

2.3.10 Golden redfish (*Sebastes norvegicus*) in Subareas V, VI, XII, and XIV (Iceland and Faroes grounds, West of Scotland, North of Azores, East of Greenland)

ICES stock advice

ICES advises that when the management plan is applied, catches in 2016 should be no more than 51 000 tonnes.

Stock development over time

Catches have been relative stable since 1994. The 2000–2005 year classes accounted for most of the catches in 2014, though the share of the 1985 and 1990 year classes still contribute 6%. Spawning-stock biomass (SSB) has steadily increased for the past 20 years and is well above $MSY B_{trigger}$. Fishing mortality since 2011 is estimated to be slightly above F_{MSY} .

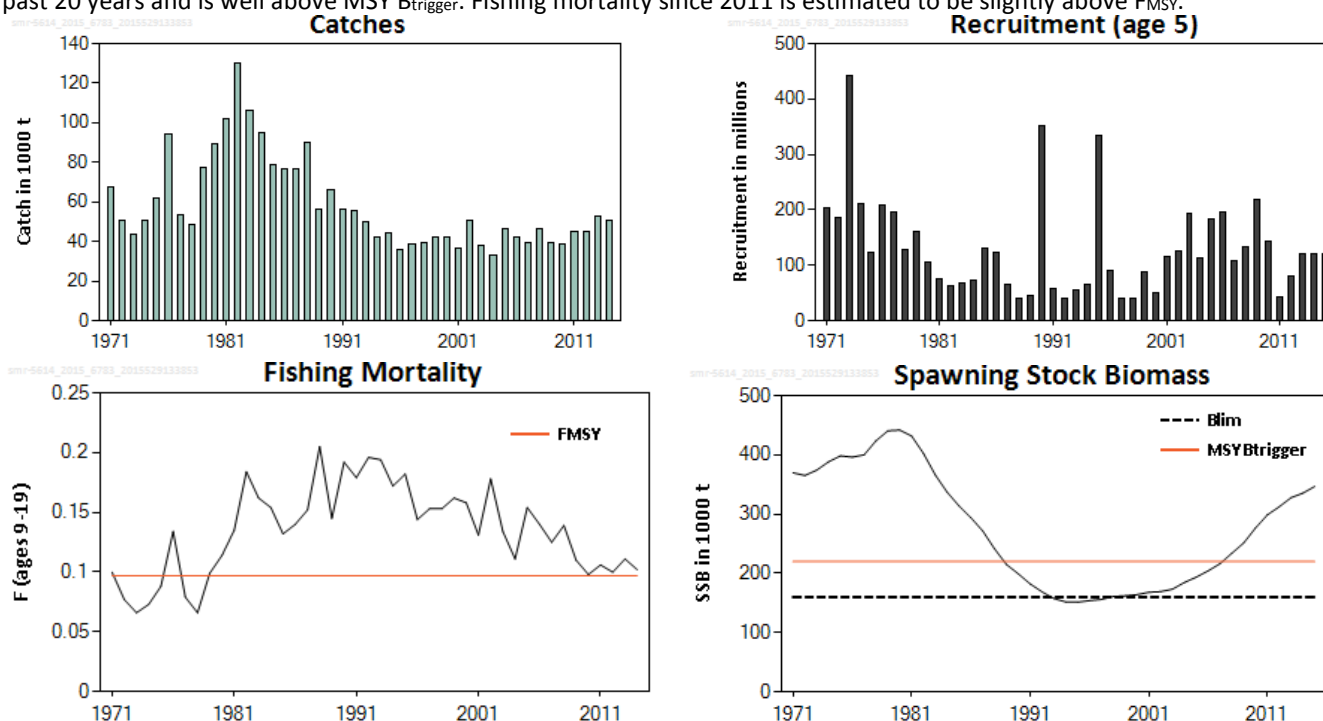


Figure 2.3.10.1 Golden redfish in Subareas V, VI, XII, and XIV. Summary of the stock assessment.

Stock and exploitation status

Table 2.3.10.1 Golden redfish in Subareas V, VI, XII, and XIV. State of the stock and fishery, relative to reference points.

| | | Fishing pressure | | | Stock size | | |
|---------------------------|----------------------|------------------|------|-------------------------|---------------|------|------------------------------|
| | | 2012 | 2013 | 2014 | 2013 | 2014 | 2015 |
| Maximum Sustainable Yield | F_{MSY} | ✘ | ✘ | ✘ Above F_{MSY} | $B_{trigger}$ | ✔ | ✔ Above trigger |
| Precautionary approach | F_{pa} , F_{lim} | ? | ? | ? | B_{lim} | ✔ | ✔ Full reproductive capacity |
| Management Plan | F_{MGT} | ✔ | ✘ | ✔ Within expected range | SSB_{MGT} | ✔ | ✔ Above trigger |

Catch options

Table 2.3.10.2 Golden redfish in Subareas V, VI, XII, and XIV. The basis for the catch options.

| Variable | Value | Source | Notes |
|--------------------------|--------------|--------------|---|
| F ages 9–19 (2015) | 0.096 | ICES (2015a) | Based on catches according to management plan |
| SSB (2016) | 354 200 t | ICES (2015a) | |
| R _{age5} (2015) | 120 millions | ICES (2015a) | |
| R _{age5} (2016) | 120 millions | ICES (2015a) | Average of 1970–2012 |
| R _{age5} (2017) | 120 millions | ICES (2015a) | Average of 1970–2012 |
| Total catch (2015) | 49 100 t | ICES (2015a) | Management plan |

Table 2.3.10.3 Golden redfish in Subareas V, VI, XII, and XIV. The catch options.

| Rationale | Landings (2016) | Basis | F _{9–19} (2016) | SSB (2017) | B ₅₊ (2017) | % SSB change * | % TAC change ** |
|-----------------|-----------------|-------|--------------------------|------------|------------------------|----------------|-----------------|
| Management plan | 51 000 | MP | 0.097 | 359 800 | 567 000 | 1.6% | 3.9% |

Weights in tonnes.

* SSB 2017 relative to SSB 2016.

** TAC 2016 relative to assumed catches 2015.

Basis of the advice

Table 2.3.10.4 Golden redfish in Subareas V, VI, XII, and XIV. The basis of the advice.

| | |
|-----------------|--|
| Advice basis | Management plan. |
| Management plan | ICES carried out an evaluation of a management plan for golden redfish (ICES, 2014a). ICES has been requested to give advice according to this plan. |

Quality of the assessment

Due to the aggregating behavior of the species, survey indices are often largely dominated by a few large hauls. This causes high uncertainties in the indices and large interannual fluctuation in estimates of biomass. The assessment indicates conflicting stock trends from different data sources, with the catch-at-age data showing less increase in stock size than the survey data. Model results based on both data sources fit in between.

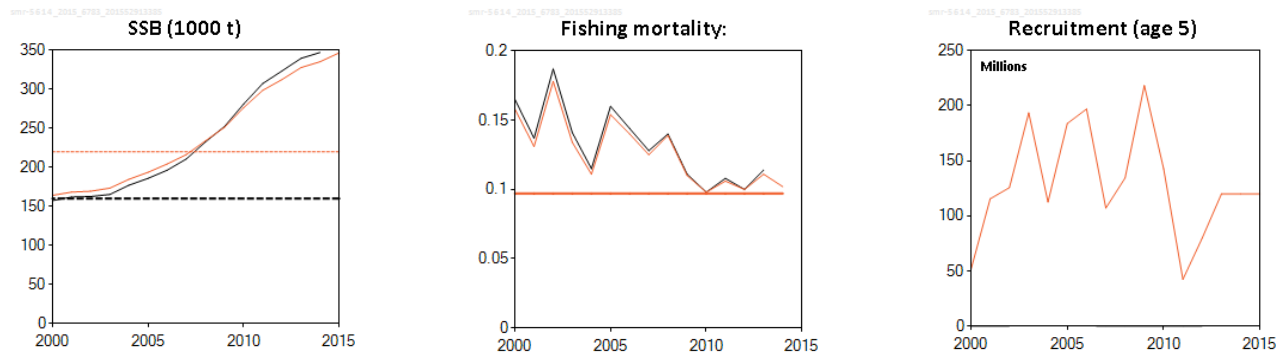


Figure 2.3.10.2 Golden redfish in Subareas V, VI, XII, and XIV. Historical assessment results (final-year recruitment estimates included).

Issues relevant for the advice

There is no information to present for this stock.

Reference points

Table 2.3.10.5 Golden redfish in Subareas V, VI, XII, and XIV. Reference points, values, and their technical basis.

| Framework | Reference point | Value | Technical basis | Source |
|------------------------|-------------------|-------------|--|--------------|
| MSY approach | MSY $B_{trigger}$ | 220 kt | $B_{lim} \times \exp(0.2 \times 1.645)$ | ICES (2014a) |
| | F_{MSY} | 0.097 | Average of ages 9–19. F_{max} in the 2012 Gadget run, leading to < 1% probability of going below B_{lim} , based on recruitment patterns since 1975 and with large assessment uncertainty. | ICES (2014a) |
| Precautionary approach | B_{lim} | 160 kt | Lowest SSB in the 2012 Gadget run. | ICES (2014a) |
| | B_{pa} | Not defined | | |
| | F_{lim} | Not defined | | |
| | F_{pa} | Not defined | | |
| Management plan | SSB_{MGT} | 220 kt | | |
| | F_{MGT} | 0.097 | | |

Basis of the assessment

Table 2.3.10.6 Golden redfish in Subareas V, VI, XII, and XIV. The basis of the assessment.

| | |
|--------------------------|---|
| ICES stock data category | 1 (ICES, 2015b). |
| Assessment type | Analytical assessment (Gadget model) that uses catches in the model and in the forecast. |
| Input data | Landings data and length distributions of catches from Iceland, Greenland, and the Faroes; survey data by length from IS-SMB and GER(GRL)-GFS-Q4, age data from Icelandic catches and IS-SMH. |
| Discards and bycatch | Not included, considered negligible. |
| Indicators | None. |
| Other information | Recruitment data for small redfish (< 19 cm) from IS-SMB, IS-SMH, GER(GRL)-GFS-Q4, and GRL-GFS. Benchmarked in 2014 (ICES, 2014a). |
| Working group | North-Western Working Group (NWWG). |

Information from stakeholders

There is no available information.

History of advice, catch, and management

Table 2.3.10.7 Golden redfish in Subareas V, VI, XII, and XIV. History of ICES advice, the agreed TAC, and ICES estimates of landings.

| Year | ICES advice | Predicted catch corresp. to advice | Iceland TAC*,## | Greenland TAC~ | <i>S. norvegicus</i> ICES landings |
|------|--|---------------------------------------|--------------------|-------------------|---------------------------------------|
| 1987 | No increase in F | 83 | 95 | | 77 |
| 1988 | No increase in F | 84 | 85 | | 90 |
| 1989 | TAC* | 117* | 77 | | 57 |
| 1990 | TAC* | 116* | 80 | | 67 |
| 1991 | Precautionary TAC | 77 (117*) | 55# | | 56 |
| 1992 | Precautionary TAC | 76 (116*) | 90 | | 56 |
| 1993 | Precautionary TAC* | 120* | 104 | | 50 |
| 1994 | Precautionary TAC, if required | 100* | 90 | | 43 |
| 1995 | TAC | 90* | 77 | | 45 |
| 1996 | TAC for Division Va (28); precautionary TAC for Division Vb and Subarea XIV (4) | 32** | 65 | | 37 |
| 1997 | Effort 75% of 1995 value | 32** | 65 | | 40 |
| 1998 | Effort reduced in steps of 25% from the 1995 level | 37.2** | 65 | | 39 |
| 1999 | Effort not increased compared to 1997 | 35** | 65 | | 42 |
| 2000 | Catch not increased compared to 1998 | 35** | 60 | | 44 |
| 2001 | Effort not increased compared to 1999 | 33**^ | 57 | | 37 |
| 2002 | 25% reduction in effort | 29^^ | 65 | | 51 |
| 2003 | 25% reduction in effort(2001) | 31^^ | 60 | | 39 |
| 2004 | 25% reduction in effort(2002) | 37.4^^ | 57 | | 33.4 |
| 2005 | Maintain fishable biomass above U_{pa} | 37^^ | 57 | | 45.4 |
| 2006 | Maintain fishable biomass above U_{pa} | 37^^ | 57 | | 42.2 |
| 2007 | Maintain fishable biomass above U_{pa} | 37^^ | 57 | 5~ | 39.1 |
| 2008 | Maintain fishable biomass above U_{pa} | 37^^ | 57 | 1~ | 46.3 |
| 2009 | Maintain fishable biomass above U_{pa} | < 30 | 50 | | 39.2 |
| 2010 | Maintain fishable biomass above U_{pa} | < 30 | 50 | 6~ | 38.7 |
| 2011 | Same advice as last year | < 30 | 37.5 | 8.5~ | 45.3 |
| 2012 | Maintain catches | < 40 | 40 | 8.5~ | 45.6 |
| 2013 | Maintain catches | < 40 | 45 | 8.5~ | 53.3 |
| 2014 | 20% increase in catches (rel. 2010–2012) | < 52 | 52 | 8.5~ | 50.7 |
| 2015 | Management plan | < 47.3 | 45.6 | 8.5~ | |
| 2016 | Management plan | < 51 | | | |

Weights in thousand tonnes.

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

** *S. norvegicus* only.

^ In Division Va only.

^^ Both Divisions Va and Vb and Subarea XIV.

Year ending 31 August.

From 1992 onwards: Quota year September–August.

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

History of catch and landings

Table 2.3.10.8 Golden redfish in Subareas V, VI, XII, and XIV. Catch distribution by fleet in 2014 as estimated by ICES.

| Total catch (2014) | Commercial landings | | Commercial discards |
|--------------------|---------------------|---------------|---------------------|
| 50.7 kt | 92% bottom trawls | 8% other gear | Negligible |
| | 53 kt | | |

Table 2.3.10.9 Golden redfish in Subareas V, VI, XII, and XIV. History of commercial catch and landings; both the official and ICES estimated values are presented by area.

| Year | Area | | | | Total |
|-------|-------------|-------------|------------|-------------|---------|
| | Division Va | Division Vb | Subarea VI | Subarea 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 | 45,538 | 569 | 64 | 80 | 46,251 |
| 2009 | 38,442 | 462 | 50 | 224 | 39,177 |
| 2010 | 36,155 | 620 | 220 | 1,653 | 38,648 |
| 2011 | 43,773 | 493 | 83 | 1,005 | 45,354 |
| 2012 | 43,103 | 491 | 41 | 2,017 | 45,635 |
| 2013 | 51,330 | 372 | 92 | 1,499 | 53,263 |
| 2014* | 47,769 | 201 | 60 | 2,706 | 50,736 |

* Provisional.

Summary of the assessment

Table 2.3.10.10 Golden redfish in Subareas V, VI, XII, and XIV. Assessment summary.

| Year | Recruitment (age 5) | SSB | Catches | Mean F Ages 9–19 |
|------|---------------------|---------|---------|---------------------|
| | millions | tonnes | tonnes | |
| 1971 | 203 | 369 800 | 67 900 | 0.1 |
| 1972 | 185 | 365 200 | 50 900 | 0.077 |
| 1973 | 443 | 374 200 | 43 700 | 0.066 |
| 1974 | 211 | 388 400 | 50 600 | 0.073 |
| 1975 | 124 | 398 400 | 61 900 | 0.088 |
| 1976 | 208 | 396 100 | 94 400 | 0.134 |
| 1977 | 197 | 400 100 | 53 800 | 0.079 |
| 1978 | 129 | 423 700 | 48 700 | 0.066 |
| 1979 | 162 | 440 500 | 77 200 | 0.099 |
| 1980 | 105 | 441 800 | 89 100 | 0.114 |
| 1981 | 75 | 431 800 | 102 000 | 0.135 |
| 1982 | 63 | 402 600 | 130 300 | 0.184 |
| 1983 | 68 | 366 000 | 106 000 | 0.162 |
| 1984 | 73 | 337 000 | 95 300 | 0.154 |
| 1985 | 132 | 313 800 | 78 500 | 0.132 |
| 1986 | 122 | 294 100 | 76 900 | 0.14 |
| 1987 | 65 | 271 800 | 76 600 | 0.152 |
| 1988 | 41 | 241 300 | 89 800 | 0.205 |
| 1989 | 45 | 215 100 | 56 600 | 0.145 |
| 1990 | 353 | 199 300 | 66 300 | 0.192 |
| 1991 | 59 | 182 400 | 56 000 | 0.179 |
| 1992 | 40 | 168 900 | 55 800 | 0.196 |
| 1993 | 55 | 157 700 | 50 200 | 0.194 |
| 1994 | 65 | 151 900 | 42 500 | 0.172 |
| 1995 | 335 | 151 600 | 44 300 | 0.182 |
| 1996 | 90 | 154 100 | 35 600 | 0.144 |
| 1997 | 41 | 156 100 | 39 000 | 0.153 |
| 1998 | 42 | 161 000 | 39 700 | 0.153 |
| 1999 | 87 | 162 200 | 42 500 | 0.162 |
| 2000 | 51 | 164 100 | 42 600 | 0.158 |
| 2001 | 116 | 168 300 | 36 700 | 0.131 |
| 2002 | 126 | 169 400 | 50 700 | 0.178 |
| 2003 | 194 | 173 400 | 38 200 | 0.134 |
| 2004 | 113 | 184 700 | 32 800 | 0.111 |
| 2005 | 184 | 193 700 | 46 600 | 0.154 |
| 2006 | 197 | 204 300 | 42 100 | 0.14 |
| 2007 | 107 | 216 300 | 39 200 | 0.125 |
| 2008 | 135 | 233 900 | 46 200 | 0.139 |
| 2009 | 218 | 251 300 | 39 300 | 0.11 |
| 2010 | 143 | 276 500 | 38 500 | 0.098 |
| 2011 | 42 | 298 700 | 45 100 | 0.106 |
| 2012 | 80 | 312 400 | 45 200 | 0.1 |
| 2013 | 120 | 327 800 | 53 100 | 0.111 |
| 2014 | 120 | 335 400 | 50 600 | 0.102 |
| 2015 | 120 | 346 700 | | |

Sources and references

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