

How does survival of discards influence stock development?

Effects of the landing obligation on the stock, assuming varying discards survival

The STECF illustrated the potential impacts of obliging fishermen to land catches (STECF 2013, page 45 onwards). They explored a stock with very high discard rates and well documented evidence of survival but the assessment procedure assumes that none of the discard survives (North Sea plaice used as an example). Note that this was only used for illustrative purposes and the relative significance of landing "surviving discards" will be heavily dependent on a number of key factors including survival rates by age; contribution discards make to the overall catch and their age structure.

Question: if a proportion of the fish that had previously been discarded survived, what are the implications of landing these individuals i.e. now removing them from the stock?

The figure below (copied from the STECF report) shows different lines representing a different assumed discard survival and the effect of landing those discards with that assumed survival. For example: in case of the bold line, the discards survival chance is zero. So for the stock it does not matter whether those fish are discarded or landed. In case of a 50% survival rate (0.5: upper grey drawn line in the figure), landing all discards would have a substantial effect on the stock. After 20 years, this would lead to a 27% decline in the spawning stock biomass. So the higher the discards survival, the larger the effect of the landing obligation on the spawning stock biomass.

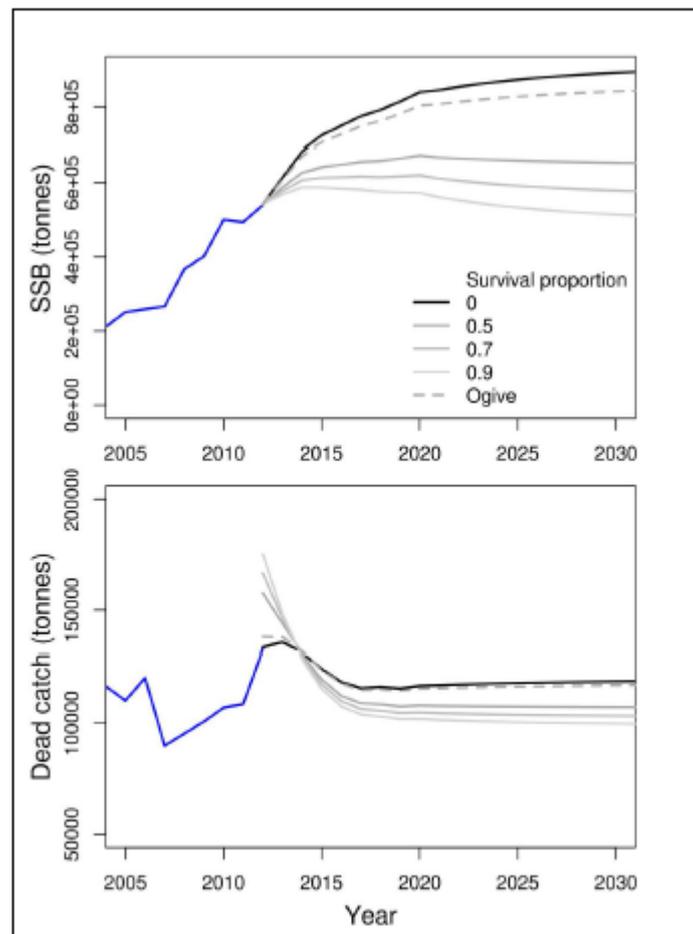


Figure 4.3-2. Effect of a landing obligation on the spawning stock biomass (top panel) and catch (bottom panel) of plaice under a range of hypothetical discard survival scenarios. Each line post-2012 in the top panel is interpreted as the resultant SSB assuming discards that previously survived at a given proportion are then landed.

Effects of the landing obligation on fishers' behaviour and the cod stock in the English Channel

Batsleer et al (2013) show through a modelling study that a discard ban – if enforced effectively – would result in a change of fishers' behaviour. As a case study, the French mixed fisheries in the English Channel, with a discard ban for cod, was taken. A conclusion was that fishers, under a discard ban, would reallocate their fishing effort to areas and weeks with low cod catches. This conclusion was supported by findings from Branch & Hilborn (2008) and Branch (2009), who showed that when TACs were increased for some species and reduced for others, fishers were able to adjust the species mixture in their catches by reallocating their fishing effort. The reallocation of effort by the French fishers would result in a reduction of over quota discarding of cod, having a positive effect on the cod stock. It should be kept in mind, however, that reallocation of effort may have an unexpected (undesired?) effect on other stocks.

References

- Batsleer J, Poos JJ, Marchal P, Vermard Y, Rijnsdorp AD, 2013. Mixed fisheries management: protecting the weakest link. *Mar Ecol Prog Ser* 479:177-190
- Branch TA, 2009. How do individual transferable quotas affect marine ecosystems? *Fish Fish* 10: 39–57
- Branch TA, Hilborn R, 2008. Matching catches to quotas in a multispecies trawl fishery: targeting and avoidance behavior under individual transferable quotas. *Can J Fish Aquat Sci* 65: 1435–1446
- STECF, 2013. Landing obligation in EU fisheries (STECF-13-23). Scientific, Technical and Economic Committee for Fisheries. Publications Office of the European Union, Luxembourg, EUR XXXX EN, JRC XXXX, 115 pp.