REPORT OF THE 23rd MEETING OF THE SCIENTIFIC COMMITTEE

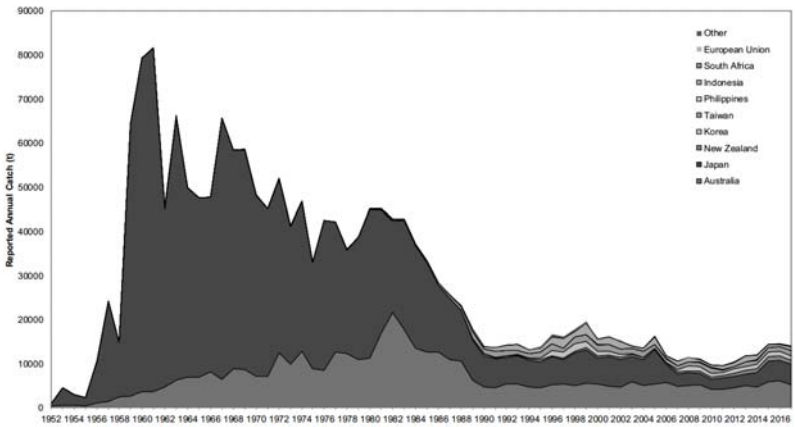
San Sebastian, Spain, 3-8 Sept 2018

Main topics

- Review of SBT fisheries and fisheries indicators
- Results of Scientific Research Programme
- Evaluation of exceptional circumstances
- SBT stock status and management advice
- Development of new MP
- Update of Scientific Workplan
- Replacement of Independent Panel member

Review of SBT Fisheries and Fisheries Indicators

Reported SBT Global Catches 1952 – 2017



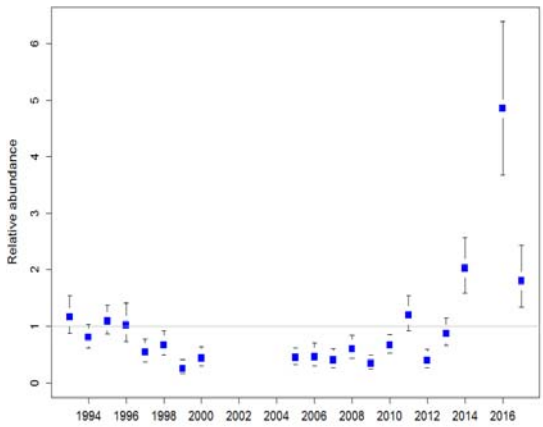
Reported southern bluefin tuna catches by flag, 1952 to 2017

Indicators

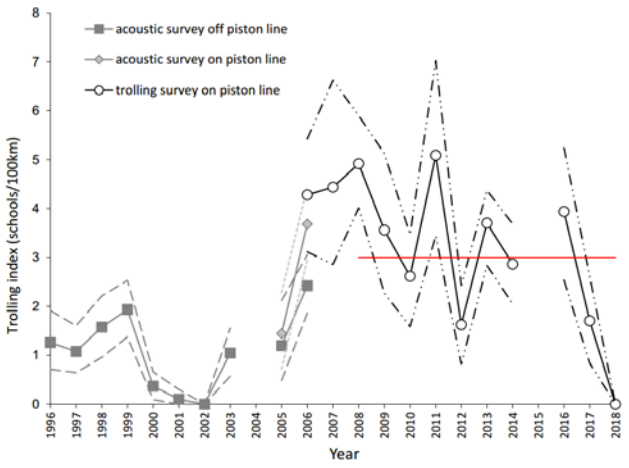
Juvenile indices in the GAB

- Both primary indicators of juvenile (ages 1-4) abundance (Aerial survey [AS] and trolling) indices decreased in 2017; 2018 not yet clear
- 2016 AS index highest on record and 2017 index higher than average – but no AS survey for 2018 (is being replaced by gene tagging)
- 2017 trolling survey index below 2006 – 2016 average and 2018 index zero as no fish caught
- Indicators of age 4+ SBT CPUE for NZ domestic LL fishery increased in 2016 and again in 2017
- First data point from gene tagging indicates age 2 in 2016 similar to that estimated in 2017 stock assessment

Aerial Survey Indicators



Trolling Survey Indicators

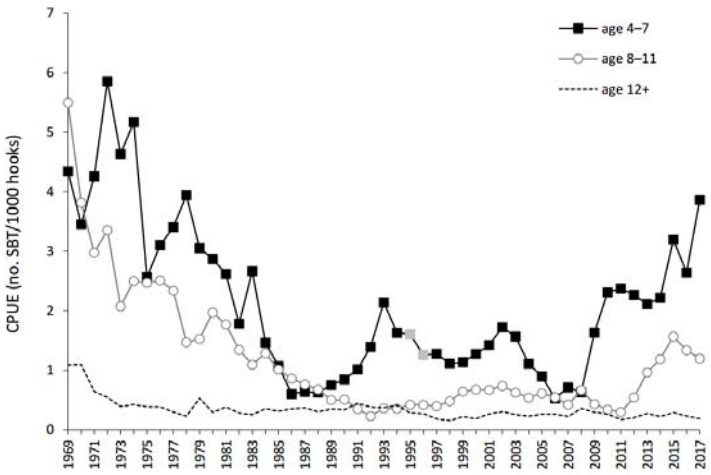


CPUE Indicators

Longline CPUE

- Longline CPUE indices for the Japanese fleet for age 4 to 7 are well above the historically lowest levels in the late 1980s or mid-2000s
- CPUE index for ages 8 – 11 has increased from 2011-2015
- Index for age 12+ has fluctuated at a low level
- Taiwanese eastern CPUE has increased from 2015
- Korean CPUE has increased since 2005

Age 4+Japanese CPUE

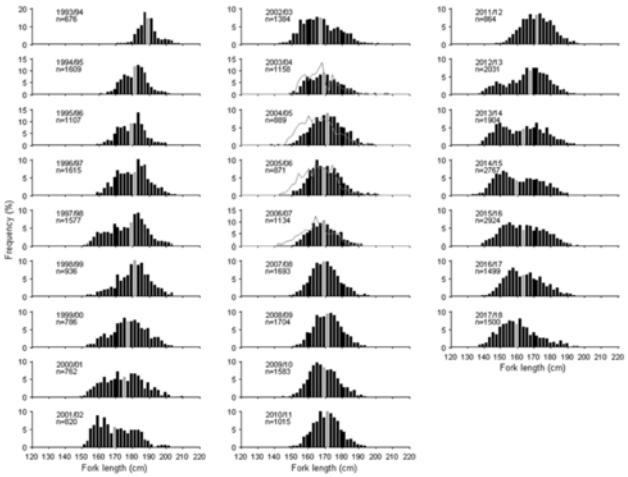


Lengths on the spawning ground

Indonesian length frequencies

- Monitoring of length and age of Indonesian catches on the spawning ground indicate a substantial increase in the frequency of smaller size and younger age classes since 2012
- Information indicates that the unusually small size classes may have been caught away from the spawning ground (areas 2 and 8) and that, if this is the case, these fish be excluded from the monitoring series
- Once this is resolved the spawning ground indicator related to mean estimated age can be reconsidered

Lengths on the spawning ground



Length frequency of SBT caught on the spawning ground by spawning season

Summary of indicators

- No change in conclusions from 2017:
- There are signs of higher recruitment in recent years
- There are consistent positive trends in longline CPUE
- There are suggestions that relatively strong cohorts are moving through the fishery, although these have not yet contributed to the spawning stock
- ESC noted that increased recruitment is of itself not necessarily indicative of increased spawning stock biomass

Scientific Research Programme

Scientific Research Programme

Gene tagging estimates of juvenile abundance

- A pilot gene tagging programme (funded by CCSBT, CSIRO and Australia) was conducted during 2016 and 2017 and provided an abundance estimate in 2018
- The long-term gene tagging programme commenced in 2017 (with initial funding from CCSBT, CSIRO and the EU) and is on track to produce annual estimates of 2 year old SBT, replacing the AS for incorporation into the new MP

Close-kin genetic estimates of adult abundance

- Close-kin genetic sampling to estimate absolute abundance of adults continued during 2016-17-18
- Estimates included in the 2017 stock assessment model and in a stand-alone CKMR model used in MPE OM and CMPs

Scientific Research Programme

Farm and Market analyses

- As in 2017, a Small WG (SWG) was formed to progress dealing with uncertainties associated with the methods used to (1) estimate growth and catch sampling in SBT farming operations and (2) the Japan Markets analyses
- The SWG considered multiple papers on both issues but reached no conclusions
- The SWG proposed two Independent Panels to consider (1) and (2) and report through the ESC [see workplan]

Meta-rules and Exceptional Circumstances

Meta-rules and Exceptional Circumstances

- In 2011 the CCSBT adopted the meta-rule process as the method for dealing with exceptional circumstances in the SBT fishery (ESC 2013)
- The meta-rule process describes:

  (1) the process to determine whether exceptional circumstances exist

  (2) the process for action

  (3) the principles for action

Meta-rules and Exceptional Circumstances

The ESC noted the following items to be considered in the context of exceptional circumstances in 2018:

- Changes in population dynamics as indicated by the 2017 stock assessment
- The small/young fish in Indonesian size/age data since 2013
- The potential impacts from unaccounted mortalities
- Changes to input data to the current MP (AS and CPUE)

Meta-rules and Exceptional Circumstances

Updated estimates of population dynamics

- The full stock assessment in 2017 resulted in a more optimistic outlook in terms of current stock status, recent recruitment trends, and prospects for rebuilding
- Given that the updated estimates of stock rebuilding are positive and do not impact on the operation of the current MP, the ESC concluded that there was no reason to modify the current TAC [same as ESC22]

Meta-rules and Exceptional Circumstances

Indonesian size/age data

- This remains a priority issue to resolve for the monitoring of the spawning stock and final conditioning in 2019 of the OMs required for MP evaluation
- However, it is not an issue for the operation of the MP because the MP does not use the data directly
- Therefore, ESC concluded there was no reason to take action to modify the 2018-2020 TAC recommendations

Meta-rules and Exceptional Circumstances

Unaccounted mortality

- ESC reaffirmed its views from 2017 that there is no reason to modify the 2018-2020 TAC
- ESC noted EC-set reduction of 306t in annual TAC for 2018-20 block aims to mitigate the impact of UAM on performance of current MP
- NB ESC agreed that UAM estimates will be included in the base set of OM for testing/tuning MPs to ensure any new MP will be robust to uncertainty in total mortality

Meta-rules and Exceptional Circumstances

Changes to input data in the current MP

Cessation of AS survey in 2017:

- 2014, 2016 and 2017 AS estimates all higher than average
- Increasing trend in recruitment estimates since 2002
- Inferred 2018 AS index within bounds tested in 2011
- Gene-tagging programme established & first estimate made
- First gene tagging estimate similar to 2017 SA estimate

Revised data used for Japanese LL CPUE:

- Little impact on CPUE used in the MP

Meta-rules and Exceptional Circumstances

Overall assessment of Exceptional Circumstances

- Overall, ESC concluded that there was no reason to take action to modify the 2019 TAC or the 2018-2020 TAC recommendations in relation to these four possible Exceptional Circumstances

SBT Stock Status and Management

Stock status in 2017

For the Base Case from the 2017 stock assessment

- The stock remains at a low level - estimated to be 13% of the initial SSB, and below the level to produce maximum sustainable yield (MSY)
- However, there has been improvement since the 2011 (5% of initial) and 2014 (9% of initial) stock assessments
- B10+ in 2017 relative to initial is estimated to be 11%, which is up from the estimate of 5% in 2011

NB The next stock assessment is planned for 2020

Summary of stock status from 2017

Maximum Sustainable Yield	33,036t (30,000-36,000)
Reported (2016) Catch	14,445t
Current (2017) Biomass (B10+)	135,171 (123,429-156,676)
Current depletion (current relative to initial)	
• SSB	0.13 (0.11 – 0.17)
• B10+	0.11 (0.09 – 0.13)
SSB (2017) Relative to SSB_{msy}	0.49 (0.38 – 0.69)
Fishing mortality(2017) Relative to F_{msy}	0.50 (0.38–0.66)

Management Recommendations

Recommendations for 2019

- Based on the results of the MP operation for 2018 -2020 in 2016, and the outcome of the review of exceptional circumstances in 2018, the ESC recommended:
  - There is no need to revise the EC's 2016 TAC decision regarding the TAC for 2019
  - The recommended annual TAC for the year 2019 is 17,647.4 t
- The ESC recommends that an allocation of 4 t in 2019 be made to cover mortality associated with approved research projects

Management Recommendations

Recommendations for 2018-2020

- The current MP was run to recommend TACs for 2018-2020
- Recommended annual TAC for 2018-2020 is 17,647.4 t
- ESC concluded there is no reason to modify the 2018-2020 TAC recommendation in relation to its review of exceptional circumstances

Development of new MP

Development of new MP

- The EC has approved the development of a new MP
- In March, 2018, the Fifth Meeting of the Strategy and Fisheries Management WG (SFMWG) met in Canberra
- Provided valuable guidance on long-term goals and desirable features of a new MP

Development of new MP

SFMWG:

- Tuning biomass level of 0.25, 0.30, 0.35, 0.40 of SSB_0
- Tuning to 50% probability of achieving the biomass level
- Tuning year set to 2035 but extend to 2045
- All candidate MPs (CMP) to achieve at least 70% probability of 20%SSB_0 by 2035 and high probability of remaining above that level after 2035
- SFMWG emphasised none of the above is final

Development of new MP

SFMWG:

- TAC to be set in 3-year blocks
- First block to be 2021-2023
- Set maximum TAC changes of 2,000t, 3,000t and 4,000t (and perhaps 5,000t) with OMMP group to decide on initial scenarios
- List of recommended performance statistics

Development of new MP

OMMP9 met in Seattle in June 2018:

- Considered SFMWG guidance
- Used reconditioned OM (based on 2017 SA and other inputs)
- First presentation of CMPs evaluated using OM
- Agreed additional robustness trials for MP Evaluation

OMMPWG-ESC23: CMP developers continued work, providing output files for use prior to and at Informal OMMP meeting and ESC23

Development of new MP

MP development status:

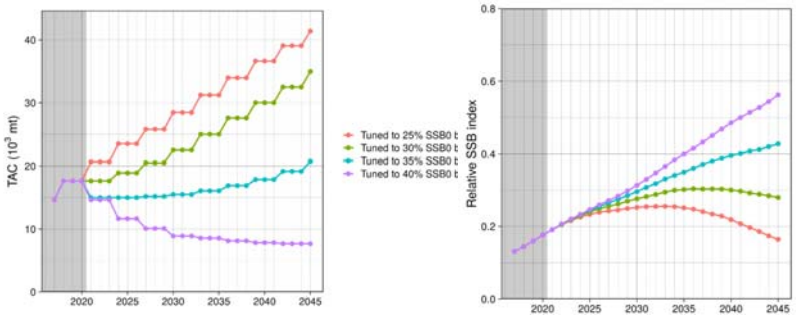
- Three developers/groups are working on a range of CMPs that use Japanese LL CPUE, gene-tagging data and close kin mark recapture (CKMR) data
- The CMPs are evaluated using an OM and Performance Statistics related to CCSBT requirements and guidance, both with respect to a baseline evaluation and using robustness trials
- CMPs are tuned to achieve specified biomass levels with given probability by given years but are tested for robustness to uncertainties

Development of new MP

SFMWG specified tuning levels and target years:

- SFMWG specified initial biomass target levels of 0.25, 0.30, 0.35 and 0.40 SSB_0 to be achieved by 2035 with 50% probability
- Plus, ensuring at least 70% probability of being above 20%SSB_0 in 2035 and beyond
- For all CMPs, given starting conditions, the 0.25 target biomass results in likely unacceptable performance wrt achieving longer term SSB_0 target and 20% levels
- For all CMPs, the 0.40 target biomass results in likely unacceptable performance wrt TACs
- **ESC agreed CMP development should focus on the 0.30 and 0.35 target levels**

Development of new MP

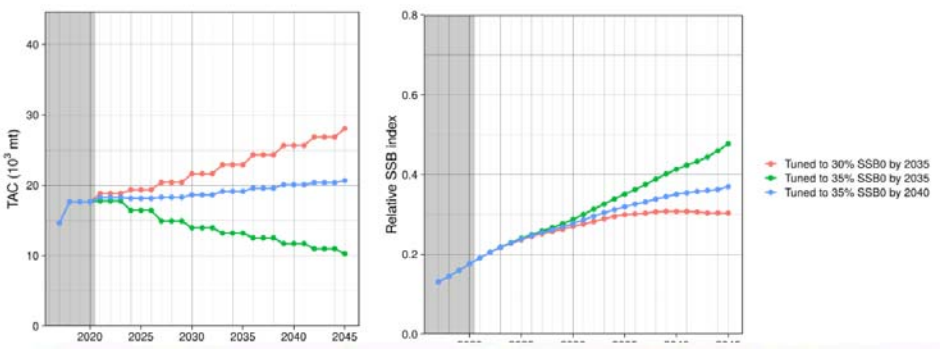


Tuning value	$P(SSB_{2035} > 0.2SSB_0)$	$P(SSB_{2045} > 0.2SSB_0)$
0.25	0.69	0.40
0.30	0.85	0.70
0.35	0.95	0.96
0.40	0.99	1.00

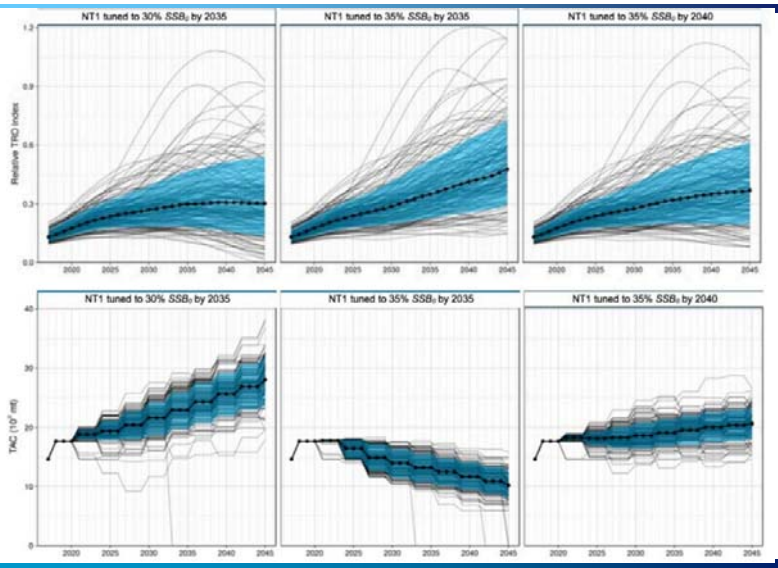
Development of new MP

- Review of results also showed a likely problem with achieving the 0.35 SSB_0 target for 2035
- Given clear SFMWG direction to explore target levels above 0.30 SSB_0, OMMP9 explored tuning period beyond 2035.
- **ESC agreed should focus on tuning to 50% probability of achieving i) 0.30 SSB_0 by 2035 and ii) 0.35 SSB_0 by 2040**
- Both i) and ii) should ensure 70% probability of achieving 20% SSB_0 by 2035 and thereafter

Development of new MP

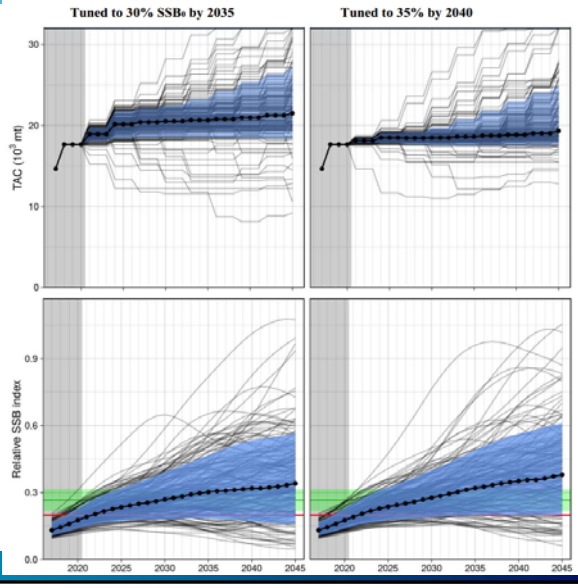


Development of new MP



Development of new MP

More detailed example of what the OMMP group and ESC are examining.



Development of new MP

SEEK UPDATED ADVICE OR AGREEMENT TO:

- Focus on tuning to i) 0.30 SSB_0 by 2035 and ii) 0.35 SSB_0 by 2040 (but may need flexibility depending on reconditioning of OM)
- Continue to test to ensure 70% probability of SSB_0 by 2035 and beyond
- Consider maximum TAC changes (likely 3,000t)
- Consider AAV and the probability of "2 up/1 down"

NOTE: Work Plan includes possible Webex post ESC24 to discuss in depth prior to EC

NOTE: 2020 Work Plan includes contingency meeting should the EC not make a decision in 2019 (ESC expects to deliver)

Workplan for MP development and consultation

2018		
March	SFMWG5	Initial discussions of rebuilding goals and MP features
June	OMMP9	First presentation of candidate MPs (CMPs) evaluated using 2017 OMs.
September	ESC + 1 day informal OMMP	Evaluation of refined CMPs.
October	EC	Results on CMP performance and trade-offs presented to EC. Consultation with stakeholders. Commission confirms or amends broad recovery objectives based on advice from the ESC.
2019		
May		Data exchange will be advanced to try to complete it by mid May
June (24-28th)	OMMP10	**Recondition the OM** and review initial updated versions of CMPs to develop a limited set to put forward to the ESC.
September	ESC + 1 day informal OMMP	Review and advice on set of CMPs
	Possible Webex	Possible webex for consultation with Commissioners
October	EC	Aim to select and **adopt MP**.
2020		
June	Special EC	Contingency placeholder in case the EC needs more time to agree on an MP
June	OMMP11	Stock assessment
September	ESC	Implementation of adopted MP to provide **TAC advice for 2021** (i.e., no standard 1-year lag) (note, this MP implementation will include the 2020 data exchange). **Updated assessments including projections using adopted MP**
October	EC	Agrees TAC for 2021-2023.

Review of the 2018 Work Schedule

ESC Workplan for 2018

The proposed workplan has the following key elements:

- Continuation of gene tagging project
- Continued collection and processing of close-kin samples
- Continued aging of Indonesian otoliths
- Evaluation of fishery indicators and exceptional circumstances
- Maturity workshop
- Development of new MP

2019 Proposed Workplan

Activity	Approximate Period	Resources or approximate budgetary implications
1. Continuation of tag recovery efforts	Tag recovery is continuous	$1,000; few tags expected
2. Provide SBT Stock Status Report to the other tuna RFMOs	Aug – Nov 2018	No additional cost
3. Update length/weight for wild SBT		No additional cost
4. Standard Scientific Data Exchange	By mid May	No additional cost
Proposed SRP activities for 2019:	Jan – Dec 2019	
1. Gene tagging project		Contracted
2. Continued collection and processing of close-kin samples		Contracted
3. Close-kin identification and exchange		Contracted
4. Continued aging of Indonesian otoliths		Contracted
5. Maturity Study/workshop	tbc	$50,000
1. Develop methodology for analysis of i) farming and ii) market data	Nov 2018 – Sep 2019	2 panels of 3 experts for 10-14 days; 1 meeting per panel; chair of each panel to attend ESC24

2019 Proposed Workplan
(continued)

Activity	Approximate Period	Resources or approximate budgetary implications
Routine OMMP code maintenance and development	Jan – Dec 2019	Consultant: 5 days Shiny App: 12 months
Inter-sessional OMMP meeting	5 day, Jun/Jul 2019	Two panel members, ESC chair, one consultant (+ 3 preparation days)
Informal OMMP technical workshop	1 day, immediately prior to ESC, Sept 2019, Cape Town, South Africa	Two panel members, ESC chair, one consultant (+ 3 preparation days), two Secretariat
Commissioner interaction Webex on CMPs	Sept 2019 (post ESC24)	Two panel members, ESC chair
Continued…		

2019 Proposed Workplan
(continued)

Activity	Approximate Period	Resources or approximate budgetary implications[1]
Extended Scientific Committee for the 24th meeting of the Scientific Committee. The meeting will focus on the following: • Regular review of indicators • Evaluation of meta-rules and exceptional circumstances • Review results of SRP activities • Finalise new MP development and provide advice to the EC	Sept 2019, Cape Town, South Africa	ESC Chair, 3 panel, one consultant, full interpretation and 3 Secretariat staff.

Replacement of Independent Advisory Panel member

Independent Panel member

- ESC considered it essential to replace Prof. John Pope in order to fulfil its terms of reference
- Endorsed specified skills in Selection Criteria (stock assessment, quantitative, etc)
- Recommended advantageous to have other skills if possible (geospatial analysis, population genetics and/or mark recapture theory, implications of environmental change in assessments)
- Advised that longer term appointment would provide benefits over 2-3 year term

END