

ECOREGION Iceland and East Greenland
STOCK Golden redfish (*Sebastes marinus*) in Subareas V, VI, XII and XIV

Advice summary for 2011

The new data (landings and surveys) do not change the perception of the stock and give no reason to change the advice from that given last year: “Catches in 2010 should be less than 30 000 t, because this is expected to keep the stock above U_{pa} in the medium term.”

ICES advises that catches should be less than 30 000 t. The relative state of the stock is assessed through a survey index series (U) in Icelandic waters. The ICES MSY reference points for this stock have not been evaluated.

Stock status

Fishing mortality	2007	2008	2009
F_{MSY}	Undefined	Undefined	Undefined
F_{PA}/F_{lim}	Undefined	Undefined	Undefined
Spawning Stock Biomass (SSB)	2008	2009	2010
$MSY B_{trigger}$	Undefined	Undefined	Undefined
U_{PA}/U_{lim}	Between	Between	Above

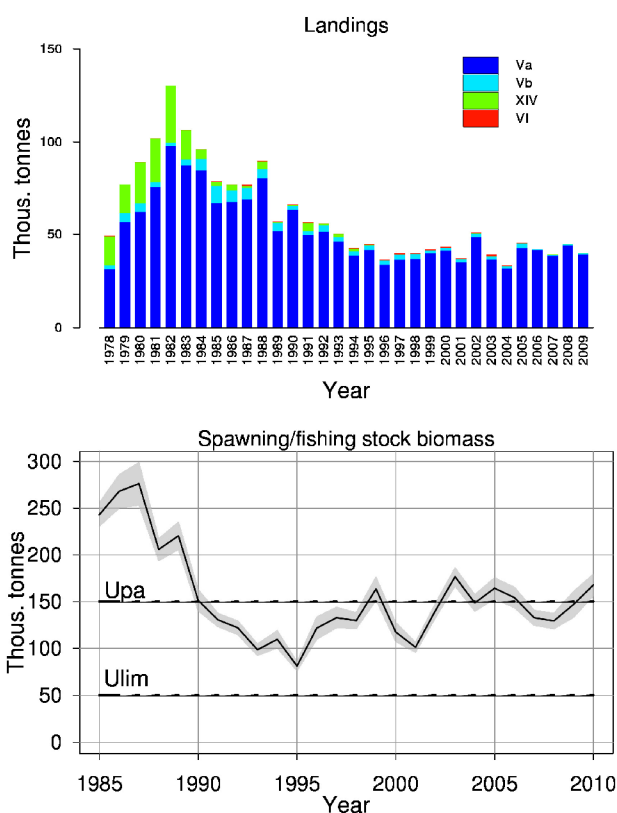


Figure 2.4.7.1 Landing of golden redfish and fishing stock biomass from the spring survey in ICES Division Va.

In recent years the survey index in Icelandic waters has fluctuated around U_{pa} (Figure 2.4.7.1) and, at present, in the vicinity of U_{pa} . Recruitment in Division Va is estimated to be low in recent years (March survey)

Survey indices of both pre-fishery recruits and of fishable size in Division XIVb (East Greenland) have increased in recent years.

In Division Vb the Faroese groundfish survey (covering 1994–2009) indicates that the abundance has been stable at a low level since 2001. Landings have declined since 1985 to a low level in recent years, and this decline is also reflected in the Faroese summer survey.

Management plans

No specific management objectives are known to ICES.

Biology

Sebastes marinus is a species with late maturation (matures between 10-14 years old) and slow growth (can get older than 50 years) and is hence considered to be vulnerable to overexploitation. It can therefore only sustain low exploitation and management should be based on that consideration.

The fisheries

The majority of the golden redfish catch is taken in ICES Division Va and in recent years contributes to about 98% of the total landings. Between 90-95% of the golden redfish catch in Va is taken by bottom trawlers targeting redfish. The remaining catches are caught as by-catch in gillnet and long-line fishery. Average annual landings 2000-2009 have been 40,000 tonnes. *S. marinus* in Va is to a small extent caught in a mixed fishery with *S. mentella* (Icelandic slope).

Catch by fleet	Total catch in 2009 40 kt where 100% landings, 0 % discards, 0 % industrial by-catch, 0 % unaccounted removals
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Scientific basis

Assessment type	Qualitative assessment
Input data	1 survey index (Icelandic spring survey)
Discards and by-catch	
Indicators	None
Other information	Faroese groundfish survey, Greenland deepsea survey.
Working group report	NWWG

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Reference points

ICES suggests that the relative state of the stock be assessed through a survey index series (U) in Icelandic waters.

	Type	Value	Technical basis
Precautionary approach	U_{lim}	55	20% of highest observed survey index*.
	U_{pa}	155	60% of highest observed survey index*.
	F_{lim}	Undefined	
	F_{pa}	Undefined	
Targets	U_v	Undefined	

(unchanged since 1998)

* Technical basis for the survey index:

The basis for the calculation of the U_{pa} is the Icelandic spring groundfish survey index series starting in 1985. Since 1990 the average U has been around half of U_{max} – the highest observed index in the time-series (276 in 1987). This has not resulted in any strong year classes compared to higher U's. A precautionary U_{pa} is therefore proposed at $U_{max} * 0.6$, corresponding to the U's associated with the most recent strong year class. U is regarded as a proxy for SSB but represents the fishable biomass.

MSY approach

The target biomass, U_{pa} , is considered to be consistent with the MSY framework.

PA Approach

The new data (landings and surveys) available do not change the perception of the stock and give no reason to change the advice from that given last year: "Catches in 2010 should be less than 30 000 t, because this is expected to keep the stock above U_{pa} in the medium term."

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Additional considerations

Management considerations

Sebastes marinus is a species with late maturation and slow growth and is hence considered to be vulnerable to overexploitation. It can therefore only sustain low exploitation and management should be based on that consideration.

The strong 1990 year class has been in the Icelandic fishery for a decade and will also sustain the stock in the short term. The 1996-1998 year classes are above average and have been recruiting to the fishery since 2006 (Figure 2.4.7.5)

The present management scheme in Division Va sets a joint TAC for *S. marinus* and demersal *S. mentella* on the shelf. This impedes direct management of fisheries on *S. marinus*. TAC or effort allocated to demersal redfish fishery should be given separately for each of the redfish species.

Subarea XIV is an important nursery area for *S. mentella* and *S. marinus*. The survey index of the fishable stock of *S. marinus* in Subarea XIV has increased in recent years, but with a large measurement error. Measures to protect juvenile redfish in Subarea XIV should be continued (sorting grids in the shrimp fishery).

In Subarea XIV redfish and cod are found in the same areas and depths and historically these species have been taken in the same fisheries. For 2010, ICES advises that no fishery should take place on cod in Greenland waters. Management measures should be put in place that minimises catches of cod in a directed fishery for *S. marinus*.

No formal agreement on the management of *S. marinus* exists among the three coastal states, Greenland, Iceland, and the Faroe Islands. In Greenland and Iceland, the fishery is regulated by a TAC and in the Faroe Islands by effort limitation.

On average, about 10% of the total landings have been taken in Divisions Vb, VI, and XIV. In recent years, catches in Division Va have represented about 98% of the catches in the entire distribution area Divisions V, VI, and XIV.

Data and methods

Survey data are available from the Icelandic spring groundfish survey 1985–2010, the German groundfish survey 1985–2009 in Subarea XIV, and the Faroese spring (1994–2010) and summer (1996–2009) surveys in Division Vb.

Data from the commercial catch in Division Va include length distribution, age–length key, and mean length-at-age.

The state of the stock is classified according to results from the Icelandic spring groundfish survey.

Comparison with last year's assessment and advice

Last year this stock was assessed with the Gadget model (length and age based). but is now the assessment is based on survey trends. The Gadget model did not capture recruitment signals and settings of the model need to be formalized

Sources

ICES. 2010. Report of the North-Western Working Group, 27 April - 4 May 2010 ICES CM 2010/ACOM:07.

Table 2.4.7.1 Golden redfish (*Sebastes marinus*) in Subareas V, VI, XII and XIV. ICES advice, management and landings

Year	ICES Advice	Predicted catch corresp. to advice	Iceland TAC	Greenland TAC ⁷	<i>S. marinus</i> ICES landings
1987	No increase in F	83	95 ¹		77
1988	No increase in F	84	85 ¹		90
1989	TAC ¹	117 ¹	77 ¹		57
1990	TAC ¹	116 ¹	80 ¹		67
1991	Precautionary TAC	77(117 ¹)	55 ^{1,5}		56
1992	Precautionary TAC	76(116 ¹)	90 ^{1,6}		56
1993	Precautionary TAC ¹	120 ¹	104 ^{1,6}		50
1994	Precautionary TAC, if required	100 ¹	90 ^{1,6}		43
1995	TAC	90 ¹	77 ^{1,6}		45
1996	TAC for Va (28); precautionary TAC for Vb and XIV (4)	32 ²	65 ^{1,6}		37
1997	Effort 75% of 1995 value	32 ²	65 ^{1,6}		40
1998	Effort reduced in steps of 25% from the 1995 level	37.2 ²	65 ^{1,6}		39
1999	Effort not increased compared to 1997	35 ²	65 ^{1,6}		42
2000	Catch not increased compared to 1998	35 ²	60 ^{1,6}		44
2001	Effort not increased compared to 1999	33 ^{2,3}	57 ^{1,6}		37
2002	25% reduction in effort	29 ⁴	65 ^{1,6}		51
2003	25% reduction in effort(2001)	31 ⁴	60 ^{1,6}		39
2004	25% reduction in effort(2002)	37.4 ⁴	57 ^{1,6}		33.4
2005	Maintain fishable biomass above U _{pa}	37 ⁴	57 ^{1,6}		45.4
2006	Maintain fishable biomass above U _{pa}	37 ⁴	57 ^{1,6}		42.2
2007	Maintain fishable biomass above U _{pa}	37 ⁴	57 ^{1,6}	5	39.1
2008	Maintain fishable biomass above U _{pa}	37 ⁴	57 ^{1,6}	1	44.8
2009	Maintain fishable biomass above U _{pa}	< 30	50 ^{1,6}		40.0
2010	Maintain fishable biomass above U _{pa}	< 30	50 ^{1,6}	6	
2011	Same advice as last year	< 30			

Weights in '000 t.

¹ Deep-sea *S. mentella* and *S. marinus* combined.

² *S. marinus* only.

³ In Va only.

⁴ Both Va and Vb and XIV.

⁵ Year ending 31 August.

⁶ Quota year September–August.

⁷ Demersal redfish (*Sebastes marinus* and *S. mentella*).

Table 2.4.7.2Official landings (in tonnes) of *S. marinus*, by area, as officially reported to ICES.

Year	Area				Total
	Va	Vb	VI	XIV	
1978	31,300	2,039	313	15,477	49,129
1979	56,616	4,805	6	15,787	77,214
1980	62,052	4,920	2	22,203	89,177
1981	75,828	2,538	3	23,608	101,977
1982	97,899	1,810	28	30,692	130,429
1983	87,412	3,394	60	15,636	106,502
1984	84,766	6,228	86	5,040	96,120
1985	67,312	9,194	245	2,117	78,868
1986	67,772	6,300	288	2,988	77,348
1987	69,212	6,143	576	1,196	77,127
1988	80,472	5,020	533	3,964	89,989
1989	51,852	4,140	373	685	57,050
1990	63,156	2,407	382	687	66,632
1991	49,677	2,140	292	4,255	56,364
1992	51,464	3,460	40	746	55,710
1993	45,890	2,621	101	1,738	50,350
1994	38,669	2,274	129	1,443	42,515
1995	41,516	2,581	606	62	44,765
1996	33,558	2,316	664	59	36,597
1997	36,342	2,839	542	37	39,761
1998	36,771	2,565	379	109	39,825
1999	39,824	1,436	773	7	42,040
2000	41,187	1,498	776	89	43,550
2001	35,067	1,631	535	93	37,326
2002	48,570	1,941	392	189	51,092
2003	36,577	1,459	968	215	39,220
2004	31,686	1,139	519	107	33,451
2005	42,593	2,484	137	115	45,329
2006	41,521	656	0	34	42,211
2007	38,364	689	0	83	39,134
2008	44,093	569	64	80	44,806
2009 ¹⁾	39,259	462	225	50	39,995

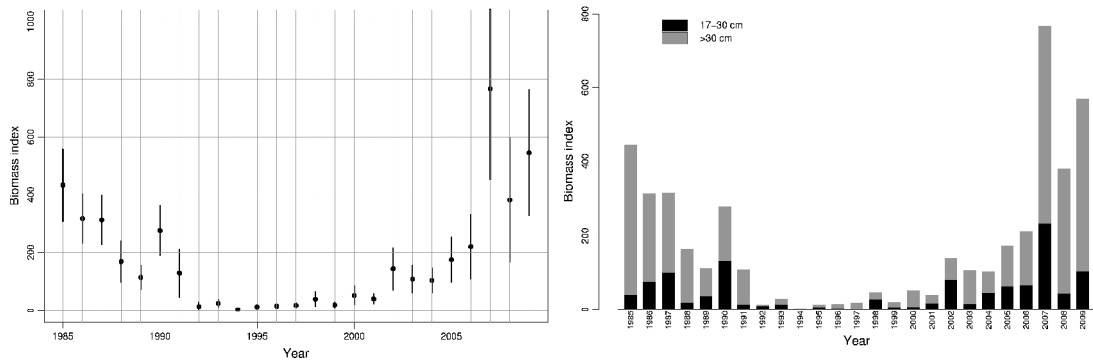


Figure 2.4.7.3 *S. marinus* (□17 cm). Survey biomass and abundance indices for East and West Greenland. Left: Total biomass index including one standard error. Right: Total biomass index split into pre-fishery recruits (17–30 cm) and fishable redfish (> 30 cm).

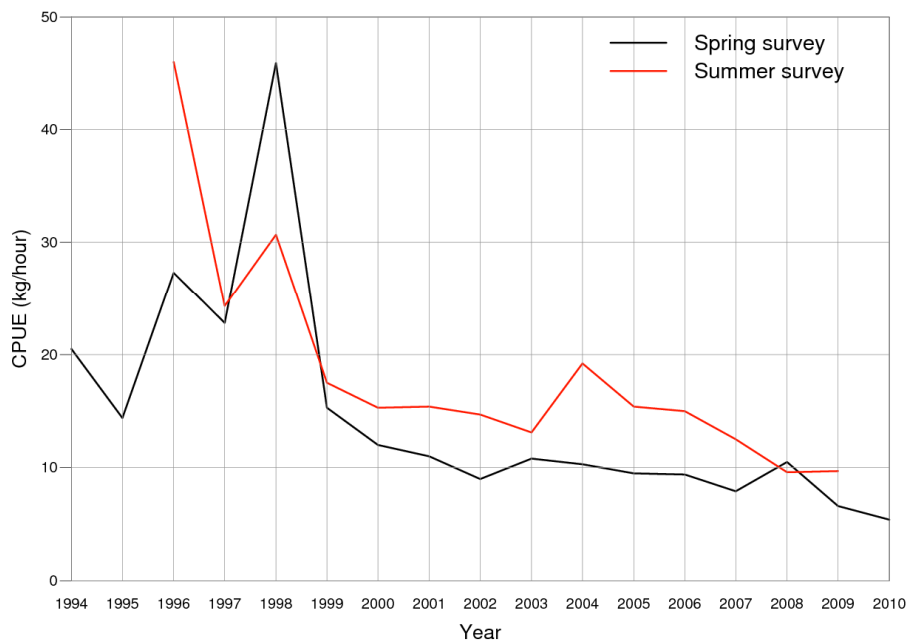


Figure 2.4.7.4 CPUE of *S. marinus* in the Faroese spring groundfish survey and the summer groundfish survey in ICES Division Vb.

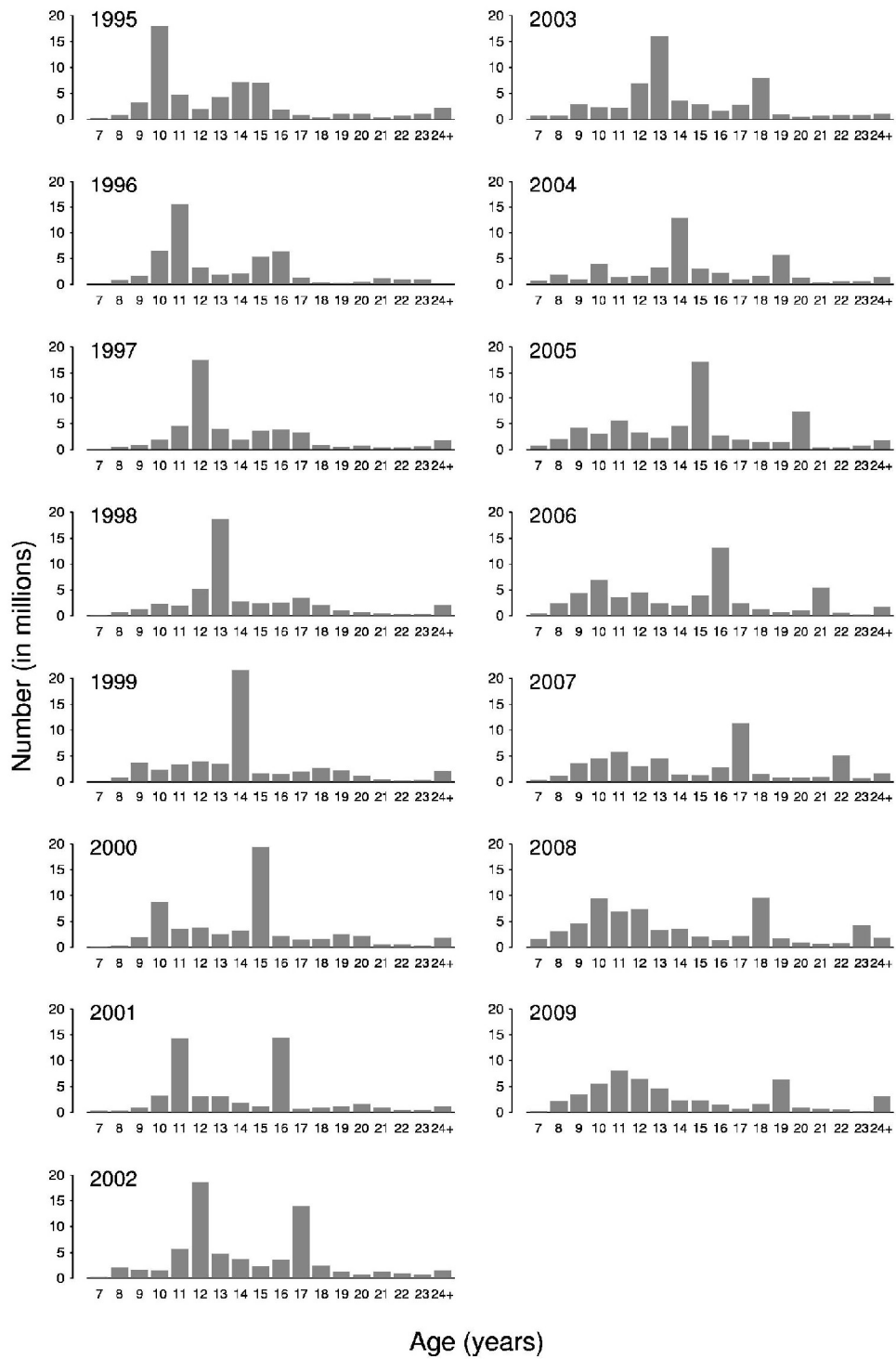


Figure 2.4.7.5 Catch-at-age of golden redfish in numbers in ICES Subdivision Va 1995-2009.