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Summary outcomes of the ACA Abalone Research Workshop

Crowne Plaza Hotel, Melbourne
17th August 2010

Present:

Alex Ziolkowski	AAAI
Ian Taylor	Abalone Industry – WA
John Smythe	ACA
Melinda Mullen	ACA - Minutes
Bob Pennington	ACA, SA
Jonas Woolford	ACA, SA
Dean Lisson	ACA, TAC
Jeremy Prince	Biospherics
Jacquomo Monk	Deakin Uni
Dallas D'Silva	DPI Victoria
Matt Bradshaw	DPIPWE Tasmania
Geoff Ellis	EZAIA
Ian Cartwright	Facilitator
Monique Leane	Fisheries Victoria
Bruce Taylor	FRB, Victoria
Zac Lewis	FRB, Victoria
Crispian Ashby	FRDC
Keith Sainsbury	FRDC
Patrick Hone	FRDC
Cameron Westaway	NSW
Duncan Worthington	NSW
Stephen Mayfield	SARDI
Caleb Gardner	TAFI
Craig Mundy	TAFI
Tony Johnston	TSF/TAC/AAA
Adam Miller	Uni Melbourne
Andrew Weeks	Uni Melbourne
Vin Gannon	VADA
Vince Collins	VADA
Harry Peeters	WADA

1. Opening remarks

The ACA Chair, Dean Lisson opened the workshop outlining the key objectives for the workshop. These were to:

- develop a more collaborative and cooperative approach to fine scale management and its supporting research; and
- improve the way in which ACA has input into abalone research applications.

He then introduced the workshop facilitator, Ian Cartwright.

The Agenda as distributed was agreed upon. Participants agreed that finer scale spatial management research should be the broad topic for the day, rather than diverting into discussions on what particular jurisdictions have interpreted 'fine scale' to mean. It was noted that 'fine scale' means different things to different jurisdictions, and is interpreted and implemented under a range legislative and industry arrangements and agreements (MOUs etc).

2. FRDC Perspectives

Patrick Hone, Executive Director, FRDC provided a broad presentation on the FRDC perspective. He noted that all states had signed up to a process based on implementing a strategy to consider research initiatives at a national level in the first instance. Such an approach is aimed at achieving more cost effective outcomes, a reduction in the current levels of duplication and savings to both industry and governments. Last year it was extremely difficult for the FRDC Board to look at and agree a way forward for funding so many competing projects – many of which had similarities between them. Dr Hone emphasized the need for the ACA to be across all aspects of abalone research and the benefits of a holistic, integrated approach rather than each state seeking to have individual projects funded and implemented, without due consideration of the potential benefits of cooperation and coordination between fisheries and jurisdictions.

Professor Keith Sainsbury, FRDC Board Member, provided a presentation on how FRDCs sees how past, current and planned research could be considered under a broad framework – the so-called 4 Box Model.

Prof. Sainsbury noted that:

- it was taken as a given that training/capacity building of industry and managers is an integral part of the model;
- there was a need ensure there is some inclusion of management processes, and in particular the workshop/industry-driven elements of management advice/decision making;
- there was a high degree of commonality between states on the left hand boxes (data recording, databases) of the model rather than the right (indicators and performance measures and harvest strategies/decision making);

- the most economic efficient way of delivering outcomes from spatial management research was the key challenge and:
- there was a need to look at what we can learn from other fisheries.

Industry expressed some concern that the model appeared to inadequately integrated, with insufficient thought or clarity given to how the results of research would be implemented or consolidated into tangible benefits for industry i.e. there is a need to ensure research is linked to outputs.

Dr Hone made the point that while states were major funders of spatial research and management in their own right, FRDC had provided an important avenue for funding new initiatives, an area where states have difficulty funding, and one which has the potential for breakthrough research.

3. State Perspectives

State perspectives were then presented. It was noted that the presentations, along with the summary of the meeting, will be available on the ACA website.

i) Victoria – Vin Gannon

Key points:

- Research must be focused on benefitting/enhancing the decision making process and not be seen as an end of itself.
- Industry must be sure that the investment it makes in research will result in a clear benefit or payoff to industry though improved management outcomes when the results of the research are implemented.
- The new Victorian Abalone Fisheries Management Plan and associated harvest strategy will place increased responsibility onto industry through increased engagement in research and monitoring, and the way in which data is used, through the workshop process, to facilitate the decision making process.
- A new decision support tool has been developed to optimise harvest of abalone spatially; the tool is:
 - robust and transparent;
 - risk averse, using a matrix to aid decisions;
 - uses Google Maps as a visual guide;
 - allows for the efficient use of all available information in a time-challenged workshop environment;
 - provides a systematic record of decisions & generation of reports; and
 - adaptable to different management circumstances or other fisheries.
- Research should be run through a ‘filter’ with the following questions asked (and answered satisfactorily) before the research is funded:
 - How will the research will make a profit/benefit industry directly.

- Are the benefits greater than the costs?
- Does this research represent value for money?
- How are the results of the research going to be applied/used?
- What is the estimated % improvement or benefit to the industry?
- What is the agreed penalty or reimbursement if the research fails to achieve the goals?
- Research often ends up with more questions to be answered than there were prior to the research commencing.

Comments:

- Without the opportunity for some “blue sky” research – there is a danger that nothing new (or new approaches) will get invented! Existing arrangements will only be improved.
- The way in which diver input to data collection and recording at workshops was carried out was queried. It was noted that workshop process makes people accountable for their comments. What is said is recorded.
- Under the Victorian system, historical catches (a relatively long time series of data) and diver input (an expert view) are used to inform upper and lower catch limits; these are fed into a database. This system should pick up a problem within 12 months of an incorrect decision, since it focuses attention on problem areas straight away.
- This system starts from a reef code basis and builds up to a TACC, rather than the other way around. Catch coming out of an area is the best indicator of abundance, rather than catch rate; the key is then to look for an indicator to determine if the decision is right.

ii) South Australia – Jonas Woolford

Key points:

- The SA abalone management model is based on
 - a Management Plan based with harvest strategy based on spatial units;
 - known stock structure and spatial differences;
 - stock status of individual populations and associated “fine-scale” management; and
 - controlling management costs.
- Research needs for the abalone sector are:
 - Performance Indicators and harvest strategy – Management Plan
 - Diver assessment to feed into harvest strategy – Management Plan
 - Fine-scale assessment – Management Plan

- Access to spatially-different blacklip stocks and non-research-diver surveys (Central Zone)
- Access to spatially-different blacklip stocks on same day – compliance (Southern Zone)
- Fine-scale assessment to allow consideration of fine-scale management (Western Zone)
- All research needs above are required in the short term, with the exception of: fine-scale assessment to allow consideration of fine-scale management and non-research-diver surveys.
- The SA industry is very wary that increased spatial management means increased compliance therefore higher costs, which may not be result in a net benefit.
- There is a desire to go down the track of getting info at finer scale - however fishermen are wary of very fine scale information being used in decisions that may well be to the detriment of industry, such as in the establishment of closures.

Comments:

- Industry reluctance to introduce fine scale monitoring in SA has some similarity to that displayed by the Tasmanian industry and seems to relate to privacy, compliance and cost concerns. While this may be seen as ‘diver paranoia’ it is important to develop protocols that are acceptable to industry in terms of addressing these concerns. It is also important to recognise that catch history/details have a monetary value in terms of IP that can be passed on at the time of sale of license. This is seen as an important incentive for the introduction of loggers and collection of fine scale data in the Tasmanian fishery.
- Problems with the use of CPUE-based performance indicators were recognised.
- Need to separate between research and compliance use (and associated sensitivities with the latter) when considering the collection and analysis of fine scale data.

iii) Tasmania – Dean Lisson/Craig Mundy/Matt Bradshaw

Key points:

- The Tasmanian abalone fishery is very significant, involving 120 divers fishing for a 2,660 tonne TAC (2010).
- A consultative process is used to make recommendations on the annual overall commercial TAC, and TACs for 5 blacklip and one greenlip zones.
- This process involves both a Ministerial advisory committee (the Fisheries Advisory Committee) and an industry funded and driven committee (the Fisheries Resource Assessment Group).
- In considering research/management priorities, the Tasmanian industry is focused on:
 - maintaining a TAC ~ 2400 to 2700 tonnes (short - medium term);

- maintaining a high quality product;
 - achieving high confidence in TAC setting process & outcome;
 - improving Fishery Management generally;
 - ensuring research activities and locations are closely coupled with the most productive zones;
 - minimising the lag in matching TAC to stock level; and
 - minimising TAC fluctuations, which should lead to more stable fishery.
- Currently there is a high reliance on low precision CPUE and catch trends at relatively large scales, which is a key limitation in assessment and management.
 - Spatial variation in \$value of abalone (size, shell and meat characteristics etc) and associated fleet behavior effects, can create substantial sub-block pressure on stocks, which are not captured by current reporting.
 - Several emerging issues may have profound, spatially complex impacts on the fishery including *Centrostephanus* and climate change.
 - Tasmania is looking to collecting and using more precise fishery data, geo-referenced on fishing location and combined with an increased field research capacity, to respond to industry/ management needs for information
 - Fine scale data can inform “intra-year assessment” (i.e. effort distribution and capping, emerging issues e.g. excessive catch, shifts in harvest patterns) as well as the annual Fishery Assessment & TAC setting

Comments:

- The Eastern zone catch is currently 896t currently worth \$45 million – heading towards another 5% increase this year. A decision has to be made as to whether or not to take this increase (worth \$2.5 million); fine scale data is needed to inform this decision and, as appropriate, distribute effort along the full East Coast.
- Another potential use is to inform decisions on ‘difficult’ blocks where the current size limit is right for some parts of the block, but restricting the overall productivity of the block.
- Industry and managers are striving to reduce fluctuations in the fishery by the use of all available levers.
- DPIW are actively looking at mandating the use of data logging equipment across the fishery.
- Victoria used a process of equitably sharing the resource in a new area - this worked well.
- There is a considerable challenge in optimising value of the available catch from a given region, noting the demand for/suitability of product for the live/canning market.

iv) NSW – Cameron Westaway/Duncan Worthington

Key points:

- There has been a strong, declining trend in the catch/numbers of abalone landed, beach price and value, as a result of stock status and TAC decisions.
- The stock assessment process is now undergoing a major transformation involving:
 - a change from a stock assessment model based on catch data and independent recruitment indices (over \$400K to run) to a logger based spatial data (FSM) and basic catch analysis \$40-50K;
 - the cessation of one system & development which has resulted in a clear gap in assessment data; and
 - a focus on stock recovery, together with data gap which has resulted in conservative TAC outcomes with associated financial pain, despite signs of recovery.
- Dept & Industry are totally committed to stock recovery and the introduction of fine scale monitoring and management noting that:
 - they are already starting down that track with variable size limits and departmental and industry investment in technology rolled out across the fishery;
 - current outputs tend to tell us where we have been not where we are going;
 - there is a the need to develop, audit and field test PIs before locking in the degree of variation over time;
 - catch/effort, length frequency, length/weight at finer scale are obvious initial candidates for PIs
 - there is a need for a national approach to develop enhanced FSM and PIs to give confidence for broader and fine scale stock assessment and guide management decisions
- Loggers, with capital purchase and maintenance funded by industry as appropriate, will be the core of assessment information in NSW, augmented by with logbook data
- Industry has given a Commitment to analyse/summarise data for use in TAC setting
- There is a need to further develop the use and application of logger data through improvements to the database and analytical tools, and for the empirical testing of potential PIs.
- Data recording technology and been rolled out and is operating at >90% coverage - funding is need to pursue further development, including options like a phone engine, where cost and reliability will be key considerations.

- Harvest strategies/management decisions still tend to be ad hoc and NSW is starting to develop a better process/workshops/working MAC.
- Since PIs remain untested there is a preference for an informal/flexible approach until the performance of PIs (as indicators of resource status) is clearer, which will allow the longer-term development of harvest strategies.

Comments:

- NSW has managed to get divers to be participative by demonstrating the benefits with no links at all to compliance. The process has been driven by industry – not forced upon them. Divers tend to be very supportive as long as they are assured that it is being used for assessment, and not for compliance. In this sense, it is very important to build trust between parties.
- Currently logger information is only being used very superficially in the TAC setting process; the priority aim is to develop this further.
- The SA experience is that they had an agreed MOU on the use of data, but this was broken by Government and data supplied through industry was used in an MPA discussion to the detriment of industry. This has had a profound effect on industry support for the process. It was noted that the NSW industry holds logger data, not government.

v) WA – Ian Taylor (in absence of researcher Anthony Hart)

Key Points:

- WA does not explicitly adopt a fine-scale approach to management, more of a behavioural fishing pattern by industry.
- Management is by its nature a high-level activity because of the legislative instruments used to enact the objectives.
- CPUE and other information is housed in two main databases, data extraction and analysis is semi-automated.
- Programmable code is used to estimate standardised catch rates, abundance indices, and fishing mortality and these are translated into performance indicators for each Management Area.
- PIs of catch rate (with target, limits and threshold) and fishing mortality/biomass are used, with associated decision rules, to inform TAC decisions.
- Current research efforts are focused on brownlip (*H. conicopora*) abalone biology and fishery and stock enhancement in greenlip abalone .

Comments:

The stock enhancement process for greenlip is progressing well, with abalone of about 20mm being put out on reefs.

4. Updates of current/recent research

Abalone researchers provided the workshop with updates of their work; it was noted that the presentations will be placed on the ACA website for future reference. The following presentations were given:

i) Steve Mayfield: Indicators and their evaluation

Key points:

- The PI/MSE project is being tackled jointly by CSIRO/TAFI and SARDI.
- SARDI will:
 - Determine, document and review PIs used for abalone and other similar fisheries
 - Identify a suite of suitable PIs through ‘expert-panel’ workshops
 - Evaluate the suite of chosen PIs against known fishery performance
- CSIRO/TAFI will:
 - Develop a Management Strategy Evaluation (MSE) framework
 - Identify suite of management strategies that aim to achieve fishery objectives
 - Use MSE to assess relative effectiveness of alternate management strategies
- Management objectives display substantial State-based differences in the specificity, diversity and number and are mostly general in nature.
- All States prescribe biological and economic objectives reflecting the importance of stock sustainability and optimizing economic values – social objectives are less clear and show great diversity between states.
- ‘Formal’, ‘informal’ and ‘potential’ PIs have been reviewed and potentially informative PIs identified
- There is a wide diversity of PIs between jurisdictions with the only ‘common’ ones being raw CPUE and temporal patterns in catch

Comment:

The expert panel used to develop the comprehensive list of PIs was industry based – not research based.

ii) Duncan Worthington: Cost effective monitoring

- A summary of two FRDC TRF projects (Northern NSW and Western Victoria) was provided.

- The projects were designed to:
 - improve on the current patchy (at best) routine surveys and get more information about stocks, using limited resources;
 - develop capacity of Industry to be involved, in-kind of hrs in the water;
 - produce information to act as a baseline for future and other areas; and
 - structure fishing to enable comparisons and maximise the information returned.
- Comparisons were made between the results of structured fishing and those from more 'traditional' abundance surveys, with evidence to show favourable comparisons.
- The projects have also shown that:
 - the further development of logger technology is important to the provision of fine scale data;
 - investment in logger-based, industry driven research and monitoring will maximise industry return on investment;
 - it is possible to arrange Structuring fishing to enable comparisons to answer specific questions; and
 - structured fishing can produce cost effective, representative, reliable and repeatable results.

Comment:

No comments provided

iii) Jeremy Prince: Local assessment and management by industry

- The presentation was in two parts:
 - *Restarting Harvest after Disease Events*: Developing Catch per Area Swept as a cost-effective survey tool for assessing absolute biomass levels; and
 - *Simple SPR Indices for Quantitative Reef Management* : Decision Trees specified with SPR PI's based on size of maturity and/or maximum size.
- The relationship between biomass and catch, using catch per swept area (Biomass in Defined Area = Catch / (% Area swept x catchability)) can be used to estimate biomass.
- Catchability can be derived as function of area swept using simple fishdown experiments.
- Spawning Potential Ratio (SPR) Indices based on eggs per recruit or spawning per recruit offer considerable potential for quantitative reef management.

- Decision trees may be specified with SPR Performance Indicators based on size of maturity and/or maximum size to inform catch setting workshops.
- A meta-study of relationship between allometric Indicators and SPR has been completed on 70+ species, including three abalone species.
- There is potential to consider the use of very cost effective fisheries assessments using SPR techniques based on:
 - mapping size of maturity / SPR P.I.'s;
 - developing techniques for routinely monitoring /mapping size composition in catch i.e. loggers & data handling systems; and
 - specifying & MSE Testing Decision Trees.

Comment:

- It was suggested that this project can be of benefit to the shell study project.
- A link between shell height/length and fecundity (SPR) was confirmed by Dr Prince.
- It was noted that there was a need to ensure Caleb uses this information for the shell study project.

iv) Craig Mundy: GPS for data collection and management - AbTrack

- Dr Munday's presentation focused on the results of FRDC project 2006/029 'Using GPS technology to improve fishery dependent data collection in abalone fisheries'.
- The use of electronic fishery-dependent data, collected using e-data methods (vessel GPS and diver loggers) to produce FS data maps using GIS technology at different scales to underpin management decisions was described.
- Grid and KUD-based performance measures offer a wide range of potential PIs.
- AbTrack comprises a GUI front end (VB .net/Nexus) and a SQL Server Spatial database backend

Comments:

- There appears to be an obvious link between this work and the current PI/MSE project – i.e. we have a cheap, effective, objective data collection method – we can then input all the performance indicators (from the PI/MSE project) – this then will give a report for management strategy evaluation.
- The issue of using 100 populations to form one model, vs. having 100 models was raised. It was noted that is where the project is heading in the future.
- Agreed that it is better to have a model for each area, rather than try and build a model to suit all areas.

- There is a danger in using maps and suggesting that trends will be the same year after year, with the unintended consequence that divers may see the results and respond in an undesirable manner. Noted that for this reason the data is not attached to maps – nor is there is no identification of where the data is from. It is possible to use information in the form of trends (bar charts, means) rather than maps.
- Clear need to better determine how the work Craig is doing will be explicitly incorporated into decision making.
- Important to remember that AbTrack and the associated analysis/outputs can be adjusted to each organisation’s needs, including measures based on shell size. Issues such as this need testing to determine the robustness of the answer.

5. Research gaps & priorities:

The workshop considered research gaps and priorities under the headings of the ‘four box model’ introduced by Dr Sainsbury and the start of the workshop.

Data and Data Recording technology:

- Size logging length/weight loggers
- Electronic data/catch reporting in real time on a fine scale
- Incorporation of market “traits” as they impact on fisher behaviour (e.g. difference between live and canned abalone prices)
- Sub-legal population estimates
- Improved/formalised diver generated data
- Other eco-system data (urchins) – diver-cam!
- Habitat mapping

Database and analytical tools: (link to 3 & 4)

- Independent databases in SQL server (modular)
- Common platform
- Set of rules for data sharing
- Standardization of data
- Finalized, confirmed “package” of analyses within database
- Longevity / ownership/storage/accessibility of data
- Auto updates

Indicators & performance measures

- Minimized for usefulness (PI’s)

- Predictive model
- Empirical tests of indicators against fisheries performance (real testing)
- Transition/calibration of logger information with historical assessments
- Estimating catchability as a function of area swept
- Selective fishing – impacts on PI's
- Economic indicators/drivers

Harvest strategies/management decisions

- Real-time decision making – legislative delay
- Decision rules/catch caps
- Tas/Vic/NSW cross fertilization – management strategies/data collection/harvest rules
- Compliance costs/risks
- Industry + government + researchers capacity building
- Stability in management

6. Abalone pre-proposals:

Noting that there is currently only one pre-proposal currently with FRDC for funding consideration, Dr Munday provided a brief presentation of his project: *Spatial Performance Measures for abalone dive fishery assessment: Development of a digital Toolbox*.

The proposed project consists of five objectives:

1. Evaluate digital diagnostic tools for a top down approach to TAC setting utilising fishery e-data.
2. Test a decision rule and reference point framework for fishery e-data.
3. Explore linear modelling techniques to facilitate a “bottom up” approach to TAC setting.
4. Apply random utility models to explore informative performance measures for fleet dynamics.
5. Develop and provide an E-resource to provide individual fishers with access to their data.

Comments:

- Objective 4 was considered vital for SA.
- Victorian industry were concerned that the project, as presented, does not appear to provide any management outcomes.

- NSW managers are wary of undertaking an ‘interim’ project of FSM which project may take 3-4 years to complete. There is a need for something new, now, to meet shorter term needs.
- Agreed that the project will meet longer term needs of a number of states, but many industry participants saw a need for short term outputs/outcomes, particularly for Victoria and NSW.
- SA stock assessment is different, as it is fishery independent.
- The rationale for making this project long term was questioned, as was the need to try and incorporate the abalone fine scale management research needs of other jurisdictions.
- The need for a better “front-end” of the project was raised.
- Matt Bradshaw pointed out the needs of the State government in Tasmania and the contribution that this project could make to improving the management of the fishery.
- FRDC reiterated that, as a national research agency, it has always been pushing for states to harmonise their fisheries research and look for common ground among States.
- There is a need to keep in mind the Tas industry are significant contributors to the FRDC and this industry has a specific need which it wishes to address through Dr Munday’s project.
- Noted that SA also invest a huge amount into their stock assessment each year.

7. ACA input into research planning and implementation

Dean Lisson President of the ACA spoke to the topic, noting that:

- The current process of putting proposals to FRDC needs reviewing.
- If FRDC want a more national approach, we need to have some forum, which sits between the FRAB’s and the FRDC (maybe something like this forum) which “filters” the projects before they get to the FRDC.
- It was suggested that this forum needs to meet earlier in the process and drive the applications, rather than review the applications already developed, not all of which are in line with industry requirements.
- The FRDC response was that at the moment they write to members, get conflicting results, then the FRDC board have to make their own decision –if there is strong conflict between proposals, then the FRDC will inevitably say no to projects, pending review.
- Dean suggested that the ACA website can be used as a forum to view the proposals.
- Clearly, there is need to recognize that there are different needs in different states, however, it is incumbent on industry and the FRDC to try and get benefit for each state from as many projects as possible.

- There was some concern that such a process, unless managed well, could add an additional meeting/level of administration without achieving much, but despite this qualification, could yield considerable benefits.

8. Closing Remarks

Dean Lisson thanked all for attending and indicated that a summary of the meeting and presentations will be posted on the ACA website at: www.abalonecouncil.com.au

It was announced that the National Abalone Conference will be held at **Hamilton Island** in July or August 2011. Suggestions for workshop participants were requested; these should be forwarded to Melinda Mullen ASAP.

The workshop closed at 4:05pm.