

## 9 Red gurnard in the Northeast Atlantic

### 9.1 General biology

The main biological features known for red gurnard (*Aspitrigla (Chelidonichthys) cuculus*) are described in the stock annex. This species is widely distributed in the North-east Atlantic from South Norway and North of the British Isles to Mauritania, on grounds between 20 and 250 m. This benthic species is abundant in the Channel (7de), the shelf West of Brittany (7h, 8a), and west of Scotland (6a), living on gravel or coarse sand. In the Channel, the size at first maturity is ~25cm at 3 years old (Dorel, 1986).

### 9.2 Stock identity and possible assessments areas

A compilation of datasets from bottom-trawl surveys undertaken within the project 'Atlas of the marine fishes of the northern European shelf' has produced a distribution map of red gurnard. Higher occurrences of red gurnard with patchy distribution have been observed along the Western approaches from the Shetlands Islands to the Celtic Seas and the Channel.

A continuous distribution of fish crossing the Channel and the area West of Brittany does not suggest a separation of the divisions 7d from 7e and 7h. Therefore, a split of the population between these Ecoregions does not seem appropriate. Divergent trends in survey abundances have been observed within the assessment area, with a sustained spike in abundance in division 6a in the early 2010's which is not seen in surveys covering SA 7-8. Further investigations, such as morphometric studies, tagging and genetic population studies, would be needed to progress on stock boundaries, however SIMWG has advised that for now, there is insufficient evidence to carry out assessments on smaller spatial units.

### 9.3 Management regulations

Currently no technical measures are specifically applied to red gurnard or other gurnard species. The exploitation of red gurnard is submitted to the general regulation in the areas where they are caught. There is no minimum landing size set.

### 9.4 Fisheries data

Red gurnard is mainly landed as by-catch by demersal trawlers in mixed fisheries, predominantly in divisions 7d, 7e and 7h (tables 9.1-2). High discard rates and lack of resolution at a species level make interpretation of spatial trends in catches in other areas problematic.

#### 9.4.1 Historical landings

Official landings of red gurnard reported to ICES are presented in tables 9.1 and 9.2. Before 1977, red gurnard was not specifically reported. Landings of gurnards are still not always reported at a species level, but rather as mixed gurnards (GUX). Use of this code is not consistent across countries reporting landings, and some report mixed landings of gurnards under the code GUU – which is unfortunately the FAO species code for Tub gurnard (*Chelidonichthys lucerna*).

A questionnaire was circulated to WGCATCH to gather information on how landings of gurnards are assigned to species. For those countries who responded, only Portugal has presented information on how the reporting of landings at a species level is achieved. Other countries accept the species code as declared at the point of landing, without further validation. This makes interpretation of the records of official landings, and trends within them difficult. Landings of gurnards (red, grey, tub and mixed) are shown in fig. 9.1.

International landings have fluctuated between 3452 - 5171 tonnes between 2006-2019. Landings in the most recent year (2021) were 2903 tonnes – the lowest on record. France is the main contributor of ‘red gurnard’ landings, with around 80% of landings from subarea 7d-h (Celtic Sea/English Channel). In the North Sea red gurnard landings are variable, but roughly evenly distributed between divisions 4a, b and c. Landings from the west of Scotland and Ireland, and the Irish Sea (subarea 6a-b, 7a-c, 7j) and Bay of Biscay (division 8) have been consistently low.

### 9.4.2 Discards

Discard data for red gurnard has been provided for 2015 - 2021 through Intercatch (table 9.3). For those countries which provided data, discard rates are variable but high (table 9.4). Given the uncertainty associated with landings data, these figures should be treated with caution.

## 9.5 Survey data

Information on gurnard abundance are available in DATRAS for a number of surveys. Those covering the core area of the stock as determined by WKWEST (ICES, 2021) are the Scottish West Coast Groundfish Survey (SCOWCGFS and SC-IBTS), Irish Groundfish Survey (IGFS), English Channel Beam Trawl Survey (BTS), and French Q4 surveys EVHOE in the Celtic Sea and Bay of Biscay and CGFS in division 7d. Each of these surveys covers a specific area of red gurnard distribution and no individual survey covers the entire stock area. Lengths at age are available from CGFS-Q4 and (for some years) from IGFS.

### SCO-WCGFS and SC-IBTS.

Before 1996, red gurnard was scarce on the west of Scotland. The CPUE trended strongly upwards after 1997, reaching a peak in 2013, before declining to around the series average in recent years. The value for 2020 was sharply up on 2019, however it fell back in 2021 (figs 9.2-3).

### CGFS (Q4).

Over the time-series 1988–2011, CPUE has fluctuated, peaked in 1994, reached a low in 2011, but is above long term mean since 2016. Values in 2021 were down (fig 9.4).

### EVHOE (Q4).

Over the period 1997–2020, the CPUE has fluctuated. It has been on an increasing trend since 2017, and 2020 is the second highest value in the series. Age reading of red gurnards caught during the EVHOE survey has been carried out in 2006 and routinely since 2008. They indicate that the individuals caught are mainly of age 1 and 2. Values in 2021 were down (fig. 9.4).

### IGFS.

The CPUE of red gurnard in the IGFS series has varied around the series mean without trend between 2002 and 2020. Values in 2021 were down (fig 9.5).

### BTS.

CPUE in this relatively short series has fluctuated without apparent trend since 2006. Values in 2021 were down (fig 9.5).

## 9.6 Biological sampling

Number-at-length information was provided by French and Portuguese landings and discards. There remains a lack of regular sampling for red gurnard in commercial landings and discarding to provide series of length or age compositions usable for a preliminary analytical assessment.

## 9.7 Biological parameters and other research

There is no update of growth parameters and available parameters from several authors are summarized in the Stock Annex. They vary widely. Available length–weight relationships are also shown in Stock Annex. Natural mortality has not been estimated in the areas studied at this Working Group. Accurate estimates of landings are still lacking for this species.

## 9.8 Assessment

Having explored the trends in available survey data, the delta-lognormal assessment method developed during WKWEST (ICES, 2021) was applied. This approach extracts the estimates of year effect from the log-normal part of the model (there is no temporal term in the binomial part), together with their associated standard error, and standardises the series relative to its mean value, to provide an index of biomass across the multiple surveys. Goodness of fit metrics of the model remain acceptable (figs 9.6-7) and the log-normal part of the model has an adjusted  $r^2$  value of 0.32.

After a period of relative stability, the biomass indicator declined in 2019, before recovering strongly in 2020 (fig. 9.8). The indicator remains above the biomass limit reference level of 0.81.

The influence of COVID-19 related disruption to surveys in the Channel during 2020 has not been investigated for this stock.

## 9.9 Data requirements

Gurnards are still not always reported by species, but rather as mixed gurnards. National approaches to validating the species composition of mixed gurnard landings are undocumented, other than for Portuguese landings. This makes interpretation of the records of official landings difficult. An international approach to the collection of data on species composition of gurnard landings is required to support the provision of advice for this stock.

## 9.10 References

- Dorel, D. 1986. Poissons de l'Atlantique nord-est relations taille-poids. Institut Francais de Recherche pour l'Exploitation de la Mer. Nantes, France. 165 p.
- ICES. 2021. Benchmark Workshop on selected stocks in the Western Waters in 2021 (WKWEST). ICES Scientific Reports. 3:31. 504 pp. <https://doi.org/10.17895/ices.pub.8137>

**Table 9.1. Red gurnard in subareas 3-8. Official landings by country in tonnes.**

Year	Belgium	Spain	France	Jersey	Guernsey	Ireland	IM	Netherlands	Portugal	UK	Total
2006	313	0	4552	0	10	0	0	57	125	115	5172
2007	328	0	4494	1	4	0	0	66	127	156	5176
2008	352	0	4045	0	8	0	0	92	112	166	4775
2009	227	0	3310	0	6	0	1	160	150	263	4117
2010	237	0	3437	0	2	0	0	251	115	362	4404
2011	306	0	3176	1	2	0	1	295	134	257	4172
2012	306	0	2706	3	4	26	0	329	148	257	3779
2013	288	576	3154	3	9	16	2	267	113	329	4757
2014	263	399	3782	3	6	0	5	241	108	283	5090
2015	187	91	2919	2	3	0	0	210	122	341	3875
2016	238	87	2598	3	2	9	1	224	106	381	3646
2017	265	104	2396	0	1	9	4	226	113	335	3454
2018	314	89	2968	0	1	1	1	306	114	347	4141
2019	289	84	2448	1	5	3	0	247	117	478	3672
2020*	211	105	2335	0	0	10	1	235	123	254	3273
2021*	123	69	2240		0	8	0	160	117	370	2968
2021**	90	31	2251		0	8	0	158		365	2903

\*preliminary data

\*\*Intercatch data

**Table 9.2. Red gurnard in subareas 3-8. Official landings by area in tonnes.**

Year	4a	4b	4c	5b	6a	6b	7a	7b	7c	7d	7e	7f	7g	7h	7j	7nk	8a	8b	8c	8d	9a	9nk	10a	12c	10nk	14a	Total
2006	13	83	64	0	32	1	11	9	12	1101	2803	229	16	446	5	0	153	60	1	5	9	115	0	0	1	0	5054
2007	12	120	55	2	21	0	7	7	15	1229	2674	246	15	437	4	0	139	59	3	2	125	0	0	0	2	0	5174
2008	34	64	54	0	28	3	5	7	16	1236	2451	249	9	408	5	0	66	24	3	1	109	0	3	0	0	0	4772
2009	58	59	92	0	94	2	4	8	6	1293	1557	112	22	510	7	0	98	40	1	3	148	0	1	0	0	0	4115
2010	79	63	86	0	101	46	13	8	10	1531	1608	132	23	433	9	0	100	33	0	2	114	0	0	0	1	0	4392
2011	66	29	51	0	69	54	13	5	6	1295	1753	124	20	372	9	0	112	46	1	3	133	0	1	0	0	1	4163
2012	83	71	78	0	51	7	8	2	5	1244	1441	145	53	294	2	0	83	50	8	1	136	4	1	0	0	1	3768
2013	88	109	60	0	47	0	10	2	6	1193	1692	170	58	477	2	0	79	72	532	1	155	0	2	0	0	0	4755
2014	102	52	68	0	47	3	7	1	2	1294	1642	115	19	1069	1	0	82	75	363	3	139	0	3	0	0	0	5087
2015	133	102	53	0	58	1	4	3	1	790	1553	87	6	703	1	0	95	70	81	2	128	0	2	0	0	0	3873
2016	112	83	117	0	76	1	11	3	1	906	1270	114	16	608	1	0	87	63	56	1	120	0	1	0	0	0	3645
2017	53	44	90	0	27	1	14	1	0	874	1424	83	38	473	3	0	78	48	59	1	142	0	1	0	0	0	3454
2018	109	40	113	0	43	0	7	0	0	903	1785	164	28	631	4	0	80	43	62	2	116	0	1	0	0	0	4131
2019	128	19	75	0	84	0	12	1	0	959	1516	75	24	477	5	5	73	38	65	0	109	0	0	2	0	0	3663
2020	58	13	65	2	53	4	10	1	4	680	1504	90	19	425	4	0	69	51	87	1	128	0	0	8	0	0	3273
2021*	60	18	75	0	113	4	4	2	1	602	1390	46	15	471	4	0	62	40	62	0	119	0	1	8	0	0	3096

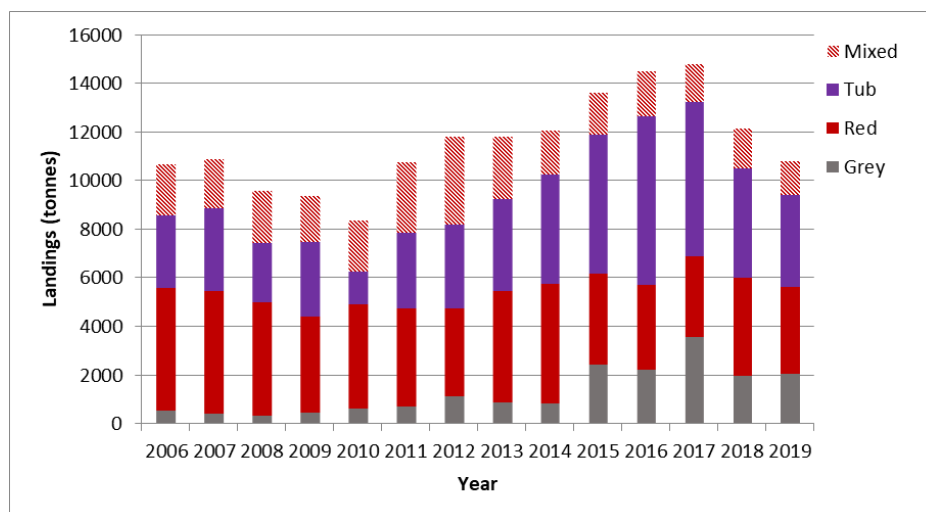
\*preliminary data

**Table 9.3. Red gurnard in subareas 3-8. Discards (t) by country, 2015 – 2021.**

Country	2015	2016	2017	2018	2019	2020	2021
France	1323	2249	2232	770	3132	292	623
Ireland	10	147	93	251	180	76	56
Spain		286	272	189	122	161	128
UK (ENG)	74	30		207	506	110	708
UK (SCO)	649	411	198	512	331	117	
Total	2056	3123	2795	1929	4270	757	1515

**Table 9.4. Red gurnard in subareas 3-8. Discarding of Red gurnard in the Northeast Atlantic, as a percentage of catch, by country, 2017-2021.**

Country	Discard rate (%)				
	2017	2018	2019	2020	2021
France	48	21	56	11	22
Ireland	91	95	95	88	87
Spain	72	68	78	91	80
UK (England)			67	51	83
UK (Scotland)	68	92	60	45	

**Figure 9.1. Red gurnard in subareas 3-8. Official landings of red, grey, tub and mixed gurnards from SA3-8, 2006-2019.**

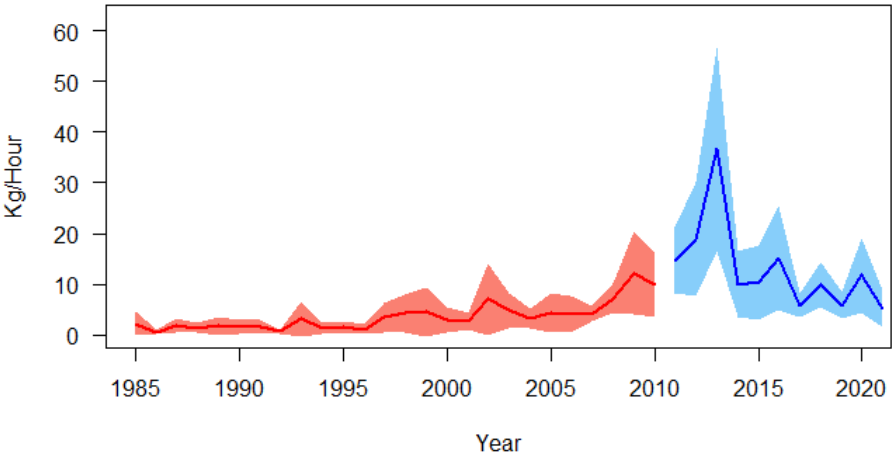


Figure 9.2. Red Gurnard in subareas 3-8. Trends in mean abundance (kg/hr) in the Q1 Scottish IBTS (1985 - 2010) and Q1 Scottish West Coast Groundfish Survey (2011 - 2021)

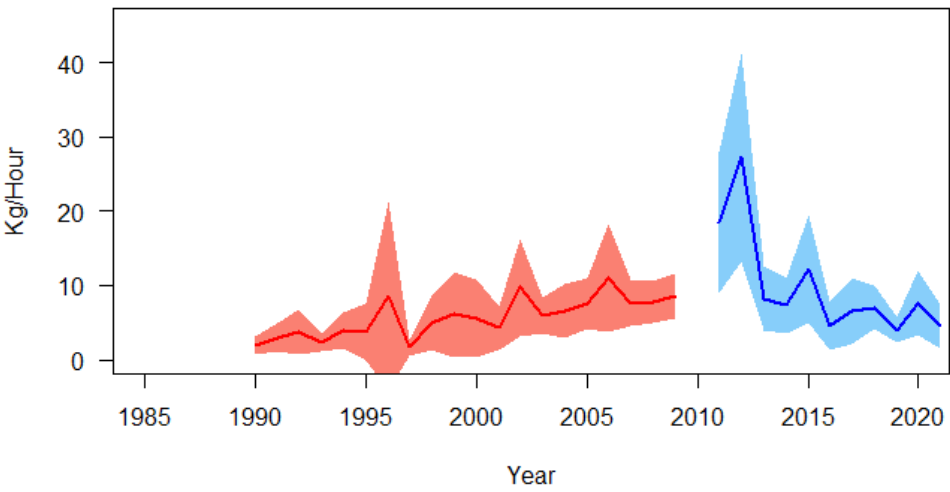


Figure 9.3. Red Gurnard in subareas 3-8. Trends in mean abundance (kg/hr) in the Q4 Scottish IBTS (1990 - 2009) and Q4 Scottish West Coast Groundfish Survey (2011 - 2021)

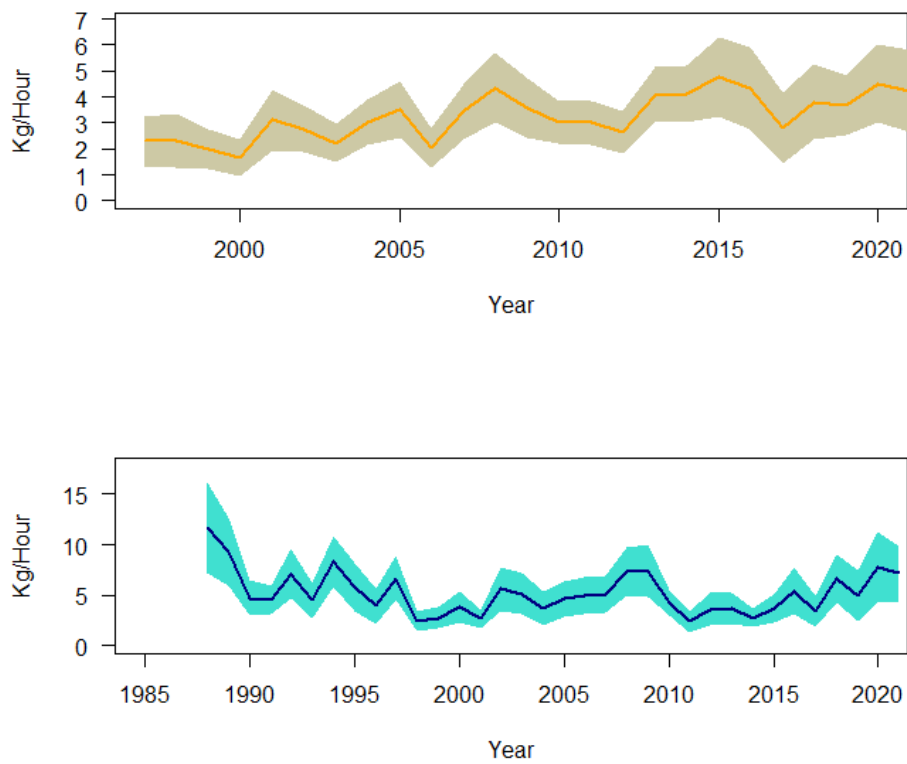


Figure 9.4. Red Gurnard in subareas 3-8. Trends in mean abundance (kg/hr) in the EVHOE (top) and French Channel Groundfish Survey (bottom)

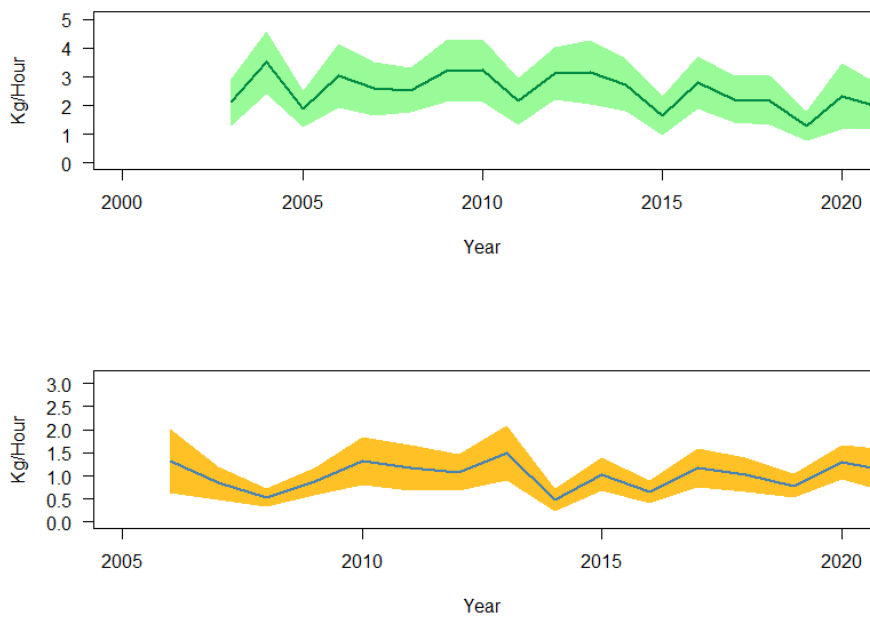


Figure 9.5. Red Gurnard in subareas 3-8. Trends in mean abundance (kg/hr) in the Irish Groundfish Survey (top) and English Channel Beam Trawl Survey (bottom)



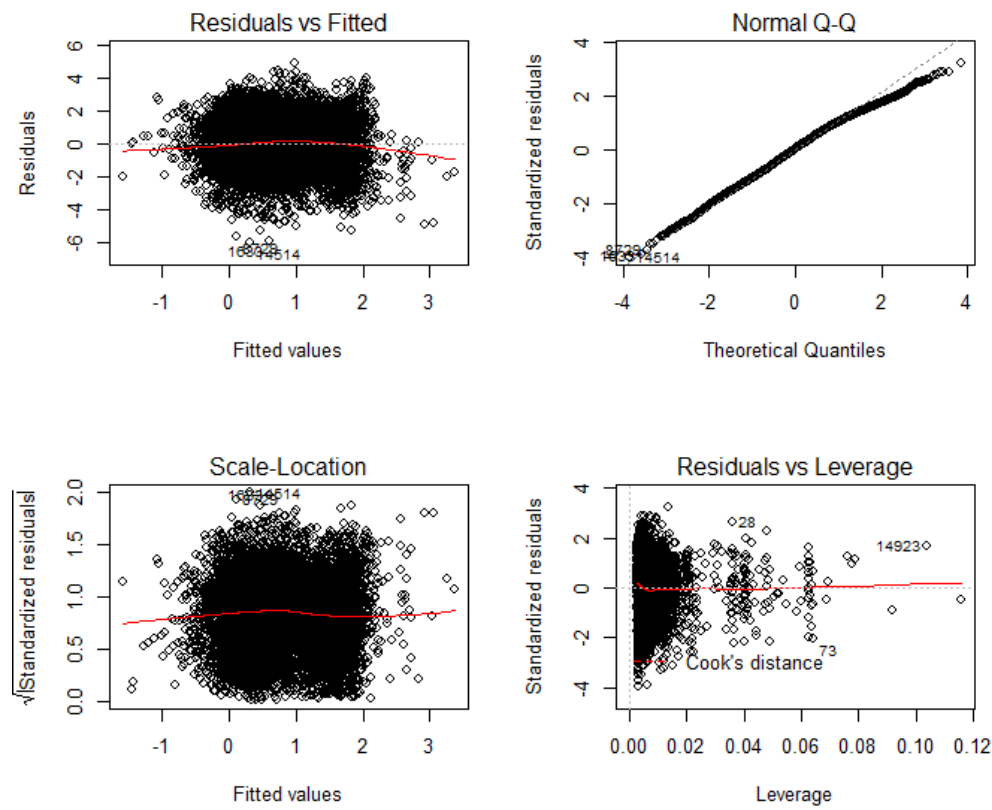


Figure 9.6. Red Gurnard in subareas 3-8. Measures of goodness of fit of the lognormal part of the assessment model.

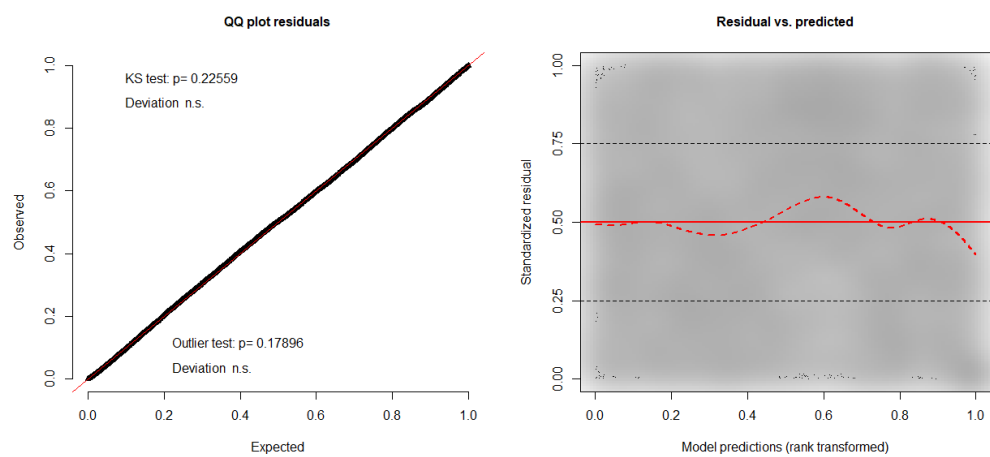
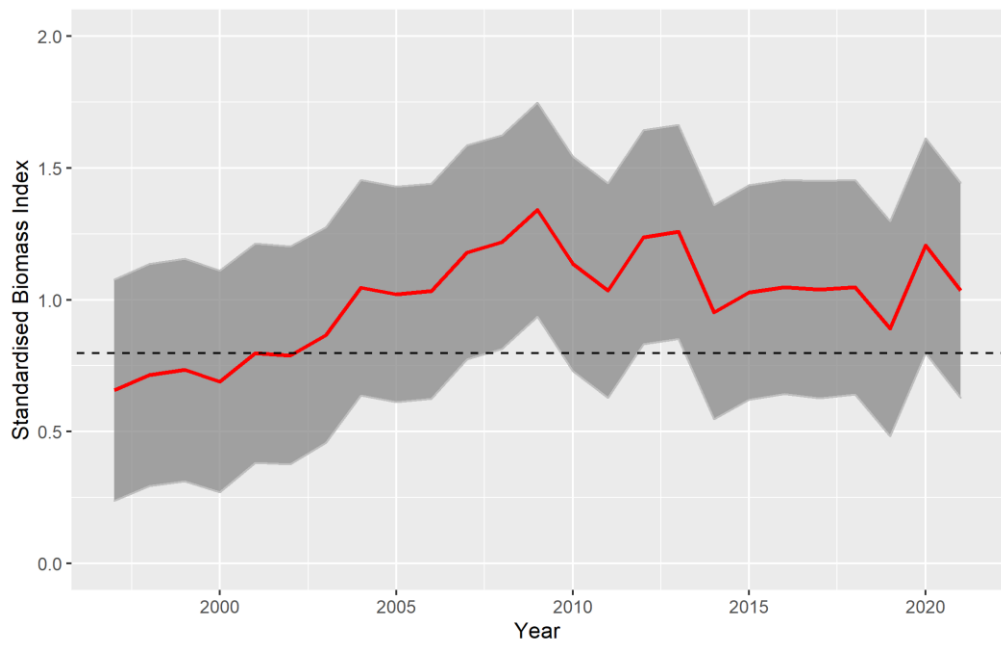


Figure 9.7. Red gurnard in subareas 3-8. Measures of goodness of fit of the binomial part of the assessment model.



**Figure 9.8. Red gurnard in subareas 3-8. Results of the assessment model. Shading corresponds to 2 standard errors around the estimate. The dashed line represents MSY  $B_{trigger}$  (0.81).**