REPORT

Meeting: **Workshop on Management Strategy Evaluation for North Sea Saithe**
Parties: **ICES, stakeholders**
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Chairs: **Alexander Kempf, Marc Taylor**

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Introduction

A stakeholder workshop held on 15 October 2026 reviewed preliminary results from the Management Strategy Evaluation (MSE) for North Sea saithe. The work was undertaken in response to a joint request from the European Union, the United Kingdom and Norway to develop a long-term management plan for the stock.

The workshop brought together scientists, external reviewers and stakeholders to examine the performance of alternative harvest control rules and management measures. The objective was to assess how different approaches could balance sustainable catches, stock recovery, precautionary safeguards and stability for the fishing industry.

MSE is a structured way of testing management rules against different plausible futures, uncertainties and biological conditions before a rule is implemented. It helps identify the strengths and limitations of different approaches and makes the trade-offs between management objectives more transparent.

Stock status and key challenges

The assessment indicated that North Sea saithe biomass was below the biomass limit reference point, while fishing pressure was above the relevant fishing-mortality target. This

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situation raises the need for a management strategy that supports recovery and maintains the stock within precautionary limits.

Recruitment had generally been low since the mid-2000s, with particularly low levels during the most recent decade, although the latest year showed a stronger recruitment signal. Mean weight and mean weight-at-age had also declined, while recent changes in growth and maturity suggested lower productivity.

The workshop discussed several possible explanations for these trends, including changes in environmental conditions, climate-related effects on recruitment and food availability. Reduced availability of suitable prey was raised as a possible factor. These uncertainties make it difficult to determine whether recent conditions represent a temporary period or a more persistent productivity regime.

The discussion also noted that the fishing industry had generally followed the scientific advice. The presenters therefore cautioned against attributing the stock's current low status simply to catches exceeding the advice.

The principal challenge for management is consequently to develop a strategy that remains effective if productivity stays low, while also performing appropriately if recruitment and growth improve.

Approach and assumptions

The MSE simulated the interaction between stock biology, fishing activity, scientific monitoring, stock assessment, management advice and the resulting catches over time. Simulated observations were passed through an assessment process intended to resemble the one used in practice. The resulting advice and catches then affected the stock in subsequent years. The performance of each management rule was evaluated across many simulated trajectories.

Two operating models formed the main reference set:

- **Moderate productivity**: used a longer historical period to represent stock–recruitment relationships and incorporated growth and maturity patterns from the most recent decade.
- **Low productivity**: placed greater emphasis on the most recent years, using a shorter period for recruitment and recent growth and maturity patterns. This produced a more pessimistic outlook for future productivity.

The low-productivity model represented an estimated 17% reduction in expected recruitment relative to the moderate-productivity model. A separate high-recruitment scenario was also included in robustness testing.

Both main operating models were treated as equally plausible and their results were pooled when assessing the performance of management rules. This approach reflected the

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uncertainty about whether future conditions would resemble the longer period of moderate productivity or continue to reflect the more recent, less productive years.

The main precautionary criterion was that the long-term probability of spawning-stock biomass falling below the biomass limit should not exceed 5%. This risk measure was assessed over the final 15 years of a 25-year projection. Since the stock began near the limit, risk was higher in the initial years; the focus was on whether each strategy could meet the precautionary criterion over the long term.

The evaluation considered fishing-mortality targets corresponding to maximum long-term yield and a lower target intended to deliver 95% of maximum yield. It also tested different biomass triggers and several approaches to catch stability.

Management options evaluated

Biomass triggers

The biomass trigger is a management choice that determines when fishing mortality begins to be reduced. It is distinct from the MSY biomass trigger, which is a reference point used to assess stock status.

A higher management trigger initiates reductions in fishing pressure at a higher stock biomass. This can reduce long-term risk and support rebuilding, but it can also reduce catches in the short term and increase year-to-year variability in advised catches.

A lower trigger allows catches to rise more quickly while the stock is recovering, but may delay rebuilding and leave the stock exposed to greater risk. The choice of trigger therefore has important consequences for both immediate fishing opportunities and longer-term stock protection.

Fishing-mortality targets

The MSE compared a target designed to maximise long-term yield, subject to the precautionary risk criterion, with a more conservative target producing 95% of maximum yield.

The lower target generally provided a useful compromise. Across the tested rules, it delivered approximately 93–96% of the long-term yield associated with the maximum-yield target. It also generally reduced catch variability, increased long-term spawning-stock biomass and lowered the risk of falling below the biomass limit.

The results suggest that a relatively small reduction in long-term yield can provide meaningful precautionary and stability benefits. However, the lower target generally reduced short-term yield, so the choice still involves trade-offs for the fishing sector.

Catch-stability measures

Three broad approaches to stability were examined: conventional **total allowable catch (TAC)** constraints, an **alternative method** for applying those constraints, and **rules that reduce fishing mortality progressively** as biomass rises above the trigger.

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Conventional TAC constraints limit the permitted year-to-year change in advice. The alternative approach applies the constraint by reference to the previous unconstrained advice rather than the previous constrained TAC. The two methods performed similarly in aggregate, although they can differ in how quickly TAC advice responds to stock changes.

The newer stability-factor approach reduces fishing mortality as spawning biomass increases above the management trigger. This may help stabilise catches and keep the stock at higher biomass levels. An adaptive decision approach was included to avoid the unintended outcome of advice falling excessively at very high biomass.

The evaluation also considered sensitivity tests, including banking and borrowing and changes in selectivity, although not all of these results were sufficiently mature for detailed presentation at the workshop.

Main results

Long-term yield and stock protection

Long-term yield differed relatively little between many of the management rules. The preliminary results indicated that the long-term yield associated with maximum-yield targets generally fell within a relatively narrow range of fishing-mortality targets, approximately 0.22–0.27 across the tested configurations.

Biomass trigger choice was a major determinant of long-term precautionary performance. Higher triggers generally reduced long-term risk, although the benefits were accompanied by lower short-term catches and greater interannual catch variability in some cases.

The lowest trigger values—190,000 and 230,000 tonnes—were particularly important in the analysis because several maximum-yield configurations were constrained by the 5% risk threshold. This illustrates that a strategy delivering high catches is not necessarily compatible with the required level of stock protection.

The 95%-of-maximum-yield target generally improved precautionary performance. It was below the 5% risk threshold in most tested configurations, including most of the low-productivity cases. It also produced higher long-term spawning biomass than the maximum-yield target, while retaining most of the potential yield.

Catch stability

The results suggested that catch stability could be improved with limited loss of long-term yield under several management options. Stability factors of 0.8 or lower produced particularly notable reductions in catch variability.

However, the strongest stability setting, a factor of 0.7, was associated with a more substantial reduction in long-term yield—greater than 10% for some comparisons. A factor of 0.8 appeared to offer a more balanced outcome, providing increased stability while retaining a long-term yield relatively similar to other rules.

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The conventional TAC stability constraint generally fell between the unconstrained rule and the stronger stability-factor options in terms of catch variability. The results underline that no single approach maximises every objective: greater stability can reduce flexibility to respond to stock changes, while rules that follow biomass developments more closely may produce more variable fishing opportunities.

Short-term versus long-term outcomes

The management rules produced more noticeable differences in short-term than in long-term yield. The biomass trigger largely determined how quickly catches could increase during the initial years of the projection.

Lower triggers generally produced higher short-term yields because fishing mortality could increase more rapidly as the stock recovered. Higher triggers provided a more cautious approach, with lower early catches but greater protection and, in many scenarios, faster rebuilding.

Over the long term, average yield differences between many rules became much smaller. This suggests that management decisions should not be assessed solely on long-term yield estimates: the distribution of catches over time, stock recovery, risk and predictability are also important considerations.

Robustness testing

Under a high-natural-mortality scenario, estimated risk increased by around two percentage points for some of the lowest-trigger rules, and more options failed to meet the 5% precautionary criterion. Under a low-end scenario, risk moved in the opposite direction because of differences in assessment bias. In the high-recruitment scenario, the rules generally performed more favourably because biomass was higher.

The 95%-of-maximum-yield target performed relatively robustly across the tested scenarios, with most tested rules remaining below the 5% risk threshold. However, it did not guarantee precautionary performance in every combination of assumptions and management settings.

Stock rebuilding analysis

The analysis compared alternative biomass triggers and fishing-mortality targets under moderate- and low-productivity assumptions. A no-fishing scenario was included as a reference point. Rebuilding was defined in the analysis as reaching or exceeding the MSY biomass trigger and remaining above it for three consecutive years.

Under the no-fishing scenario, median rebuilding time was approximately four years under moderate productivity and five years under low productivity. Continuing to fish delayed recovery, with the speed of rebuilding depending on the biomass trigger and fishing-mortality target.

Higher biomass triggers generally led to faster rebuilding, but at the cost of lower cumulative catches during the recovery period. Lower triggers allowed greater catches in the short term

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but generally resulted in slower rebuilding. The 95%-of-maximum-yield target also tended to support faster recovery than the maximum-yield target.

The results depend on the starting condition of the stock, assumptions about future recruitment and growth, and the precise definition of recovery. Participants noted that reaching a biomass threshold alone may not fully describe recovery: age structure, length structure and other indicators could also be relevant.

Stakeholder discussion

The discussion reinforced the importance of treating the MSE as a tool for developing a long-term strategy, rather than simply selecting a rule that delivers the highest catch in the next few years. Participants highlighted the need for a management framework that can respond to changing stock conditions without requiring frequent fundamental changes.

Several points were highlighted:

- The stock's current condition and uncertainty about future productivity underline the importance of retaining a clear safeguard against falling below the biomass limit.
- Several options can substantially reduce catch variability while maintaining similar long-term yield. Stronger stability measures, however, may involve more noticeable yield reductions.
- Biomass triggers can have limited effects on long-term average yield while producing important differences in immediate catches and the speed of recovery.
- Recent biological trends mean that low productivity represents one plausible continuation of observed conditions.
- Rebuilding-time estimates provide useful comparisons, but their interpretation depends on agreed criteria and may benefit from additional indicators of stock structure and condition.
- Clear explanations of the assumptions, performance measures and trade-offs will help stakeholders understand why a particular management approach is selected.

Conclusions and next steps

The preliminary MSE results indicate that North Sea saithe management could achieve meaningful improvements in precaution and catch stability without necessarily sacrificing substantial long-term yield. In particular, a fishing-mortality target delivering 95% of maximum yield performed favourably across many of the tested rules, generally increasing spawning biomass, reducing risk and improving catch stability.

Higher triggers generally improve stock protection and accelerate rebuilding but reduce short-term catches and may increase interannual variability. Lower triggers allow higher catches during the early years but can prolong recovery and leave less room for error under low productivity.

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The stability-factor results also suggest that a moderate approach, particularly a factor of 0.8, may offer a useful balance between catch stability and yield. More restrictive settings can deliver greater stability, but may carry a larger long-term yield cost.

Further technical refinements were needed, particularly to ensure that rules intended to meet the 5% risk threshold did so reliably. External review and finalisation of the scientific report and advice will follow.

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