

```
If isUnderLandingsObligation And Not isUnderSurvivability Then
    fleetMetiers(fm).MetierHarvest(s).TargetEffort(y) = TargetEffort
    If TACmin(fm) > TargetEffort Then
        TACmin(fm) = TargetEffort
        TACminSpecies(fm) = s
    End If
End If
'Make sure target effort is not set above MAX effort - needed for the Results approach
If TargetEffort > fleetMetiers(fm).BaselineEffort * effortMultiplier Then
    fleetMetiers(fm).MetierHarvest(s).TargetEffort(y) = fleetMetiers(fm).BaselineEffort *
```

# UK Landing Obligation Analysis

Analysis of the implications of the LO for UK fishing fleets

Arina Motova & Tom Catchpole

DAG meeting , 13 February 2018, London

```
If useTACmin And y >= startYearIdx Then
    If fleetMetiers(fm).BaselineEffort * effortMultiplier < TACmin(fm) Then
        fleetMetiers(fm).effort(y) = fleetMetiers(fm).MetierHarvest(s).TargetEffort(y)
```

## Content

- Objectives
- Scenarios
- Materials and Methods
- Results
- Conclusion

# Objectives

## Two questions:

**Q1:** Under full implementation of the LO, and with no change in fishing patterns or gear selectivity, what is the estimated UK quota requirement (deficits and surpluses by stock) that would enable existing fishing effort levels to continue?



**Q2:** Under full implementation of the LO (assuming full compliance), and with no change in fishing patterns or gear selectivity, what are the estimated foregone catches for UK fleets (by stock) resulting from the cessation of fishing caused by the exhaustion of quota (choke points)?



# Scenarios

## Two scenarios:

S1: Initial UK quota allocation

S2: UK quota allocation after international and national swaps

New scenario



B1: Landing obligation rules are applied – no mitigation

B2: B1 + Catch allowance for zero-TAC stocks

B3: B2 + Quota adjustment (top-up/uplift) is applied

B4: B3 + Vessel movement between metiers to better utilise PO quota

S1: B4 + full use of UK quota (reallocated within UK).

S2: S1+ quota end of year allocation

[See scenarios definitions in Seafish methodology report](#)

# Materials & Methods

## Seafish model features:

- 54 UK fishing stocks (pelagic stocks excluded)
- 2016 landings and effort data by vessel aggregated to Seafish métier level
- Discard rates at the métier (fleet) level are calculated from the STECF FDI database (2016 data)
- For métiers where stocks have a discard rate of 100%, these have been adjusted to 99.5%, so that total catch can be calculated when landings occur.
- For métiers with no reported landings, no catch is calculated, even if discards are reported in FDI. This potentially underestimates the total catch but is not considered to influence the results.
- Stock catch estimates and stock level discard rates, used to calculate quota uplifts, are taken from the latest ICES' advice (available in mid. 2017).
- The scenario that includes international quota movement is based on the end of year quota uptake as recorded in 2016 (uplifts are applied to all end of year quota)

# Materials & Methods

## Key modelling assumptions:

- Full compliance with the LO is assumed
- No change in selectivity
- Stocks with ICES' advice for zero TAC and skates and rays are excluded from LO
- The TAC uplift applied at the stock level is the same as that used in previous years. Within the UK the quota uplift is allocated in alignment with FQAs
- Total catches are limited to that which can be taken by 2016 fishing effort
- Constant catch rates by fleet are based on catch estimates and days-at-sea fishing effort, and catchability is adjusted in line with stock biomass
- The domestic movement of quota is simulated to optimise quota usage
- To project the size of assessed stocks in 2019, a biomass dynamic model using the Schaefer Model was applied (modification to the previous model version).
- Following biological stock projections, TAC setting is based on achieving  $F_{MSY}$  subject to a maximum change between years of either +/-5% or +/-15%, depending on historical changes for each stock (modification to the previous version)

# Results

## Q1: % Difference catch and catch quota

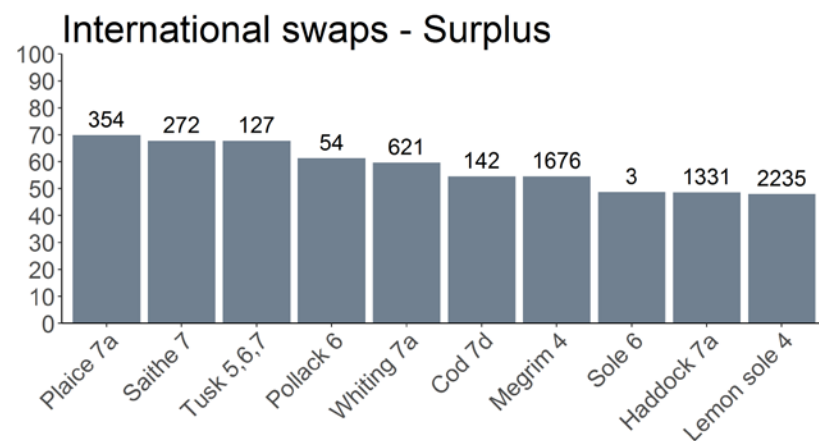
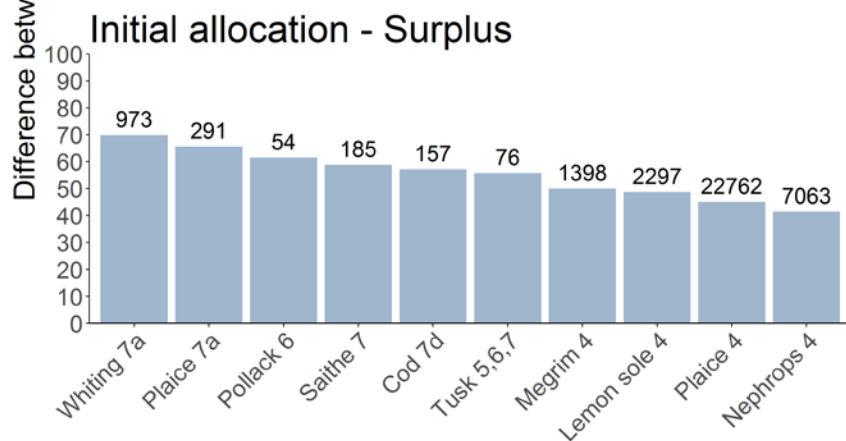
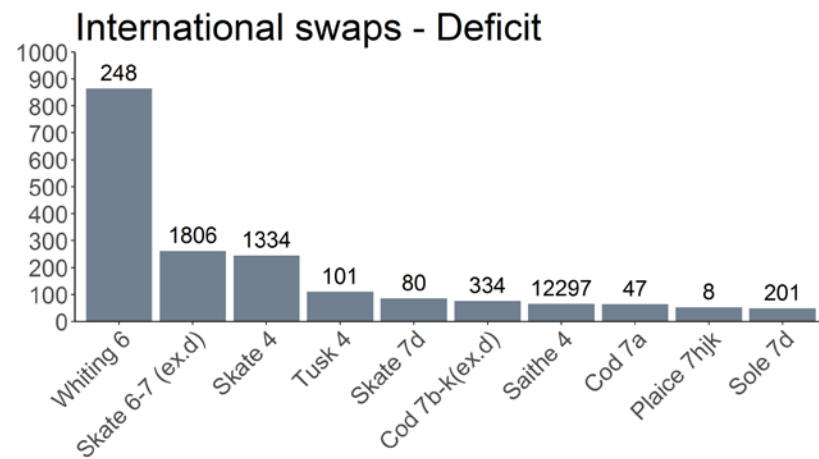
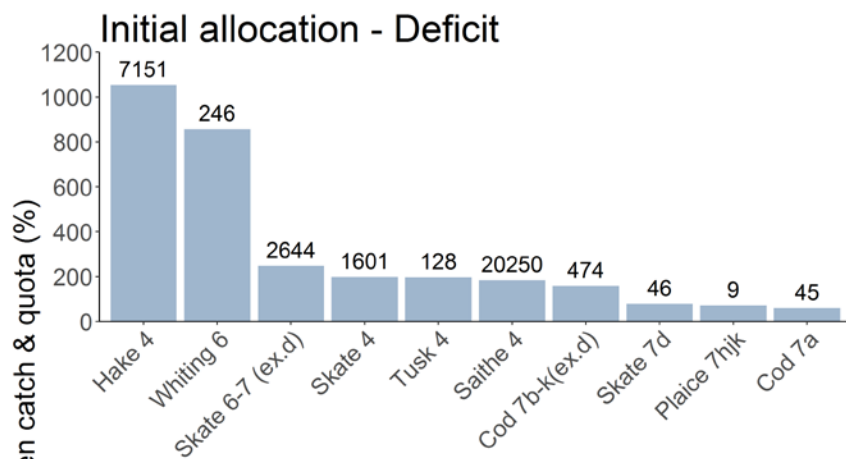
| Stock      | S1    | S2   | Stock            | S1   | S2   | Stock            | S1   | S2   | Stock        | S1   | S2   |
|------------|-------|------|------------------|------|------|------------------|------|------|--------------|------|------|
| North Sea  |       |      | Lemon sole 4     | -49% | -48% | Area 6-7         |      |      | Sole 7d      | 22%  | 48%  |
| Hake 4     | 1053% | 34%  | Megrim 4         | -50% | -55% | Skate 6-7 (ex.d) | 248% | 262% | Sole 7fg     | 4%   | 7%   |
| Skate 4    | 198%  | 245% | West of Scotland |      |      | Ling 6-7         | -29% | -36% | Pollack 7    | 1%   | -8%  |
| Tusk 4     | 197%  | 110% | Whiting 6        | 858% | 865% | Hake 6-7         | -30% | -5%  | Nephrops 7   | -1%  | -16% |
| Saithe 4   | 184%  | 65%  | Anglers 6        | 37%  | -10% | Tusk 5,6,7       | -56% | -68% | Haddock 7b-k | -1%  | -2%  |
| Sole 4     | 47%   | -1%  | Haddock 5b6a     | 31%  | 24%  | Area 7           |      |      | Sole 7e      | -12% | -21% |
| Ling 4     | 29%   | 11%  | Cod 6b           | 22%  | 22%  | Cod 7b-k(ex.d)   | 159% | 76%  | Plaice 7de   | -27% | -14% |
| Haddock 4  | 23%   | 7%   | Megrim 6         | 3%   | -12% | Skate 7d         | 79%  | 86%  | Haddock 7a   | -28% | -49% |
| Cod 4      | 22%   | -6%  | Nephrops 6       | -12% | -19% | Plaice 7hjk      | 71%  | 53%  | Plaice 7fg   | -31% | 23%  |
| Anglers 4  | -12%  | -21% | Sole 6           | -23% | -49% | Cod 7a           | 60%  | 64%  | Whiting 7b-k | -41% | -9%  |
| Whiting 4  | -17%  | -28% | Haddock 6b       | -32% | -43% | Megrim 7         | 43%  | 2%   | Cod 7d       | -57% | -55% |
| Turbot 4   | -26%  | -5%  | Plaice 6         | -38% | -41% | Anglers 7        | 30%  | -3%  | Saithe 7     | -59% | -68% |
| Nephrops 4 | -41%  | -39% | Saithe 6         | -38% | -41% | Sole 7a          | 28%  | -2%  | Plaice 7a    | -66% | -70% |
| Plaice 4   | -45%  | -32% | Pollack 6        | -62% | -61% | Sole 7hjk        | 26%  | -19% | Whiting 7a   | -70% | -60% |

 UK quota surplus (<0%)  
 UK quota deficit ( around 5%)

 UK quota deficit between 5-50%  
 UK quota deficit >50%

# Results

## Q1: % Difference catch and catch quota (Top 10)



# Results

## Q2: % Catch quota foregone due to choke

| Stock            | S1  | S2  | Stock                   | S1  | S2  | Stock           | S1  | S2  | Stock         | S1  | S2  |
|------------------|-----|-----|-------------------------|-----|-----|-----------------|-----|-----|---------------|-----|-----|
| <b>North Sea</b> |     |     | Sole 4                  | 47% | 54% | <b>Area 6-7</b> |     |     | Pollack 7     | 50% | 33% |
| Plaice 4         | 98% | 94% | Hake 4                  | 0%  | 17% | Tusk 5,6,7      | 66% | 71% | Sole 7hjk     | 48% | 48% |
| Lemon sole 4     | 96% | 83% | <b>West of Scotland</b> |     |     | Hake 6-7        | 58% | 20% | Plaice 7de    | 44% | 34% |
| Turbot 4         | 92% | 84% | Pollack 6               | 73% | 68% | Ling 6-7        | 51% | 43% | Haddock 7a    | 44% | 58% |
| Whiting 4        | 92% | 67% | Plaice 6                | 60% | 60% | Skate 6-7 (ex.c | 24% | 14% | Nephrops 7    | 43% | 53% |
| Megrim 4         | 92% | 77% | Haddock 6b              | 55% | 48% | <b>Area 7</b>   |     |     | Megrim 7      | 37% | 37% |
| Nephrops 4       | 90% | 79% | Saithe 6                | 52% | 48% | Saithe 7        | 86% | 82% | Sole 7e       | 33% | 34% |
| Anglers 4        | 88% | 65% | Sole 6                  | 46% | 65% | Whiting 7a      | 81% | 75% | Plaice 7hjk   | 29% | 3%  |
| Haddock 4        | 85% | 45% | Nephrops 6              | 34% | 43% | Plaice 7fg      | 77% | 52% | Anglers 7     | 29% | 28% |
| Cod 4            | 84% | 49% | Cod 6b                  | 30% | 28% | Plaice 7a       | 76% | 79% | Sole 7a       | 16% | 35% |
| Ling 4           | 83% | 44% | Whiting 6               | 27% | 27% | Whiting 7b-k    | 70% | 45% | Skate 7d      | 10% | 14% |
| Skate 4          | 65% | 27% | Megrim 6                | 23% | 23% | Cod 7d          | 67% | 71% | Cod 7b-k(ex.c | 0%  | 0%  |
| Saithe 4         | 62% | 11% | Haddock 5b6a            | 9%  | 0%  | Haddock 7b-k    | 66% | 53% | Cod 7a        | 0%  | 0%  |
| Tusk 4           | 54% | 0%  | Anglers 6               | 0%  | 19% | Sole 7fg        | 60% | 59% | Sole 7d       | 0%  | 0%  |

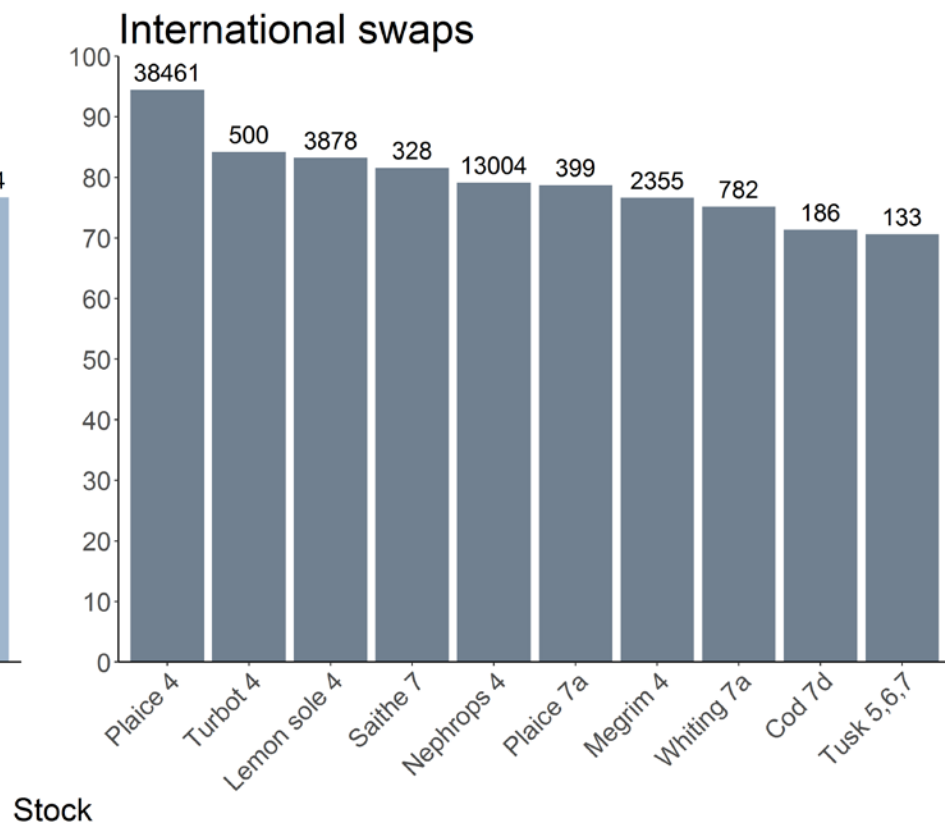
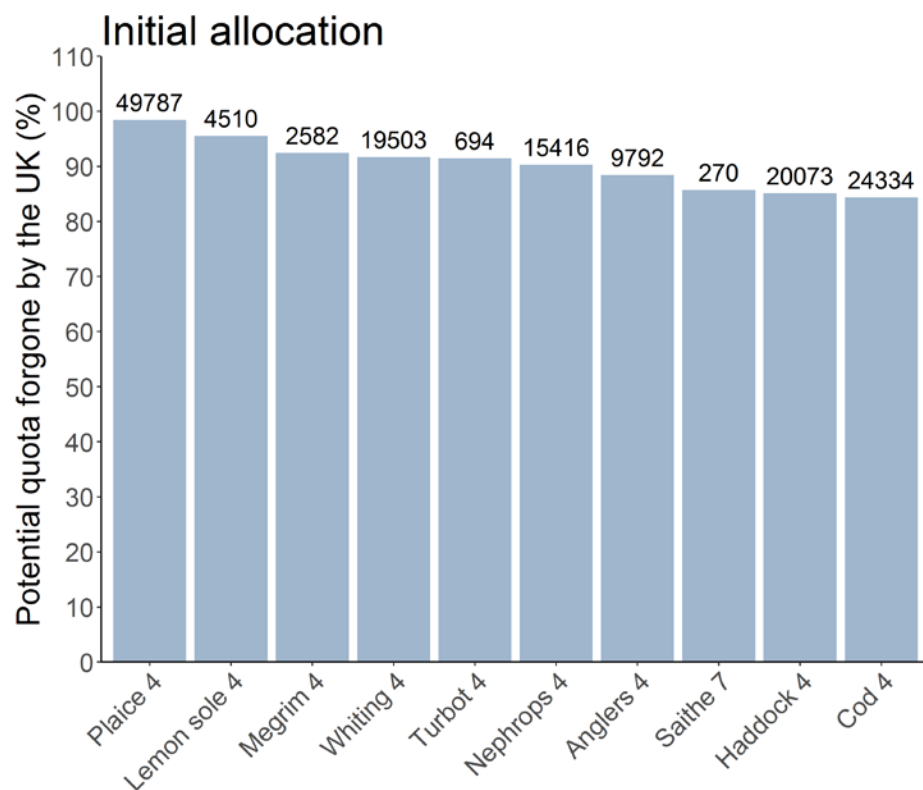
 UK catch quota fully used (around 0%)  
 UK catch quota used around 5

 UK catch quota unused between 50-90%  
 UK quota unused >90%

**Main chokes**

# Results

## Q2: % Potential catch quota foregone due to choke (Top 10)



Stock

## Conclusions

- **Q1:** According to **S2** in 2019,
  - the total estimated quota **deficit is estimated to be 21,726 tonnes** (8% of total UK demersal quota)
  - this compares with an estimated **UK quota surplus of 52,068 tonnes** (made up from stocks which the UK fleet would not take).

*Equivalent values for when international movement is excluded are also presented in the report.*



## Conclusions

- **Q2:**
  - *With current levels of international quota movement, up to three-quarters of the quota for each stock would not be taken due to the fisheries reaching choke points*
  - *overall, foregone catches are estimated to be approximately 50% of the total UK demersal quota*
  - *in the absence of international quota swaps, this figure is 73%*



**Foregone catches:**  
**S2: 50%**  
**S1: 73%**

## Additional choke mitigation measures (not included in the current model)

- De minimis (possibly combined)
- Survivability (assumed only for skates in the model)
- Inter species flexibility
- Removing TACs/management measures (e.g. common dab/flounder TAC in NS was removed in 2017)
- Area flexibility/realignment (e.g. of hake stocks swaps between hake NS vs WS&Area7)
- Avoidance and selectivity
- Others (will be included in the white paper by Government)

# Questions?

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