Effects of version update of Stock Synthesis on the stock assessment results for blue shark in the North Pacific [1]

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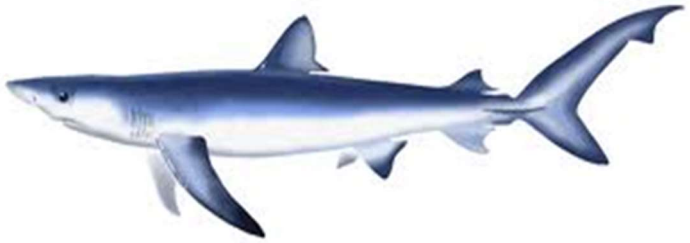

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Summary

This working paper examined the effects of version update of Stock Synthesis (SS) model on the main results of stock assessment for blue sharks in the North Pacific Ocean. The version of SS was updated from V3.24 to V3.30.18 for the base-case SS files used in the previous stock assessment in 2017. Comparisons of main outcomes for the base-case model indicated that there were small differences between the version of models. We considered that the latest version of SS is more suitable for the use of the upcoming stock assessment than the previous version because new functions were added to the latest version and many bugs were removed from the previous version.

Introduction

Blue shark (*Prionace glauca*) is widely distributed from tropical to temperate waters around the globe and is the most abundant species of oceanic pelagic shark (Nakano and Steven, 2008). The stock assessment of blue shark in the North Pacific Ocean was conducted using Stock Synthesis (SS) model (Method and Wetzel, 2013) in 2017 by the ISC SHARK working group (WG) (ISC, 2017). The SS model is frequently updated to improve the functions of SS and to remove the bugs. The aim of this working paper is to examine the effects of version update of Stock Synthesis (SS) model on the main results of stock assessment for blue sharks in the North Pacific Ocean.

Materials and Methods

SS version was updated from 3.24 to 3.30.18 (https://github.com/nmfs-stock-synthesis/stock-synthesis/releases) for the SS files of base-case model used in the stock assessment in 2017. The input files from V3.24 including control file, data file, starter file and forecast file were transformed to those of latest version V3.30.18 using the executable file (ss_trans.exe).

Results and Discussions

Comparisons of main outcomes (i.e., Annual spawning stock biomass (1000 metric tons), annual fishing mortality rates (per year), annual age-0 recruitment (millions), and annual abundance indices for Japanese shallow-set offshore and distant water fishery in the early (1976-1993) and late (1994-2015) time series) for the base-case model indicated that there were small differences between the version of models (**Fig. 1**). We considered that the latest version of SS is more suitable than the previous version because new functions were added to the latest version and many bugs were removed from the previous version. Therefore, we recommend using the new version of SS at the upcoming stock assessment in 2022.

References

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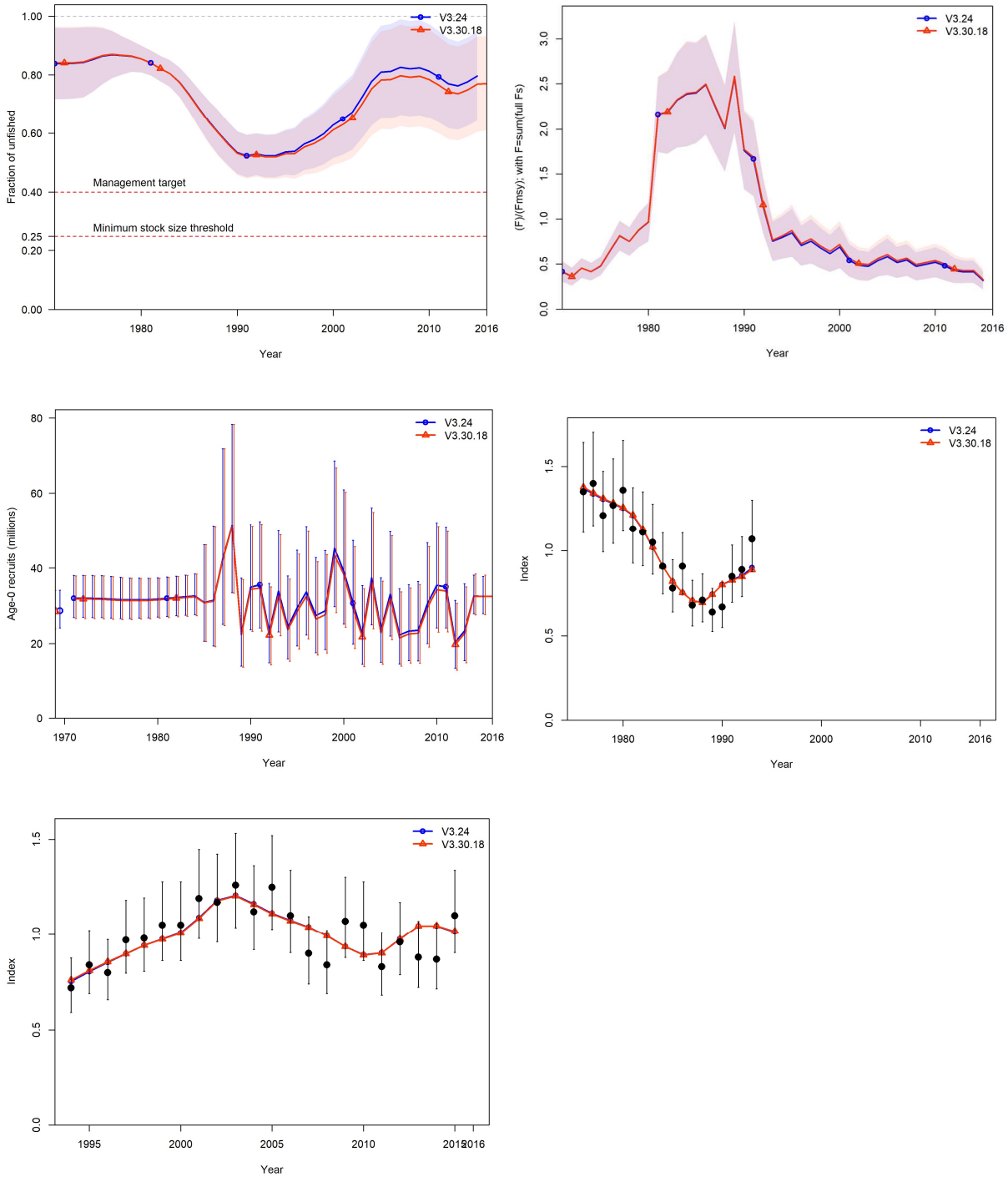

Figure 1. Comparisons of main outcomes between different versions (3.24 and 3.30.18) of Stock Synthesis model. Annual spawning stock biomass (1000 metric tons), annual fishing mortality rates (per year), annual age-0 recruitment (millions), and annual abundance indices for Japanese shallow-set offshore and distant water fishery in the early (1976-1993) and late (1994-2015) time series.