

# Further projections Assessment of the toothfish (*Dissostichus eleginoides*) resource in the Prince Edward Islands vicinity to include data from 1997 to 2013, including tag-recapture data

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## ABSTRACT

Further projections suggest that the resource would increase slowly under constant annual future catches of 500 t and for all but one of the sensitivity tests, a TAC of 600 t would still result in a slowly increasing resource.

## INTRODUCTION AND RESULTS

This paper provides further projections under different constant future annual catches for the base case model with tagging data and three sensitivity tests described in Brandão and Butterworth (2014). Projections assume that in future all catches are from the trotline fishery as has been the case in 2014 and that there are no illegal removals. Projections are given for constant future catches of 400 t to 700 t in steps of 100 t.

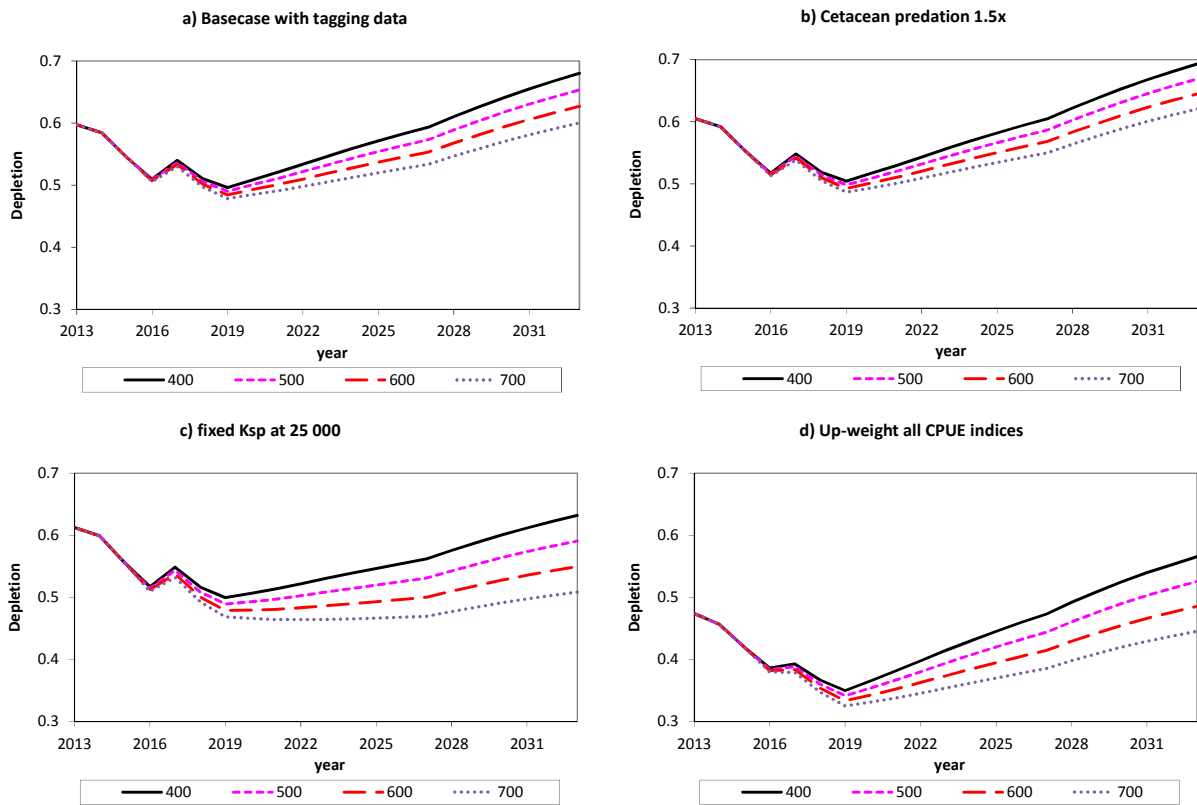
Figure 1 shows the spawning biomass together with twenty year projections under different constant future annual catches for the base case model with tagging data and three sensitivity tests. Figure 2 provides similar results to Figure 1, but the projections are for the trotline exploitable components of the biomass.

## CONCLUSIONS

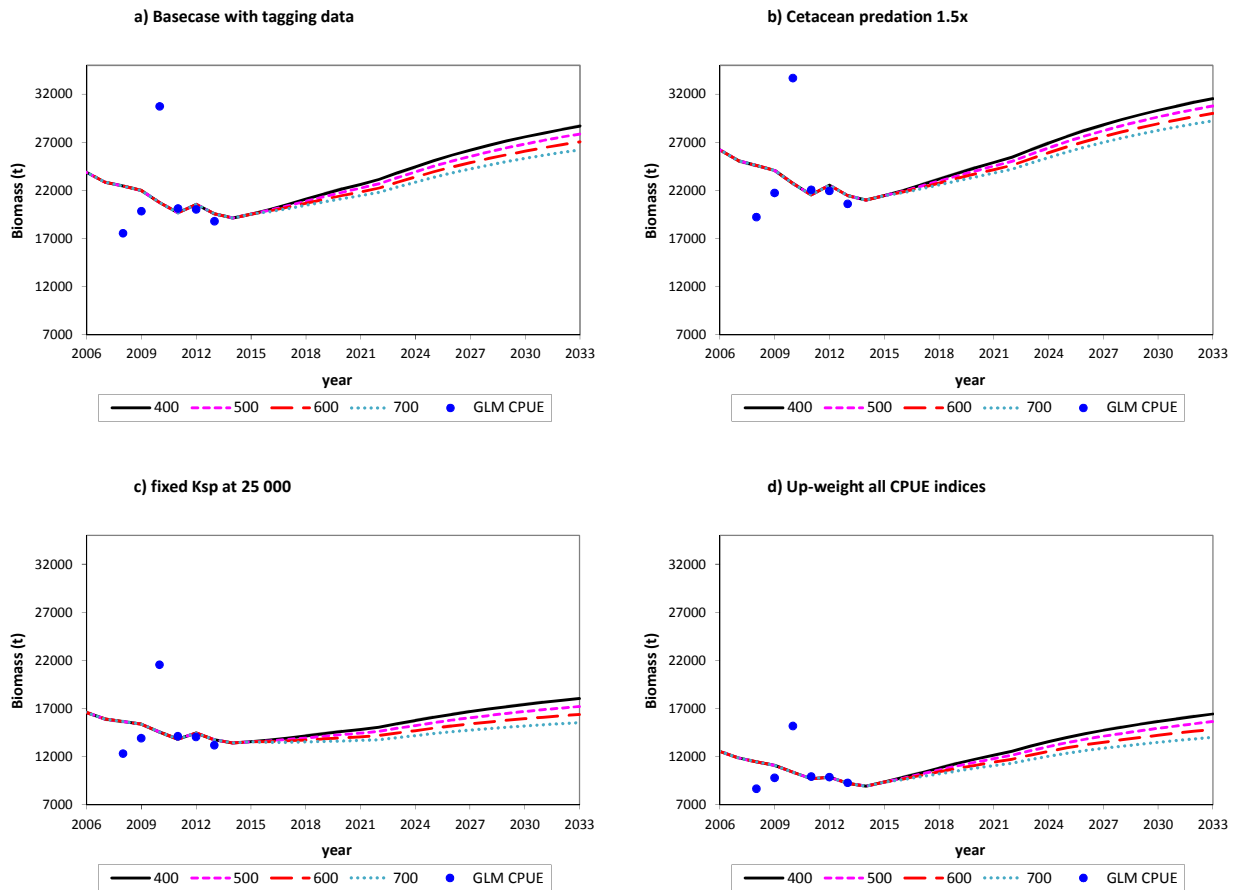
Projections in Figures 1 and 2 show that in all scenarios increases in spawning biomass occur in the long term (twenty years) under a 700 t TAC, except for the sensitivity test in which  $K_{sp}$  is fixed at 25 000 t and when all CPUE indices are up-weighted. In this case of the former sensitivity test, the spawning biomass is only slightly less than the current biomass at the end of the twenty year projection period for a constant catch of 500 t. For the sensitivity test that up-weights all CPUE indices, a TAC of 700 t results in spawning biomass at the end of the projection period slightly less than the current biomass.

**REFERENCES**

Brandão, A. and Butterworth, D.S. 2014. Assessment of the toothfish (*Dissostichus eleginoides*) resource in the Prince Edward Islands vicinity to include data from 1997 to 2013, including tag-recapture data. DAFF Branch Fisheries document: FISHERIES/2014/OCT/SWG-DEM/49.



**Figure 1.** Spawning biomass projections under future annual catches of 0, 500 and 1 000 tonnes (assumed to be all from trotlines as is the case for catches taken in 2014) for the base case with tagging data (a) and three sensitivity tests ((b) accounts for cetacean predation of 1.5x, (c) a variant of the base case that fixes  $K_{sp}$  at 25 000, and (d) a variant of the base case that varies  $\sigma_R$  from 0.1 pre 1998 to 0.5 otherwise).



**Figure 2.** Exploitable biomass for the trotline fishery and the GLM-standardised CPUE indices to which the model is fit (divided by the estimated catchability  $q$  to express them in biomass units), together with projections under future annual catches of 0, 500 and 1 000 tonnes (assumed to be all from trotlines as is the case for catches taken in 2014) for the base case with tagging data (a) and three sensitivity tests ((b) accounts for cetacean predation of 1.5x, (c) a variant of the base case that fixes  $K_{sp}$  at 25 000, and (d) a variant of the base case that varies  $\sigma_R$  from 0.1 pre 1998 to 0.5 otherwise.