

# Results related to possible changes in the efficiency of the vessel *Koryo Maru* as estimated from trotline CPUE for PEI toothfish

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## Abstract

The GLMM (General Linear Mixed Model) reported by Brandão and Butterworth (2019) to standardise toothfish CPUE for trotlines is rerun under assumptions of a different catchability coefficient for the *Koryo Maru* for the period 2016 to 2017 and for the period 2016 to 2018. Very little change is estimated, and the pattern of the standardised CPUE series is scarcely changed.

## Introduction

This paper presents results when the GLMM (General Linear Mixed Model) reported by Brandão and Butterworth (2019) to standardise toothfish CPUE for trotlines is rerun under the assumption of a different catchability coefficient for the *Koryo Maru* for the period 2016 to 2017 and for the period 2016 to 2018. This investigation is motivated by suggestions that that vessel's operations may have been less efficient over these periods. Note that the computations continue to assume no change in the catchability for trotlines for the other vessel (*El Shaddai*) in the fishery over the whole 2010-2018 period analysed.

## Results and Discussion

Table 1 gives catchability estimates for the *Koryo Maru* for the different periods considered. Figure 1 show the relative abundance indices for toothfish provided by the standardised commercial trotline CPUE series for the Prince Edward Islands EEZ that assume different catchability coefficients for the *Koryo Maru* for two sets of periods. For comparison, the GLMM-standardised CPUE trend reported by Brandão and Butterworth (2019) that assumes a catchability coefficient for the *Koryo Maru* which is invariant over time is also given.

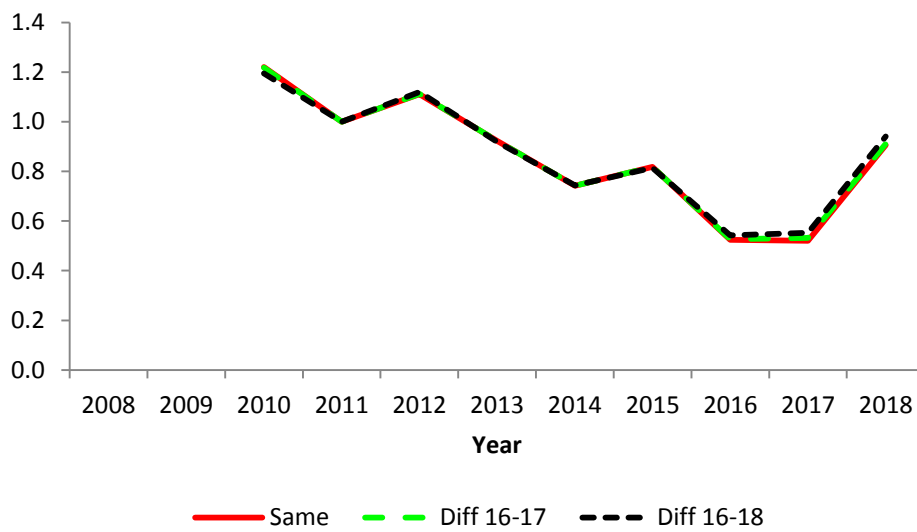
Very little change is estimated, and the pattern of the standardised CPUE series is scarcely changed.

## Reference

Brandão, A. and Butterworth, D.S. 2019. Updated GLMM standardised trotline CPUE series for the toothfish resource in the Prince Edward Islands EEZ to include data for the 2018 season. DAFF Branch Fisheries document: FISHERIES/2019/OCT/SWG-DEM/24.

**Table 1.** Catchability estimates for the *Koryo Maru* for different periods.

	Catchability estimate
<i>Koryo Maru</i> (2010 – 2015, 2018)	1.000
<i>Koryo Maru</i> (2016-2017)	0.983
<i>Koryo Maru</i> (2010 – 2015)	1.000
<i>Koryo Maru</i> (2016-2018)	0.909



**Figure 1.** GLMM-standardised CPUE trends for the **trotline** toothfish fisheries for the Prince Edward Islands EEZ when the *Koryo Maru* is assumed to have a different catchability for the period 2016 to 2017 and for the period 2016 to 2018. For comparison, the GLMM-standardised CPUE trends when the catchability for *Koryo Maru* is assumed to be unchanged for the whole period (i.e. 2010 to 2018) is also shown.