1985 ásamt meðaltali allra ára (blá lína).

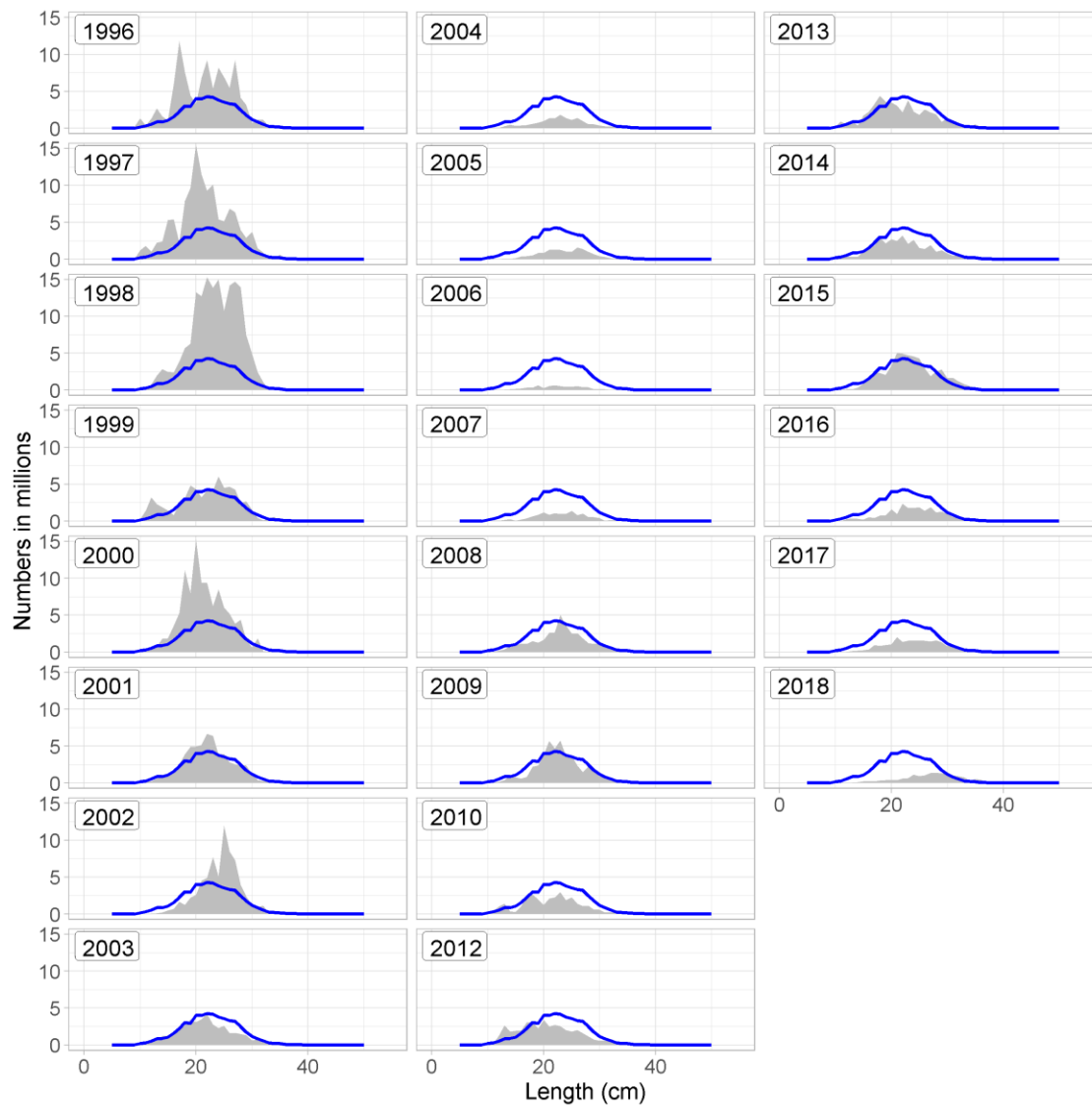


Figure 11. Dab. Length disaggregated abundance indices from the autumn survey. The blue line shows the mean for all years.

Mynd 11. Sandkoli. Lengdarskiptar vísitölur úr stofnmælingu botnfiska að hausti frá 1996 ásamt meðaltali allra ára (blá lína).

Dab were most abundant in the south and west in the spring survey in 2019, with most of the catch coming from several tows in the west and southwest part of the country (Figure 12). From the onset of the spring survey a considerable part of the biomass has been measured in the southeast. After 2004 this changed, and very little has been observed in this area ever since, suggesting a change in the spatial distribution of dab around the country (Figure 13). Biomass in the west and northwest areas has increased over the same period.

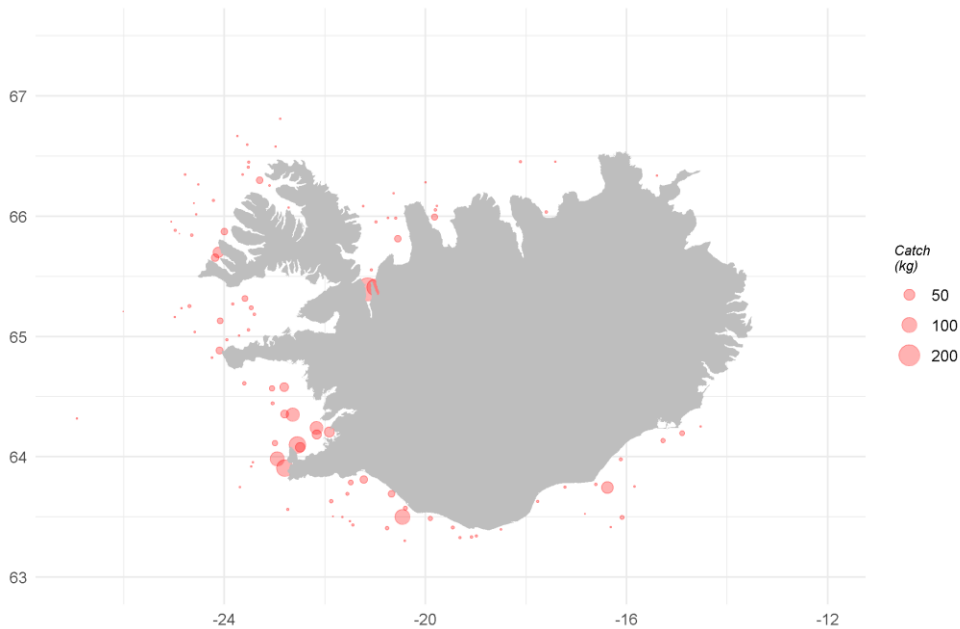


Figure 12. Dab. Spatial distribution in the spring survey in 2019.

Mynd 12. Sandkoli. Útbreiðsla í stofnmælingu botnfiska að vori 2019.

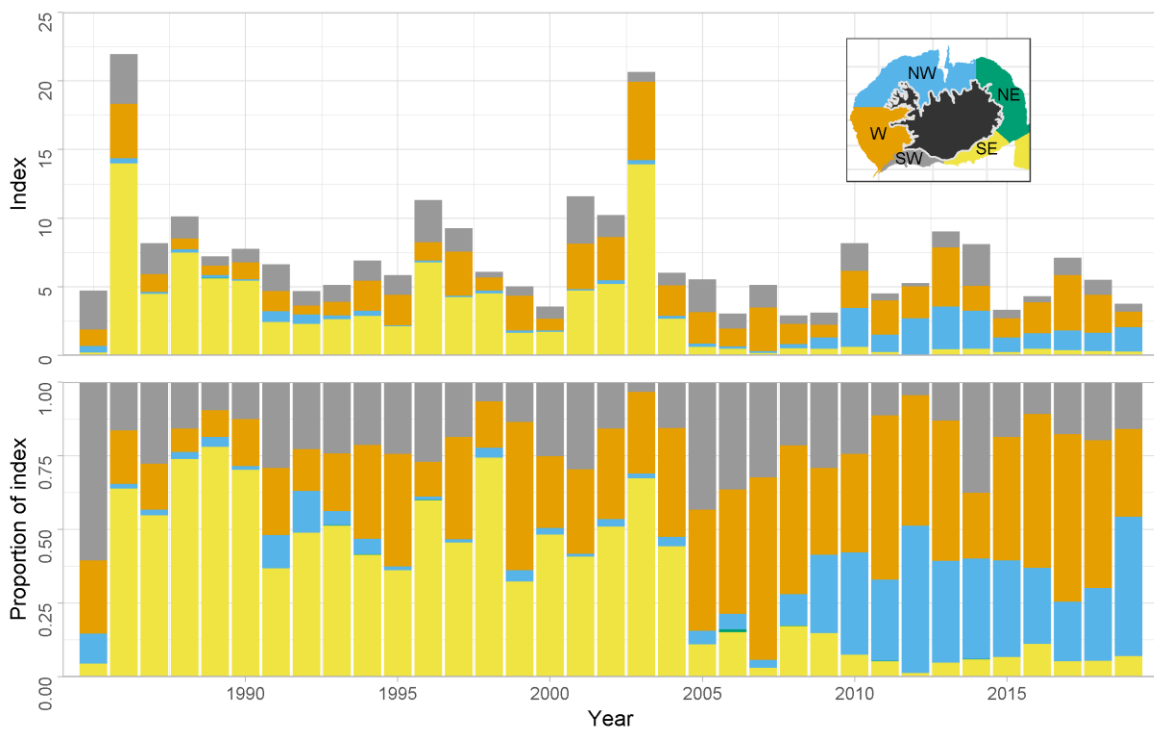


Figure 13. Dab. Spatial distribution of biomass index from the spring survey since 1985.

Mynd 13. Sandkoli. Dreifing lífmassavísitölu í stofnmælingu botnfiska að vori, árin 1985.

Dab were mainly observed in the south, west and northwest of Iceland in the 2018 autumn survey (Figure 14). Abundance is patchy, and most of the observed dab came from a few large tows. Comparable changes in spatial distribution of dab are observed in the autumn and spring surveys (Figure 13 and 15). The importance of the SE area diminishes as the importance of more westerly areas increases.

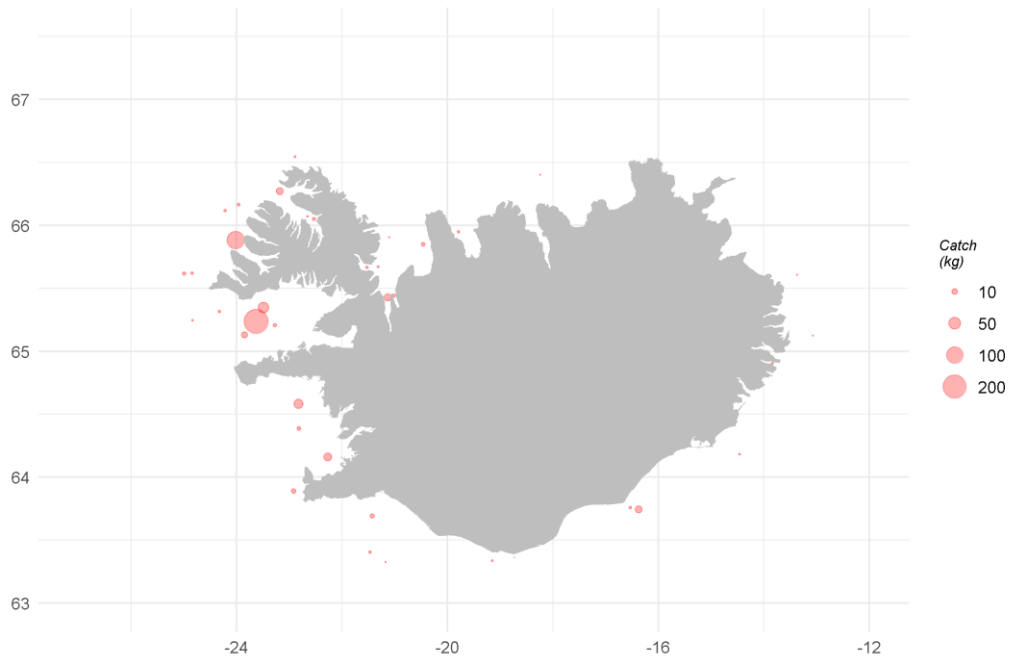


Figure 14. Dab. Spatial distribution of Dab in 2018 in the autumn survey.

Mynd 14. Sandkoli. Útbreiðsla í stofnmælingu botnfiska að hausti árið 2018.

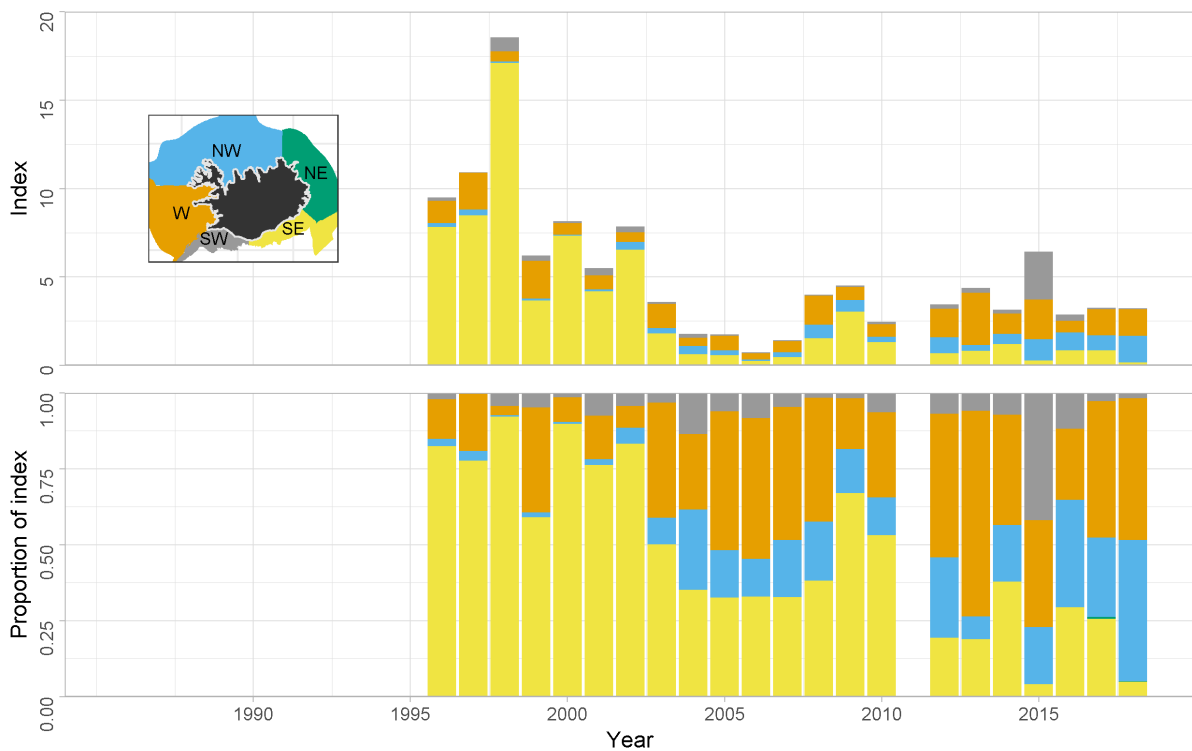


Figure 15. Dab. Spatial distribution of biomass index from the autumn survey in 1996-2018.

Mynd 15. Sandkoli. Dreifing lífmassavísitölu í stofnmælingu botnfiska að hausti, árin 1996-2018.

MANAGEMENT

The Ministry of Industries and Innovation is responsible for management of the Icelandic fisheries and implementation of legislation. Dab was included in the ITQ system in the 1997/1998 quota year and as such subjected to TAC limitations (Table 5). For most of the fishing years up to 2004/05 the TAC was set according to recommendations, but for the fishing years 2005/06 to 2012/13 the TAC was somewhat higher than recommendations.

Figure 16 shows the net transfers for dab in the Icelandic ITQ-system. The net transfer has always been from dab to other species, the amount ranging from 5 to almost 60% of the allocated quota of the respected quota year. Transfer of dab quota from one quota year to the next is usually in the range of 7-15%, but was much higher in the 2016/17 quota year, or almost 25%.

Table 5. Dab. Recommended TAC, national TAC set by the Ministry, and landings (tonnes) within the quota area and total landings.

Tafla 5. Sandkoli. Tillögur Hafrannsóknastofnunar um hámarksafla, ákvörðun stjórnvalda um aflamark og landaður afli (tonn) innan kvótasvæðisins og heildarlöndun. UPPFÆRA

FISHING YEAR	REC. TAC	NATIONAL TAC	LANDINGS FROM QUOTA AREA	TOTAL LANDINGS
1995/96	7000	-	-	6780
1996/97	7000	-	-	8179
1997/98	7000	7000	6045	6260
1998/99	7000	7000	4253	4471
1999/00	7000	7000	2749	3154
2000/01	4000	5500	2300	2931
2001/02	4000	4000	3808	4177
2002/03	7000	7000	4266	4652
2003/04	7000	7000	3612	3992
2004/05	5000	5000	2634	2880
2005/06	2500	4000	1247	1372
2006/07	1000	2000	796	1011
2007/08	500	1500	592	705
2008/09	500	1000	697	805
2009/10	500	1000	571	717
2010/11	500	900	596	815
2011/12	500	900	711	890
2012/13	500	800	587	780
2013/14	500	500	403	580
2014/15	1000	1000	334	546
2015/16	500	500	334	443
2016/17	500	500	181	206
2017/18	500	500	297	399
2018/19	500	500		
2019/20	399			

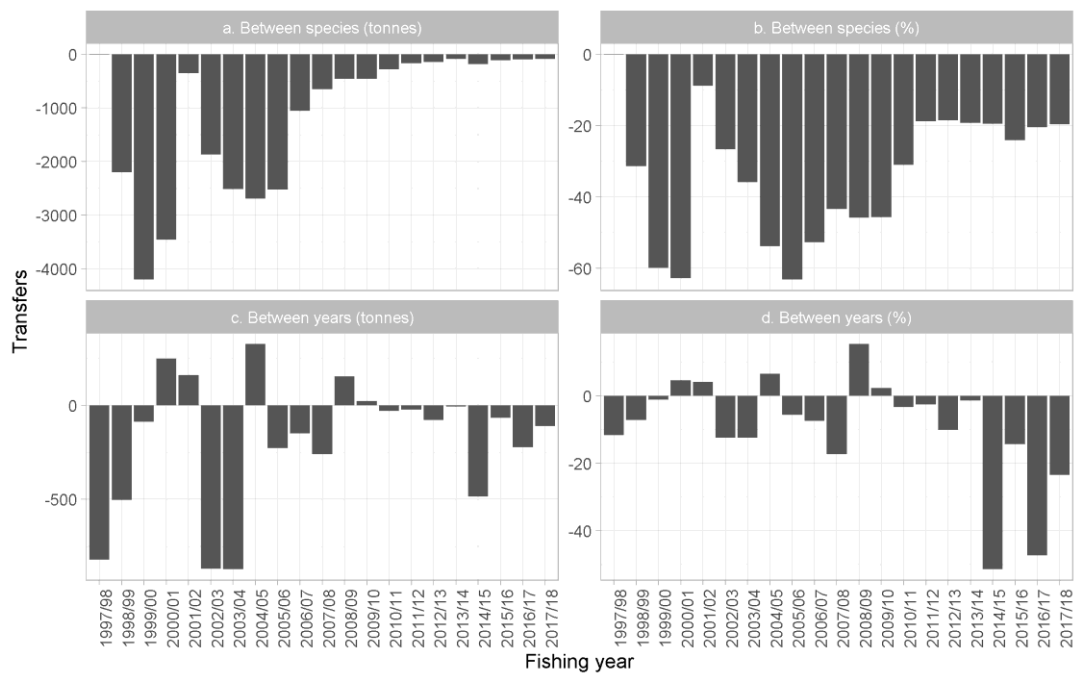


Figure 16. Dab. Net transfers of quota to and from Dab in the Icelandic ITQ system by quota year. Between species (upper): Positive values indicate a transfer of other species to dab, but negative values indicate a transfer of dab quota to other species. Between years (lower): Net transfer of quota for a given fishing year.

Mynd 16. Sandkoli. Nettó tilfærsla á kvóta eftir fiskveiðiárum. Tilfærsla milli tegunda (efri myndir): Jákvæð gildi tákna tilfærslu á kvóta annarra tegunda yfir á sandkola en neikvæð gildi tilfærslu sandkolakvóta á aðrar tegundir. Tilfærsla milli ára (neðri myndir): Nettó tilfærsla kvóta á viðkomandi fiskveiðiári.