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Progress report for ACA/CRC projects; 30 September 2011

This is an updated progress summary (as of 30- September 2011) of the major projects currently within the ACA/CRC Abalone project portfolio:

The update comments are highlighted in **red lettering**;

CRC Communal Projects;

1. *Seafood Market Intelligence* – the outcome of this project is to publish reports describing export market dynamics of seafood and providing Seafood CRC participants with new market opportunities: – this year we have benefitted from two projects – both conducted by Dr Joanne Freeman from the University of the Sunshine Coast – the first was focussed on the abalone market in Shanghai (April 2010) and the second was focussed on the abalone market in Beijing (September 2010).

Ben Manning provided a presentation at the 5th National Abalone Convention on Hamilton Island from 21st to 23rd of July 2011 that encompassed the main research learning's/findings from the two USC reports (Shanghai & Beijing).

2. *Seafood Access Forum (SAF) and Seafood Trade Expert Panel (STEP)* – this project is all about ensuring that Seafood CRC participants have well analysed positions available to support trade and market access negotiations - i.e. to ensure favourable outcomes from current and future international trade negotiations including WTO and FTA's: - the SAF and STEP have both been established with the SAF secretariat being operated by Seafood Services Australia. STEP is now called SafeFish and has established productive working relationships with the Australian Quarantine and inspection Service (AQIS) and with Food Safety Australia and New Zealand (FSZANZ). Input into the SAF and SafeFish is through the SAF forum conducted by SSA every 6 months. The recent EU market reopening tactics were developed and implemented (based on technical information from ACA project 2008/909) resulting in the reopening of EU market access and importantly providing a degree of protection against the China market implementing similar requirements. Future ease of access to markets will be aided by the completion of a follow on project (from 2008/909) being led by Dr Cath McLeod (from SARDI) – this is now fully approved and has commenced. – the new project is number 2010/737 and is entitled “Marine bio-toxins and Market Access for Abalone”.

SAFEFISH has once again proven itself to be relevant to the market access needs of the Abalone industry in recent months due to the management assistance provided in the wake of a toxic algal bloom in south east Tasmania – there was a “super-bloom” of *Gymnodinium Catenatum* in the Huon Estuary late in 2010 which lasted until May 2011. The bloom spread south into the d’Entrecasteau Channel, Recherche Bay and Cloudy Bay Lagoon. Abalone tested within the Channel in May 2011 (under ACA/CRC project 2010/737 – see below comments) were found to contain paralytic shellfish toxins (PST’s) at levels above international standards for human consumption. These results have led to the temporary suspension by AQIS of live exports of abalone from some abalone fishing areas. These fishing areas are being progressively re-opened as the PST’s are metabolized (depurated) within the viscera and foot tissues. This toxin event may also have wider implications for the industry in terms of management of marine bio-toxins going forward. AQIS, Abalone Council Australia and the ASCRC have requested additional technical advice to assist in the risk management of this notification and to help in determining appropriate management arrangements in the future. An Expert Consultation Group meeting was convened on June 30 2011 by SafeFish to identify key knowledge gaps and potential avenues of work that may assist risk managers and the industry. The

advice from this meeting is likely to be used to draft an FRDC (TRF) application focusing on developing appropriate management arrangements in the future.

3. *Market Access Database* – this project is about establishing an online, easy to understand and access, updateable database that details technical market access requirements for important existing markets: - the Trade and Market Access Database is now available online at www.seafoodservices.com.au.

4. *Australian Seafood Diagnostic Capability Map* – this project is all about CRC participants having access to rapid diagnostic and testing services that enable rapid response to issues with minimal disruption to trade: - a project is underway to investigate diagnostic capacity for marine bio-toxins and there is still funds available for assessing capacity in other areas.

A report has been commissioned focussing on opportunities for developing diagnostic capacity (high quality analytical services) to underpin the integrity of Australian Seafood products for domestic and international consumption and to enhance food safety and market access capability in Australia – the report has been completed and has identified that there is a viable commercial opportunity for a laboratory within Australia. Discussions are underway with potential partners to undertake diagnostic services, provide R, D & E for Australian needs and develop additional capacity such as consulting, training and networking.

This project is of particular relevance to the Australian abalone industry at the moment as testing of abalone foot tissue and viscera for Paralytic Shellfish Toxins in the wake of the recent algal bloom event in SE Tasmania has necessitated the “export” of abalone tissue samples to the Cawthron Institute in Nelson, New Zealand – at the moment, there is no laboratory facility within Australia with the appropriate level of infrastructure and accredited technical expertise to conduct this type of analytical research. Another goal of the project is to enhance food safety and market access capability in Australia. At present accredited and accepted capability for marine bio-toxin testing resides in NZ (Cawthron Institute). This confers significant cost and public health risk to the Australian industry and government.

5. *Compositional Profiles for Seafood products sold by CRC participants* – this project involves the establishment of a consistent platform for developing compositional profiles of seafood products sold by CRC participants with the establishment of an online web portal to provide secure access to the information: - David Padula from SARDI received abalone samples from various exporters across the five abalone producing states to complete the abalone portion of this project – the resultant compositional profiles will then be used by CRC participants to underpin product claims and/or standards and may be used to differentiate products in the market. This data may also be used to negotiate market access in a timely fashion and will also help to ensure that Seafood CRC participants have well analysed positions available to support trade and market access negotiations. As of May 2011, all of the testing was completed. Since then, an extensive peer review process of the results has been underway.

The peer review process has been completed and SARDI are now completing final statistical checks on the compositional data set. The resultant compositional profiles will include information re fatty acids, vitamins, carbohydrates, protein, cholesterol and minerals (macro & trace elements) – the profile will be used to develop an “internationally verified nutritional information panel” for Australian “wild caught” abalone – this should be completed by November 2011. Whilst many exporters already have nutritional information included on their products, this project will provide a scientifically rigorous and independent assessment of the compositional profile of abalone that may then be used to facilitate market access for abalone products in an increasingly regulated international market environment.

Progress Report; CRC project 2009/723: “Analysis of product differentiation opportunities for Australian Wild Caught Abalone in China—Stage 2”; Principal Investigator; Dean Lisson

This project is designed to measure and benchmark the relative effectiveness of different market development activities for Australian wild caught Abalone in China. It will highlight the options that would be most effective in delivering the objectives of the abalone industry: to increase the awareness of Australian Abalone in the China Market, with the aim to increase repeat purchase from restaurants and increase the value per unit sold from restaurants.

The project has been running for just over 12 months since the launch event in late August 2010 in Shanghai. By a process of immersion within the Chinese (principally Shanghai) marketplace, the project team has been able to appreciate the complexities and challenges of doing business in China. Accordingly, there have been a number of key research findings that will shape the project “going forward”.

The key research findings to date are as follows;

1. The China Market is void of any Quality Assurance system for Australian Wild Caught Abalone.
2. Premium restaurants currently find it difficult to place Australian Wild Caught Abalone as a permanent entry on their menu due to Price, Supply and Quality volatility and a lack of product certification (COO & HACCP)

3. Possession of non-certified product by restaurants presents the risk of prosecution from Chinese Food Safety Authorities
4. The Australian Wild Caught Abalone Industry is acting on a false assumption that the market prefers live abalone
5. The more sophisticated the Chinese market becomes the less relevant Australian Wild Caught Abalone will become under its current supply regime.
6. Due to recent events (melamine scare) food safety is “front of mind” with Chinese consumers in both the B2B and B2C environments
7. Food manufacturers and retailers are customising foods and educating the consumer to “move the market”
8. There is a high proportion of down stream processed, value added foods in the upper quartile food retailers
9. There is little evidence of down stream processed, value added Abalone in the upper quartile retail environment
10. The “Mass Affluents” (Chinese “upwardly mobile” middle class) are adopting cuisine diversification and cultural engagement with cuisine is changing in China as consumers become more “global aware”, sophisticated and brand conscious in their outlook.
11. For directly imported “fully compliant” abalone products, the key market segment is within 5 star hotels and prestige stand-alone restaurants – specifically establishments with stringent quality, health and hygiene standards.
12. There is a desire for authentic, safe, quality product that meets all certification requirements for both restaurant and premium retail food outlets.
13. There is an opportunity to impart product knowledge to chefs and F&B managers - Market education is critical – chefs are open to being trained and educated regarding abalone products and abalone cuisine development.
14. The industry needs to establish a “direct import abalone product portfolio” with COO and HACCP certification.
15. The industry needs to establish a restaurant and consumer focused promotional strategy for the Australian Wild Abalone product portfolio.
16. The industry needs to seek out a suitable Chinese entity(s) to engage in restaurant recruitment, sales and product supply functions.
17. The industry needs to develop product variants customised to suit the top end restaurant and food service sector.
18. High service levels will provide a source of differentiation.
19. Value Added Products and Services pose an opportunity to expand the category footprint and thus provide differentiation in both the food service and retail environments.

All of the above key findings clearly point to the need to develop and commercialise a Supply Chain Management & Marketing Model that is custom “built” for China. The main components of this model are as follows;

- A. *Quality Assurance Code of Practice* - For the project and subsequently the Australian Wild Caught Abalone Industry – Includes product, supply chain and service codes of practice
- B. *New Product Research and Development Program* – Project must be in a state of continuous innovation to develop a suite of customised and down stream processed value added products for the Food Service and Retail Sectors that is market driven. Includes product form, application of modern technologies and packaging
- C. *Product Compliance Program* – Develop technologies and protocols to streamline product compliance and provide safer and more reliable market access and to reduce the leverage the “Grey Channel” has over the industry
- D. *Industry Market Orientation Program* – Develop and execute a program that engages industry participants and establishes a sustainable market oriented perspective
- E. *Service Model Development* – Develop a service model that engages with the China Market sufficiently to provide the Australian Wild Caught Abalone Industry with a sustainable competitive advantage over other abalone industries and potential substitute industries

F. *Commercialisation* - Develop the required intellectual property and performance metrics to align the project as a commercially viable business model

G. *Place of Origin Brand Development* – Establish a Place of Origin Brand as a repository for the developed IP and as a sustainable Value Chain Management and Marketing Model for the Australian Wild Caught Abalone Industry, using the industry trademark as its logo.

The project will run until around April/May 2012. During this time specific and detailed information will be regularly gathered from the recruited restaurants by the China based marketing company (Grey Group). This information will be used to monitor and review the performance of the products and associated market activation strategies.

This project is potentially ground breaking for the industry and addresses the need for a carefully constructed and well coordinated marketing strategy using a distinct Australian trademark that will benefit the entire industry. The challenge for industry is to devise a marketing strategy that will increase awareness, demand and ultimately the value of the product all along the supply chain. The question for industry stakeholders is “what sort of marketing and promotion strategy will work and how can we invest in that strategy to provide increased profits to businesses both here and in China?” In the 45-year history of the industry there has never been a large-scale project focussing on researching and developing markets for Australian wild caught abalone.

The project anticipates recruiting top restaurants with the aim of creating a premium product offering and service model identifiable as *Australian Wild Abalone (AWA)*. AWA is the registered industry trademark, an umbrella for quality product from Australian suppliers. Part of the key to success is to improve market entry and comply with the requirements of the direct trade route into China. The project will be supplying premium quality product that will satisfy all Chinese import regulations and be identifiable as wild caught Australian abalone.

Gains in product integrity and traceability via direct entry into China will be a huge benefit both to the industry and to the building of new long term and mutually beneficial relationships with five star restaurants in China. Direct entry in China requires Australian suppliers to meet strict import regulations for their processed products. However, there are many benefits to be gained with respect to product identity and developing demand for a quality certified product.

Australian exporters are expecting to gain much needed information from the project on end-consumer product preference, as this is largely uncharted territory within the rapidly evolving Chinese consumer market. China is changing rapidly: the Chinese consumers have a real appetite for knowledge, new experiences and anything “western” and even though abalone is a traditional food you can mix it up and try it in all different kinds of ways of cooking – as is evidenced in the many new and flourishing “fusion” style restaurants that are popping up in the major Chinese cities. Exporters who provide abalone products for the trials will do so under the AWA banner but will be able to retain their brand individuality whether based on regional differences or exporters’ know-how in the way the product is processed and conditioned before it reaches the Chinese market.

China is signing up to world (food standard) protocols and is gradually starting to enforce those protocols ... as this process continues, the Australian abalone industry must adapt to the new ways of China otherwise it risks becoming less relevant to the new generation of “Mass Affluents” – i.e. the newly emerging well educated, globally aware and hyper brand conscious China “Middle Class”. In Australia we go to a great deal of trouble to make sure product is of the highest quality and well presented... much of our product then goes through an importation and distribution system (the grey channel) where it potentially loses its identification and where there are no uniform quality handling procedures. By making the move to increasingly go through the legitimate (direct entry) supply chains... it (the product) retains its identity and product handling can be monitored and controlled - this will add further “weight” to the quality standards that we already put into our product and will eventually ensure that restaurants receive the product “at its best”.

A 5 module *Quality Assurance Code of Conduct* is being developed for project participants that clearly specify their roles and responsibilities. The modules are as follows; Module 1 - Supply Partner; Module 2 -Distribution Partner; Module 3; - Sales and Marketing; Module 4 - Data Capture & Accounting; Module 5 -Product Recall/Withdrawal

An application for formal registration of the identifying industry mark (Australian Wild Abalone) has been lodged with the Australian Trade Marks office. Proceedings required for registration of the industry mark in China are also well progressed.

Please note that as an offshoot of the China Market project, new abalone product forms (and packaging formats) are likely to be developed and tested for access into China. Provided access to China for these product forms can be obtained before the Marketing trial finishes, these products will be tested as part of the trials.

It has become apparent to members of the China project team that the existing supply chain for abalone (and indeed all seafood products) from Australia to China is relatively unsophisticated and that there is currently a low level of engagement between the importers and the end consumer i.e. restaurants and their customers. This low degree of sophistication has caused a service gap to develop (in particular) between the end point in the supply chain and the premium “stand alone” and “hotel” restaurants in the tier one cities of Shanghai, Guangzhou and Beijing.

In addition to this service “gap”, restaurants at the top level are subject to increasing levels of regulatory scrutiny regarding their sourcing of raw materials. Country of origin labelling is required along with the relevant food safety certification – these requirements effectively preclude supply via the “grey channel” which is used for the majority of seafood imports into China. Accordingly, a direct legal entry importation channel needs to be developed and implemented so that Australian seafood can enter China with the appropriate documentation and a high degree of product integrity.

Here is a summary of recent key project developments:

Current status of AWA restaurant recruitment program as at 30/9/2011:

1. Total AWA sales to date; \$111 000 AUD of frozen and dried black-lip and green-lip abalone - all of these sales have been generated in restaurants that were not purchasing Australian Wild Abalone when they were approached by the recruitment team
2. 40 entities are currently participating (across Shanghai and Guangzhou) of which 8 are regularly ordering product – the rest are intermittently ordering product or are “on hold” pending restaurant refurbishment
3. The 8 entities that are regularly ordering AWA product represent 48 restaurant premises/outlets
4. Abalone products are currently being supplied by 3 Australian suppliers via 2 China based importers
5. Regular ongoing monthly sales of around \$14 000 AUD (dried & frozen product)
6. Contracted monthly supplies to 40 restaurant premises across Shanghai

The **restaurant recruitment process** takes months from the first contact through to regular ordering of product. The process passes through the following stages:

1. Assessment of “suitable” restaurant for recruitment;
2. Initial contact (by phone);
3. First appointment where program is explained (activation strategy including media plan) and project information brochure is provided to the restaurant;
4. Subsequent appointments (usually a further 2 or 3) when product is introduced and subject to assessment (of the likelihood of recruitment), product samples are provided and cuisine development is initiated;
5. New abalone recipes are trialled by restaurant usually as “specials” – ordering of product commences on an intermittent “as consumed” basis;
6. Subject to successful trials, new abalone dishes are added to the “permanent” menu and regular orders commence – supply contracts are negotiated and established – at this stage restaurant is fully recruited.

The key project learning’s from the restaurant recruitment process are as follows:

1. The recruitment process takes up to 3 months and requires patience and perseverance on the part of the recruitment “team”
2. The recruitment team needs to include representatives from the Market Activation entity (Grey Group) and from the Sales “entity”
3. The Sales “entity” representative must have intimate knowledge of all abalone product forms and must act as the intermediary between the restaurant and the product supplier/distributor
4. The appointment of a “suitable” AWA sales representative (person or entity) is critical to the success of the recruitment process. The sales person(s) needs to be a Chinese national able to speak English and the local Chinese language/dialect – they also need to be very familiar with the product portfolio and need to have a “go getter” salesman type mentality tempered with sensitivity to local cultural practises.
5. Provision of product samples is a necessary part of the recruitment process as the potential client familiarises and experiments with the product and develops new dishes

6. Generally speaking, chefs are very keen to learn more about abalone products and their properties/provenance – they want to understand the “story” behind the product and want to learn about the product variants and the different characteristics of each abalone product type – including in particular, optimal preparation and cooking techniques to get the best out of the product. A comprehensive product information pack is a must – along with proper explanation by a knowledgeable sales representative
7. Chefs and/or purchasing managers want to develop a working relationship directly with the supplier entity/representative who can quickly (and politely) respond if there are product issues or service issues.
8. Chefs and/or purchasing managers are seeking “consistent” quality, fully compliant “legal import” product with appropriate “paperwork”, proven provenance, consistent pricing and reliable “after sales” service
9. The successful recruitment of high profile “premium” restaurants leads to “Food & Beverage Media” interest/coverage which in turn generates further interest in AWA product and further restaurant recruitment – the cycle begins and will perpetuate if properly managed

Further project developments are as follows;

A new CRC (abalone) project (2010/776 – see below) has been approved and activated – this “sister” project will cover all issues related to the development of improved packaging and/or product formats.

The project engaged George Chung as the AWA Representative for several months between March and August 2011. George facilitated the restaurant recruitment process and acted as an intermediary between the restaurant and the supplier.

Some of the initial KPI’s established for this project have not been achieved due to ongoing problems encountered when sourcing suitable product for the recruited restaurants.

In an attempt to address these issues, the project team have approached a broader group of abalone exporters for assistance in supplying product for the project. This request has been met by a group of abalone exporters calling themselves the “Primary Exporter Group” or PEG. This group consists of the following companies: Ralph’s Tasmanian Seafoods, Tasmanian Seafoods, Dover Fisheries, Western Abalone and Lonimar. The PEG are considering becoming participants in the project by supplying (legally compliant, first grade) product through their existing “preferred” China based importers and distributors under the AWA banner. The PEG are firm in their view that AWA product should be supplied via their existing supply chain partners. The PEG have proposed that a small representative team including ACA & CRC representatives travel to China/Hong Kong to visit key importers to assess their potential involvement in the AWA project going forward.

The PEG have also proposed the introduction of “Nanotag” labelling of AWA products. Nanotags can be used to prevent counterfeiting and product theft and “in effect” will provide a product provenance verification tool that purchasers of AWA product can utilise to satisfy their desire to source genuine Australian wild caught abalone products for their restaurants. The provision of Nanotag technology to project suppliers is being managed via ACA/CRC project 2010/776. Please refer to www.nanotag.com

The project team will now work with the PEG group to facilitate the potential provision of AWA product (legally compliant first grade product with nanotag verification) via the established China import supply and distribution chain provided the selected importers/distributors are supportive.

Restaurants that are already in various stages of recruitment to the project will continue to be serviced by the project and planned activation/media strategies will continue to be trialled in the months ahead.

Progress Report; CRC project 2009/708 “An Abalone Quality Assurance program for the Australian Wild Caught Abalone Industry”; Vin Gannon

This project has been temporarily suspended – however, recent discussions with the PI have resurrected the project and expanded the focus to include additional bio-security protocols in light of recent AVG outbreaks in Tasmania. The project will be redesigned to allow for the engagement of a nationally accredited RTO to conduct the training and assist with the national rollout of the QA plan.

This project forms part of Objective 2 of Investment Platform 1 of the ACA’s Strategic Plan – “Establish an ACA Ltd Quality Assurance and Product Integrity Program through the supply chain that is applied to all legally harvested Australian abalone”. The program is to involve fishers, processors, exporter/importers and handlers.

The need to adopt a consistent quality assurance approach has been identified in both the Tasmanian Abalone Council Strategic Plan 2008-2013 and the Abalone Council Australia Strategic Plan.

A revised QA Master Manual is in the final stages of development (to be finalised October 2011) and will include product handling, bio-security and food safety provisions. The Master Manual will be made available to a suitably qualified RTO to create a training package that will in turn be made available to each abalone producing state for rollout. It is intended that the training package will be ready for roll out early in 2012.

The QA project 2009/708, when rolled out across industry early in 2012, will address quality and product handling issues from point of harvest to point of export from the processing facility. The 5 Module QA Code of Conduct Manuals (described above in project 2009/723) will address (with continual revision) the QA issues from the export facility to the restaurant door in China.

Progress Report; CRC project 2010/737: Marine Bio-toxins and Market Access for abalone"; Dr Cath McLeod et al

Paralytic Shellfish Toxins (PST's) are the most common and widespread marine bio-toxins detected globally. These toxins are water-soluble and heat stable and have been confirmed as causing the toxic syndrome known as paralytic shellfish poisoning (PSP) in humans.

The report for earlier bio-toxin project 2008/909 confirms that there exists a negligible risk of Paralytic Shellfish Poisoning (PSP) to humans from the consumption of *H. laevigata* (greenlip abalone) even after the high contamination expected during typical dinoflagellate blooms. This is good news for the wild harvest sector and I am pleased to report that the EU has now accepted the conclusions from the above project and that Australian wild harvest abalone has now formally regained access to the EU markets.

A follow on bio-toxin project (2010/737) has now commenced - a key aim of the new project is to provide an updated risk assessment to support standard setting processes at Codex - more specifically to support the debate that bio-toxin standards should be risk based and not mandated across the board. This assessment will also be able to support negotiations with China and Japan (note that bio-toxins are currently being targeted by these markets). The project will fill some of the data gaps identified in the first project and also extend the Risk Assessment to include other marine bio-toxins (in addition to PSTs).

The technical trade hurdles that Australian seafood products have to overcome to maintain international market access increase each year, with additional microbiological and chemical tests being imposed by importing countries. The Australian abalone sector has not escaped this increasing regulation trend. For example, in 2010 abalone and marine bio-toxins are being targeted by the Chinese and Japan authorities for import testing. - Regulatory standards for marine biotoxins in abalone have been enforced by the EU since 2007. - The Codex Committee on Fish and Fishery Products are progressing an international abalone standard with proposed marine biotoxin testing requirements. These standards would potentially require Australia to intensively sample abalone from the entire coastline.

Australia is a major producer and exporter of wild caught' abalone. Due to the reliance of the abalone sector on export, it is important that technical access requirements are appropriate in scale. Meeting a standard for bio-toxin levels fundamentally would not appear to be an unreasonable requirement. However, the application of marine bio-toxin standards in Australia is logistically difficult to implement and costly, because this potentially would require the testing of a large proportion of the coastline in order to comply.

In 2009, fundamental research was undertaken (ASCRC Project 2008/909 – mentioned above) to determine the risk that Australian abalone carried to consumers. This research demonstrated that marine bio-toxins in Australian abalone are well below acceptable standards and are of negligible risk. On the basis of the preliminary data generated in Project 2008/909, a minimalistic sampling and testing regime was proposed that would verify the ongoing extremely low bio- toxin status of our product. However, Project 2008/909 also identified significant data gaps that adversely affect the accuracy of the risk assessment and this limits Australia's ability to promote a minimalistic sampling/testing strategy. The major data gaps identified were:

- Insufficient data on levels of marine bio-toxins in wild-caught Australian abalone (only 52 samples analysed in Australia).
- Limited data available on depuration dynamics of toxins from abalone. - No data available on the effect of the actual canning process on the levels of toxins in abalone.

Therefore, in order to confidently promote a risk based bio-toxin testing strategy with Asian markets (China and Japan) and at Codex, the data gaps identified in Project 2008/909 need to be addressed. Consequently the research program in the second bio-toxin project (2010/737) aims to: (1) provide baseline data on marine bio-toxins in Australian abalone; and (2) develop a scientifically robust position (risk assessment) to support Australian negotiations with key export markets (China) to implement risk based marine bio-toxin testing protocols.

In short, this project aims to reduce technical barriers to trade for Australian abalone in key markets such as China, Japan and the EU. This outcome will be delivered by using the risk assessment output of the project to negotiate risk based international bio-toxin standards (at Codex) that are practically achievable and minimise future industry expenditure.

ASCRC Project 2009/752.10 'SafeFish' is also being undertaken by the SARDI Food Safety group. A key component of SafeFish is the provision of technical advice to Codex Australia on key Codex standards of relevance to the seafood industry. Outputs from this proposed project (e.g. the risk assessment) will be utilised by SafeFish in providing advice on the draft Codex abalone standard. This is a core pathway for the utilisation of outputs from the proposed project and for achieving the desired outcome of a risk based international standard.

Another goal of the project is to enhance food safety and market access capability in Australia. At present accredited and accepted capability for marine biotoxin testing resides in NZ (Cawthron Institute). This confers significant cost and public health risk to the Australian industry and government. This project will be a collaborative effort between Australia and New Zealand and this will facilitate transfer of knowledge and assist in capability building for broader industry (e.g. abalone, cockle, oyster and mussel industries) benefits in Australia.

This second bio-toxin project will involve undertaking a sampling programme that will involve the testing of ~200 samples. Whole tissue samples will then be tested for the key regulated marine biotoxins (PSP, NSP, DSP and ASP).

There will also be "Adverse Event Sampling" within this project - this aspect of the project aims to investigate the potential of abalone to concentrate toxins under micro-algal bloom conditions (worse case scenario). Abalone and bivalve samples will be taken from each of two separate sites (Tasmania and NZ) that are known to be prone to regular algal bloom events. Sample collection will occur when toxin producing algae are detected at high levels in the water and when bivalve shellfish are known to be contaminated with toxins (via the routine state shellfish programmes). One sample site will be located in Banks Peninsula, New Zealand as this area is known to have *Dinophysis* (DSP toxin producer) bloom events on an annual basis. The other site will be located in Tasmania where recurrent *Gymnodinium catenatum* (PSP toxin producer) blooms occur. *Gymnodinium catenatum* is a dinoflagellate (type of phytoplankton) that produces Paralytic Shellfish Toxins (PST). Bivalve shellfish are well documented to accumulate significant levels of PSTs and therefore regulatory limits for these toxins have been established. *Gymnodinium catenatum* blooms annually in Tasmania and causes routine closures of bivalve shellfish areas.

Adverse event sampling occurred in the d'Entrecasteau Channel in SE Tasmania in May 2011 - Ten abalone and ten bivalve samples from each of two areas were taken and tested for the relevant toxin. The bivalves were tested whole and the foot and visceral portions of the abalone were tested separately (due to potentially accumulation of toxins in foot tissue). These samples were sent to Cawthron (NZ) for analysis. Below is a summary of the algal bloom event and the sample testing outcomes;

- In late November 2010 low levels of *Gymnodinium catenatum* cells were first detected in the Huon Estuary in Tasmania.
- By mid December the cell numbers had reached levels of concern and bivalve flesh testing was instigated (note, this area does not contain commercially farmed bivalve shellfish).
- The early stages of the bloom seemed more focused on the lower Huon Estuary, but by mid March 2011 sites from as far north as Roberts Point and as far South as Hastings were affected by the *Gymnodinium catenatum* bloom.
- A public health warning against eating 'wild harvested' shellfish was issued on the 25th March 2011. This did not include abalone or rock lobsters.
- Bivalve shellfish (mussels and oysters) have been taken and tested throughout the bloom event by the Tasmanian Shellfish Quality Assurance Programme (TSQAP) and have consistently been found to contain significant levels of PSTs, above the maximum permissible limit (800 µg/kg).
- This bloom event appears to be a relatively significant event, in terms of cell numbers and toxin levels in bivalves, when compared to other years.
- The most recent phytoplankton samples taken in early May indicate that the bloom is likely to be crashing.

Abalone Sampling

- Given the significance of this bloom event a decision to sample abalone as part of the ASCRC project 2010/737 was taken.
- Adverse weather conditions prevailed during late March, early April and prevented abalone samples being taken.
- Abalone (5 x individual black foot abalone) were collected from Partridge Island (M9) on Thursday 21/04/2011
- Abalone (5 x individual black foot abalone) and a mussel sample were collected from Garden Island (M10) on Monday 02/05/2011

Abalone PST Results

- The abalone collected were tested individually (in total n=10) and the viscera and foot tissue was tested separately by the Cawthron Institute in Nelson, New Zealand (under contract to SARDI).
- The abalone were tested by an HPLC screen method (the 'Lawrence method'), which has been approved for regulatory purposes by the European Commission and the New Zealand Food Safety Authority. The method is also IANZ accredited for bivalve shellfish (equivalent to NATA).
- The HPLC screen test results were received Monday 16th May 2011.
- The HPLC screen results for abalone foot tissue from Garden Island (M10) ranged between 97 – 144 µg/kg and abalone viscera between 829 and 6711 µg/kg. All abalone meat (n=5) and viscera (n= 5) samples were positive.
- The HPLC screen results for abalone foot from Partridge Island M9 ranged between 187 - 747 µg/kg and abalone viscera between 232 and 3251 µg/kg. All abalone meat (n=5) and viscera (n= 5) samples were positive.

- The regulatory limit for bivalve shellfish is 800 µg/kg.
- After receiving the HPLC 'screen' result the HPLC confirmatory method was undertaken on the highest abalone foot and viscera samples.
- Confirmatory results were obtained on 19/05/2011 that confirmed that the abalone contained 586 µg/kg and 2437 µg/kg in the foot and viscera respectively.

As a result of these adverse results, discussions were held between SARDI, the ACA and local abalone processors and a further series of sampling and testing was conducted later in May 2011 from a broader area including the southern shore of Bruny Island, the Actaeon Island and Recherche Bay. The samples were also sent to Cawthron for analysis and the results indicated that abalone from this broader area had also accumulated levels of bio-toxin which in some cases exceeded the permissible limit. These results were disclosed to AQIS and discussions were initiated between representatives of SARDI, ACA, TAC, Tasmanian Department of Health and AQIS. Following these discussions AQIS advised Tasmanian abalone exporters of a series of restrictions regarding export of abalone harvested from the affected area – the “head of power” for AQIS to impose such restrictions lies within Clause 1.1 of Schedule 5 of the Export Control (Fish and Fish Products) Orders 2005 and Order 75.

Since the first restrictions were imposed in late May 2011, there has been some relaxation of these restrictions due to depuration of the toxins with the passage of time (abalone metabolise the toxins). As at 30th September 2011, a further series of sampling and testing was being organised for early October – it is likely that further depuration of the toxins will allow some of the remaining AQIS export restrictions to be relaxed/removed.

CRC project 2010/737 will continue throughout 2011/2012 and will gather more data as part of the baseline bio-toxin assessment as well as via the “adverse event” sampling process – analysis of depuration rates will be an important component of this work and the effect of canning on toxin reduction in abalone will also be investigated using commercially viable time/temperature combinations in the processing step.

The data gathered in the above project components will be used to update the risk assessment generated in the previous market access for abalone project (2008/909). The scope of the risk assessment will be significantly expanded to cover all major toxin groups (DSP, ASP and NSP in addition to PSP toxins), key commercial species of abalone in Australia and New Zealand and include information on toxin reductions through canning and depuration. The risk assessment will be the key component used to support the development of risk-based standards at Codex and for trade negotiations with China, Japan and the EU.

Progress Report; CRC Project 2010/704 — Maximising the value by minimising stressing abalone – Optimising harvesting strategies: Dr Craig Mundy and Dr Natalie Moltschanivskyj

Harvesting, handling and transportation of abalone are stressful events and influence the capacity of the animals to recover from harvesting and their post-harvest survival. Having a better understanding of the stress profile during these phases will enable divers, transport drivers and processors to better manage the supply chain and will maximise the condition and survival rates of abalone and ensure that the maximum value of the harvest quota is retained. The concept proposal for this project has been modified several times and has been before the CRC RAC for consideration.

A workshop was held in Hobart and the project scope was agreed with industry stakeholders to include the development of a stress profile from (a) point of harvest to processor and (b) during tank holding phase prior to export and/or processing. The stress profiles are to be developed for a range of harvesting and transport scenarios including day fishing from runabouts and extended stay fishing from abalone mother-boats.

Based on the understanding gained from the stress profiles, the project will make a series of recommendations regarding improved harvesting, handling and transportation methods as well as how to minimise stress (and spawning) of abalone whilst in the tank holding phase prior to export and/or processing.

Assessment of stress will be made using blood samples of animals based on measures of haemolymph glucose, pH, lactate, and CO₂; these parameters respond when animals have restricted access to oxygen or become heat stressed. In addition, phagocytes counts will be made as this is an indication of an immune and stress response. Blood is sampled from the large blood vessel on the dorsal side of foot of live animals, the pedal sinus, using a syringe. As natural biological events and processes will affect stress levels of wild animals, baseline measures of blood parameters will be obtained by sampling blood from animals underwater, within minutes of being chipped off the rock. For each animal from which blood samples are taken, a visual assessment of somatic, reproductive and shell status of the individual will be recorded.

Sampling will be undertaken over a 10 day period in summer and winter, allowing an assessment of the effect of water temperature and reproductive status on stress during the supply chain at times of year when mortalities post harvest is greatest and smallest.

As temperature is one source of stress for abalone during transport temperature loggers placed in the crates/bins will provide data about the temperature experienced by the animals from the time they are stacked to arrival at the processors.

Once at processors an assessment of the condition and health of the animals will be made using industry based protocols and criteria, additional mortality rates and spawning events will be quantified. If spawning occurs at the processors fertilisation rates will be assessed using gametes released to determine if animals are releasing gametes prematurely as a stress response, or if the animals are reproductive mature at harvest and changes in environmental conditions trigger spawning.

This project has received full approval from the FRDC, CRC and ACA Boards and has gone to contract.

The first (winter) sampling trials were due to commence during September 2011 – I have been informed by one of the project leaders (Dr Craig Mundy – IMAS) that one of the key research assistants allocated to this project has moved to another group within IMAS for a longer term contract and that this could postpone the commencement of the project proper by several months.

Dr Mundy has advised that the project team will re-schedule the first experiment for the University summer break (early 2012) when Dr Natalie Moltschaniwskyj is free from undergraduate teaching commitments at the University of Newcastle - meanwhile the team will push on with some of the other components of the project.

Progress Report; CRC project 2009/714: “Decision Support Tools for economic optimisation of invertebrate fisheries”;
Principal Investigator; Dr Caleb Gardner

This project will conduct baseline economic studies across all Australian abalone fisheries that will provide a snapshot of the fisheries and will provide the basis for the economic analyses. A methodology will be produced for using the economic data and stock assessment reports to make TACC recommendations. The economic benefits of various fishing to market strategies will be determined.

This project is one of a suite of Decision Support Tool projects (based on bio-economic modelling) in our key invertebrate fisheries (WRL, SRL and ACA). In our provisional CRC economic benefits modelling these projects stand to deliver the most significant ROI benefits of any projects. Whilst the three Decision support tool projects are set up as separate projects there is cooperation between them, particularly in the area of modelling and in communication, uptake and adoption (e.g. can the model that has worked well for SRL in Tasmania work as well for WRL and Abalone fisheries). The final budget has come in at \$250,959.00, \$21,041 lower than the approved budget. The WRL project is already underway and the SRL project has just been approved by SRL and will now go to contract.

The two Future Harvest projects (this one and 2009/715 – “Optimising business structures and fisheries management systems for key fisheries” – see below) have now been finalized after long periods in gestation and the CRC is very keen to get them both underway. Both of these projects lie at the core of what the Future Harvest theme is about (improving the economic efficiency of our key fisheries) and cross multiple sectors and the CRC and FRDC are strongly supportive of both. The good news is that the CRC has driven a hard bargain with the PIs and reduced the costs of both projects below the provisional budgets appearing in the spreadsheet and approved by the CRC and FRDC Boards.

This project was approved by the ACA at its most recent meeting on 20th July 2011. Dr Gardner has advised that the contracts for this project are being finalised with the first industry workshop planned to occur before the end of 2011.

Progress Report; CRC project 2009/715: “Optimising business structures and fisheries management systems for key fisheries”

For 2009/715, this is a more innovative project with the early stage focused on application of a new wealth based fisheries performance indicator that is developing credence with involvement now from the World Bank. The project is a true multi-sector project and is to be funded by SRL, ACPF and ACA. The structure is different to the decision support tools project in that it is a single project working with three participant industry sectors (and we have all too few examples of this type of project in the CRC). The project has three sequential objectives to be applied to multiple individual fisheries within each industry sector:

1. Assess the performance and identify impediments to wealth creation in selected CRC fisheries (based on the new Fisheries Performance Indicator - FPI)
2. Describe and evaluate innovative systems that have been established to improve the performance of successful fisheries worldwide (particularly any that address the weaknesses identified through the FPI process).

3. Identify practical opportunities for overcoming impediments to wealth creation and improving the performance of selected CRC fisheries.

This project was approved by the ACA at its most recent meeting on 20th July 2011. Dr Gardner has advised that this project has just gone to contract and that there are no significant developments to report on at this stage.

Progress Report; CRC project 2010/776: "Australian Wild Abalone – New Product Development" Principal Investigator; Karen McNaughton

While the existing China Market project 2009/723 will continue to work on differentiating Australian Wild Abalone in China as a premium product, we have a unique opportunity as we are building new customer relationships to work closely with them to firstly ensure that existing product complies with the technical requirements and supports the premium positioning being marketed. Following this we can work closely with them to develop new product variants and develop a new product supply chain.

New Product types verbally discussed with suppliers, distributors and customers as part of the project so far include frozen sliced product, product with sauce, chilled vacuum packed meat, chilled modified atmosphere packed meat, gut/viscera product. Development of these products and a market for them will help remove the price volatility and supply issues associated with a mainly live market and thus overcome one of the barriers to having Australian wild caught abalone product on high-end premium restaurant menus.

For both existing and new products, the project will provide technical input to ensure that the product can meet the requirements of the Chinese import authorities and ensure that authentic, safe quality product is available through the direct supply channel to the high end food service sector (also meeting their standards). This work will provide evidence to support the product safety and quality claims of Australian wild caught abalone trademarked product.

It is proposed to run the project in two stages. The first stage will focus on the existing products being supplied as part of project 2009/723 and the associated technical support for market access and product compliance, including quality systems and product specification documentation for the supply chain.

Stage two will focus on new product variants based on end user and customer feedback and this stage will follow recognised best practice product development process. Again these new products will be supported with technical information to meet regulatory and customer requirements for supplying premium product directly into China.

This proposal has been developed with members of the project team for Project 2009/723. Specifically meetings held with Dean Lisson and Jayne Gallagher to discuss the initial scope of the project (27/10/11). The PI visited Tasmania on 16/11/10 to meet with Abalone Council Australia (ACA) and Australian Seafood CRC (Dean Lisson and Jayne Gallagher) to develop the proposal further. Tas Live Abalone (processor) was visited (who are a current abalone supplier to project 2009/723) and the project proposal detail discussed and agreed in principle. The consultation process is ongoing with the ACA and CRC to ensure that the project proposal meets stakeholder needs.

The project concept was approved by the RAC, CRC and FRDC boards in February 2011.

Discussions will continue with the current suppliers to CRC Project 2009/723 with regard to cash contributions for stage 2 from the companies involved, of up to \$100,000.

The agreed objectives of the project are as follows;

- 1 To identify and implement optimised post-harvest value-added processes with current suppliers of project 2009/723 to ensure product meets the premium positioning and product compliance.
- 2 To develop, trial and evaluate a range of new Australian wild caught abalone products (from concept to test market), with current suppliers to end users in project 2009/723.
- 3 To provide technical support to supply products (existing and new) through the direct supply

The PI for this project, Karen McNaughton travelled to China in May of 2011 and spent the first two days with the Grey Group team, being briefed on the current status of project 2009/723. A new distributor to this project, Honghai Seafoods was introduced and a visit to their facilities was undertaken.

An interview to gain product quality feedback was undertaken with the purchasing manager of one of the restaurant chains being supplied with AWA abalone. Current issues indicated were of soft product and sizes/packaging not being to the agreed specification. Photographic evidence was received of these issues.

Understandings were gained about the distribution channel and handling of the frozen abalone products. Direct feedback on quality issues and photographic evidence from end users was obtained to report back to the Australian abalone processors. New product ideas were also documented to discuss with our processors. Updates to Chinese food standards were obtained that directly impact on the exporting of canned abalone into China. This document was passed to SARDI Food Safety market access colleagues for reference and translation.

Karen has recently visited abalone processing facilities in Streaky bay, South Australia as well as spending a day on a working abalone harvest vessel. The cool chain process was followed through from the vessel to the factory using two methods on selected green-lip and black-lip abalone sent through the usual commercial process, including blast-freezing at the factory. This process was monitored using I-button temperature data loggers (which were inserted into selected black-lip and green-lip abalone once shucked on board) and there was periodic use of a temperature probe.

Texture and tissue pH were measured of the abalone onboard and at the factory. Once frozen, the temperature monitored abalone were sent back to the Adelaide laboratory and placed in a -18°C freezer. These were thawed after 2 weeks, loggers removed and weights and texture measurements taken. Texture was also monitored through chilled shelf life.

Fluid loss was monitored from shucking (at sea) to the factory. Bagged abalone were sent through the cool chain with fluid loss measured by difference the following day and after freezing.

The temperature and texture data is currently being collated and reviewed. This will form the basis of the information to determine further trials with this participant. The next stage is targeted before the end of October.

Karen will be progressively visiting all of the factories that are currently providing product for the China Market project 2009/723 to examine their cool chain and processing and packaging technologies.

Karen is currently working with Nanotag technologies regarding the potential use of this technology with suppliers to the China Market project 2009/723.

Dean Lisson: September 2011