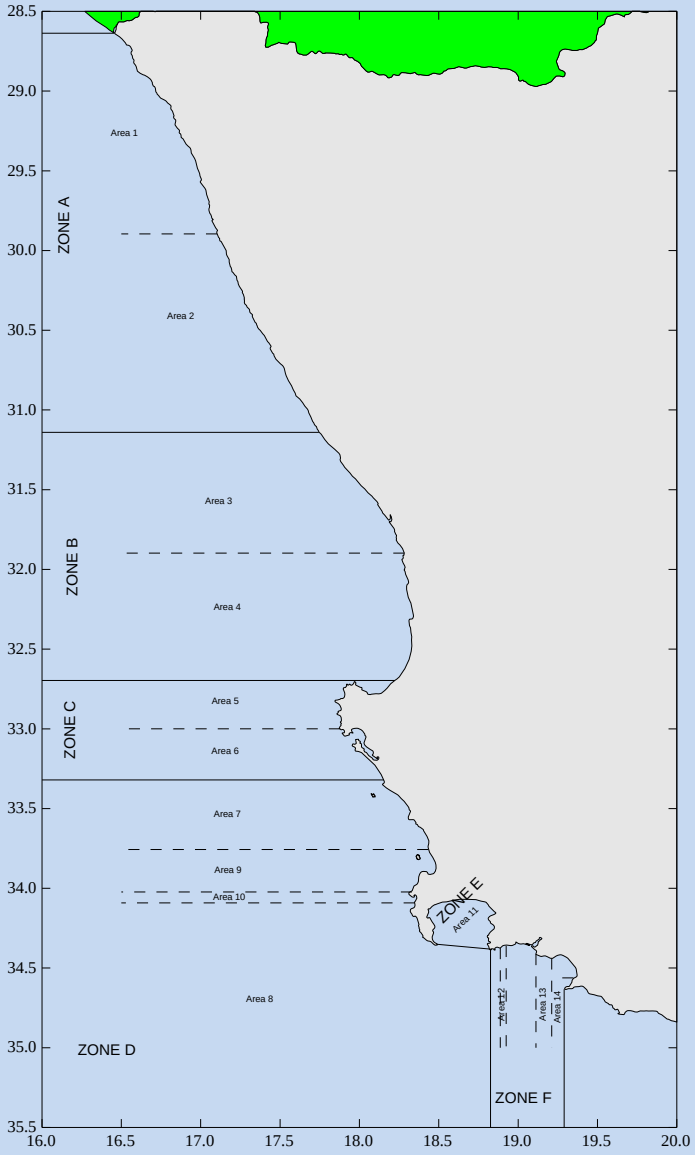
West Coast Rock lobster fishery: 2018 updated assessments and

- *Jasus lalandii*
- *<200m depth*
- *Slow growing long lived*
- *Very depleted (2-3% K)*
- *Commercial fishing ~1880s*
- *Sectors:*
  - *Offshore commercial*
  - *Nearshore commercial*
  - *Interim relied/small scale*
  - *Recreational sector*

estimation of the extent and trends of poaching



Current Management

- Minimum size limit (currently 75mm CL for commercial and 80mm CL for recreational)
- Gear restrictions (traps offshore, hoopnets inshore)
- TACs (more recently also effort limitations to combat poaching)
- Closed seasons and restriction on retention of berried females
- Subdivision into management zones and MPAs: fishery split into five super-areas for assessment purposes (A1+2, A3+4, A5+6, A7 and A8+).
- So GLOBAL TAC needs to be split between the five super-areas and the different sectors.

Since 1997 – TACs set annually through application of OMP

- 4 OMPs since
- BUT: in 2016 – the updated assessment + re-evaluation of poaching

↓

poaching found to have doubled over last three years

and main area A8+ showed 50% abundance drop in last 5 years

↓

resource outside the range the OMP had been simulation tested

↓

"Exceptional Circumstances"

- Therefore: "best estimate projections" used to recommend TAC

DATA available

Data are collected and analysed at the super-area level (5 super-areas) – a previous Panel recommended to treat these as separate stocks.

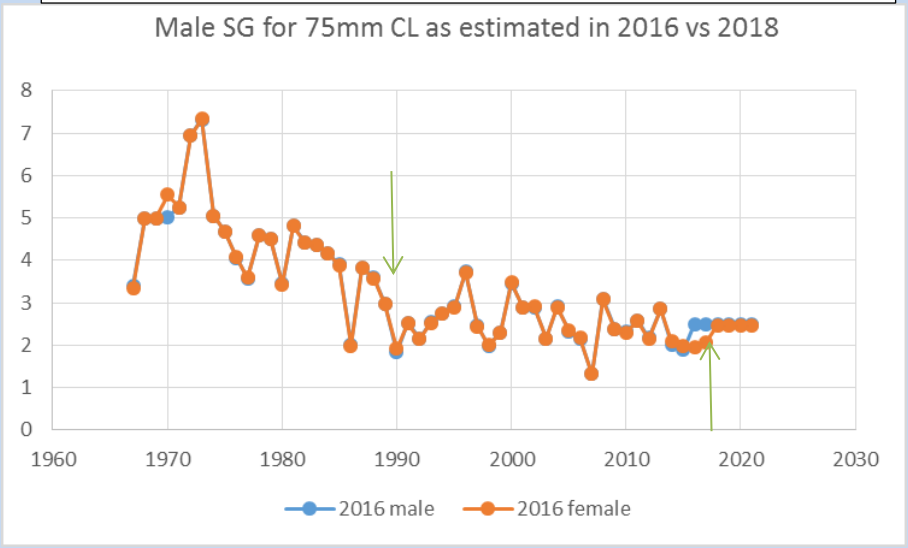
1. Commercial catch data 1910+
2. Recreational catch data 1992+ (telephone surveys)
3. Poaching estimates: assume poaching started in 1950 (zero poaching before then)
4. Trap:hoopnet ratios for sources of catches
5. CPUE
    - Trap CPUE 1981+ (A3+4, A7, A8+)
    - Hoopnet CPUE 1986 (A1+2, A3+4, A5+6, A8+)
    - FIMS CPUE 1992 (A3+4, A5+6, A7 and A8+)

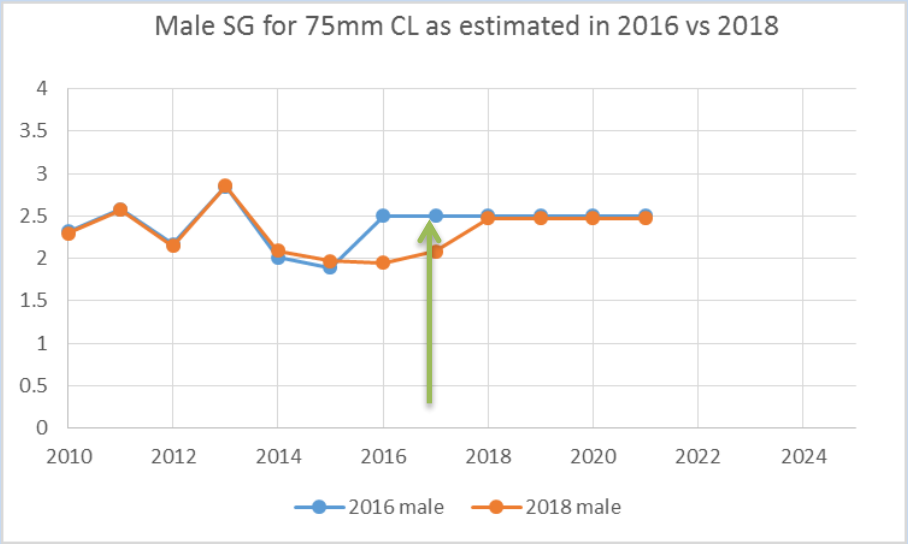
6. Catch size structure (none since 2008)
   - males and females separately
   - 5mm size classes
   - Traps (deeper water) and hoops (shallower water) since 1976
   - FIMS (Fishery Independent Monitoring Survey) since 1992 (uses smaller mesh size than commercial gear)

   [Note: Minimum legal carapace length : 75 mm carapace length]
7. Percent females in catch (F%)
8. Somatic growth estimates
   - A moult probability analysis is applied to tagging data to estimate somatic growth
   - From 1968 from all super-areas

Somatic growth rate for A8+

(with future projections assumed)

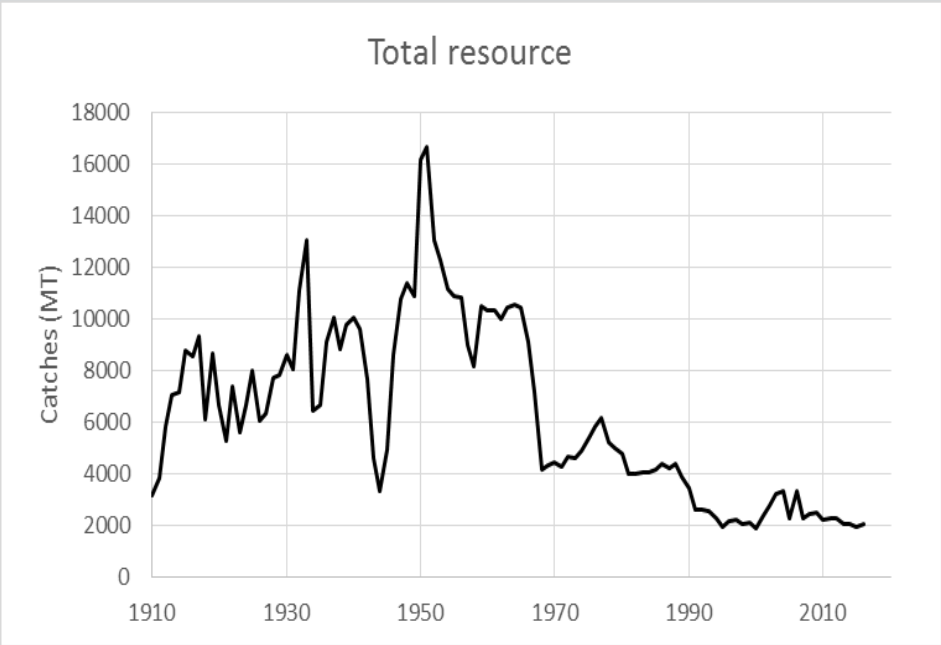


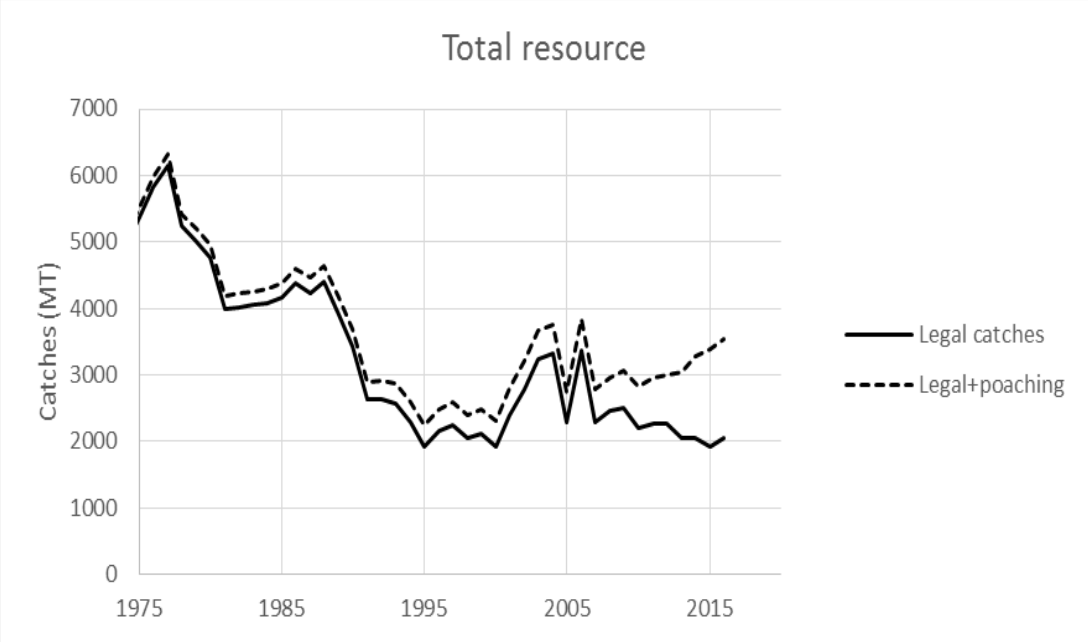


Stock assessments – updated in 2018

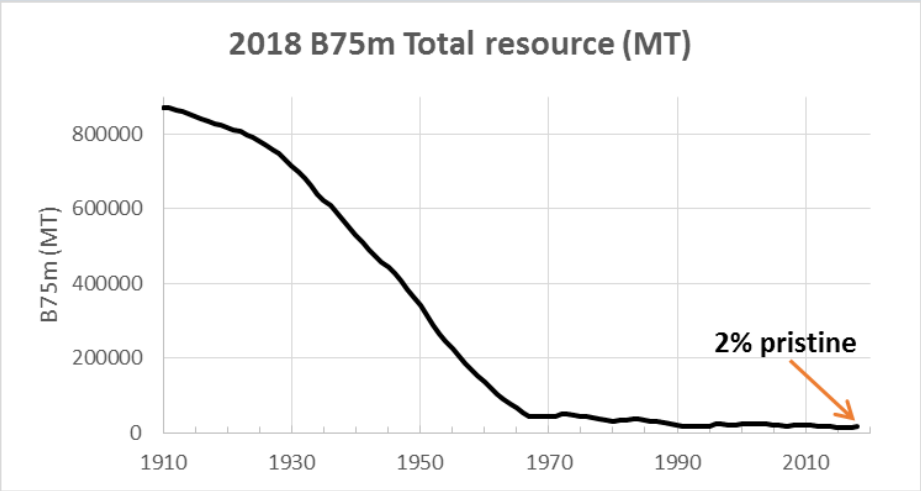
- Length based model (at 1mm intervals)
- Different assessment for each of five super-areas as per previous Panel recommendation
- Concentrate on male biomass above legal size limit (B75m) (females hardly get larger than this size)
- Took into account three different poaching scenarios (that effect the past).

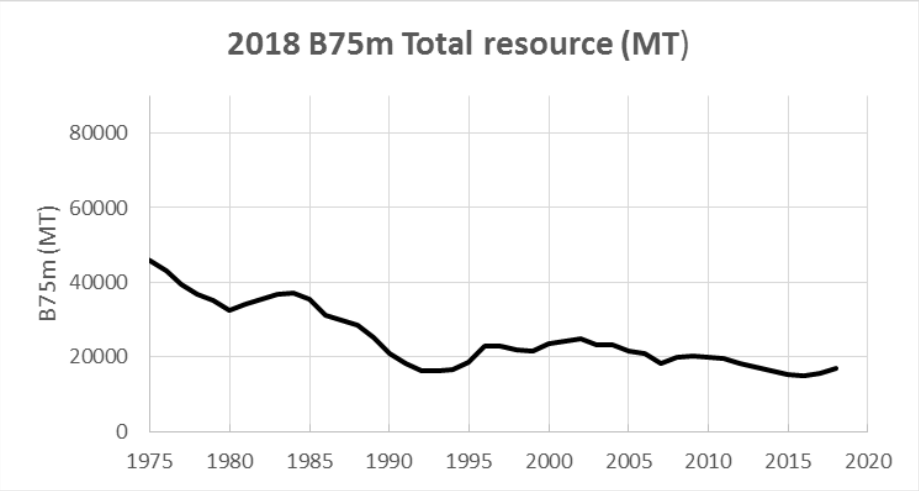
Historic Catch for resource as whole





Updated 2018 assessments

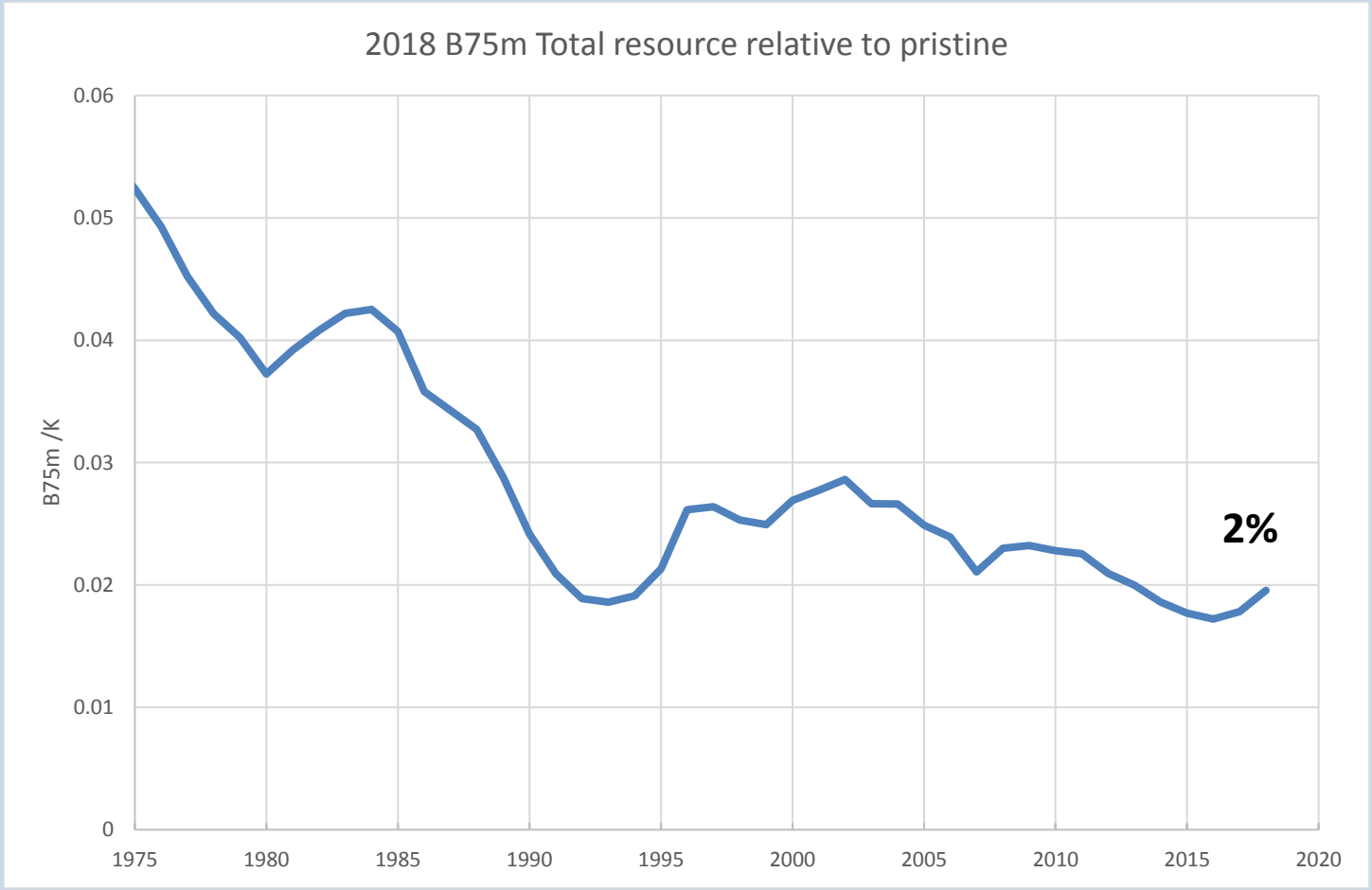




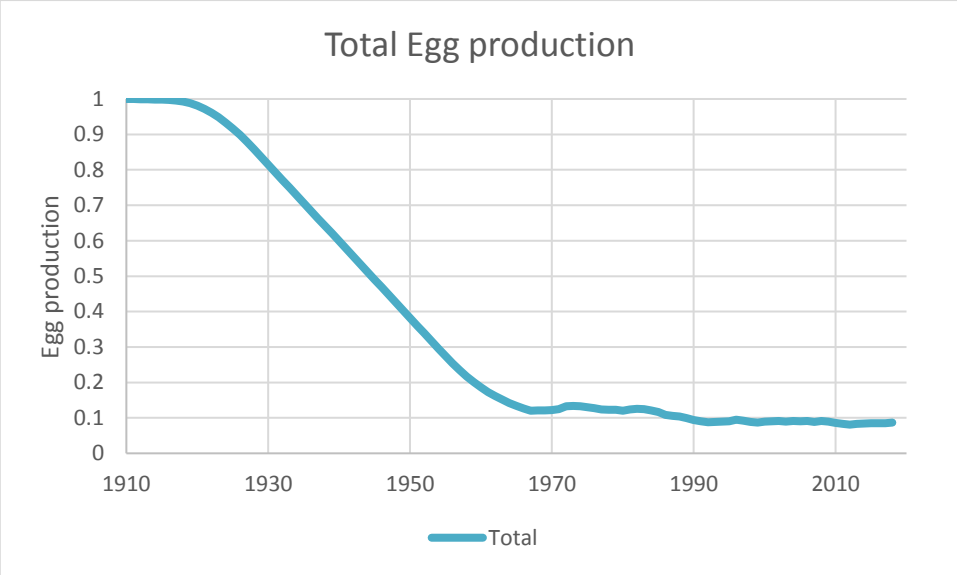
In 2016 the assessments had already shown:

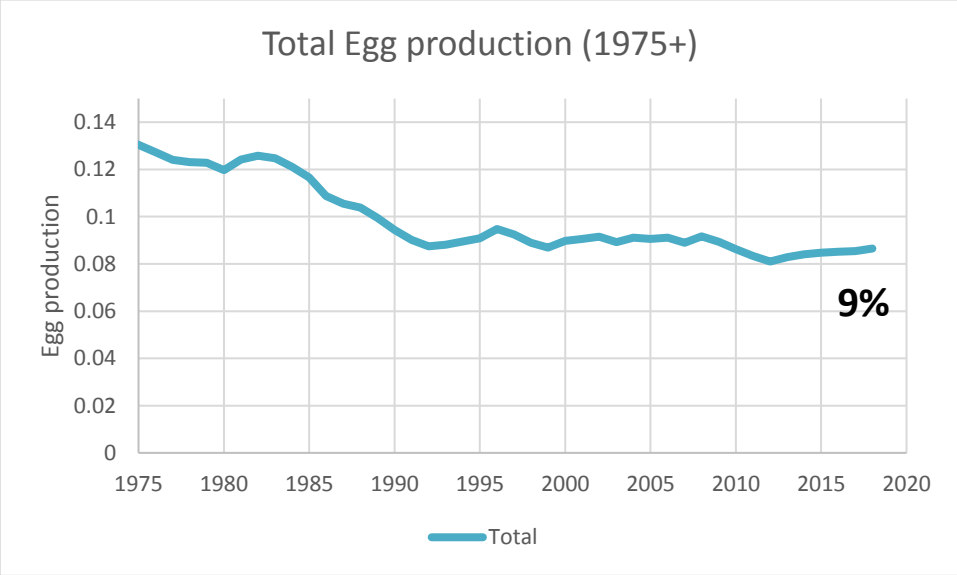
- Resource is about 20% less abundant than previous thought
- Decline in abundance by about 20% over the last five years
- Super-area 8 had declined by 50% over this five year period
- Even in absence of any future catches – resource is would not be able to reach the 35% biomass increase target for 2021 compared to the 2006 baseline – best assessment projections for advising on TAC

B75m relative to pristine

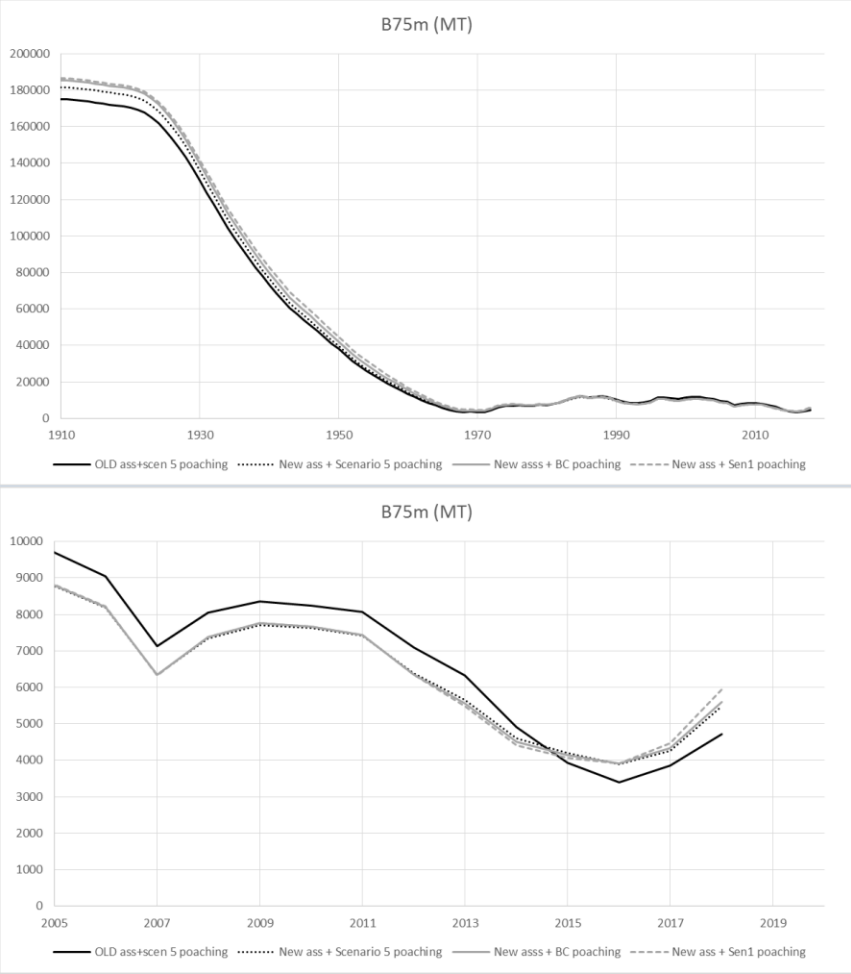


Egg production relative to pristine





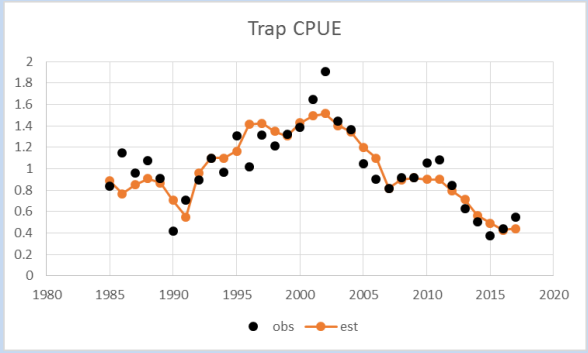
Comparison of estimated A8+ B75m (MT) trends for four of the assessments. Note that "Scenario 5" refers to the 2016 BC poaching scenario, and "OLD" refers to 2016.

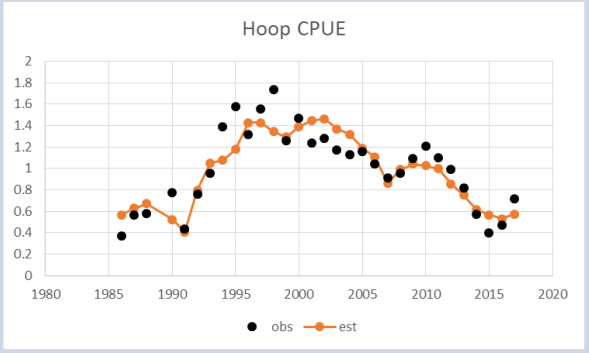


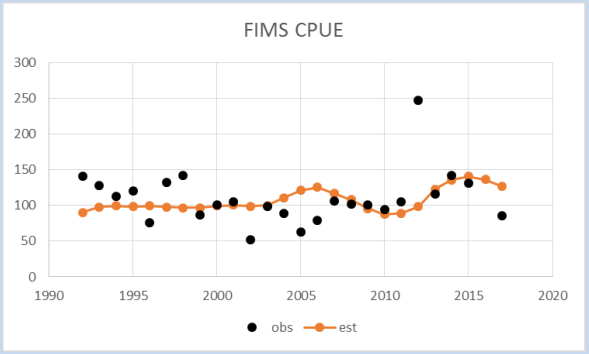
Comment

The various poaching scenarios do not have a great impact on the past i.e. to the assessment of the resource in each area

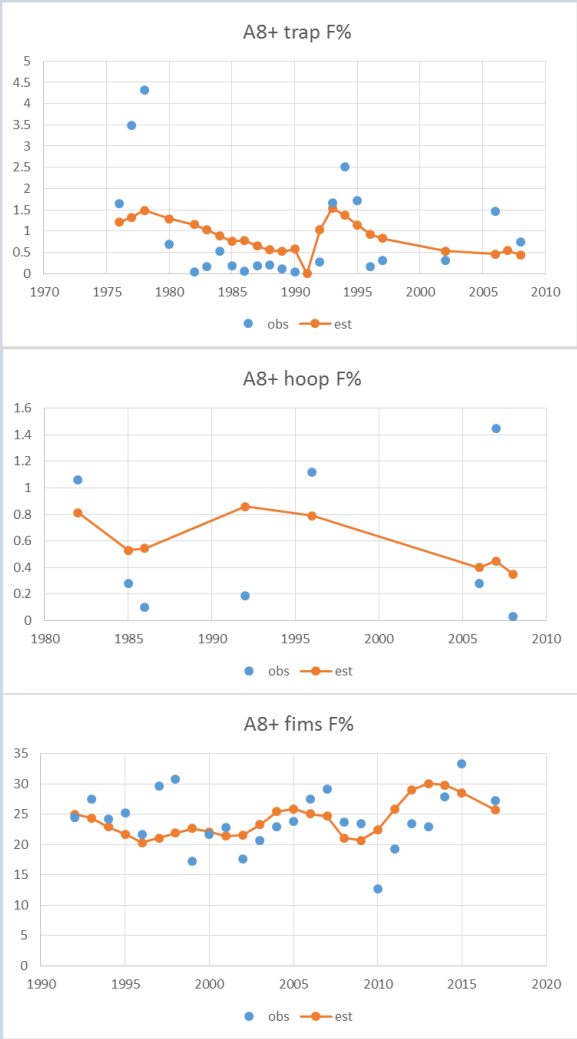
Updated 2018 fits to GLM standardised CPUE data for BC poaching scenario for A8+.



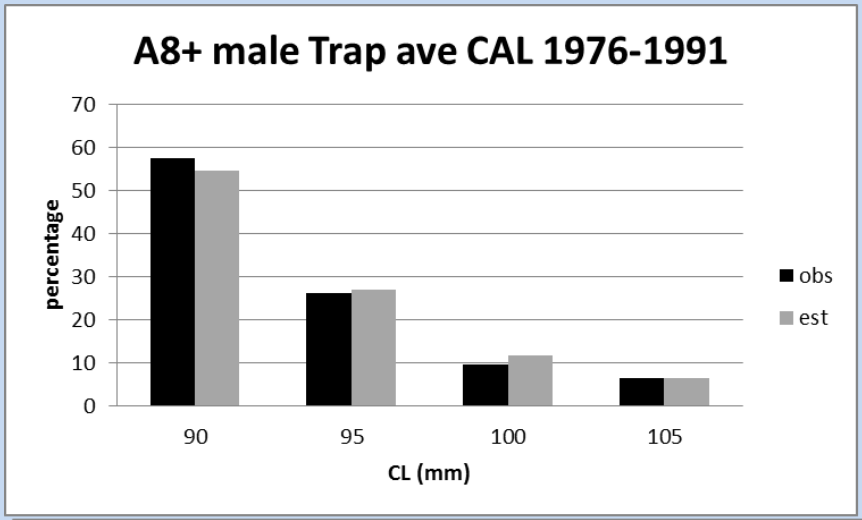


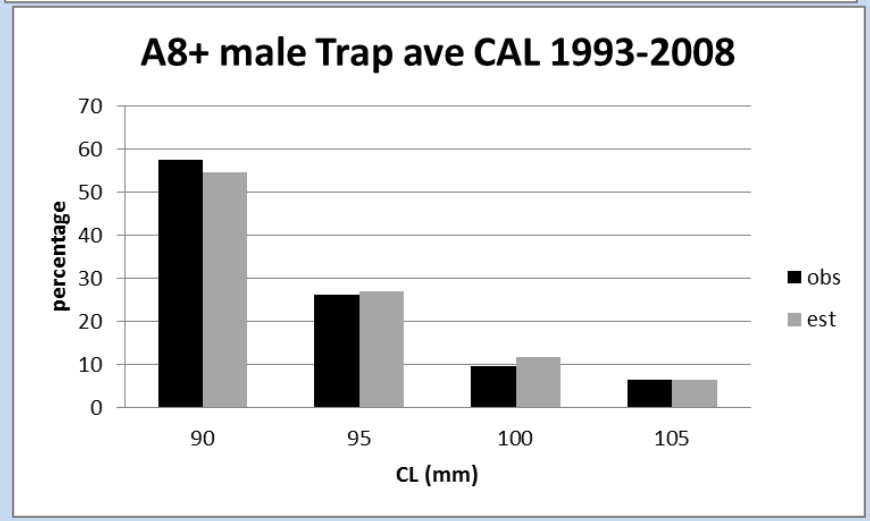


2018 model fits for percent females in the catch for A8+. (BC poaching scenario).

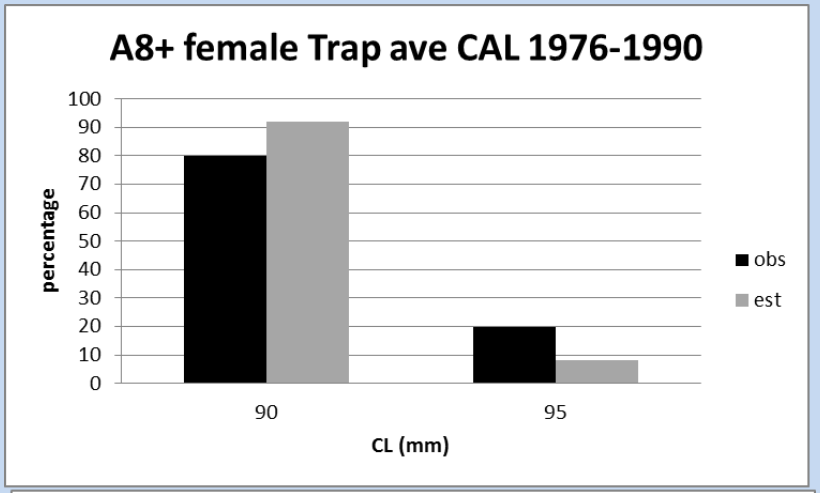


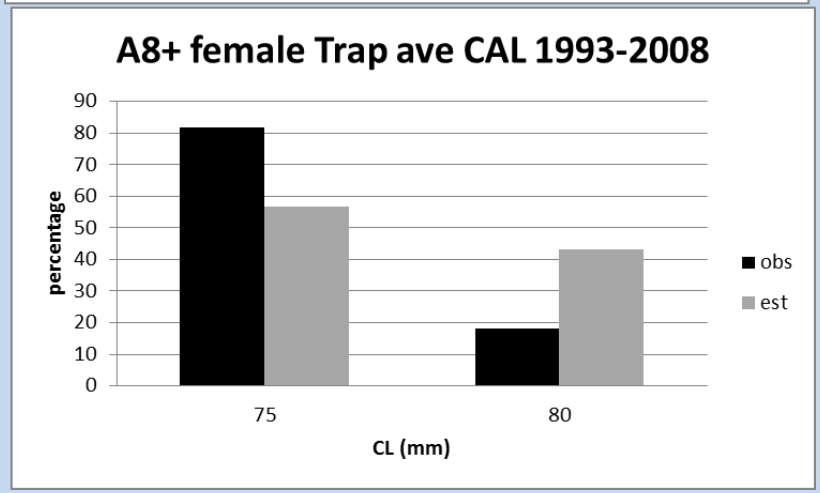
A8+ fits BC TRAP male CAL fits.



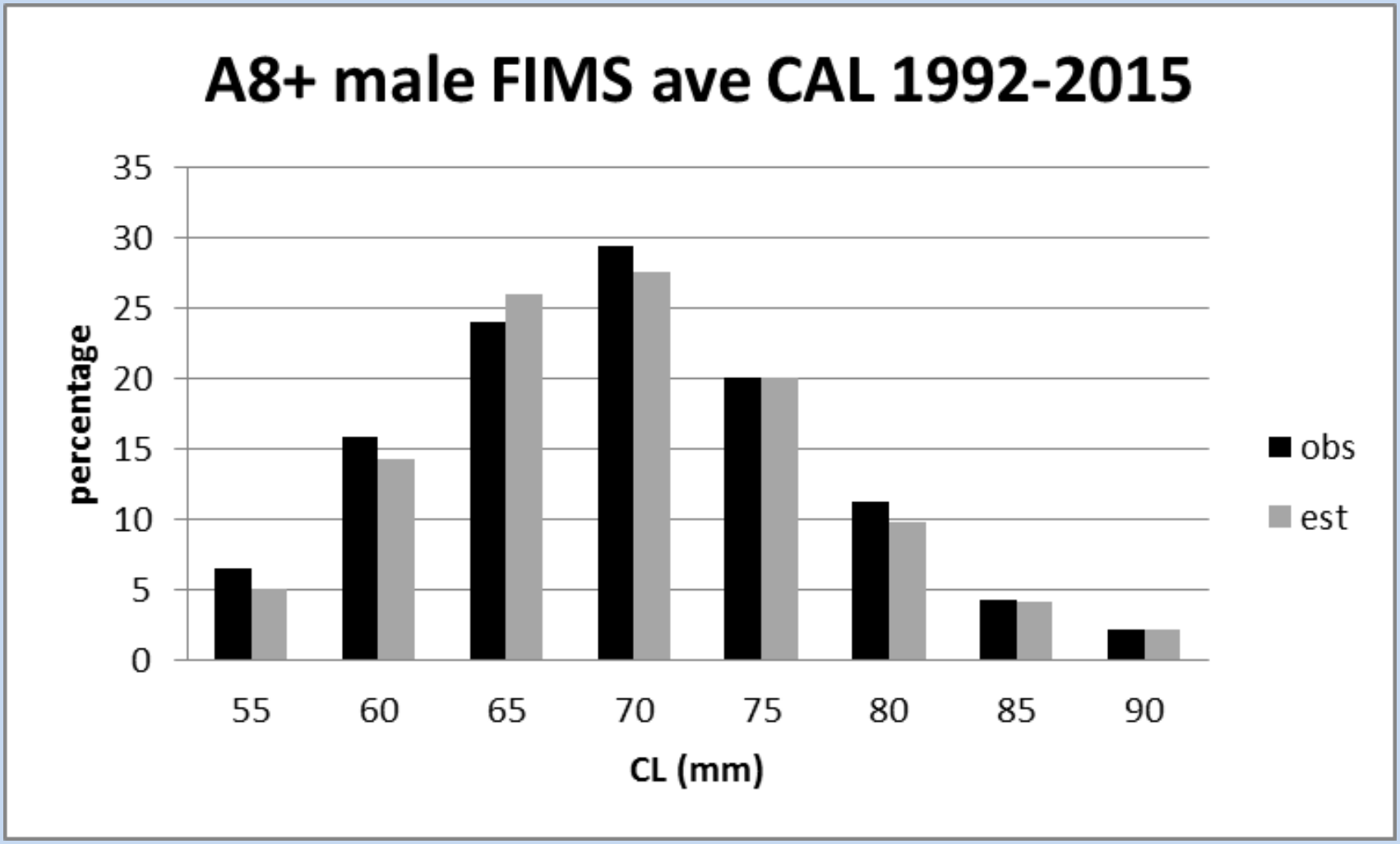


A8+ fits BC TRAP male CAL fits.

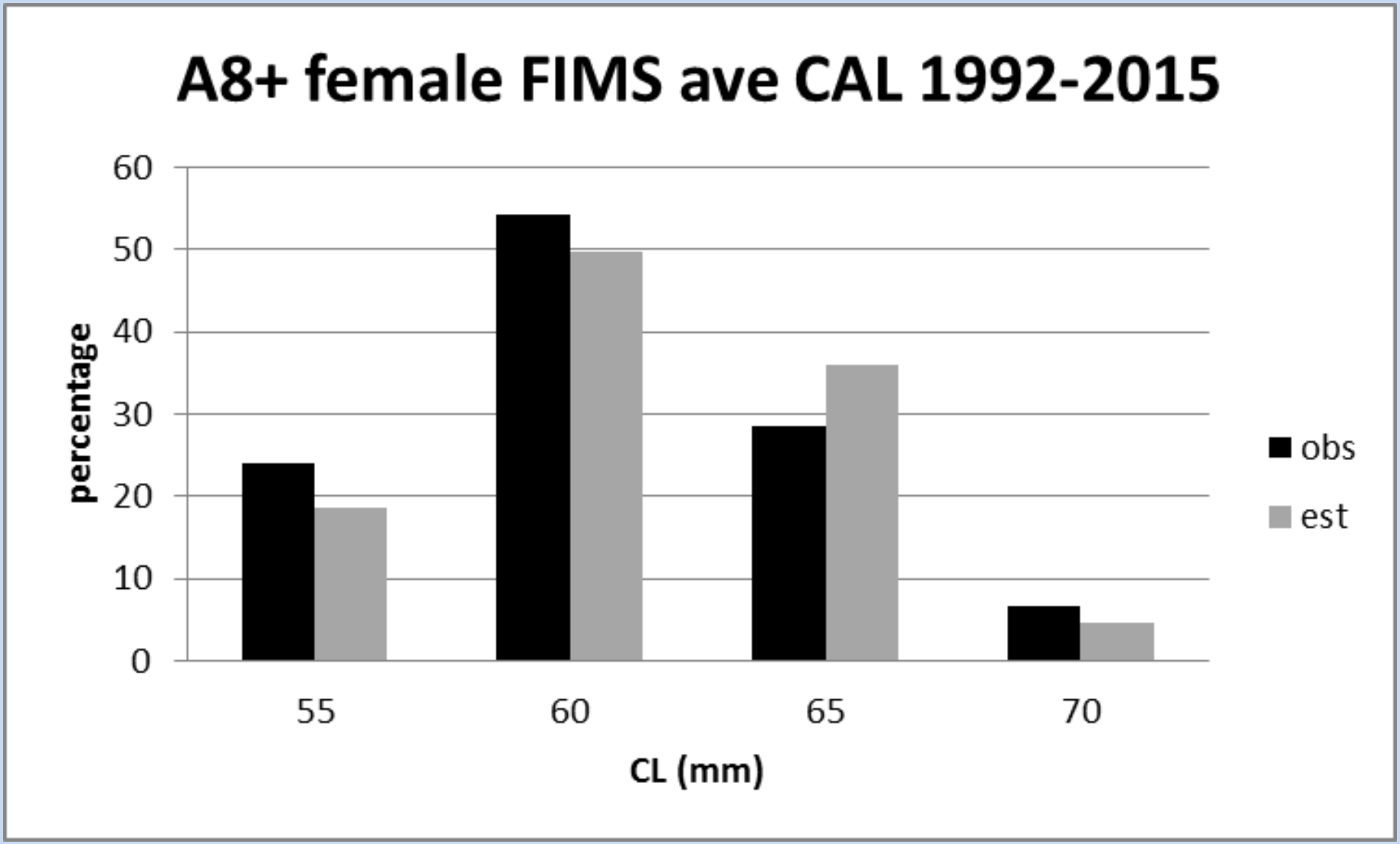




A8+ fits BC FIMS male CAL fits.



A8+ fits to BC FIMS females CAL.

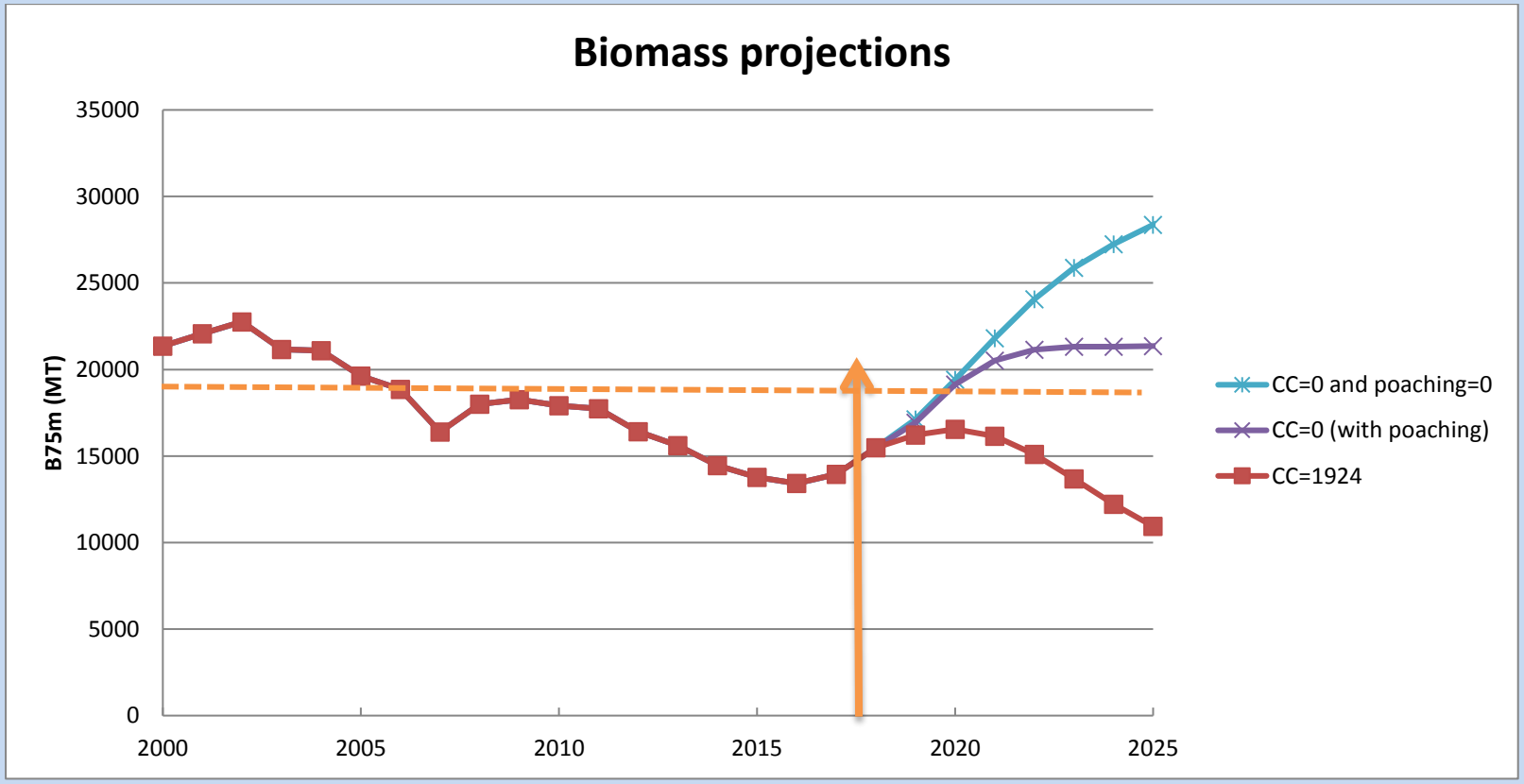


Comparison between super-area and total resource B75m(2018)/B75m(1910) and Egg production/B75m(1910)

2018/1910	**A1+2**	**A3+4**	**A5+6**	**A7**	**A8+**	**Total**
B75m	2.1%	2.0%	1.3%	0.9%	3.0%	**1.8%**
Egg production	3.1%	4.5%	2.9%	4.1%	23.2%	**8.6%**

Projections of the resource for a range of future constant catch and poaching scenarios

Knowing what past and future poaching scenarios are plausible is VERY NB!!!!



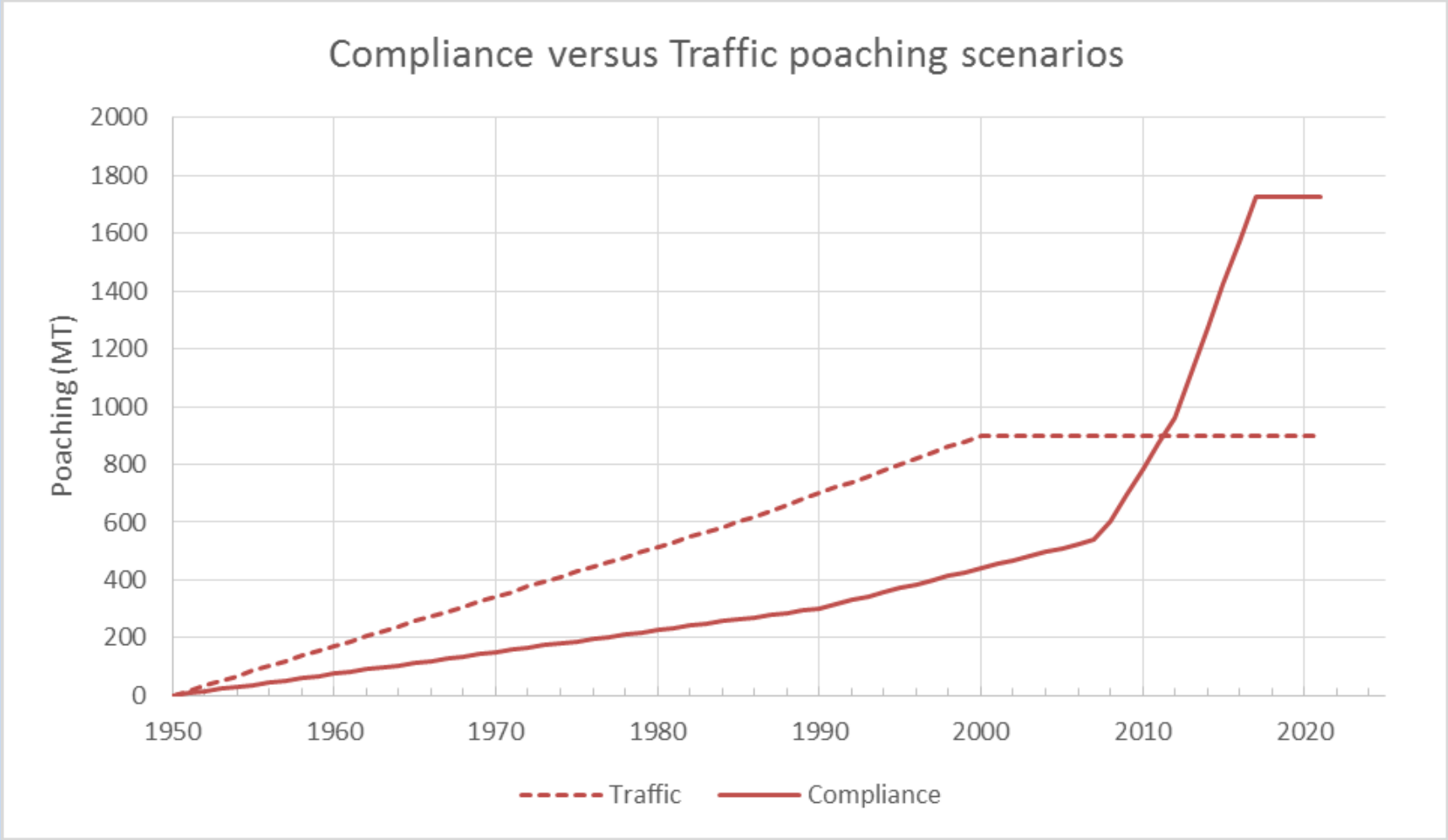
Note: 1924 MT was the 2015-2017 TAC

Update on Poaching analyses since Dec 2017

- **The main problem = compliance data base did not link the confiscations with the policing effort type**
- **Upon further discussions with DAFF Compliance, it came to light that there were in fact records available that linked confiscations to policing effort type. P1 gives results for the tasks listed below to analyse poaching trends given the "old" (confiscations not linked to the type of policing) and the "new" (confiscations linked to policing effort type) databases, and incorporating the recommendations from the Panel. The tasks were:**
  - Update the poaching analyses as before using the updated "old" database.
  - Run an analysis on the "new database" to obtain results for the poaching trend – this will also provide the relative efficiencies of the different policing effort types.
  - Rerun analysis on the "old" database but now using the relative effort efficiencies estimated in ii).
  - Compare the overall "trends" between i), ii) and iii).

- GLM methods are applied to the DAFF "new" compliance database in which policing effort is linked to confiscations taken as well as to the "old" compliance database on confiscations (and abandonments) and on policing effort (but restricting the analyses to policing effort types that are common with the "new" database) to estimate recent trends in the amount of rock lobster that is poached.

Comparison between the Compliance and Traffic poaching scenarios for the resource as a whole (Super-areas 3 to 8+).



- The results in the previous figure are clearly different for the two scenarios.

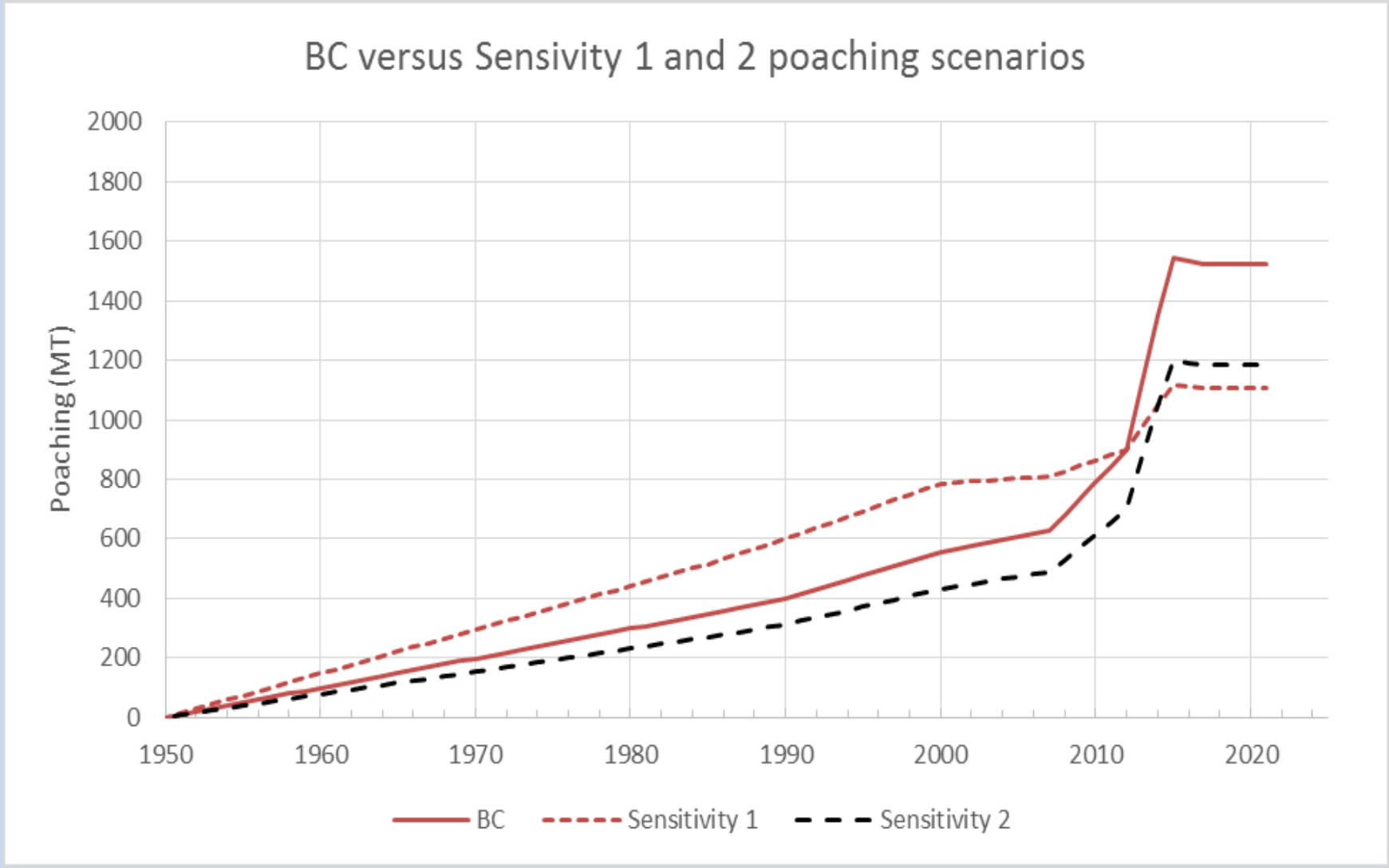
- The TG agreed that neither would reflect the true situation: the TRAFFIC scenario fails to take account of likely growing illegal sales on the local market, whereas the Compliance scenario may be more reflective of that local trend than of the trend for all the components of the illegal catch.

- The TG therefore considered that reality likely lies between the two scenarios shown in the previous figure, and that they needed to be weighted to provide a more realistic result.
- The majority of the TG favoured giving a 75% weighting to the Compliance scenario, but there was a minority view that it should receive only a 25% weighting. The TG consequently agreed on a Base Case (BC) time series and a Sensitivity to that as shown below for use in updating assessments:

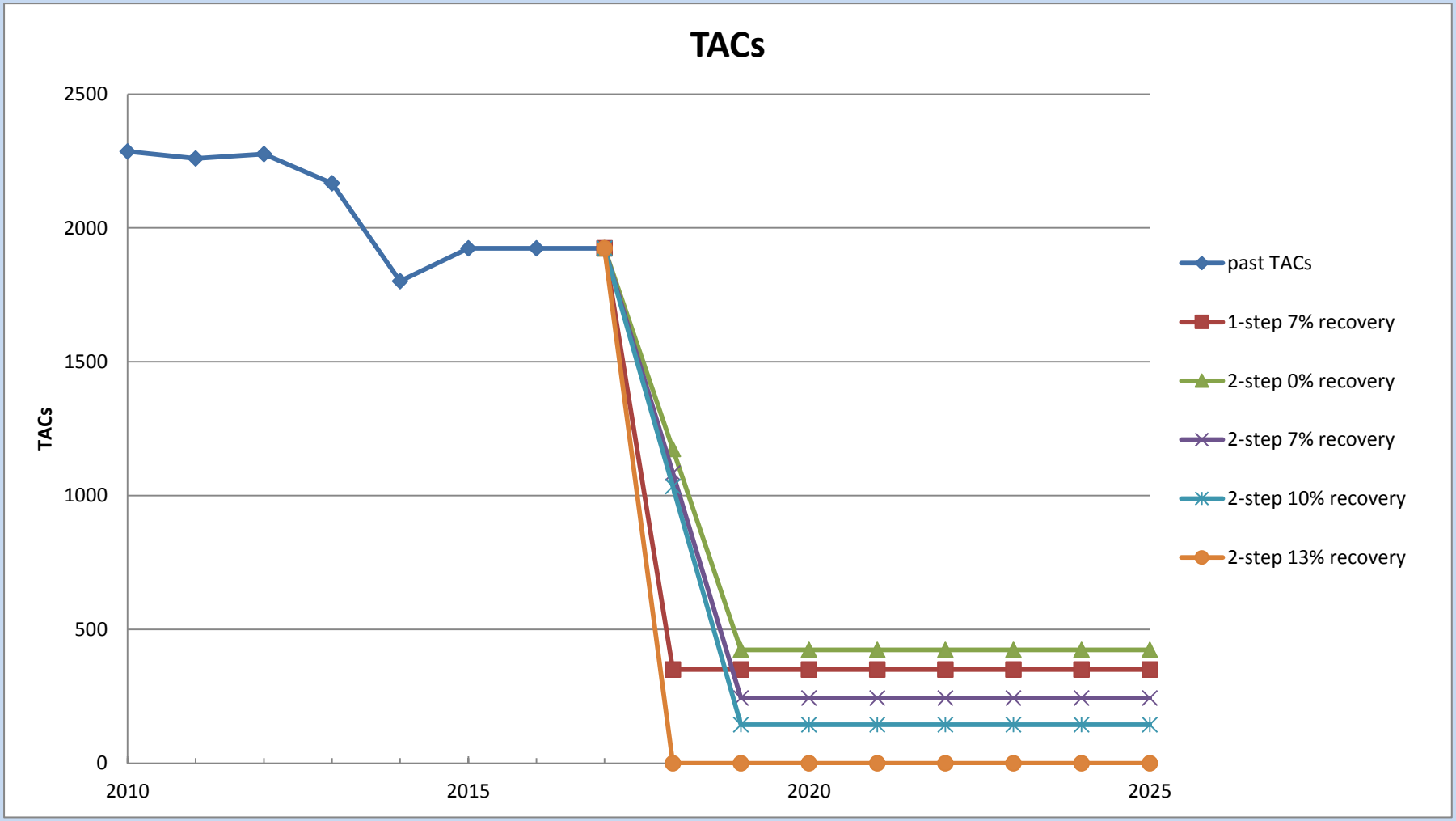
BC: Gives 75% weight to the compliance trend and 25% weight to the TRAFFIC trend.

Sensitivity 1: Gives 25% weight to the compliance trend and 75% weight to the TRAFFIC trend.

Sensitivity 2: In the light of arguments put forward relating to the interpretation of the TRAFFIC data, the TG agreed to a further Sensitivity which replaces the 900 ton absolute take value used to develop the original two Scenarios by 700 tons, by down-scaling all BC values by the ratio 700/900.

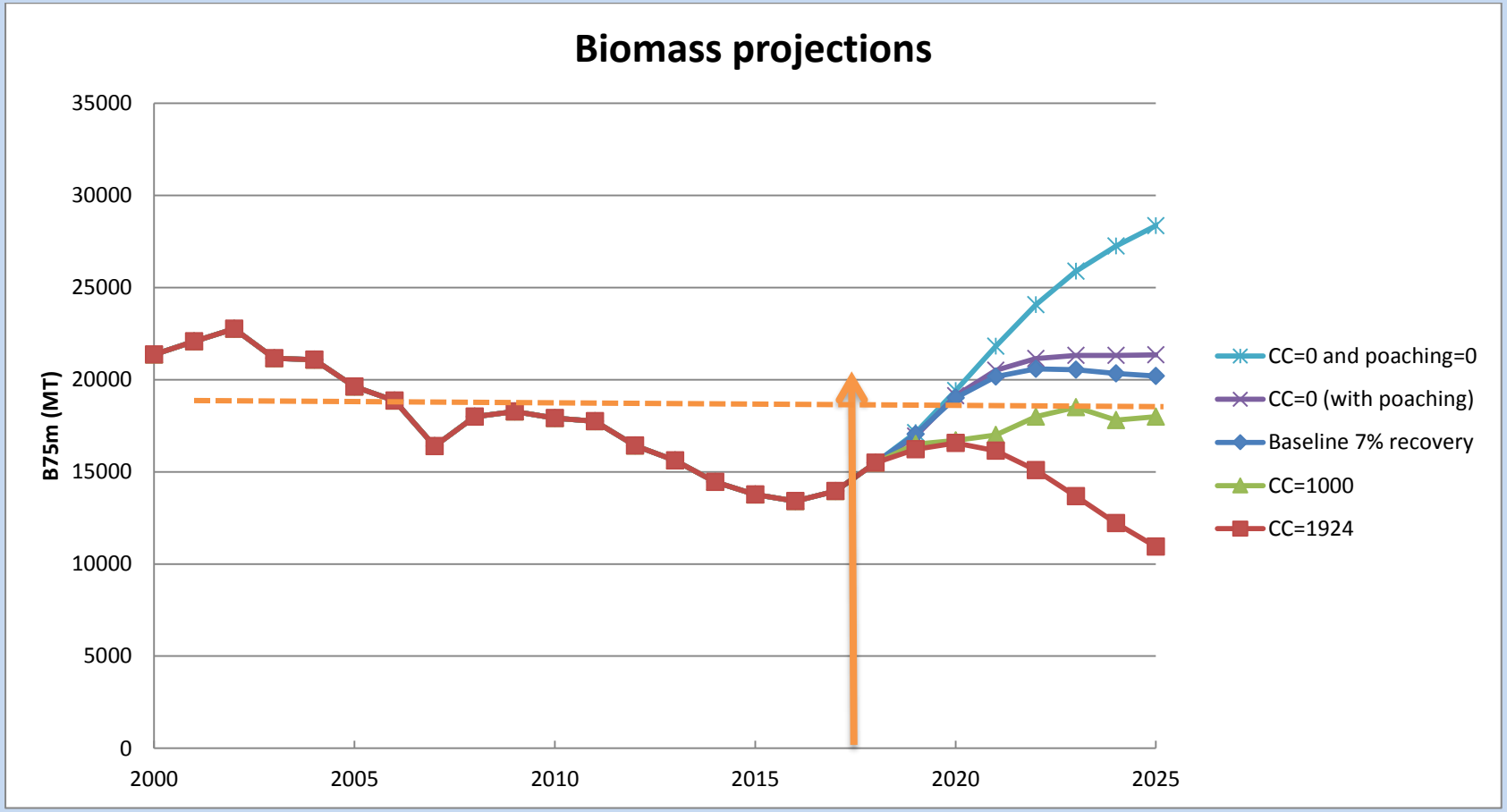

BC versus Sensivity 1 and 2 poaching scenarios
Poaching (MT)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
1950
1960
1970
1980
1990
2000
2010
2020
BC
Sensitivity 1
Sensitivity 2

Future legal TAC scenarios for which results will be presented

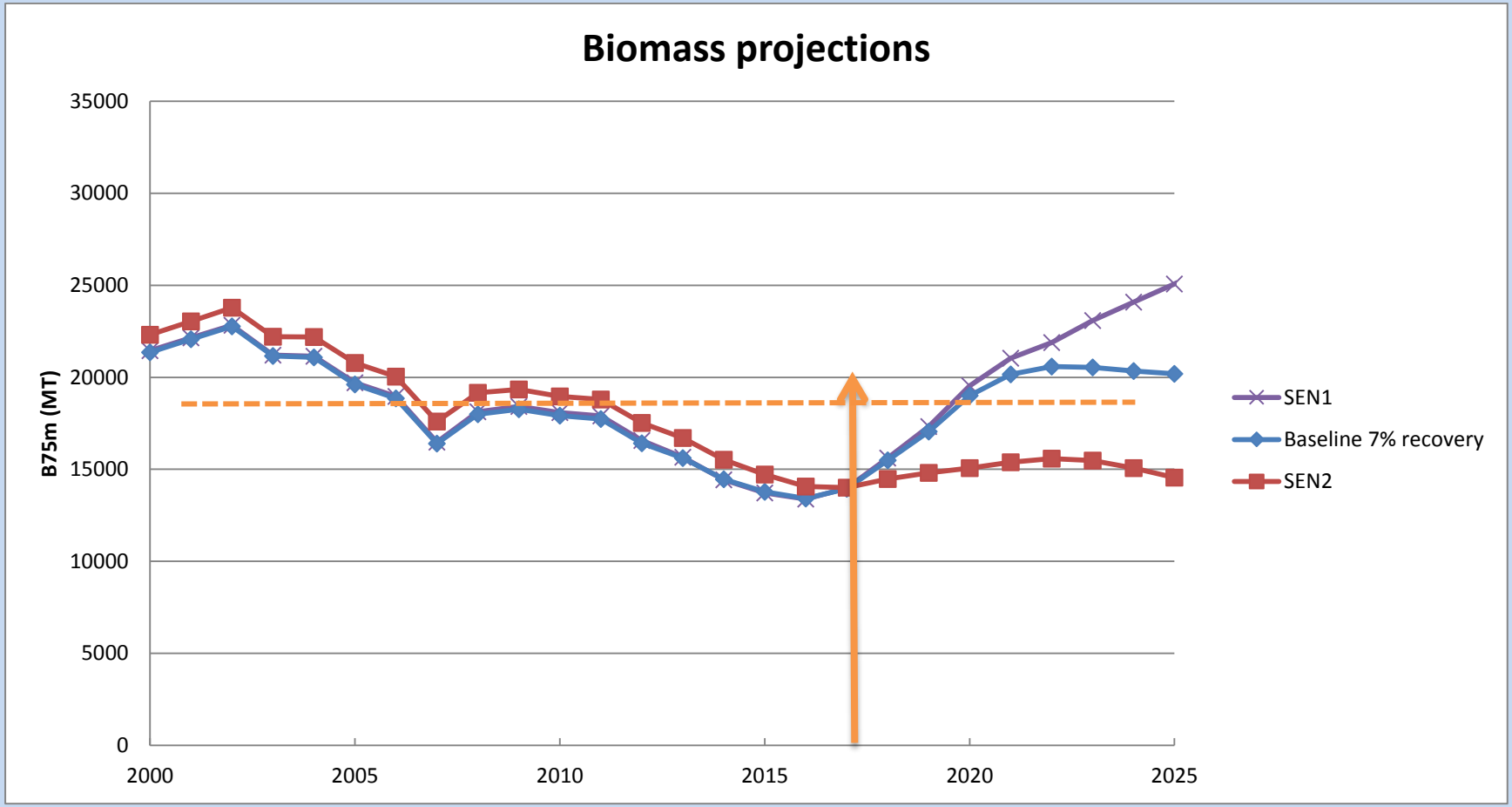


Projections of the resource for different catch and poaching scenarios

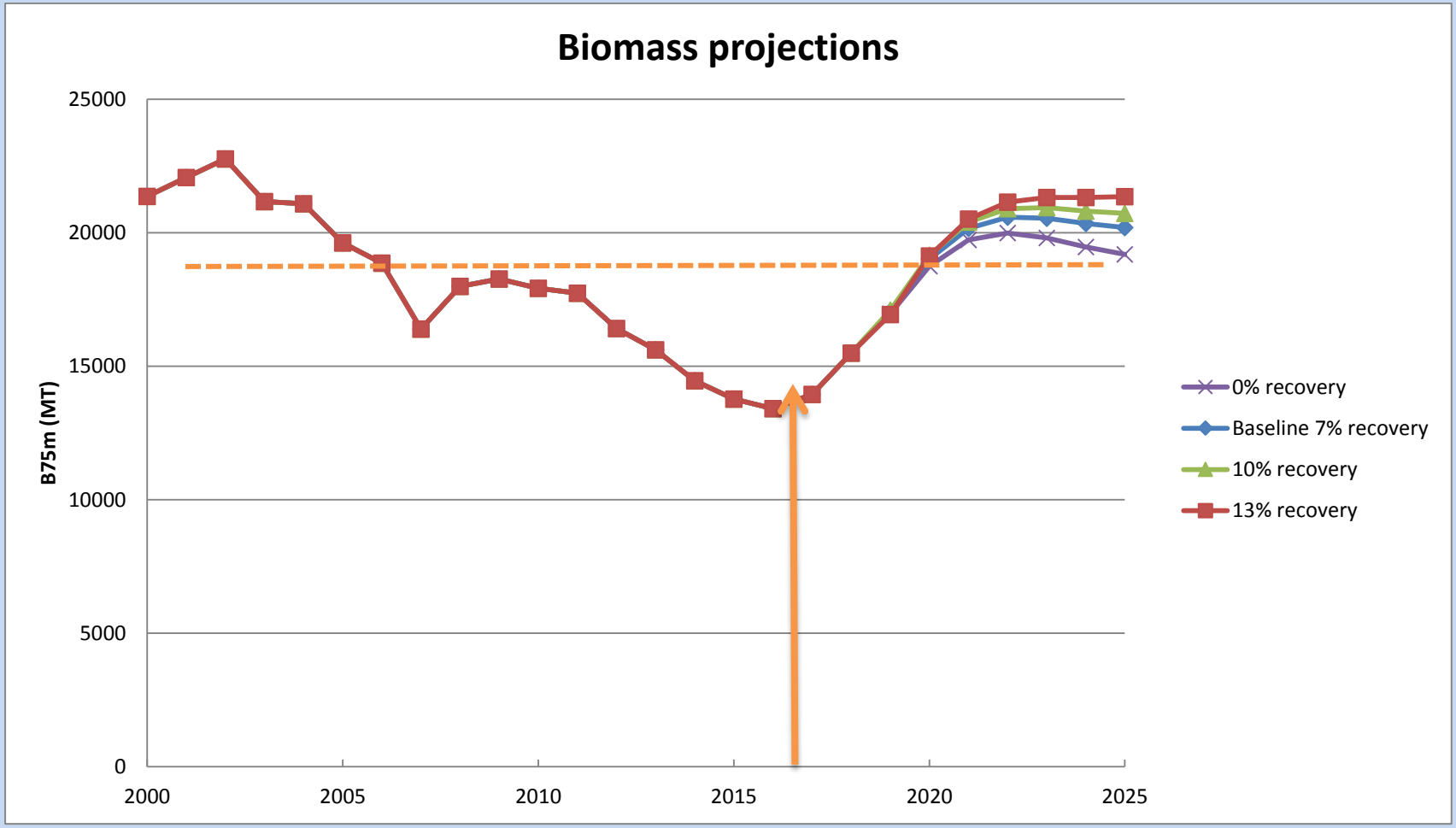
Baseline 2-step 7% recovery compared with zero, 1000 MT, and 1924 MT constant catch (CC) trajectories (1924 corresponds to the TAC over 2015 to 2017) as well as zero commercial catch AND zero poaching for 2018+. Here and below the horizontal orange dashed line is the 2006 baseline compared to which percentage recovery is quoted, and the vertical line shows that year (2018) from which projections commence



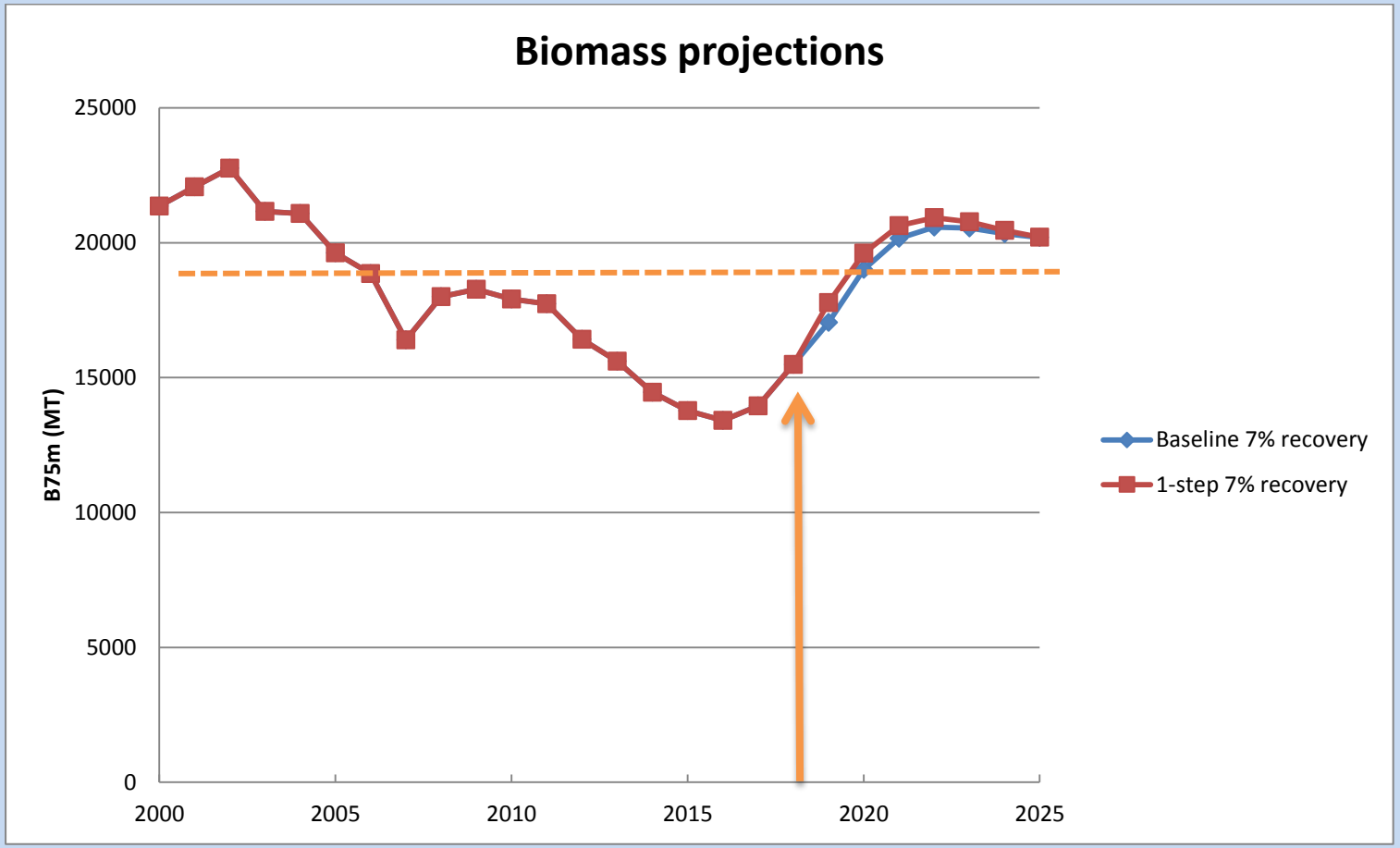
Baseline 2-step 7% recovery compared with 2 alternate poaching scenarios – SEN1 and SEN2.



Baseline 2-step 7% recovery compared with 0% recovery, 10% recovery and 13% recovery (all 2-step). 13% is the "maximum possible" (zero commercial catch, but unchanged poaching).



Baseline 2-step 7% recovery compared with 1-step 7% recovery



Baseline 2-step 7% recovery: 2018 TAC=1084 MT, 2019+ TAC = 244 MT

1-step 7% recovery: TAC 2018+ = 350 MT

Questions to the Panel

1) Have the Panel's 2017 recommendations about the analysis of the compliance data to estimate poaching trends been appropriately addressed? (MARAM/IWS/WCRL/P1)

2) Have updated assessments of the resource and projections been carried out appropriately? (MARAM/IWS/WCRL/P2 and P3)

3) How could these assessments be improved, with prioritised suggestions related to data and to analysis methodology? (MARAM/IWS/WCRL/P3 – see particularly the Assessment shortfalls section)

4) Have updated resource projections under alternative future levels of catch (both legal and illegal/poaching) been carried out appropriately? (MARAM/IWS/WCRL/P4)

5) How might such projections be best improved methodologically in future, including in particular taking account of stock-recruitment effects? (MARAM/IWS/WCRL/P5)

6) In the current situation, what schedule would be appropriate to return to an OMP basis for management recommendations, and how should future data/indices on poaching best be treated in this process? (MARAM/IWS/WCRL/P5)

Suggestions for future improvements to assessments and management approach

- At present recommendations for TACs are being based on deterministic projections of a “best” assessment.

- This approach needs to be expanded to provide probability envelopes about these projections to take account of major uncertainties.

- Following that, decisions will be required on when to move back to an OMP as the basis for TAC recommendations.

- The main matters needing consideration in this process include whether or not poaching index values for future years should be input to harvest control rules.