

## **Option 6: Use of Square Mesh Panels**



### **The Invest in Fish Bio-Economic Model**

**The IIF Bio-Economic model is designed to simulate the interactions between fish stocks, the size and effort of the fishing fleet and regional output and employment within the South West. The aim of the model is to provide a means of comparing the effects of different policy options for the management of the region's fisheries relative to the baseline of what is expected to happen if no action is taken.**

**It is important to recognise that the model is an 'OPTION COMPARISON' model NOT a forecasting model. The aim of the model is to compare what happens if a 'management' decision is taken to implement a particular policy and all other factors are assumed to stay the same. Thus the impacts of policies are examined 'relative to this FIXED baseline' where all variables are held constant over time.**

# IIF Bio-Economic Model of South-West Fisheries

## Option 6: Use of Square Mesh Panels

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One way in which to reduce the impact of commercial fishing upon fish stocks is to change the type of net mesh used by certain fishing vessels. Option 6 examines the likely impact of a policy to introduce the use of square mesh panels for beam trawlers. Within the model mesh size is modelled in terms of catchability and the amount of fish taken. As this measure is still at a trial stage there is only limited information on the efficacy of this measure.

Within the model this option is shown to have no impact upon fish stocks.

However, early evidence from the trials suggest that square mesh panels are effective in reducing ‘discards’, both in terms of undersized commercial species and non-target or valueless species. The evidence suggests that whilst the use of square mesh panels has little impact on the amount of targeted fish landed, the reduced mortality of undersized fish may impact positively upon future stock sizes and landings. In addition to improving stocks, reduced discards can help to lower costs as well as leading to environmental benefits. Therefore, although the evidence does not yet exist to show such improvements within the bio-economic model, it is clear that this is an innovation that it may be very valuable to monitor, not just for beam trawlers but also for the new twin riggers entering the fleet.

The likely effects of this option are evaluated against a number of key measures as follows:

- ❖ The level of spawning stocks (Demersal, Pelagic and Shellfish)
- ❖ Overall impact on the environment
- ❖ The value of revenue by port
- ❖ Boat profitability (overall and by gear activity)
- ❖ The value of recreational angling expenditure
- ❖ Regional output and employment.

The graphs show the outcomes of each alternative option. The outcomes are shown ‘*relative to the baseline*’. This means that rather than showing actual values year by year, the graphs show how each different option impacts upon outcomes compared to what would have happened if nothing had been done (i.e. the baseline). This means that if the values are positive, the outcome is better than the baseline and if negative worse than the baseline.

It is important to recognise that the option outcomes are based upon a number of key assumptions;

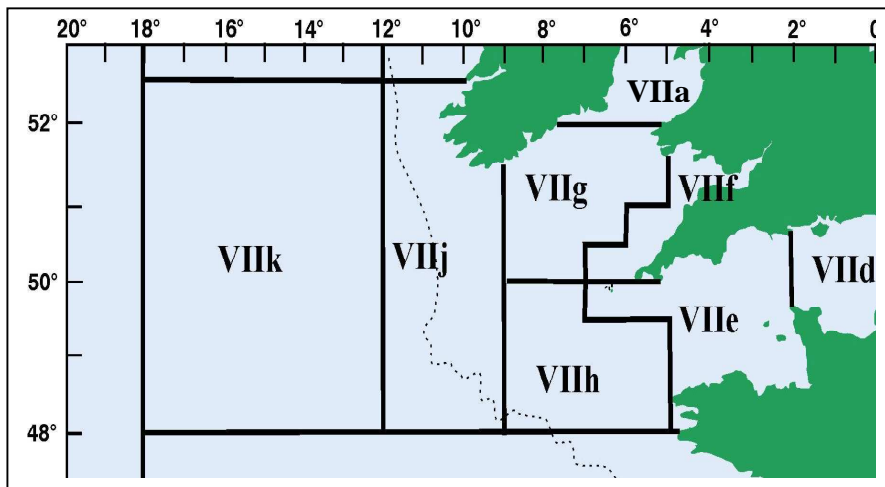
- ❖ In all cases (except where specified) options are applied ‘unilaterally in the model’ (thus most options are applied only to the UK fleet over which DEFRA has jurisdiction). It is therefore assumed that the effort of other EU fleets will remain at the level modelled in the baseline. The impact of the foreign fleet is modelled in terms of its effect on fish mortality/catch and this impact may be altered within the model as ‘reduced effort’ or days at sea (see option 3i), but technical changes cannot be applied to this fleet.
- ❖ Prices of all fish species caught and landed are ‘fixed’ so that changes in revenue are ‘real’ changes (due to catch size) rather than ‘apparent’ changes due to alterations in prices at sale.

- ❖ Estimates of spawning stock biomass are based on ICES data of recruitment observations over the past 20 to 30 years, which may be considered by some to be precautionary or pessimistic.
- ❖ Unless specifically stated as part of the option being considered, the size of the fleet is assumed to remain at its current level, vessels continuing to fish even if they are unprofitable.
- ❖ Spawning stock to recruitment relationships were analysed in conjunction with CEFAS in order to determine the appropriate stock-recruitment relationships for the model.

### Fish Spawning Stocks

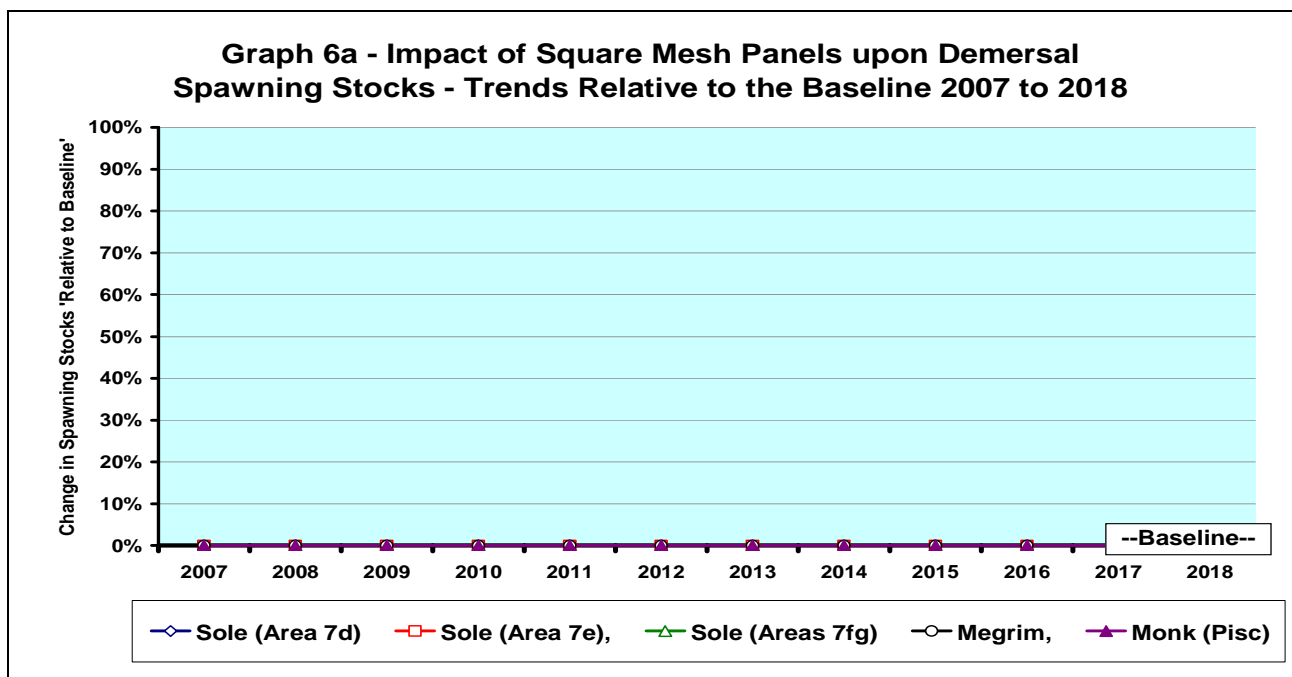
The following graphs show how level of spawning stocks are forecast to change within the IIF Bio-Economic model if the size of the fishing fleet is reduced by 10% (UK only). For a number of species the volume of spawning stocks is shown for specific fishing areas (metiers) within the South West region. These areas are referenced as 7a to 7g as shown in Figure 1 below:

**Figure 1: ICES Fishing Areas modelled**



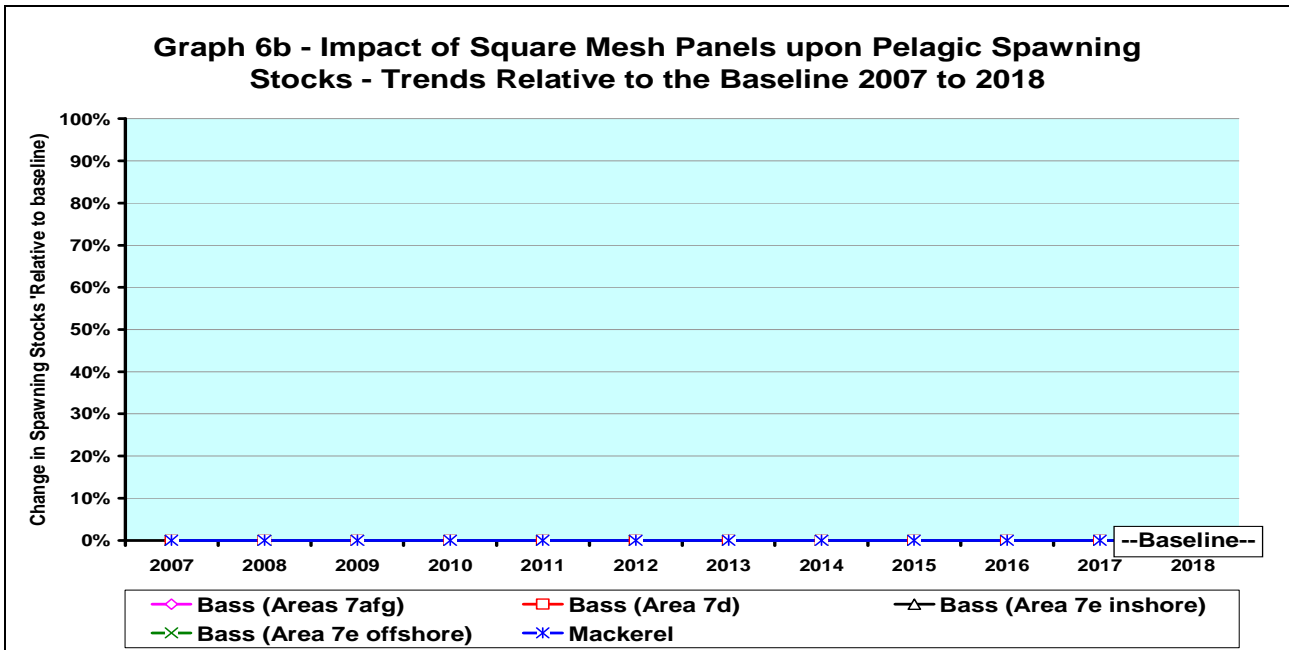
### Spawning Stocks – Demersal Fisheries

Graph 6a shows that the impact of option 6 upon spawning stocks in demersal fisheries would be negligible. The graph shows that the impact upon all demersal stocks would be zero, although it must be recognised that trials of this initiative are still at an early stage

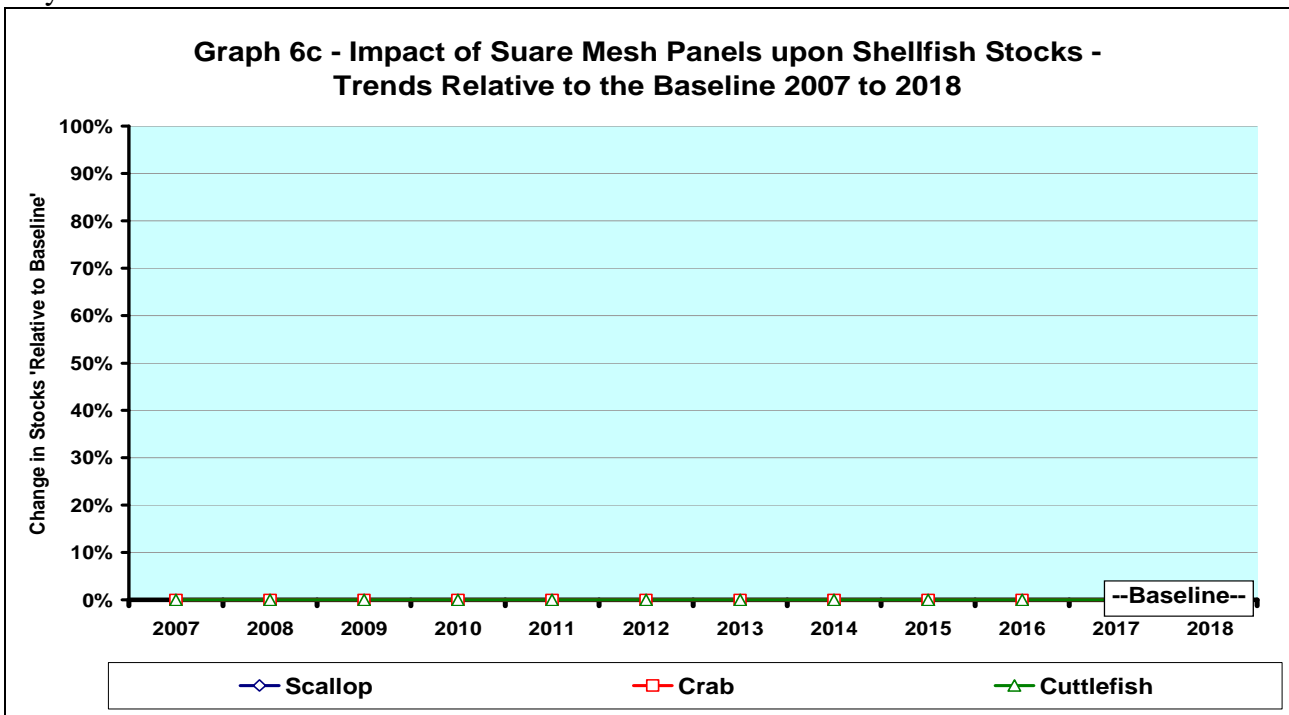


## Spawning Stocks – Pelagic Fisheries

Graph 6b provides a summary of the impact of option 6 upon pelagic spawning stocks. The graph shows that pelagic stocks are unaffected by the use of square mesh panels. However, early evidence suggests that there may be long term benefits to stocks as discards of undersized fish increase.



**Stocks – Shellfish** Graph 7c provides a summary of the impact of option 7 upon stocks of crustacean and shellfish. The graph shows that the impact would in fact be almost zero with only a very minor decline in crab stocks



### Important Note:

*Given the insignificant impact of this option upon fish stocks, the remainder of the analysis is not shown as the outcomes are all at or near baseline. This is to be expected as fish stocks are the main driver of changes relative to the baseline scenario. If fish stocks do not change in response to the policy option being investigated then there can be no impact upon the other measures of revenue, profits, output and employment relative to the baseline.*