

DRAFT RECORD OF MEETING

Meeting #31, 1 June 2021

Microsoft teams meeting

CHAIR: Ian Knuckey

MEETING COMMENCED: 9:30am

1. PRELIMINARIES

Present	
Ian Knuckey	Chair
Toby Jeavons	Victorian Fisheries Authority (Executive Officer)
Klaas Hartmann	Institute of Marine and Antarctic Studies (IMAS)
David Reilly	Victorian Fisheries Authority
Jeanne Cinel	Victorian Fisheries Authority
Lawrence Moore	Recreational fishing representative/VRFish
Gary Ryan	Industry Member
Wayne Dredge	Industry Member
Ross Bromley	Industry member
Markus Nolle	Industry member
Dallas D'Silva	Victorian Fisheries Authority
Rafael Leon	Institute of Marine and Antarctic Studies (IMAS)
Caleb Gardner	Institute of Marine and Antarctic Studies (IMAS)
Karlie McDonald	Institute of Marine and Antarctic Studies (IMAS)
Ben Scullin	VR Fish
Peter Galvin	Scuba Divers Federation Victoria
Zeb Johnston	Industry
Rohan Henry	Bunurong Land Council Aboriginal Land Corporation
Guests	
Robert Timmers	Latrobe Valley Scuba Club
Steve Parsons	Industry member
Julian Tagell	Industry Black Rock Underwater Dive Group
Allan Conley	Black Rock Underwater Dive Group
Tom Consentino	SRL
Apologies	
Anthony Olver	Industry member
Joanne Butterworth Grey	SIV
Mark Peychers	Industry member

1.1. Welcome

Ian Knuckey, as Chair, stated an Acknowledgement of Country and welcomed members to the 31st meeting of the Victorian Rock Lobster and Giant Crab Resource Assessment Group (RLRAG). Ian noted the apologies to the meeting.

1.2. Adoption of agenda

The agenda was adopted with Agenda item 6.1 brought forward and discussed following on from the Management update (item 2.4). Given Tom from SRL was attending the meeting, he gave the overview rather than Markus.

1.3. Minutes and actions from last meeting

Ian noted that a final copy of the minutes of the last meeting had been circulated via email. As a matter of process, the RLRAG endorsed the minutes to record that they are a true and accurate reflection of the meeting.

Progress against the outstanding actions were summarised as follows:

- Modelling – Klaas to provide further updates on WRL model development and circulate out of session.
- Klaas analysis on voluntary data based on regional areas – To be addressed under Agenda Item 3.1
- David confirmed that Giant Crab CPUE data has been adjusted to account for historical ‘wrongdoing’ in the fishery
- Toby to schedule the next 3 RLRAG meetings – To be discussed under ‘Other business’
- Klaas to apply 2-year average to giant crab CPUE time series to assess smoothing impact – To be addressed under Agenda Item 5.1
- Toby to schedule a meeting for Tom Consentino to provide a market/access sampling presentation to industry – Toby to follow up with Tom Consentino to schedule a suitable time
- Toby to circulate an SRL update on behalf of Tom Consentino - Completed
- Toby to circulate ‘new RLRAG membership’ power-point to Peter and Zeb – Ian Knuckey to provide
- Klaas to review ‘weight of evidence’ wording and implication on application of the Harvest Strategy in the Stock Assessment Report – Completed
- Klaas/Dave to determine an appropriate finer spatial scale that is representative of how the fleet fishers – To be addressed under Agenda Item 4.1
- Klaas to consider including finer spatial scale resolution in CPUE standardisation process - To be addressed under Agenda Item 4.1
- RLRAG to consider adopting a standard technology efficiency improvement factor over time as part of Harvest Strategy review – To be addressed under Agenda Item 4.3
- Klaas to incorporate alternative LML’s as component of work in developing MEY – To be addressed under Agenda Item 4.2

The following actions remained outstanding:

Review of Harvest Strategy

- Klaas to model different levels of PRI and likelihood of breaching reference points. Analyse and present alternatives with PRI uncertainty and change and rolling average approach - Klaas
- Klaas to develop a strategic plan for tag recapture program based on findings of growth sensitivity analysis
- Klaas to incorporate alternative LML’s as component of work in developing an MEY approach to fisheries management
- Consideration of formally adopting a new method to calculate egg production -Klaas

- Klaas to consider including concept of a sliding PRI scale (including above a threshold on the CPUE/TACC table) as part of the Harvest Strategy review

Indigenous participation

- Toby to follow up with Mike and Rohan to create a space to engage with Traditional Owner groups to further understandings and identify opportunities for participation.

Stock Assessment

- Klaas to review growth estimates of large lobster in the Eastern Zone

Model development

- Klaas to investigate MEZO projection/harvest strategy evaluation function – If funding is pursued
- Rafael to investigate temporal relationships – Outstanding
- Decision to be made on final position on which model to adopt going forward following completion of new WRL model in 2021

Research projects

- Klaas to contact Katie Creswell to inform discussion of South Easterly weather patterns and their impact on productivity in Victoria
- Klaas to provide update to research project investigating the impact of larger lobster keeping smaller lobster from pots

Biotoxin Management

- Markus to take DRAFT biotoxin Management Plan to SRL

Data collection

- David and Toby to consider data collection requirements that are mandated/overlap with the voluntary data collection program and be presented at next RLRAG

Puerulus monitoring program

- David to progress engaging with Southern Otway Landcare Network (SOLN)

Giant Crab

- Provide update on continued progress against review of Harvest Strategy
- Toby to provide update on GC research project

Other business

Markus to raise the MEZO project, biotoxin monitoring, whale entanglement and AQUI-S at the upcoming SRL meeting

All other actions arising from Meeting 31 are outlined in the attached 'Actions List' circulated with the meeting minutes.

2. Management update

2.1 Management Plan review

Toby provided an update on the establishment of the steering committee to undertake a review of the rock lobster fishery management plan. The review was expected to commence in June and be completed by July 2022, however the start date has been delayed due to further COVID restrictions.

The steering committee members will consist of:

- Seafood Industry Victoria (SIV): **Johanne Butterworth-Gray** (SIV Independent Chair)
- Victorian Rock Lobster Fishing Industry:
 - Eastern Zone: **Ross Bromley** (Eastrock), **Matt Harry** (San Remo – Licence holder/operator) and **Wayne Dredge** (Lakes Entrance – Licence holder/operator)
 - Western Zone: **Gary Ryan** (Warrnambool – Licence holder), **Alex Haberfield** (Warrnambool – Licence operator) and **Leslie Feast** (Port MacDonnell – Licence holder/operator)
- VRFish: **CEO VRFish**
- Recreational representatives: **Lawrence Moore** (VRFish), **Peter Galvin** (SDFV)
- Coastal Indigenous representative: **Rohan Henry** (Bunurong Land Council Aboriginal Corporation)
- Environmental Representation: **Adrian Meder** (Australian Marine Conservation Society)

The Chair of the Rock Lobster and Giant Crab Resource Assessment Group, the Institute of Marine and Antarctic Studies rock lobster scientist and the VFA rock lobster fishery manager and scientist will be permanent members of the committee. Other VFA management, policy, compliance, and science staff will participate as required.

The Steering Committee will:

- Provide advice on the review and performance of the Plan;
- Provide advice on the review and performance of the Harvest Strategy;
- Provide advice on the review of objectives, strategies and actions under the existing plan to establish clear direction for management of the fishery under the new plan, including any necessary regulatory or management changes that may be appropriate;
- Identify and make evidence-based recommendations on issues impacting the biological, social, economic and wider ecological factors affecting the performance of the rock lobster fishery;
- Identify additional measures that can be implemented to assist rebuilding the Eastern Zone fishery;
- Provide advice, via the Chair, to the VFA CEO on issues raised by the broader community in relation to the Plan and the performance of the fishery;
- Attend and respectfully participate in Steering Committee meetings.

2.2 Summary of Port visit meetings and TACC setting

Toby presented a summary of the discussion from each of the port meetings relating to the recommended TACC for 2021/22. Overall attendance across both the Eastern and Western meetings was down on previous years. Toby noted that the TACC has since been set at 32 tonnes (8t reduction) in the Eastern Zone and 246 tonnes in the Western Zone. Key comments from each of the port meetings are as follows:

Eastern Zone comments on recommended 32t TACC for 2021/22

San Remo

- Concern that a further quota reduction will result in loss of fishers and experienced operators
- Quota reduction will result in significant social and economic loss
- COVID shut down peak catch rates for 2020 in January and when fishing returned the water temperature had dropped and catch rates had declined

Queenscliff

- Shut the fishery for 12 months and remove licence fees
- No reason not to adopt a 32t TACC
- Concern over mortality in the fishery – Octopus predation should be addressed to assist the stock to recover more quickly

Apollo Bay

- Close the fishery and let it rest for 3 years
- Some sentiment that catch rates in this region would have been better if the weather had permitted

Toby noted that discussion on the impact of high licence fees limiting viability of Eastern Zone fishers was discussed at all Eastern Zone port meetings.

Western Zone comments on recommendation for a 246t TACC for 2021/22

Apollo Bay

- Sentiment that TACC is set at the correct level and agreement with decision rules
- Need to clarify with industry why egg production is declining, however biomass is increasing

Port Fairy

- No comment on proposed 246t TACC
- More pressure on the in-shore fishery due to market forces. May need to address the in-shore/off-shore fishery separately
- Sentiment that the combined PRI is reflective of the correct level

Port MacDonnell

- Sentiment that TACC is set at appropriate level and market cannot handle an increase to the TACC
- Condition of the stock is good and similar to 1999 levels
- Sense that catch rates and numbers of undersize should be much higher in this region
- Egg production and future direction to the CPUE is the biggest concern
- Pressure on in-shore fishery needs to be addressed

Giant Crab comments on recommended 10.5t TACC for 2021/22

- No attendance at the giant Crab TACC setting port meeting

Toby provided a summary of key management considerations that were raised at the TACC forms and will be reviewed during the management plan review process:

- Reduction to 60 pots in the Eastern Zone (not supported across all meetings in EZ)
- Introduction of soak time requirements to address mortality
- Pot reduction could be spatially managed within certain areas of the EZ
- In-shore/off-shore management of stock
- Allow fishers to land 'green crays' off quota
- Increase male only period
- Increase closed period
- Actively manage recreational sector to the 10% allocation in EZ

Members of the RLRAG considered the issue of mortality resulting from octopus depredation in rock lobster pots. Toby summarised that typically if pots are left to soak for longer periods the risk of octopus depredation increases. Other factors contributing to increased risk includes moon phases, bait type and the number of rock lobster in pots. Caleb noted that given catch rates in the Eastern Zone are lower, this will result in lower numbers of rock lobster in pots and further increases their risk to depredation.

RLRAG members raised concern over the consistent message from Eastern Zone fishers across the TACC meetings that there was a preference to close the fishery. Members queried if the VFA were considering this as an option. Toby explained that many fishers do not have an alternative income stream and the option to close the fishery was not supported across all Eastern Zone fishers. Toby highlighted that the VFA is undertaking an internal review of available support to options and the VFA policy team is leading a review of the current cost recovery model.

Steve Parsons raised an anecdotal account that Western Zone recreational divers have observed a decline in numbers of rock lobster in highly accessible areas of recent years. Ian noted that the combination of quota management and size limits help to manage the stock, however this does not stop recreational or commercial fishers going back to the same areas. Lawrence noted that many of the highly accessible areas have always been fished hard. This is somewhat how the fishery operates with rock lobster returning to the same ledges each year. However, there is concern when rock lobster do not crawl back not the same ledges and may be reflective of changes to the stock at a larger scale.

2.3 RL Tagging program update

Toby provided an overview of updates to the recreational rock lobster tagging program.

Toby extended his gratitude to IMAS for their work in undertaking an independent review of the rock lobster tagging program. Whilst the review has not yet been completed, the team has been in regular discussion with the VFA and their work is actively shaping the current RL tagging review process.

The Rock Lobster Tagging Steering Committee has been successfully progressing arrangements under the new program. Key management changes will include a 48-hour reporting requirement, transition to the use of digital tags and an 'opt-in' reporting requirement to measure annual participation.

Transition of the existing RL tagging App under the Go Fish Vic framework has commenced. This will streamline the reporting process for fishers and reduce delays in tags arriving, remove the requirement to order tags, remove the requirement to carry tags and reduce the plastic footprint of the program. Amalgamation with the Go Fish Vic App will also significantly increase the functionality of the reporting platform with fishers being able to report their catch of different species, access to a digital fishing diary, weather reports and social media sharing capability.

Toby provided an overview of the 'workflow' of the new reporting process including the ability to capture 'zero-catch' days, provide an abundance index and annual participation measure.

Toby summarised that progress against the revised program is on schedule and is set to launch on 16 November 2021. The requirements under the program will be added to the Fisheries Regulations and opportunity to comment will be provided through public consultation in July/August 2021.

2.4 Monitoring program update

David thanked the commercial fishers and onboard observers and explained that there is not much happening at present.

- Preparing for fixed site surveys in the Eastern Zone in August/September
- Puerulus collectors and mooring buoy was removed from Port Campbell in May
- Trial of alternative puerulus collectors at Apollo Bay to commence in July/August. This will utilise plastic oyster bags, suspended from the floating pontoons in the harbour and easily retrievable without the need for diving. Southern Otway Landcare will assist in servicing these new collectors.
- Vic e-Catch App – Recent improvements will enable reporting of all bycatch species, retained either for bait or sale, or discarded. Previously only species retained for sale were reported.

3. Voluntary data collection

3.1 Analysis of voluntary data based on regional areas

Klaas presented a review of voluntary data following questions around the PRI in the Western Zone stock assessment as a result of an incomplete index due to reduced observer coverage. During the assessment the RLRAG therefore looked at other sources of information including voluntary LF frequency sampling data to determine if the spike in PRI was picked up in other indicators. This was particularly important as the PRI rose above threshold for the first time.

During the process of reviewing the voluntary data information, concerns were raised around the usability of the data. The Western Zone voluntary data showed a significant spike in PRI vs Champions data that showed a smaller increase. Similarly, the Eastern Zone PRI showed an up-tick, however the up-tick was not shown through voluntary, logbook or champions data. There has been an increasing number of fishers reporting undersize and an increasing number of fishers providing length frequency measurements. The increase in data is very positive, however the increase also creates potential for an inconsistent index.

Klaas summarised that changes in spatial distribution of voluntary data has influenced voluntary PRI trends. A comprehensive standardisation process similar to that undertaken for CPUE is undesirable due to limited data availability. A simple spatially weighted approach as per the observer/fixed site survey may be desirable. Klaas noted that a caveat is that if coverage reduces there may be regions with limited or no data.

Caleb noted that East of Lorne there has been very little to no PRI's recorded. Dave clarified that the PRI is very different in the eastern compared to the western zone. Historically, many areas in the eastern zone have produced only larger lobsters which could be due to the faster growth rates experienced in the east. The annual fixed site surveys at Torquay and Ocean Grove probably still provide the best indication of pre-recruitment in the EZ. There was an increase in the numbers of pre-recruits reported in the EZ fixed site survey last year and fishers also have reported an increase in the number of undersize in their catches.

Gary Ryan asked whether we should have a different PRI for each zone. David confirmed that there are different PRI trigger points (WZ – 1.81 undersize/pot lift; EZ – 0.32 undersize/pot lift) that accounts for differences in productivity between the two zones.

Peter Galvin and Lawrence Moore provided anecdotal evidence of recreational dives that they had undertaken and the numbers of undersized lobsters that they had observed. Dave Reilly suggested that if divers are going back to the same dive sites at the same time each year, there may be an opportunity to formalise these observations into a fixed site survey. Peter suggested that some of this data will be captured through the citizen science option in the Vic RL Tagging App. Toby noted that anecdotally observations from recreational divers in the Eastern Zone reflect similar trends as shown in the PRI.

Ian summarised the discussion increasing participation in the voluntary data program is promising and the RLRAG encourages that this continues. The RLRAG notes that results are different across the spatial areas of the fishery. Availability of voluntary data does not align with spatial input from other information. Data can therefore bias the potential index of PRI and the RLRAG agrees to continue investigating methods to incorporate additional sources of data into the PRI, however until this analysis is undertaken the PRI will remain as it is currently derived.

Action:

- **Klaas to undertake analysis of voluntary LF, undersize returns and logbook data in line with 'weighting approach' undertaken for fixed site and observer data to ensure the index is spatially representative to be considered at the December RLRAG**

4. Harvest Strategy Review

4.1 Spatial variation in catch rate, stock and fishing fleet

Klaas provided an overview of an analysis reviewing the spatial management and assessment boundaries for the fishery. There is clear spatial structure in the fishery, with different operator characteristics, natural stock density variation and limited operator movements between ports. At recent TACC meetings it has been noted that there is a lot of variability occurring within zones i.e. Fishing practices, stock variation, inshore/offshore fisheries. Trying to gain a better understanding of fishery dynamics within each zone will inform discussion held through the management plan review.

Ian noted the sensitive nature of the analysis with regard to the 5-fisher rule and advised all to consider this discussion as in-confidence only. Ian requested that all in attendance delete the paper against Agenda Item 4.1 immediately.

Caleb noted that this is also good reminder for the VFA, and that similar discussion has taken place in Tasmania around the availability of this data as it is important to inform how this public resource is being harvested. Ian reaffirmed that this data is ok to review at this forum, however, must not be distributed any further. Wayne clarified that he has no issues with display of his data at the resolution that has been shown.

Toby noted that a discussion was held regarding presentation of the data at the spatial resolution that has been provided. It was determined that it was necessary to have it at this spatial scale to inform a decision. Toby asked the question - Do we have the correct boundaries drawn across this fishery for the scale as which we are managing?

David provided historical context into the creation of the one-degree reporting grids. David recalled that historic data was reported from the 1950's in one degree of longitude, therefore there are three regional blocks in the West and three regional blocks in the East.

Klaas added that we are asking fishers to look at size limits to consider, what areas are fished differently, what areas have different stock dynamics and what are the inshore/offshore drivers. An understanding of these considerations will be valuable at the management plan steering committee.

Ian asked for comments from RLRAG members and observers:

Wayne responded saying he feels that the Eastern Zone could be broken down to a finer spatial scale. Different stock of fish in each area and breaking down at a finer resolution would be more representative. Wayne noted that there is a similar stock of fish from Liptrap to 147 degrees, from 147 – 149 is very much an inshore fishery and all fish caught from 149-150 are brindle fish and considered a different stock again.

Ross noted caution in slicing areas up into finer spatial resolution as this will result in limited data to inform assessments. Ross suggested the fishery is currently sitting at a very low TACC, and historical information may give better understanding of splitting.

Wayne questioned if it is worth sectioning off into smaller areas. The Eastern Zone is already a very large zone with a very small TACC. Areas that were historically productive have undergone widescale ecological changes with urchin incursions and loss of kelp.

Ross posed a question to Ian, Klaas and Toby as to the benefits of splitting the Eastern zone up? What is the main driver? Is the VFA considering more zones than just Eastern and Western, or it is just something that you explore in general?

Klaas responded that there are different perspective's from across the ports in terms of what is happening to the stock from an assessment perspective. Those don't necessarily align with the current regions. The thinking is not to have more regions but to adjust the boundaries to sit at a more representative point. In terms of the management element we may follow a similar path to discussion held in Tasmania and look at ideas such regional size limits or other regional elements that may be more suited at a finer scale for the fishery.

Ian questioned if we want to have a similar discussion for the Western Zone. Toby suggested that it be an action for everyone to go away and to get back to the RLRAG with thoughts on why we might review some of the boundaries or consider additional boundaries. The perspective of undertaking a review of the management plan is we should be reviewing the scale in which we are managing and assessing that this is still relevant.

David mentioned that the common theme at recent port visits was to consider inshore/offshore management. The offshore fishery has a much higher catch rate for a lower price product and that is where fisherman have raised the question about managing that fishery differently. Ian noted that there was an analysis done a few years ago on an appropriate depth to inform this discussion and this would be worth revising.

Steve Parsons noted that the new wind farm being constructed in the Eastern Zone would need to be considered. Rohan Henry informed that he would look to have a conversation with fishers around potential impacts in the near future.

Action:

- **RLRAG members to put forward information to be considered for revising spatial boundaries of the fishery with options to be considered at the next RLRAG – Consideration to be given to inshore/offshore boundaries, biological/discrete stock boundaries, market drivers, recreational effort etc for our next RLRAG -September**
- **Dave to locate analysis of suitable depth range for managing Western Zone inshore/offshore fishery for further consideration**

4.2 Size Limit analysis

Klaas presented an overview of the size limit analysis considering the size of capture from the perspective of egg production and the yield per individual. Klaas summarised that capturing animals at sizes well above the minimum legal lengths is shown to result in the highest productivity across all zones and sexes. However, this needs to be considered in the context of impact on CPUE (fishing cost) and the size/price grading (fishing revenue).

Klaas presented a number of graphs showing that very few animals survive beyond 160mm in both the East and West, growth slows significantly in both zones once sexual maturity is reached, females that reach 145mm in the Eastern Zone will have produced 50% of their lifetime egg capacity and that there is a trade-off between the yield obtained by harvesting an animal at different sizes.

Klaas summarised the analysis that:

- An increase in female size limit of 10-20mm could double the amount of egg production
- Capturing animals at sizes well above the minimum legal lengths is shown to result in the highest productivity across most zones/sexes
- Opportunity to increase size limit for future
- Needs to be considered in the context of impact on CPUE (fishing cost) and the size/price grading (fishing revenue)

Egg production benefits was discussed by members beginning with Ian questioning if there is very little stock recruitment relationship, then will an increase in legal minimum length materialise to actual stock benefits for the Eastern Zone? Ross noted that the understanding has been that South Australia is largely responsible for Victoria's recruitment. Klaas clarified that the spatial linkage of larval dispersal continues to be an unsolved problem and as such we are looking to boost egg production across all jurisdictions. Klaas clarified that there is no stock recruitment relationship in the model and that the analysis shown is focused on a single animal and its optimal size of harvest.

Management plan review will work through establishing a target but at the moment its just to achieve a rebuild over the life of the Management plan. Need to address other additional measures in the eastern part of the state and this is something that could come into the strategy or measures. If we can get significant benefits from a small increase to the LML and understanding the impact on catch rates and market for fishers, that's where this discussion should be informing.

Gary suggested an option to 'flip the gauge' to increase female LML and decrease male LML. Klaas explained that this would heighten egg production, it would increase the yield you get from each female producing which is a positive, however there would be a trade-off with harvesting males at a smaller size and foregoing maximum potential yield. This option will also result in less of an impact on catch rate whilst providing greater access to smaller animals for marketing reasons. If this is a trade-off that's more palatable among industry, this option could be considered through the management plan review.

Zeb suggested an additional option to consider is opening up male only season to skew sex ratios therefore shifting catch onto males and having a positive impact for egg production.

Ian noted that the Victorian strategy has been plagued with not having targets and we really need to look at having examples to inform development of appropriate targets at the management plan review. Klaas agreed that having targets is really critical to then inform measures (combination of TACC/size limits) to achieve the target.

Toby highlighted that an initial focus of the management plan review steering committee will be to determine where we want the fishery to be, so then we can then look at the combination of catch and size limits and seasons to achieve that objective. Toby also noted that we need to consider the economic benefit or loss from increasing size as part of this process.

Ian suggested that Klaas undertake a comprehensive management strategy evaluation to inform discussion on reviewing legal minimum length at the rock lobster management plan review steering committee.

Action:

- **Klaas to provide examples of target reference points from similar fisheries to inform discussion at the RL MPSC for next RLRAG meeting**
- **Klaas to undertake Management Strategy Evaluation to inform discussion on altering LML, for next RLRAG meeting**

4.3 Investigating a vessel efficiency factor

Klaas presented an analysis that considers incorporating a vessel efficiency factor into the catch rate index to assist addressing the divergence in nominal and standardised catch rates and potential bias in the interpretation of long term CPUE trends and thus biomass .

Klaas summarised that CPUE standardisation does consider some changes in efficiency as the standardisation compares vessels as they enter and exit the fishery to determine their relative efficiency. In the Western Zone this indicates that efficiency has increased about 0.6%-0.8% per annum since 1978/79. A total increase of about 33% over 41 years. This is also part of the reason that the Western Zone standardised and nominal CPUE time series have diverged over time. Due to the smaller number of vessels the standardisation process does not identify efficiency increases in the Eastern Zone.

Klaas noted that the standardisation approach does not account for efficiency changes to a vessel during the time that it is active in the fishery. This is likely to result in an under-estimate of efficiency increases. Globally other fisheries find gains of 2-4% per annum.

Klaas noted that the most robust method for calculating efficiency creep is through comparison to a standardised fisheries independent survey. However, unfortunately due to operating constraints there are limitations to the level of standardisation achieved in the Victorian fixed site surveys. For example, fishers conducting the surveys i) have a degree of flexibility in how they set their pots (and are thus influenced by information from modern sounders) and ii) can draw on modern weather and swell forecasts when choosing when to conduct the surveys.

Klaas requested RLAG input on significant changes that have occurred through the last 40 years that have affected vessel efficiency.

Gary highlighted that some fishers have been in the industry for 30 years with the same boat, same areas, same technology as they always have done. Gary suggested it could be an interesting exercise to compare these fishers catch rates against fishers who have actively utilised efficiency gains during the same period. Fishers to consider for this analysis may be David Barker, Ross Ferrier and perhaps Russel Frost. Zeb noted that this analysis may be impacted due to health concerns of some of the operators and the different stage of life that may influence motivation and work ethic.

Ian suggested that a useful exercise would be to include in the stock assessment report a recognised time line of management changes, when GPS came into effect, sounders introduced, dive hull GPS introduced and then look at planing verse displacement hulls and other fleet characteristics. Klaas confirmed that aspects related to vessel changes are currently considered however changes beyond the vessel, such as 3D sounding technology would be worth investigating.

Members suggested key changes related to:

- satellite compasses adopted by approximately 30% across the fleet

- Increased capacity of plotters
- 3D Mapping
- Introduction of escape gaps
- Improvement in pots, ropes, winches, coilers, floats
- Octopus depredation
- Bait changes – Has there been improvement in quality and supply? Current bait used is generally salmon, barracouta, mackerel, carp and bony. Toby added that he heard during the Port visits that some fishers are using cheaper baits whilst trying to keep their operating costs low which may have had a negative impact on catch rates.
- Introduction of weather forecasting such as Willy Weather and Buoy Weather. Gary confirmed that the adoption of Buoy Weather in early 2000's made a big change to the inshore fishery in the Western Zone

David noted that there has been a document that details technological advancements and he will provide this for the RLAG.

Klaas will put together and maintain a new list moving forward that will be added to the stock assessment report. Ian added that this list should also include market changes such as the China trade ban and COVID19 as markers in the fishery time line.

Vessel efficiency discussion

- **Klaas to consider a review of catch rate data from fishers who have maintained consistent practice with minimal uptake of technology in comparison to fishers who have adopted technology to improve efficiency for next RLRAG meeting**
- **Dave Reilly to circulate old stock reports that have previously detailed technology improvement for next RLRAG meeting**
- **Klaas to put together timeline of key milestones that have either resulted in efficiency gains or changes to catch rate (ie. New technology, COVID, China Trade ban etc) for next RLRAG meeting**

5. Giant Crab

5.1 Harvest strategy development

Klaas provided an update on development of the new harvest strategy for the giant crab fishery. To enable the fishery to develop further, a tiered approach is suggested whereby the provision of more data enables a better assessment and introduces the possibility for relaxation of input controls and TACC increases. It would also provide earlier warning of recruitment failure and allow quicker and smaller management changes to address these issues.

RLRAG members suggested the following considerations:

- Review the TACC row within the tiered table to include options to increase, decrease and cap TACC
- Reword level 3 requirements to refer to 'fishery independent survey'
- Under level 4 – Consider including justification of the benefits from completing an independent survey for multiple years before reverting to a lower level

Ian noted that a fishery Independent survey gives you a great snap shot of your fishery, however, the further you get away from your survey time, the less certain you become for what the survey means for the current population. Ian suggested that giant crab are a long lived species and a fishery independent survey will have value for multiple years. The harvest strategy should recognise that the value of the information does degrade over time. The harvest strategy should outline that you will fall back to a lower tier the further away you get from the fishery independent survey.

Klaas presented the 2-year running average catch rate time series which achieved the desired smoothing effect as discussed at the previous RLRAG. Ross questioned the decision making behind a 2-year average, rather than a 3-year average. Klaas clarified that the 2-year approach rather than 3-year approach achieves the balance between volatility of time series and response time to indicators of stock issues. The RLRAG endorsed using the 2-year running average as the formal decision-making time series.

Toby noted that IMAS have been tasked with providing technical advice on development of a harvest strategy for the giant crab fishery. This work has now been underway for close to 12 months and updates have continually been provided to the RLRAG. Toby explained that we are now getting close to finalising the overarching framework for the fishery moving forward, however the time series and corresponding reference point will need to be reviewed due to the availability of recent new information.

Actions:

- **Klaas to incorporate updates to HS document as discussed at the RLRAG for next RLRAG meeting**

5.2 TACC setting

Toby informed the RLRAG that during the consultation period new information has become available that has reduced the VFA's confidence in the limited data available to assess the stock in recent years. The information suggests it is likely that there has been a decline in the catch rate, and in accordance with the current management plan, a review of the TACC would have been triggered during previous assessments.

In the absence of independent data and the inherent biological traits that increase the susceptibility of the resource to depletion, the risks were considered to too high to maintain the current TACC. Whilst further work is undertaken to better understand current biomass levels it necessary to apply the precautionary principle in setting the 2021/22 TACC to ensure the sustainability of the resource. The VFA has therefore decided to undertake a second round of consultation on a proposed TACC of 5.5 tonnes (Reduction of 5 tonnes).

RLRAG members suggested that from recent observations they would support a reduction to 5.5 tonnes as the fishery did not appear to be in particularly good shape.

5.3 FRDC project update

Toby presented a project summary which has recently been sent out to industry. IMAS have largely been tasked in this initial 12-month period with developing the technology to deliver the project objectives. IMAS have now completed a draft literature review that draws on similar existing work and projects globally to guide the direction of the giant crab project. The team is now looking at a range of technology to deliver the objectives. This includes automated image recognition of giant crab, triggering image capture and analysis of the number, size, sex and individual identification. This information is then stored in a central location to be accessed by the different jurisdictions to inform stock assessments.

Toby informed that IMAS have received around 40 Giant Crab from a Tasmanian fisher and now have these stored in captivity and have in storage. IMAS have commenced a trial of image collection and approached for analysis.

The steering committee for the project is meeting monthly to guide development of a prototype that we can look to trial on vessels across the different jurisdictions in the second half of 2021.

Rafael confirmed that IMAS has 40 crabs in storage and are currently taking images and working with the information technology department to develop analysis models. IMAS has also begun working with a local company to build the prototype suitable for fitting on a vessel. Rafael summarised that all is on track for the first prototype to be developed in the next couple of months to start trials in the lab and second stage trials on board vessels.

Toby informed that there is a lot of interest in this project from the WA crystal crab fishery and Northern Territory mud crab fishery which present some really good extension options. However, at this stage the steering committee have decided there is already a significant amount to achieve and will initially limit the scope to the giant crab fishery. Once deliverables are achieved, we may look to extend the scope of the project to incorporate other fisheries (including rock lobster).

6 Other Business

6.1 SRL update

Thomas Consentino joined the RLRAG to provide an update on behalf of SRL. Thomas noted that the largest sampling program of rock lobster to ever take place has been completed in response to Chinas' request to undertake a risk assessment of all Australian rock lobster fisheries. The sampling program was completed on the third of March. The results are being processed and response will be provided to China. Thomas noted that the result will not be publicly available, and that they will be distributed depending on the outcome.

Caleb questioned if the results for other heavy metals will be available. Thomas clarified that only results for Cadmium will be released for China initially. The samples have been stored and analysis of other metals has been undertaken also and this will be used to inform any future requests.

SRL have now been focusing on funding under the ATMAC program to support trade expansion. This includes options such as cooking, freezing and export strategy development into the EU.

Zeb questioned if Western Rock Lobster returned a positive result under the sampling program, would SRL consider separating itself to open access to markets again? Thomas clarified that if SRL needed to separate to re-open markets, this would be considered.

Toby agreed to follow up with Thomas in the near future to determine a suitable time to present an update to whole of Vi industry on the sampling program results and next steps

6.2 WRL model development

Klaas provided an update on development of the Australian Rock Lobster (ARL) model that has been funded by Western Rock Lobster.

Klaas informed that Andre Punt (developed the current model used in Victoria and Tasmania RL fishery) has been working on the Australian lobster model for WRL. The nature and complexity of the WRL fishery will result in development of all the features we require for Victoria and Tasmania. The only exception is features related to translocation in Tasmania.

Klaas has received the new code update however has been requested to hold off testing as there are still a few issues that need to be sorted through. Klaas informed that he hopes to get to look at the new model within the next few weeks and will present results at the next RAG meeting.

Klaas informed the RLRAG that the current lobster model does have a reasonable feature set for supporting the current management plan and harvest strategy review. However, shifting to the Australian lobster model would make things a lot easier going forward for other scientists to pick up. This may arise if there is a shift to a new science provider or transition to Karlie McDonald (IMAS) taking on a greater role in the assessment.

Action:

Klaas to present findings Next RLRAg Klaas to provide demo and findings to assist discussion with which model to take forward for next RLRAg meeting

6.3 Scheduled meetings

The next RLRAg meetings have been scheduled for 30 September 2021 and 2 December 2021.

Toby noted that he will look to disband the Trello platform after minimal adoption within the group.

Meeting concluded at 3.10pm.