



FORM 5

Content and Format of the Final Research Report

Title of Report: Objective 2: To apply the agreed harvest control rule for SBW6B, 2018
Author(s): Ian Doonan
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Principal Investigator: Matt Dunn
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EXECUTIVE SUMMARY

The currently accepted harvest control rule (HCR) for SBW6B, Bounty's Platform, was applied using the abundance estimated from the industry acoustic survey completed in the 2017 fishing season. The HCR depends on the values of natural mortality and steepness and these were specified by MPI to be 0.2 yr^{-1} and 0.9, respectively. The HCR gave a yield for the 2018 fishing season of 3209 t. This yield assumes that there is not a very large cohort entering the mature population.

OBJECTIVES

To apply the agreed harvest control rule for SBW6B and run additional calculations as required to support management

METHODS

The HCR sets a TACC for year $t+1$ from $\xi (B_t - C_t / 2)$, where, B_t is the absolute acoustic abundance from a survey at the beginning of the fishing season (i.e. divided by the assumed catchability, q , which was set to 0.6), C_t is the catch, and ξ is a fixed factor that is found by simulation. The simulations were completed by Doonan (2017) for the 2017 fishery in SBQ6B and the HCR was accepted as the method to manage the SBW6B fishery in the same fishing year.

For a specified natural mortality and steepness (by MPI), an ξ is found that meets the principle performance measure for setting the TACC, i.e., that the mid-fishery B_{current} should not fall below 20% B_0 more than 10% of the time over a 120-year projection period. For the 2017-18 fishing year, a M of 0.20 yr^{-1} and a steepness, h , of 0.90 were used, the same as in 2016-17 fishing year. An alternative estimate was made using a natural mortality of 0.25 yr^{-1} .

The FV *Tomi Maru 87* completed one snapshot (15 transects) on a spawning aggregation overnight on 5–6 September 2017. The biomass estimate was 7719 t (CV 24%) (R O'Driscoll, pers. comms.). The 2017 SBW6B catch was 2370 t, with 1694.6 t taken before the survey. Therefore, the abundance estimate needed to be adjusted to make it correspond to the start for the fishery. This was done by adding the pre-survey catch onto the absolute acoustic abundance derived from the above estimate, i.e., $7719/0.6 + 1694.6 = 12\,865 \text{ t}$.

No further work was conducted into developing or exploring assumptions underlying the current HCR, e.g., what procedures should be undertaken to detect and respond to another very large recruitment event (which is excluded from the current HCR), or, is the HCR more robust if it is based on end-of-year biomass rather than start-of-fishing season?

References

Doonan, I.J. (2017). Evaluation of a simple harvest control rule for the southern blue whiting Bounty management area (SBW6B). *New Zealand Fisheries Assessment Report 2017/52*. 14 p.

RESULTS

The calculations are shown in Table 1.

Table 1: Yield calculations for the SBW6B fishery in 2017-18 using $\xi (B_t + C_{t,before} - C_t / 2)$ tonnes, where $C_{t,before}$ is the catch taken before the acoustic survey; M is natural mortality, h is steepness.

M	h	ξ	B_t	C_t	$C_{t,before}$	C_t	Yield
0.20	0.9	0.24	12 865	2370	1694.6	2370	3 209
0.25	0.9	0.28	12 865	2370	1694.6	2370	3 744

CONCLUSIONS

The HCR was successfully applied.

PUBLICATIONS

None

DATA STORAGE

- NA