Marine Strategy Framework Directive Consultation: UK Initial Assessment and proposals for Good Environmental Status

Impact Assessment Annex D

Western Channel plaice

Stock and recruitment

Figure 1 presents the plaice time series of recruitment at age 1 used by the ICES WGCSE working group. Figure 2 presents stock-recruitment estimates for Western Channel plaice, no strong connection exists between recruitment and stock biomass.

Fishing mortality scenarios

Fishing mortality for Western Channel plaice, F = 0.45, currently exceeds the ICES F_{MSY} (F = 0.19) by a factor of more than 2. Three alternative fishing mortality scenarios are explored (Figure 3):

1) No change in the exploitation level – status quo fishing morality at the current level (the black line in Figure 3)
2) A single decrease in fishing mortality to the current ICES F_{MSY} framework target mortality of F = 0.19 (the purple line in Figure 3)
3) A 10% reduction in fishing mortality per annum until the F_{MSY} target is achieved (the green line in Figure 3) corresponding to similar management plans agreed for the North Sea flatfish.

Discarding scenarios

Discarding of Western Channel plaice is very low, due to young fish occurring in areas outside of the area in which the fishery occurs. Consequently the ICES assessment and the projections presented here do not include discards.

Output

Percentiles of fishing mortality, spawning biomass, recruitment and landings for a run of the model for 30 years are included for the options:

a. Status quo fishing mortality
b. A single reduction to F_{MSY} = 0.19
c. A 10% annual reduction in fishing mortality until the F_{MSY} target is achieved

Figures 3–5 present the realised fishing mortality, spawning stock biomass and landings outcomes for each fishing mortality scenario.

Discussion

A reduction in fishing mortality corresponding to the F_{MSY} target will result in higher spawning stock biomass and landings in the future, considerably above that recorded historically at high mortality rates. In the long term landings from the three scenarios are similar lower mortality rates with high stock abundance giving similar results to the higher percentage removals from a smaller stock abundance.
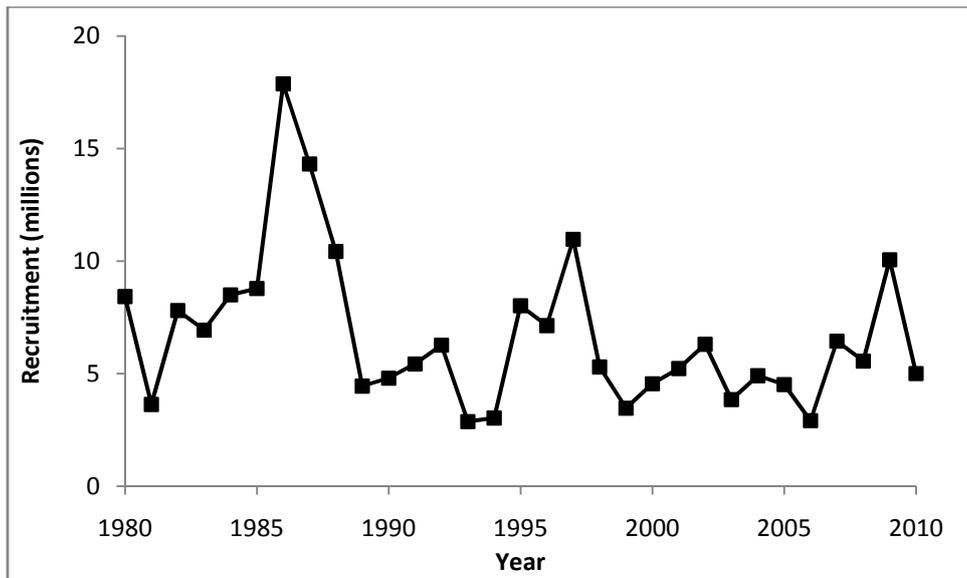
Figure 1. The time series of Western Channel plaice recruitment at age 1, illustrating the highly variable nature of recruitment for this stock.
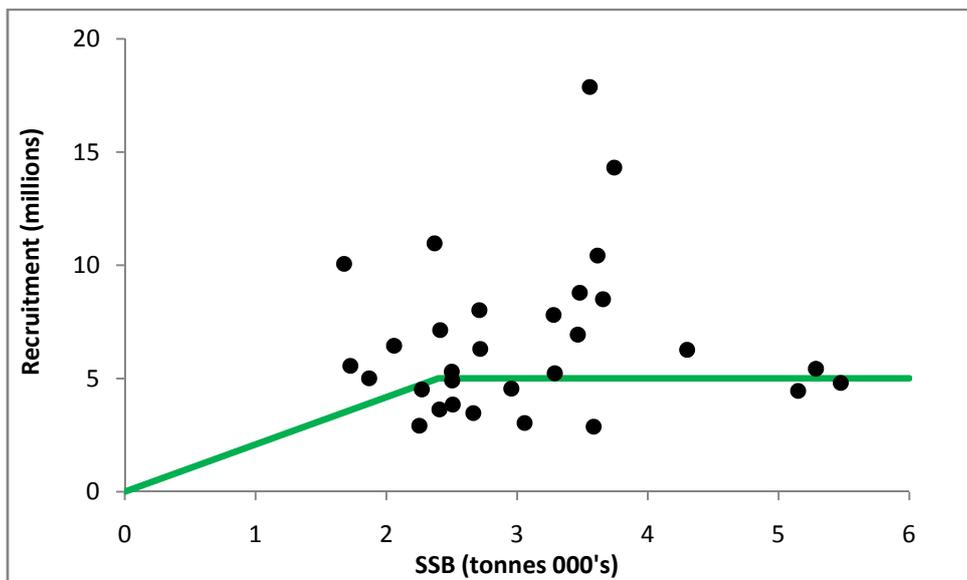

Figure 2. Stock-recruitment estimates for Western Channel plaice. Note that the green reference line indicates geometric mean recruitment and MSY $B_{trigger}$.
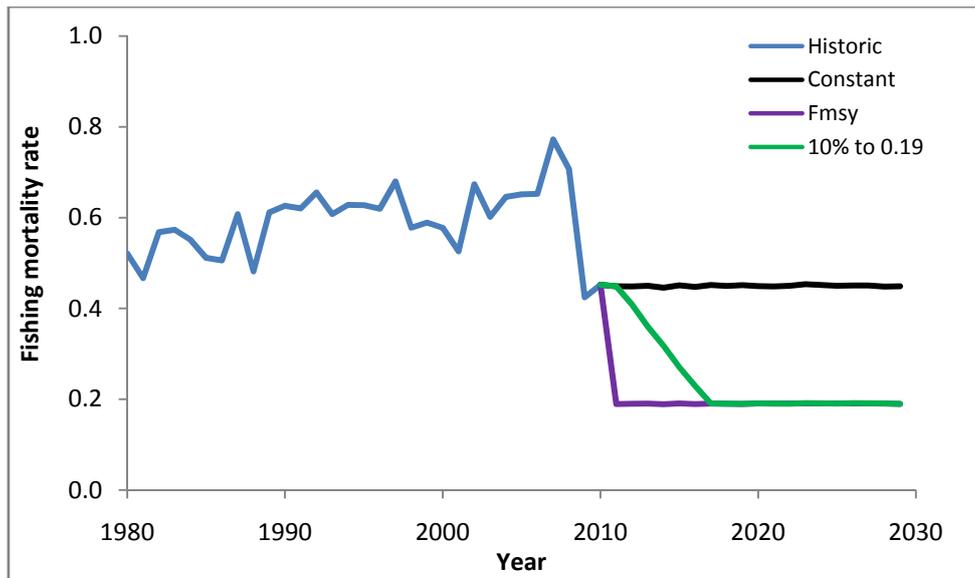
Figure 3. Western Channel plaice historic and representative future fishing mortality scenarios; black line – continued exploitation at the current level, purple line – an increase in fishing mortality to reach the Fmsy target of F = 0.19, green line – 10% reductions in fishing mortality per annum to achieve the Fmsy target.
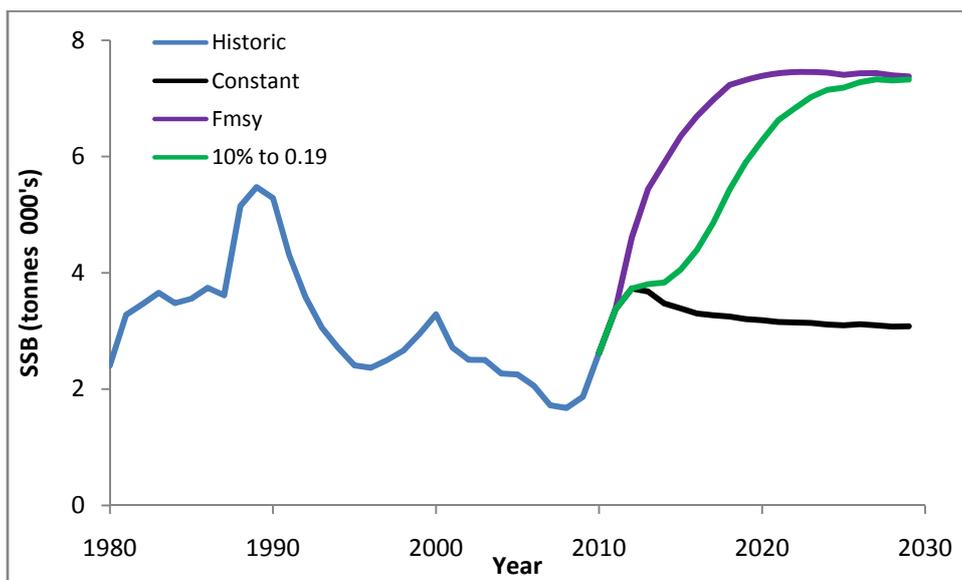

Figure 4. Western Channel plaice historic and projected spawning stock biomass; black line – continued exploitation at the current level, purple line – an increase in fishing mortality to reach the Fmsy target of F = 0.19, green line – 10% reductions in fishing mortality per annum to achieve the Fmsy target.
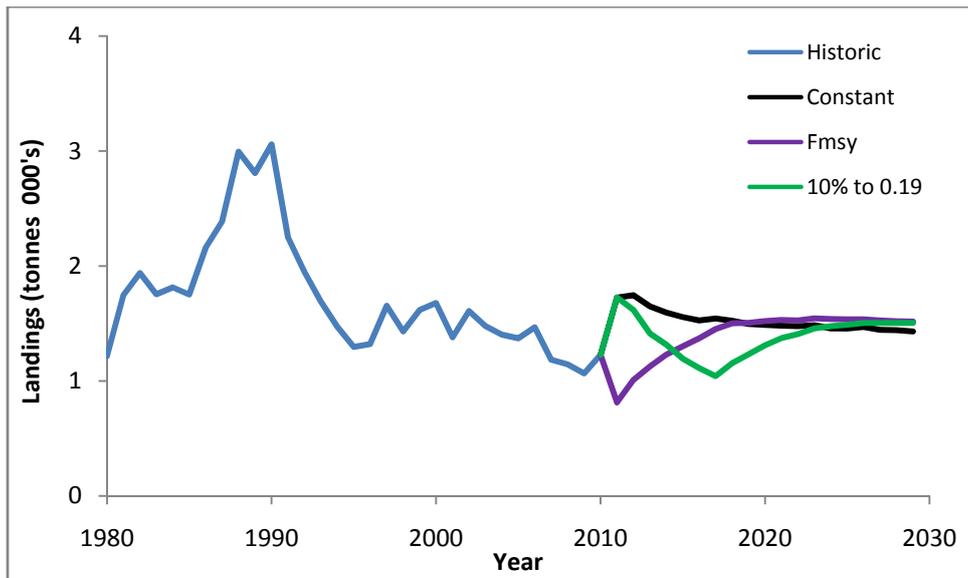
Figure 5. Western Channel plaice historic and projected landings; black line – continued exploitation at the current level, purple line – an increase in fishing mortality to reach the Fmsy target of F = 0.19, green line – 10% reductions in fishing mortality per annum to achieve the Fmsy target.