

ESCR ORH: updated assessment to 2015 and projections to 2016

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Introduction

The Deepwater Group Ltd (DWG) requested that Innovative Solutions Ltd (ISL) update the 2014 assessment of east and south Chatham Rise (ESCR) orange roughy (ORH) using updated catch estimates for fishing years 2013-14 and 2014-15. They also requested that a single year projection be done at the current catch limit (3100 t).

Methods

Sub-area catches for ORH3B in 2013-14 and 2014-15 (up to June) were obtained by DWG from Fishserve who are contracted to manage sub-area catch reporting on behalf of DWG. The reported catch for ESCR in 2013-14 was 3185 t and the catch limit for 2014-15 is 3100 t. The catch in 2014-15 and the projected catch in 2015-16 were assumed to be equal to the catch limit of 3100 t.

The stock assessment for ESCR (base model) was updated by changing the 2013-14 catches and extending the time period by one year to include 2014-15. To be consistent with the approach used in the 2014 ORH assessments (Cordue 2014) the catches used in the model included an over-run of 5% (which is the allowance that MPI uses for additional mortality). The catches were split across the four fisheries in the model using the proportions assumed for 2013-14 in the previous assessment:

	Proportion (%)	2014-15 catch (t)
Box & flats	73	2361
East hills	2	59
Andes	16	528
South	9	307

The results will not be sensitive to these proportions as the estimated selectivities are not very different across the four fisheries (Cordue 2014).

Full Bayesian estimation was used as in Cordue (2014). Three MCMC chains were run starting from random jumps from the MPD estimate. The chains were each 10 million long with 1 in every 1000 samples retained and the first 1000 retained samples discarded as a “burn in”. Estimates are therefore based on 27,000 samples from the marginal posterior

distributions (point estimates being the median). The convergence diagnostics were adequate (e.g., the three chains each providing almost the same estimate for 2015 stock status: 30, 31, 32 % B_0).

The single-year projection to the end of 2015-16 was done as per Cordue (2014) using random sampling of year class strengths from the last 10 estimated years.

Stock status in 2014-2015 (2015) and 2015-2016 (2016) are mid-spawning season biomass divided by mid-spawning season virgin biomass (B_0).

Results

The estimates of B_0 and 2014 stock status from the updated assessment are very similar to those from the previous assessment (Table 1).

Table 1: Estimates of B_0 and 2014 stock status from Cordue (2014) and the updated assessment. The median and 95% CIs are given.

Assessment	B_0 (000 t)	B_{2014} (% B_0)
2014	320 280–350	30 25–34
2015	320 280–360	30 24–34

The updated assessment and the one-year projection show a slowly improving stock status for the current catch limit of 3100 t (Table 2). The estimated probability of being above the lower bound of the target biomass range (30–50 % B_0) is below 70% in 2015 but well above it in 2016 (Table 2).

Table 2: Estimates of stock status and the probability of being above the lower bound of the target biomass range in 2015 from the updated assessment and for 2016 from the single-year projection. The median and 95% CIs are given for stock status.

Year (mid-spawning season)	Stock status (% B_0)	$P(B > 30\% B_0)$
2015	31 26–36	0.64
2016	32 27–37	0.81

References

Cordue, P.L. 2014. The 2014 orange roughy stock assessments. *New Zealand Fisheries Assessment Report 2014/50*. 135 p.