ECOREGION Widely distributed and migratory stocks
STOCK Orange roughy (*Hoplostethus atlanticus*) in the Northeast Atlantic

Advice summary for 2013 and 2014

Due to its very low productivity, orange roughy can only sustain very low rates of exploitation. Currently, it is not possible to manage a sustainable fishery for this species. ICES recommends no directed fisheries for this species. Bycatches in mixed fisheries should be as low as possible.

Stock status

F (Fishing Mortality)		
		2009–2011
MSY (F_{MSY})	?	Unknown
Precautionary approach (F_{pa},F_{lim})	?	Unknown
Qualitative evaluation	?	Unknown
SSB (Spawning-Stock Biomass)		
		2009–2011
MSY ($B_{trigger}$)	?	Unknown
Precautionary approach (B_{pa},B_{lim})	?	Unknown
Qualitative evaluation	?	Unknown

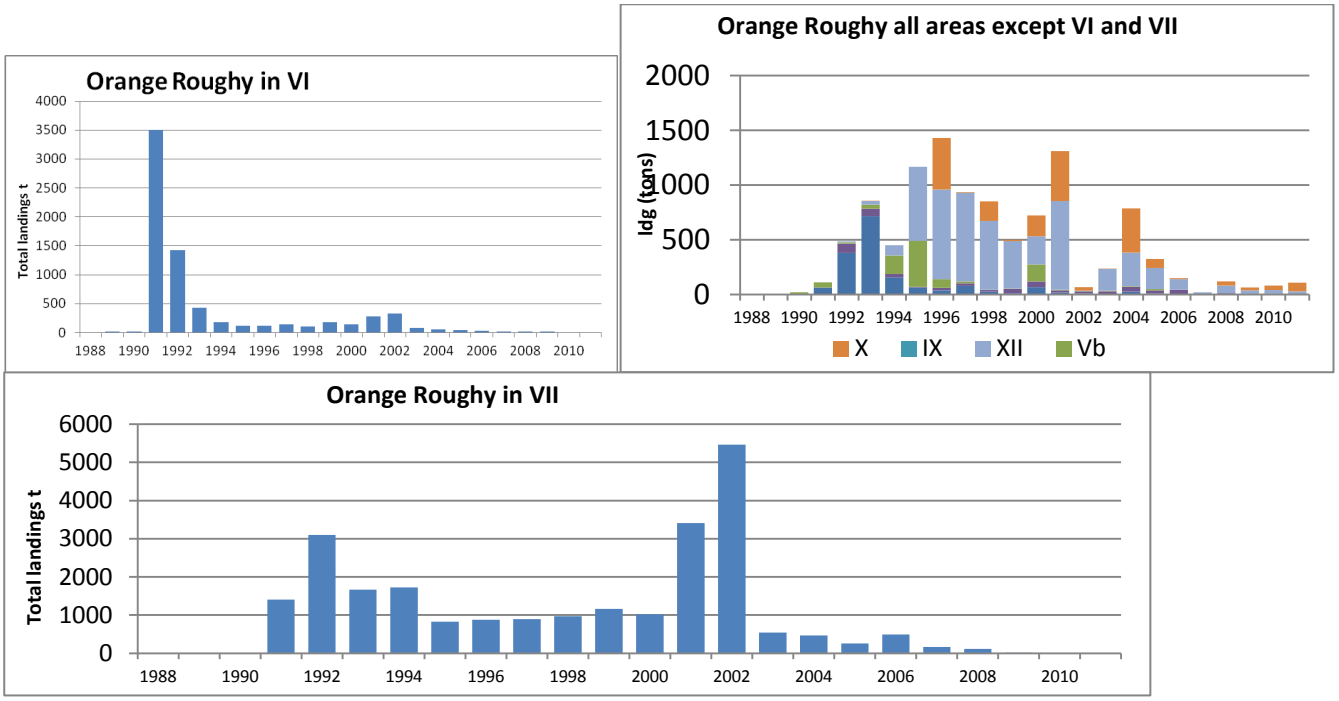

Figure 9.4.14.1 Orange roughy in the Northeast Atlantic. Top panels: ICES estimates of international catch of orange roughy in Subareas VI and VII. Bottom panel: ICES estimates of international catch of orange roughy in all other ICES subareas.

Fisheries have been closed for all EC fisheries in these and other areas. There is insufficient information to evaluate the status of the stock in other areas. There is currently no internationally agreed TAC in the NEAFC regulatory area.

Management plans

No management plans exist for orange roughy in any of the areas.

Biology

Orange roughy form discrete spawning aggregations around bathymetric features, which are susceptible to sequential depletion. It is not known if individual aggregations are reproductively distinct. There are juvenile areas on the flat grounds.

The fisheries

In Subareas VI and VII there have been two fisheries for orange roughy: a targeted peak fisheries on distinct topographical features and a mixed trawl fisheries along the continental slope that had orange roughy as a bycatch. In ICES Subarea VI, a targeted French trawl fishery began in 1989 centred on spawning aggregations around the Hebrides Terrace Seamount. Landings in this area peaked at 3500 t in 1991, and 5300 t were removed from the stock by the end of 1993. The cumulative catch of orange roughy in Subarea VI in 2010 was 7185 t. In ICES Subarea VII, a targeted French orange roughy fishery first developed in 1991, with initial landings increasing to over 3000 t in 1992. An Irish fishery commenced in 2001 and landings peaked at over 5000 t in 2002. The total accumulated catch in Subarea VII is 24 581 t. Due to zero TACs and depleted stock levels there are no more targeted fisheries for orange roughy in Subareas VI and VII. Observer data from the French mixed deep-water trawl fishery suggest that the bycatch of orange roughy is low.

Small fisheries have existed in Divisions Va and Vb and Subareas VIII and X, and to a greater extent in Subarea XII. Cumulative landings in all these areas have been 10 831 t. There are currently Faroese exploratory trawl fisheries occurring along the Mid-Atlantic Ridge targeting orange roughy and black scabbardfish.

Catch distribution	Total catches (2011) were 0.1 kt, where 100% were landings (demersal trawl).

Effects of the fisheries on the ecosystem

Directed trawl fisheries for orange roughy have been associated with seamounts and other bathymetric features. In ICES Subareas VI and VII there has been a spatial overlap of historical orange roughy fisheries with vulnerable habitats such as cold-water corals. The direct impact of this fishery on vulnerable habitats has not been evaluated. However, in other areas of the world, such fisheries have been demonstrated to have considerable impact. There are currently no directed fisheries targeting orange roughy in Subareas VI and VII. The spatial resolution of catch data for orange roughy in other areas currently available to the working group is not sufficient to assess the spatial overlap with vulnerable habitats.

Quality considerations

Due to the closure of the fishery in Subareas VI and VII limited fishery-dependent data are available to evaluate the status of the stocks. The Irish and Scottish deepwater trawl surveys provided information on the cpue of juveniles which was used for qualitative assessment in 2010. The Irish survey was discontinued in 2009 and the Scottish survey only partially covers Division VIa. Therefore, current monitoring programmes are insufficient to monitor the recovery of the stocks in Subareas VI and VII. Catch information and length distributions were provided from the Faroese exploratory fishery on the Mid-Atlantic Ridge. In order to evaluate the impact of this fishery on discrete orange roughy populations, data is required at the spatial resolution of single seamounts.

Scientific basis

Assessment type	Catch trends-based assessment.
Input data	Information on landings by division or subarea and historical cpue information are available. Length frequencies are available from the Faroese exploratory fishery on the MAR.
Discards and bycatch	There is currently no known orange roughy discard practices.
Indicators	None.
Other information	Historical commercial cpues and survey data.
Working group report	WGDEEP

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Reference points

Potential reference points for orange roughy in Subareas VI and VII have been evaluated and indicate that sustainable fishing levels would be very low (F_{MSY} proxies = 0.04–0.06).

Outlook for 2013 and 2014

No reliable forecast can be presented for this stock.

Additional considerations

Orange roughy catches in Subarea VI increased rapidly and subsequently dropped (Figure 9.4.14.1). Orange roughy cpue in Subarea VI (Figure 9.4.14.1) has shown a strong declining trend since the early 1990s. It is presumed that the aggregations were fished out.

Orange roughy fisheries in Subarea VII have exhibited a similar pattern to that in VI (Figure 9.4.14.1). High catches have not been sustained by individual fleets and have dropped to low levels, suggesting sequential depletion. Orange roughy cpue in Subarea VII (Figure 9.4.14.1) has shown a strong declining trend since the early 1990s.

Orange roughy are known to reach very old ages (highest estimated age of an individual is 187 years), and experience in other areas (e.g. South Pacific) has shown that this species is especially vulnerable to exploitation.

Due to stringent management restrictions including a zero TAC and protection areas, the fishery for orange roughy in Subareas VI and VII has now ceased. A zero TAC without allowing a bycatch can potentially lead to discarding if existing fisheries overlap with the distribution of orange roughy. Examination of French observer data suggests that bycatch and discarding of orange roughy is currently not significant (<0.2%).

In order to protect the species, careful monitoring of the spatial overlap of existing fisheries with the distribution of orange roughy, coupled with the collection of fisheries-dependent and -independent data (observer programme and surveys) is required.

Length frequency data and cpues of the Scottish and Irish deep-water surveys indicate that juveniles are found among the flat grounds of the continental slope in Subareas VI and VII.

Assessment and management area

The orange roughy management areas VI, VII, and other areas in the Northeast Atlantic correspond to ICES assessment areas.

The advice units used by ICES do not correspond to the assessment units used by ICES WGDEEP.

Source

ICES. 2012. Report of the Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP), 29 March–05 April 2012, ICES Headquarters, Copenhagen. ICES CM 2012/ACOM:17.

Table 9.4.14.1 Orange roughy in the Northeast Atlantic. ICES advice, management, and landings.

Year	ICES advice	Predicted catch corresp. to advice	TAC EU Subareas I–V, VIII–XII, and XIV	TAC EU Subarea VI	TAC EU Subarea VII	Total TAC EU Subareas I–XII and XIV	ICES landings
2003	Exploitation strictly limited and populations closely monitored. No direct fishery in Subarea VI	-	-	0.088	1.349	1.437	0.9
2004	Biennal	-	-	0.088	1.349	1.437	1.3
2005	No fishery unless accompanied by programmes to collect data	0	0.102	0.088	1.148	1.338	0.7
2006	Biennial	0	0.102	0.088	1.148	1.338	0.7
2007	No direct fishery, bycatch in mixed fishery as low as possible	0	0.044	0.051	0.193	0.288	0.2
2008	Biennial	0	0.03	0.034	0.13	0.194	0.2
2009	No direct fishery, bycatch in mixed fishery as low as possible	0	0.015	0.017	0.065	0.097	0.08
2010	Biennial	0	0	0	0	0	1
2011	No directed fisheries and measures to minimize bycatch	0		0 0	0 0	0 0	1 0.1
2012	No new advice, same as 2011						
2013	No directed fisheries and measures to minimize bycatch	0					
2014	No new advice, same as 2013						

Weights in thousand tonnes.

Table 9.4.14.2a Orange roughy in the Northeast Atlantic. Working group estimates of catch by country and area (tonnes).

Year	Va		Vb			VI							VII							VIII				IX	
	Iceland	**Total**	Faroes	France	**Total**	Faroes	France	E & W	Scotland	Ireland	Spain	**Total**	France	Spain	E & W	Ireland	Scotland	Faroes	**Total**	France	Spain (VIII and IX)	E & W	**Total**	Spain	**Total**
1988	-	**0**	-	-	**0**	-	-	-	-	-	-	**0**	-	-	-	-	-	-	**0**	-	-	-	**0**		
1989	-	**0**	-	-	**0**	-	5	-	-	-	-	**5**	3	-	-	-	-	-	**3**	0	-	-	**0**		
1990	-	**0**	-	22	**22**	-	15	-	-	-	-	**15**	2	-	-	-	-	-	**2**	0	-	-	**0**	-	**0**
1991	65	**65**	-	48	**48**	-	3502	-	-	-	-	**3502**	1406	-	-	-	-	-	**1406**	0	-	-	**0**	-	**0**
1992	382	**382**	1	12	**13**	-	1422	-	-	-	-	**1422**	3101	-	-	-	-	-	**3101**	83	-	-	**83**	-	**0**
1993	717	**717**	36	1	**37**	-	429	-	-	-	-	**429**	1668	-	-	-	-	-	**1668**	68	-	-	**68**	-	**0**
1994	158	**158**	170	+	**170**	-	179	-	-	-	-	**179**	1722	-	-	-	-	-	**1722**	31	-	-	**31**	-	**0**
1995	64	**64**	419	1	**420**	40	74	-	2	-	-	**116**	831	-	-	-	-	-	**831**	7	-	-	**7**	-	**0**
1996	40	**40**	77	2	**79**	0	116	-	0	-	-	**116**	879	-	-	-	-	-	**879**	22	-	-	**22**	-	**0**
1997	79	**79**	17	1	**18**	29	116	1	-	-	-	**146**	893	-	-	-	-	-	**893**	1	22	-	**23**	1	**1**
1998	28	**28**	-	3	**3**	-	100	-	-	-	2	**102**	963	6	-	-	-	-	**969**	4	10	-	**14**	1	**1**
1999	14	**14**	4	1	**5**	-	175	-	-	0	1	**176**	1157	4	-	-	-	-	**1161**	33	6	-	**39**	1	**1**
2000	68	**68**	155	0	**155**	-	136	-	-	2	-	**138**	1019	-	-	1		-	**1020**	47	-	5	**52**	0	**0**
2001	19	**19**	1	4	**5**	-	159	-	11	110	-	**280**	1022	-	1	2367	22	-	**3412**	20	-	-	**20**	0	**0**
2002	10	**10**	1	0	**1**	n/a	152	-	41	130	-	**323**	300		14	5114	33	4	**5465**	20	-	-	**20**	0	**0**
2003	0	**0**	2	3	**5**	-	79	-	-	2	-	**81**	369			172			**541**	31			**31**	0	**0**
2004	28	**28**		7	**7**	-	54	-	-	2	-	**56**	279			188			**467**	43			**43**	0	**0**
2005	9	**9**	3	10	**13**	-	41	-	-	6	-	**47**	165			90			**255**	29			**29**	0	**0**
2006	2	**2**	0	0	**0**		32			1		**33**	451			37			**489**	43			**43**	0	**0**
2007	0	**0**	0	1	**1**		12					**12**	145			28			**164**	1			**1**	0	**0**
2008	4	**4**	0	<1	**<1**		5					**5**	118						**118**	8			**8**	0	**0**
2009	<1	**<1**	<1	2	**2**		2					**2**	15						**15**	3			**3**	0	**0**
2010	<1	**<1**	**<1**		**<1**							**0**							**0**	8			**8**	0	**0**
2011*	4	**4**	0		**0**							**0**							**0**	0			**0**	,1	**,1**

* Preliminary.

Table 9.4.14.2b Orange roughy in the Northeast Atlantic. ICES estimates of catch by country and area (tonnes).

Year	X							XII									TOTAL
	Faroes	France	Norway	E & W	Portugal	Ireland	Total	Faroes	France	Iceland	Spain	E & W	Ireland	New Zealand	Russia	Total	
1988	-	-	-	-	-	-	**0**	-	-	-	-	-	-	-	-	**0**	**0**
1989	-	-	-	-	-		**0**	-	0	-	-	-			-	**0**	**8**
1990	-	-	-	-	-		**0**	-	0	-	-	-			-	**0**	**39**
1991	-	-	-	-	-		**0**	-	0	-	-	-			-	**0**	**5021**
1992	-	-	-	-	-		**0**	-	8	-	-	-			-	**8**	**5009**
1993	-	-	1	-	-		**1**	24	8	-	-	-			-	**32**	**2952**
1994	-	-	-	-	-		**0**	89	4	-	-	-			-	**93**	**2353**
1995	-	-	-	-	-		**0**	580	96	-	-	-			-	**676**	**2114**
1996	470	1	-	-	-		**471**	779	36	3	-	-			-	**818**	**2425**
1997	6	-	-	-	-		**6**	802	6	-	-	-			-	**808**	**1974**
1998	177	-	-	-	-		**177**	570	59	-	-	-			-	**629**	**1923**
1999	-	10	-	-	-		**10**	345	43	-	43	-			-	**431**	**1837**
2000	-	3	-	28	157		**188**	224	21	-	-	2			12	**259**	**1880**
2001	84	-	-	28	343		**455**	345	14	-	-	2		450	-	**811**	**5002**
2002	30	-	-	-	-		**30**	+	6	-	-	-		0	-	**6**	**5855**
2003		1					**1**		64				136	0	-	**200**	**859**
2004	384					19	**403**	176	131					0		**307**	**1311**
2005	128	2					**130**	158	36					0		**193**	**676**
2006	8						**8**	81	15							**96**	**671**
2007	0						**0**	20								**20**	**198**
2008	37						**37**	71								**71**	**243**
2009*	26						**26**	34								**34**	**82**
2010	39						**39**	35								**35**	**74**
2011*	77						**77**	27								**27**	**104**

*Preliminary.