

Golden redfish (*Sebastes norvegicus*) in subareas 5, 6, 12, and 14 (Iceland and Faroes grounds, West of Scotland, North of Azores, East of Greenland)

ICES advice on fishing opportunities

ICES advises that when the Greenlandic and Icelandic management plan for golden redfish is applied, catches in 2023 should be no more than 25 545 tonnes.

Stock development over time

Fishing pressure on the stock is above F_{MSY} and below F_{pa} and F_{lim} , and spawning-stock size is above $MSY B_{trigger}$, B_{pa} , and B_{lim} .

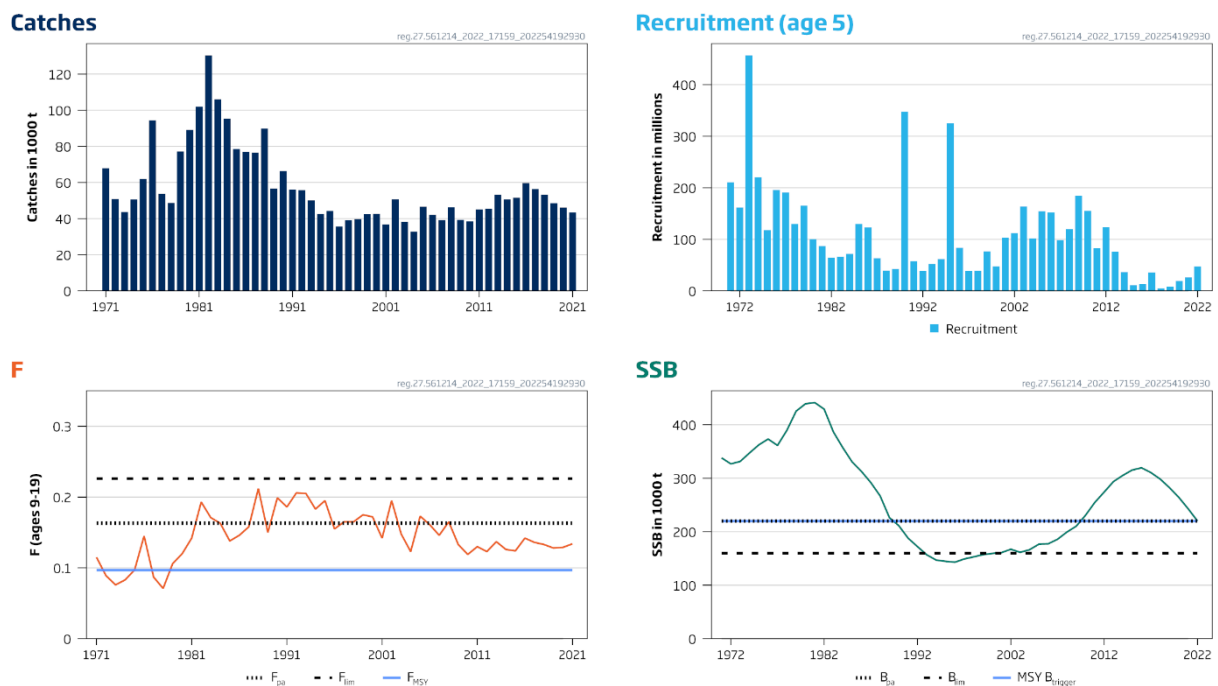


Figure 1 Golden redfish in subareas 5, 6, 12, and 14. Summary of the stock assessment. $F_{mgt} = F_{MSY}$; $SSB_{mgt} = MSY B_{trigger}$

Catch scenarios

Table 1 Golden redfish in subareas 5, 6, 12, and 14. Values in the forecast and for the interim year.

Variable	Value	Notes
$F_{ages\ 9-19}$ (2022)	0.128	Based on assumed catch in 2022
SSB (2023)	200045	Short-term forecast; tonnes
$R_{age\ 5}$ (2022)	47.2	From the assessment; millions
$R_{age\ 5}$ (2023)	39.5	Average of the five smallest year classes in 1980–2007; millions
$R_{age\ 5}$ (2024)	39.5	Average of the five smallest year classes in 1980–2007; millions
Total catch (2022)	37241	Sum of expected landings, accounting for interannual transfer from 2021; tonnes

Table 2 Golden redfish in subareas 5, 6, 12, and 14. Annual catch scenarios. All weights are in tonnes.

Basis	Total catch (2023)	F_{9-19} (2023)	SSB (2024)	% SSB change*	% advice change**
ICES advice basis					
Management plan	25 545	0.097	189 588	-5.2	-20
Other scenarios					
$F = 0$	0	0	213 812	6.9	-100
$F_{sq} = F_{2021}$	31 152	0.134	184 271	-7.9	-2.2

* SSB 2024 relative to SSB 2023 (200045 tonnes).

** Advice value for 2023 relative to the advice value for 2022 (31 855 tonnes).

The advised catch has decreased because the biomass is in a downwards trajectory, and its estimate has been revised downwards in this year's assessment (Figure 2).

Basis of the advice

Table 3 Golden redfish in subareas 5, 6, 12, and 14. The basis of the advice.

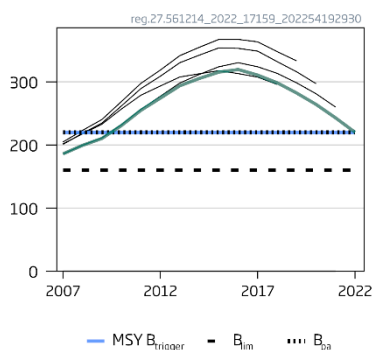
Advice basis	Greenland and Iceland management plan for golden redfish
Management plan	A management plan for golden redfish, aimed at providing maximum sustainable yield, has been evaluated by ICES (ICES, 2014a) and is considered to be precautionary. ICES has been requested to give advice according to this plan.
	The management plan states that: If $SSB_Y \geq SSB_{mgt}$: the catch for year Y+1 corresponds to the fishing mortality $F_{Y+1} = F_{mgt}$ If $SSB_Y < SSB_{mgt}$: the catch for year Y+1 corresponds to $F_{Y+1} = F_{mgt} \times SSB_Y / SSB_{mgt}$
	where SSB_Y is the spawning-stock biomass in year Y, $F_{mgt} = 0.097$, and $SSB_{mgt} = 220\ 000$ tonnes. The expected range of realized fishing mortality (F) following the management plan (F_{mgt}) is between 0.07 and 0.16

Quality of the assessment

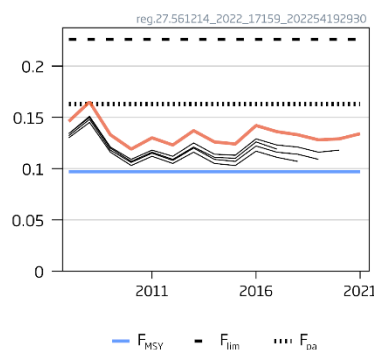
The latest assessment shows downwards revision of the stock biomass (about 6%) and a corresponding upward revision of fishing mortality for a long period. For a long-lived species the assessment is likely to show slower convergence back in time compared to shorter-lived species.

This assessment is considered to be uncertain but consistent with previous assessments. Because of the aggregating behavior of the species, survey indices are often largely dominated by a few large hauls. This causes high uncertainties in the survey indices and large interannual fluctuation in estimates of the biomass index. The catch-at-age data show very low recruitment, which is consistent with the information from the survey indices.

SSB (1000 t)



F (ages 9-19)



Rec (age 5; Millions)

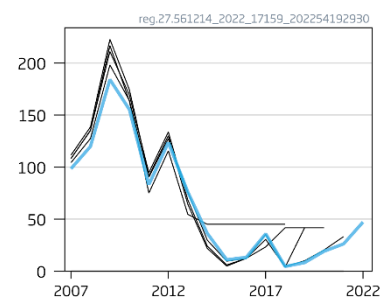


Figure 2 Golden redfish in subareas 5, 6, 12, and 14. Historical assessment results.

Issues relevant for the advice

Since 2009, surveys of golden redfish have consistently shown very low abundance of small fish (≤ 30 cm). While current indices of adult biomass are high they are decreasing and the absence of any indications of incoming cohorts raises concerns about the productivity of the stock. This is reflected in the current assessment of this stock as the spawning-stock biomass is projected to decline below MGT B_{trigger} in 2023.

Catches from Subarea 6 are not included in the stock assessment.

Reference points

Table 4 Golden redfish in subareas 5, 6, 12, and 14. Reference points, values, and their technical basis. All weights are in tonnes.

Framework	Reference point	Value	Technical basis	Source
MSY approach	MSY B_{trigger}	220 000	B_{pa}	ICES (2014b)
	F_{MSY}	0.097	Average of ages 9–19. F_{max} in the 2012 Gadget assessment, leading to < 1% probability of going below B_{lim} , based on recruitment patterns between 1975 and 2012 and with large assessment uncertainty.	ICES (2014b)
Precautionary approach	B_{lim}	160 000	Lowest SSB in the 2012 Gadget assessment	ICES (2014b)
	B_{pa}	220 000	$B_{\text{lim}} \times \exp(0.2 \times 1.645)$	ICES (2014b)
	F_{lim}	0.226	The F that leads to B_{lim} in the long term. From stochastic simulations.	ICES (2014b)
	F_{pa}	0.163	$F_{\text{lim}} / \exp(0.2 \times 1.645)$	ICES (2014b)
Management plan	SSB_{mgt}	220 000	From the management plan	ICES (2014b)
	F_{mgt}	0.097	From the management plan	ICES (2014b)

Basis of the assessment

Table 5 Golden redfish in subareas 5, 6, 12, and 14. Basis of assessment and advice.

ICES stock data category	1 (ICES, 2022a)
Assessment type	Analytical assessment (Gadget model) that uses catches in the model and in the forecast (ICES, 2022b)
Input data	Landings data and length distributions of catches from Iceland, Greenland, and the Faroes; survey data by length from the Icelandic bottom trawl survey - Spring (IS-SMB [G3239]) and Greenlandic Groundfish survey (GGS [G3244]); age data from Icelandic catches and the Icelandic bottom trawl survey - Autumn (IS-SMH [G4493])
Discards and bycatch	Considered negligible
Indicators	None
Other information	Benchmarked in 2014 (ICES, 2014b)
Working group	Northwestern Working Group (NWWG)

History of the advice, catch, and management

Table 6 Golden redfish in subareas 5, 6, 12, and 14. ICES advice, TACs, and ICES catch. All weights are in tonnes.

Year	ICES advice	Catch corresponding to advice	Iceland TAC *, ##	Greenland TAC	ICES catch
1987	No increase in F	83 000	95 000		77 127
1988	No increase in F	84 000	85 000		89 989
1989	TAC*	117 000*	77 000		57 050
1990	TAC*	116 000*	80 000		66 632
1991	Precautionary TAC	77 000 (117 000*)	55 000#		56 364
1992	Precautionary TAC	76 000 (116 000*)	90 000		55 710
1993	Precautionary TAC*	120 000*	104 000		50 350
1994	Precautionary TAC, if required	100 000*	90 000		42 515
1995	TAC	90 000*	77 000		44 765

Year	ICES advice	Catch corresponding to advice	Iceland TAC *, ##	Greenland TAC	ICES catch
1996	TAC for Division 5.a (28000 tonnes); precautionary TAC for Division 5.b and Subarea 15 (4000 tonnes)	32 000**	65 000		36 597
1997	Effort 75% of 1995 value	32 000**	65 000		39 761
1998	Effort reduced in steps of 25% from the 1995 level	37 200**	65 000		39 825
1999	Effort not increased compared to 1997	35 000**	65 000		42 040
2000	Catch not increased compared to 1998	35 000**	60 000		43 550
2001	Effort not increased compared to 1999	33 000**,^	57 000		37 326
2002	25% reduction in effort	29 000^^	65 000		51 092
2003	25% reduction in effort (2001)	31 000^^	60 000		39 220
2004	25% reduction in effort (2002)	37 400^^	57 000		33 451
2005	Maintain fishable biomass above U_{pa}	37 000^^	57 000		45 329
2006	Maintain fishable biomass above U_{pa}	37 000^^	57 000		42 211
2007	Maintain fishable biomass above U_{pa}	37 000^^	57 000	5000 [‡]	39 134
2008	Maintain fishable biomass above U_{pa}	37 000^^	57 000	1000 [‡]	46 251
2009	Maintain fishable biomass above U_{pa}	< 30 000	50 000		39 177
2010	Maintain fishable biomass above U_{pa}	< 30 000	50 000	6000 [‡]	38 648
2011	Same advice as last year	< 30 000	37 500	8500 [‡]	45 354
2012	Maintain catches	< 40 000	40 000	8500 [‡]	45 635
2013	Maintain catches	< 40 000	45 000	8500 [‡]	53 263
2014	20% increase in catches (relative to 2010–2012)	< 51 980	52 000	8500 [‡]	50 736
2015	Management plan	< 47 300	45 600	8500 [‡]	51 645
2016	Management plan	< 51 000	48 500	8500 [‡]	59 707
2017	Management plan	≤ 52 800	47 205	7520 [‡]	56 141
2018	Management plan	≤ 50 800	45 450	6222 [‡]	53 227
2019	Management plan	≤ 43 600	39 240	5274 [‡]	48 530
2020	Management plan	≤ 43 568	38 896	5271 [‡]	46 197
2021	Management plan	≤ 38 343	34 379	4748 [‡]	43 426
2022	Management plan	≤ 31 855	28 554	3186 [‡]	
2023	Management plan	≤ 25 545			

* Deep-sea *S. mentella* and *S. norvegicus* combined until 2010.

** *S. norvegicus* only.

^ In Division 5.a only.

^^ Both divisions 5.a and 5.b and Subarea 14.

Fishing year ending 31 August.

From 1992 onwards: fishing year 1 September – 31 August.

‡ Demersal redfish (*Sebastes norvegicus* and *S. mentella*).

History of the catch and landings

Table 7 Golden redfish in subareas 5, 6, 12, and 14. Catch distribution by fleet in 2021 as estimated by ICES. All weights are in tonnes.

Catch (2021)	Landings		Discards
43 426	Bottom trawl 95%	Other gear 5%	Discarding is considered negligible
	43 426		

Table 8 Golden redfish in subareas 5, 6, 12, and 14. History of commercial catch; ICES estimated values are presented by area in the fishery. All weights are in tonnes.

Year	Area				Total
	Division 5.a	Division 5.b	Subarea 6	Subarea 14	
1978	31 300	2039	313	15 477	49 129
1979	56 616	4805	6	15 787	77 214
1980	62 052	4920	2	22 203	89 177
1981	75 828	2538	3	23 608	101 977
1982	97 899	1810	28	30 692	130 429
1983	87 412	3394	60	15 636	106 502
1984	84 766	6228	86	5040	96 120
1985	67 312	9194	245	2117	78 868
1986	67 772	6300	288	2988	77 348
1987	69 212	6143	576	1196	77 127
1988	80 472	5020	533	3964	89 989
1989	51 852	4140	373	685	57 050
1990	63 156	2407	382	687	66 632
1991	49 677	2140	292	4255	56 364
1992	51 464	3460	40	746	55 710
1993	45 890	2621	101	1738	50 350
1994	38 669	2274	129	1443	42 515
1995	41 516	2581	606	62	44 765
1996	33 558	2316	664	59	36 597
1997	36 342	2839	542	37	39 761
1998	36 771	2565	379	109	39 825
1999	39 824	1436	773	7	42 040
2000	41 187	1498	776	89	43 550
2001	35 067	1631	535	93	37 326
2002	48 570	1941	392	189	51 092
2003	36 577	1459	968	215	39 220
2004	31 686	1139	519	107	33 451
2005	42 593	2484	137	115	45 329
2006	41 521	656	0	34	42 211
2007	38 364	689	0	83	39 134
2008	45 538	569	64	80	46 251
2009	38 442	462	50	224	39 177
2010	36 155	620	220	1653	38 648
2011	43 773	493	83	1005	45 354
2012	43 103	491	41	2017	45 635
2013	51 330	372	92	1499	53 263
2014	47 769	201	60	2706	50 736
2015	48 769	270	44	2562	51 645
2016	54 041	179	50	5442	59 707
2017	50 119	1418	93	4501	56 141
2018	48 014	1129	80	4004	53 227
2019	44 746	1119	101	2665	48 530
2020	40 688	1304	100	4105	46 197
2021*	39 616	178	100	3532	43 426

* Preliminary.

Summary of the assessment

Table 9 Golden redfish in subareas 5, 6, 12, and 14. Assessment summary. Catches from ICES Subarea 6 are not included in the assessment. Weights are in tonnes. Recruitment in thousands.

Year	Recruitment age 5	SSB	Catches	F Ages 9–19
1971	210600	338242	67880	0.115
1972	161700	326889	50890	0.089
1973	456700	331438	43719	0.076
1974	220500	347290	50598	0.083
1975	117900	362455	61920	0.097
1976	195900	373340	94420	0.145
1977	191000	361350	53753	0.087
1978	129600	389424	48736	0.071
1979	165500	425542	77212	0.106
1980	100200	439297	89143	0.120
1981	86900	441430	101966	0.142
1982	64200	429215	130322	0.193
1983	66100	386355	106050	0.171
1984	71800	357097	95288	0.163
1985	129500	330502	78531	0.138
1986	123300	312661	76908	0.146
1987	63400	291881	76559	0.158
1988	39100	266908	89804	0.21
1989	42500	226159	56645	0.150
1990	347600	211258	66314	0.199
1991	57500	187851	56015	0.186
1992	38600	172180	55826	0.21
1993	52100	156762	50179	0.21
1994	61700	147027	42520	0.183
1995	325400	144733	44263	0.195
1996	83500	143002	35595	0.155
1997	38500	149041	38996	0.165
1998	38800	152952	39694	0.165
1999	76500	157102	42463	0.175
2000	47500	159403	42607	0.172
2001	103200	160947	36744	0.142
2002	111800	167273	50730	0.195
2003	163600	161447	38219	0.148
2004	101600	166336	32766	0.123
2005	154300	176691	46619	0.173
2006	151700	177413	42108	0.161
2007	98400	185875	39154	0.146
2008	119800	199321	46195	0.165
2009	184100	210288	39301	0.133
2010	155300	230741	38504	0.119
2011	83200	254843	45146	0.130
2012	123600	274185	45423	0.123
2013	76100	293834	53223	0.137
2014	36300	305377	50697	0.126
2015	11000	315360	51621	0.124
2016	13300	319575	59711	0.142
2017	35900	310673	56355	0.136
2018	4500	298542	53167	0.133
2019	8200	282338	48550	0.128
2020	19100	264207	46116	0.129
2021	26200	242926	43337	0.134
2022	47200	220056		

Sources and references

ICES. 2014a. Iceland, Faroe Islands, and Greenland request to ICES on evaluation of a proposed long-term management plan and harvest control rule for golden redfish (*Sebastes marinus*). In Report of the ICES Advisory Committee, 2014. ICES Advice 2014, Book 2, Section 2.2.3.1.

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[Download the stock assessment data and figures.](#)

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