SESS Fishery Slope Resource Assessment Group (SlopeRAG) Tele Meeting #3 November 2015

Meeting Minutes

Date: 25 November 2015
Venue: Teleconference

Attendance

Name	Membership (type i.e. chair etc.)
Members	
Mr Sandy Morison	Chair
Dr Marcus Finn	AFMA member
Dr Geoff Tuck	Scientific member, CSIRO
Mr Andrew Penney	Scientific member
Dr Sarah Jennings	Scientific (economics) member
Mr Tom Bibby	Industry member
Mr Simon Boag	Industry member
Mr Ross Bromley	Executive Officer - AFMA
Invited participants	
Mr Patrick Cordue	Fisheries consultant, Innovated Solutions Ltd.
Dr Simon Nicol	Invited participant, ABARES
Observers	
Dr Jemery Day	Assessment scientist, CSIRO
Dr Malcolm Haddon	Assessment scientist, CSIRO
Dr Rowan Chick	NSW, DPI
Apologies	
Mr John Jarvis	Industry
Mr Malcolm McNeill	Industry

Minutes

Wednesday 25 November 2015

1. Preliminary

1.1 Welcome and introduction and apologies

1. The Chair opened the telephone meeting and welcomed members and other participants at 09:30, 25 November 2015.

2. The RAG noted apologies from Mr John Jarvis and Mr Malcolm McNeill.

1.2 Declarations of interest

3. The RAG followed the conflict of interest declarations process as outlined in the revised Fisheries Administration Paper 12 (FAP12). A list of the full conflicts of interest declarations made by SlopeRAG members and other participants for the meeting is provided in **Attachment 2**. Mr Bibby and Mr Boag left the tele meeting in turn while the RAG considered their declared conflict of interests. The RAG agreed that Mr Bibby's and Mr Boag's expertise in the fishery warranted them being allowed to participate in the meeting however they may be asked to leave the meeting when RBC's are being decided. The RAG noted that any RAG member can bring any perceived conflict to the Chair's notice and that the issue can be dealt with at the time on a case by case basis.

1.4 Adoption of agenda

4. The RAG adopted the agenda as circulated, Attachment 1.

2. Pink ling – eastern base case and RBC

5. SlopeRAG met in Hobart from 28-30 Oct 2015 to consider a final base case assessment for pink ling.

6. While the base case model for western pink ling was accepted by the RAG, additional work was requested on the eastern base case.

7. The additional work was requested because the eastern base case was considered to be overly optimistic in its current biomass estimate. Sensitivity analysis in the form of worst case scenarios were informative, but not appropriate to be used as the base case model.

8. The optimistic estimates of current eastern pink ling biomass were considered to be driven by two (linked) issues apparent in the base case stock assessment:
   - When trawl selectivity was allowed to be set within the model rather than defined or limited a priori, flat-topped selectivity was selected for the first of the three periods. This essentially drives the model to think that there are more large fish in later periods (because the later dome-shaped selectivity suggests the large fish are in the population, just not being caught by trawlers), resulting in a higher relative biomass estimate. As a result, one of the MCMC runs did not converge with the others, finding a different parameter space with flat-topped selectivity and higher productivity.
   - Presumably as a result of the early flat-topped selectivity, the model settled on an estimate of natural mortality (0.245) that was appreciably higher than that for the western stock and higher than the RAG expected.

9. Given these issues, the RAG requested that the base case model be run with dome-shaped selectivity forced in the first of the three selectivity periods. The aim of this was to establish a base case with selectivity curves more closely matching the

understanding of the trawl fishery selectivity, and a more realistic natural mortality estimate, closer to that for the western stock and RAG expectations.

10. Patrick Cordue from ISL ran the model incorporating the selectivity assumptions. The key features of the new base case model are:

- Selectivities have been forced to be dome-shaped by giving the right hand limb of the selectivity curve an informed prior (ensuring they cannot be flat-topped, but giving the model some ability to modify selectivity based on data inputs).
- Three Markov chain Monte Carlo (MCMC) chains converged well (and quickly) for estimates of unfished spawning stock biomass (SSB), current SSB, current stock status and natural mortality.
- The MCMC estimate of natural mortality (M) was 0.245 (95% CI = 0.22-0.26). This is substantially lower than the initial model estimate for M of 0.26, and more closely matches that for the western stock, which was considered to be a good estimate of ling M.

Results

The new base case estimates are shown in Table 1, and are copied below.

Table 1: MCMC estimates of M, virgin SSB, current SSB, and current stock status. The median and 95% CI are given. Also shown are the probabilities of current stock status being below 20% B_0, 30% B_0, or being at or above the target of 48% B_0.

	M	B_0 (t)	B_{2015} (t)	$ss_{2015}(\%B_0)$	$P(ss_{2015} < 0.2)$	$P(ss_{2015} < 0.3)$	$P(ss_{2015} \geq 0.48)$
New base	0.245	5400	1590	30	0.01	0.46	0.01
	0.22–0.26	4860–6330	1130–2600	21–45			

11. The eastern zone base case Bayesian median RBC estimate from the model for 2016 is 250 t. This estimate however is very uncertain with 95 per cent CI between 30 – 603 t.

12. The long-term yield estimate from the model using the harvest control rule is 580 t.

13. Table 3 of Mr Cordue's report shows projection results based on this final base case for a series of constant catch scenarios, showing the probability of falling below various reference points (20%, 30% and 48% B_0) under each of the constant catches by 2016 and 2017.

Table 3: MCMC projection results for the new base model showing the expected SSB in 2017 and 2022 under different constant catch scenarios with the associated probabilities of being below 20% or 30% B_0 and at or above the target of 48% B_0.

Catch (t)	$E(B_{17}/B_0)$	$E(B_{22}/B_0)$	$P(ss_{17} < 0.2)$	$P(ss_{22} < 0.2)$	$P(ss_{17} < 0.3)$	$P(ss_{22} < 0.3)$	$P(ss_{17} \geq 0.48)$	$P(ss_{22} \geq 0.48)$
0	38	63	0.00	0.00	0.13	0.00	0.10	0.92
300	35	48	0.01	0.00	0.26	0.03	0.06	0.48
400	33	43	0.02	0.01	0.38	0.12	0.05	0.31
500	31	38	0.04	0.04	0.48	0.25	0.03	0.18
550	30	35	0.07	0.08	0.54	0.35	0.02	0.13
600	29	32	0.09	0.13	0.56	0.44	0.02	0.09
700	27	27	0.15	0.28	0.68	0.64	0.01	0.04

14. The constant catch scenarios indicate that:
    - constant catches up to 550 t pose low risk (<7% by 2017 or 8% by 2022) of the stock biomass falling below the limit reference point
    - constant catches in excess of 550 t lead to a greater than 10 per cent probability of eastern pink ling declining to below the limit reference point by 2022
    - catches over 500 t substantially increase the time taken to rebuild the stock to the management target.

15. The RAG endorsed the following text as an RBC recommendation for the consideration of the South East Management Advisory Committee (SEMAC), and the AFMA Commission when setting future total allowable catches:

- *SlopeRAG accepts the final eastern pink ling base case stock assessment presented out–of–session in November 2015, noting the estimated current eastern zone spawning stock biomass of 30 per cent of unfished biomass, and the 2016 median RBC estimate of 250 t.*
- *SlopeRAG notes the projections under alternative constant catches (for catches ranging from 0 t to 700 t) using the base case model structure, which provides probabilities of being below the limit reference point or approaching the target reference point given a projected constant catch scenario.*
- *SlopeRAG notes that, should the constant catch scenarios be used to consider management options or future TAC recommendations for the eastern zone, constant catches in excess of 550 t lead to a greater than 10 per cent probability of eastern pink ling declining to below the limit reference point by 2022, and catches over 500 t substantially increase the time taken to rebuild the stock to the management target.*

16. The RAG recommended that if a TAC greater than the 2016 RBC was considered by the AFMA Commission then Table 3 (above) should be used as basis for determining the TAC.

17. The RAG recommended 10 per cent undercatch and overcatch be applied for the 2016-17 season.

Species	Assessment	RBC (t)	Discount factor	Under/over catch
Pink ling – eastern zone	Tier 1	250	N/A	Over catch – 10% Undercatch – 10%
Pink ling – western zone (from October meeting)		990		

3. Silver warehou – RBC advice

18. SlopeRAG met in Hobart from 28-30 Oct 2015 to consider a final base case assessment for silver warehou.

19. The 2015 preliminary silver warehou model calculates a:
    a) current (2016) spawning stock biomass of 40 per cent of unfished biomass
    b) 2016 RBC of 1958 t
    c) long-term yield of 2281 t.

20. However, the RAG expressed some concerns with the 2015 model. In particular:
    a) In previous stock assessments the most recent two recruitment estimates have been revised downwards by the model when additional data has been added. Apparent over-estimation of recent recruitment has established a pattern where model–estimated biomass tends to show a recent upward trend that is not reflected in CPUE data or subsequent catches.
    b) The 2015 model again estimates recent recruitment to have recovered to near average levels, although with high uncertainty.
    c) There appears to have been a nine–year run of lower than average recruitment. Model projections assuming average levels of recruitment (for years in which recruitment is not estimated) are therefore likely to overestimate future biomass (resulting in optimistically high RBC estimates).

21. Following a request from the RAG at its October meeting Dr Day investigated running a sensitivity that applied catches calculated using the SESSF Tier 1 harvest control, but assuming a future low recruitment scenario. Dr Day advised the RAG that this calculation is not technically possible using the harvest control rule in the current version of Stock Synthesis without simultaneously changing the target reference biomass. It is possible to calculate RBCs and project the spawning biomass with lower future recruitment by formally incorporating a productivity shift, but this also results in changes to both the limit and target reference points. The RAG previously agreed that it required additional direct evidence of a productivity shift before taking this step and agreed that reference points should remain unchanged.

22. It is, however, possible to conduct constant-catch projections (i.e. not using the harvest control rule to vary catches) assuming low recruitment in order to provide advice on the risk of catches under poor recruitment scenarios. The RAG requested a series of constant catch projections be provided assuming the low recruitment scenario originally presented by Dr Day.

23. In the initial assessment, sensitivities were run using 'poor' (the average of a recent five year period of poor recruitment) and 'very poor' (the average of the worst three of these five years) recruitment scenarios. A constant catch of approximately 381 t was used in projections under these scenarios based on the volume of recent landed catches of silver warehou, (Table 1). Neither of the low recruitment scenarios sees the stock approaching the target biomass by 2020 at a catch of 381 t, and the very poor recruitment scenario sees a decline in spawning biomass to a depletion level below 40 per cent in 2020.

Table 1. Depletion levels assuming poor and very poor recruitment from 2013-2020 and a fixed catch of 381t.

Catch 381 t	Recruitment scenario, % of unfished biomass	
	Poor	Very poor
2015	35.2	35.2
2016	40.2	40.2
2017	43.3	42.4
2018	44	41.7
2019	43.9	40.2
2020	43.7	38.7

24. At the request of the RAG additional projections were run using the poor recruitment scenario to provide depletion estimates resulting from a range of constant catches, (Table 2). In all cases, the spawning biomass is projected to increase initially, with a subsequent decline in spawning biomass through to 2020.

25. This indicates that, at tested catch levels, future increases in stock are dependent on levels of future recruitment increasing to above the low recruitment assumed for these projections. The RAG noted that the recent series of sequential poor recruitments indicates that there is a risk that silver warehou recruitment may be serially correlated and that future recruitment may remain low.

Table 2. Depletion levels assuming poor recruitment from 2013-2020 and a fixed catch of 1958t, 1206t and 600t.

Fixed catch t *	Depletion estimate, % of unfished biomass		
	1958	1206	600
2015	35.2	35.2	35.2
2016	40.2	40.2	40.2
2017	37.6	40.3	42.5
2018	33	38.2	42.5
2019	28.3	35.7	41.7
2020	24.4	33.6	41

26. The RAG pointed out that if one of the objectives of the next silver warehou MYTAC is to increase the biomass from the current level then a catch below 600 tonnes is recommended. Poor future recruitment scenarios illustrate the potential dangers to the stock if the calculated RBC is actually caught, although these impacts are reduced if the current low catch levels, around 381 t, are maintained (Table 1).

Summary/recommendations

27. The assessment estimates that the 2016 spawning stock biomass will be 40% of virgin stock biomass. The RBC from the base case model for 2016 is 1,958t for the 20:35:48 harvest control rule, with a long-term yield of 2,281t. However, these scenarios assume future recruitment will be at average levels. If future recruitment continues at a similar low level to recruitment since 2003, then catching the RBC could drive depletion down to around 30% before 2020. However, if landed catches continue at levels well below the TAC (similar to current catches), then the depletion is likely to remain between 35% and 45% for the next 5 years.

28. Given the uncertainty regarding future recruitment, SlopeRAG recommended that the base case model be used to provide a single year RBC recommendation of 1958 t but that the constant catch sensitivities be considered by the AFMA Commission to highlight the risks associated with single- and multi-year total allowable catches, should recruitment remain at low levels..

29. Noting low catches and the current estimated biomass the RAG was comfortable with recommending a three year MYTAC stepping down to 600 t over the next two years. This is consistent with applying the 50 percent large change limiting rule.

30. The RAG recommended determining under/over catch at 10 percent.

Species	Assessment	RBC (t)	MYTAC (t)	Discount factor	Under/over catch
Silver warehou	Tier 1	1958	2016/17 – 1209 2017/18 – 605 2018/19 - 600	N/A	Over catch – 10% Undercatch – 10%

31. The RAG noted that the assessment model estimated biomass trend is again above recent CPUE, and was concerned that the current CPUE breakout rule would trigger again should recruitment remain low. The RAG recommended a catch trigger be included in the breakout rules for silver warehou, to prevent unnecessary re-assessment if catches remain at low levels. The RAG did not make a recommendation on the level of catch that would be appropriate for the trigger but deferred this decision for further discussion between AFMA and the RAG.

Meeting closed

32. The Chair thanked members for their attendance and closed the tele meeting at 11:15 AM.

Signed (Chairperson):

Date:

List of Attachments

1) SlopeRAG November 2015 Agenda
2) SlopeRAG November 2015 Declared Conflicts of Interest

Attachment 1. Agenda

Southern and Eastern Scalefish and Shark Fishery Slope Resource Assessment Group (Slope RAG) Agenda

Venue: Tele conference

Day 1: Wednesday 25 November

Time: 9:30

Chair: Mr Sandy Morison

Time	Item	Presenter
9:30	**1. Preliminaries** 1.1 Welcome and introductions/apologies 1.2 Declarations of interest 1.3 Adoption of agenda	Sandy Morison
9:45	**2. Pink ling – RBC advice east, constant catch scenarios** 2.1 accept the additional work completed on the 2015 eastern pink ling assessment as the base model for its RBC advice 2.2 note that the base model results in a current eastern spawning stock biomass estimate of 30 per cent of the unfished biomass estimate 2.3 note that the application of the SESSF Tier 1 harvest control rule results in a median RBC estimate for the eastern zone of 250 t, with a long-term yield estimate of 580 t 2.4 note the constant catch scenarios presented in Table 3 of the base case summary.	Patrick Cordue and Marcus Finn
10:45	**3. Silver warehou – RBC advice** 3.1 accept the base case stock assessment as the final 2015 silver warehou assessment for its RBC advice 3.2 note that the base model results in a 2016 spawning stock biomass estimate of 40 per cent of the unfished biomass estimate 3.3 note that the application of the SESSF Tier	Jemery Day

	1 harvest control rule results in a median RBC estimate for the eastern zone of 1958 t, with a long-term yield estimate of 2281 t 3.4 note the scenarios that calculate depletion estimates for constant catches under 'poor' and 'very poor' recruitment projections.	
11:30	*Close*	

Attachment 2 Declarations of interest

Name	Interest Declared
Mr Sandy Morison	SlopeRAG and ShelfRAG Chair, member of SEMAC and SESSFRAG. Consultant with an interest in funding for research purposes. Conducts fisheries related work consultancies for industry, companies and other Government departments. Had been recently engaged by an environment non-government organization to review an MSC pre-assessment of Orange Roughy in New Zealand.
Dr Geoff Tuck	CSIRO. Involved in Stock Assessments. Interest in obtaining funding for future research. Principle investigator on the SESSF stock assessment project and marine closures project.
Mr Tom Bibby	Commonwealth Trawl Sector boat and quota SFR holder. Chairman of SETFIA.
Mr Simon Boag	SETFIA CEO, CFA vice-Chair, runs a consultancy firm. Sits on boards of Commonwealth Trawl Sector boat and quota SFR holding companies as a non-beneficiary director.
Dr Sarah Jennings	Resource economist, Adjunct Senior Researcher, University of Tasmania. Interest in obtaining funding for future research. No pecuniary interest or otherwise.
Ms Marcus Finn	AFMA. Manager of Commonwealth and GAB Trawl Fisheries section. No conflicts of interest pecuniary or otherwise.
Mr Andrew Penney	Sole Director of Pisces Australis Pty Ltd, an Australian registered marine and coastal research and management consultancy based in Canberra. As such, I have an interest in any opportunities in this regard. Principal Investigator on FRDC Project No 2014-009: Development of guidelines for quality assurance of Australian fisheries research and science information, and co-investigator on FRDC Project No 2014-203: SESSF Monitoring and Assessment – Strategic Review. Member of the AFMA ERA Technical Working Group. No shareholding and hold no positions relating to any other companies, including any fishing companies or industry associations
Dr Jemery Day	CSIRO, Assessment scientist. Acquiring funding for research purposes. No pecuniary interest or otherwise.
Dr Malcolm Haddon	CSIRO stock assessment scientist. Member of SESSFRAG, Northern Prawn RAG and sub-Antarctic RAG. No pecuniary interest or otherwise.
Dr Simon Nicol	ABARES. Interest in obtaining funding for future research. No pecuniary interest.

Mr Ross Bromley	AFMA. Demersal and Midwater Trawl Fisheries section. No pecuniary interest or otherwise.
Mr Patrick Cordue	New Zealand stock assessment scientist, contracted by AFMA to undertake the 2015 pink ling stock assessment. He runs his own company, Integrated Solutions Ltd. No pecuniary interest or otherwise.