Department of Primary Industries

NSW Lobster Industry Working Group meeting 2 August 2016 - Outcomes

OUT16/42425

<table>
<tr><th>Agenda Item</th><th>Summary and Outcome</th></tr>
<tr><td>1. Welcome, apologies and introductory remarks</td><td>Meeting start 08:30am

Attendance: Nicholas Giles (DPI Commercial Management), Noel Gogerly (Industry), Lee Monin (Industry), Daniel Stewart (Industry), Scott Westley (Industry), Oly Wady (Recreational), Geoff Liggins (DPI Science & Research), Andrew Field (DPI Compliance), Renae Hulin (DPI Catch Records).

Observers: Mark Horne, Mark Cranstone

Apologies: Peter Offner (Industry), Ronald Nye (Indigenous)</td></tr>
<tr><td>2. Confirmation of final minutes of the previous meeting</td><td>The NSW Lobster Industry Working Group members confirmed the final draft minutes from the Lobster Industry Working Group meeting held on 9 June 2015 as being a true and accurate record of the meeting.</td></tr>
<tr><td>3. Lobster Industry Working Group membership update</td><td>The Lobster Industry Working Group was established in 2012. The Terms of Reference (ToR) at the time required that after three years, two of the regional fisher representatives and the Recreational and Conservation representatives be renominated, and the terms of reference be reviewed. A review and consultation on the ToR was conducted in April 2016. A call for expressions of interest for the Region 1 and Region 3 fisher positions, Recreational, Conservation, and Indigenous members was made and member appointments finalized in June 2016, noting that no nomination was received for the Conservation member position.

Current members and terms are provided below:

<table>
<tr><th>Member position</th><th>Member</th><th>Term expiry</th></tr>
<tr><td>Industry Region 1</td><td>Daniel Stewart</td><td>15 June 2019</td></tr>
<tr><td>Industry Region 2</td><td>Noel Gogerly</td><td>1 December 2017</td></tr>
<tr><td>Industry Region 3</td><td>Lee Monin</td><td>15 June 2019</td></tr>
<tr><td>Industry Region 4</td><td>Peter Offner</td><td>1 December 2017</td></tr>
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<tr><td>Industry Region 5</td><td>Scott Westley</td><td>1 December 2017</td></tr>
<tr><td>Recreational Fishing</td><td>Oliver Wady</td><td>15 June 2019</td></tr>
<tr><td>Indigenous</td><td>Ronald Nye</td><td>15 June 2019</td></tr>
<tr><td>Conservation</td><td>Vacant</td><td>N/a</td></tr>
</table>

The Working Group discussed holding a second meeting during the year with regard to time constraints for update and discussion with a one day meeting. Further time was noted to be beneficial with regard to discussion of Management, Compliance, Research, and industry/stakeholder issues, and to provide more detailed update on Research projects and activities.

Various options were discussed, including meeting for an extra day prior to the TAC meeting, holding a second day meeting part way through the year, and/or holding regional meetings to assist fisher attendance.

Outcome – The Department notes that the agenda included several complex issues, in particular items regarding future targets (e.g. economics or alternate management reference or limit points), and review and development of administrative procedures (forfeiture and suspension processes). These items will be subject to separate and specific Working Group meetings and/or consultation process with shareholders to allow appropriate consideration.

Regional members to assess interest in attending meetings by fishers in their respective regions to inform potential additional meeting and/or location/s. Item to be progressed out of session.

Costs for the current one day industry meeting are recovered as a component of the management charge. Additional general industry meeting days would be required to be cost recovered.

Additional meetings to discuss specific issues (e.g. Demerit/forfeiture review and/or harvest strategy) will be assessed on a case by case basis for cost recovery, dependent on potential cross fishery application of outcomes. Further advice will be provided prior to each meeting.
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<tr><td>4. Validation process – Options to</td><td>Compliance and Science & Research Branches have established a project to examine weight differences between validated and final weights within the validation window.</td></tr>
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enhance integrity	**Outcome** – Noted. The Department to report to the Working Group on progress as appropriate. Minor changes to lobster weights according to storage, transport, and processing are noted, and will be considered in any compliance investigation. Industry noted the SFM project to install lobster holding tanks, which may assist in rehydrating lobsters following transport where consigned to this market.
5. Update on the Total Allowable Catch Setting and Review Committee (TAC Committee) program for 2016/17	A public call for submissions on the 2016/17 TACC was advertised on 13 April 2016, and a further letter sent to all Lobster Fishery Shareholders notifying of the advertisement and the dates for the Industry and TAC meetings. The Lobster Total Allowable Commercial Catch (TACC) meeting was held on the 3rd of August 2016. All members of the Working Group and a number of additional lobster shareholders attended the meeting. Overview presentations of the information submitted from the Department's Management, Science & Research, and Compliance Units were provided for the TAC Committees deliberations on the 2016/17 TACC. The Department and industry members provided additional information in response to queries from the TAC Committee. The Committee subsequently made a determination on the TACC of 160 tons. As a new Total Allowable Commercial Catch Determination was not made prior to the commencement of the 2016/17 fishing period, the previous Determination of 160 tons remained in force until revoked by a new determination. To allow fishing to commence on 1 August 2016, and so not to constrain the decision of the TAC Committee, an initial quota allocation of 90% of the 160 ton Determination was made. A new 2016/17 fishing period Determination was made on the 23rd of September 2016, and initial allocations were adjusted to provide the full proportional determination to each shareholder. The quota transfer fee has been waived for the first three months of the fishing period, to 31 October 2016 with regards to the two step allocation process. **Outcome** – For information The 2017/18 TAC meeting date has been set for **17-18 May 2017**. Shareholders will receive letter notification in early 2017.
6. Management charges for the 2016/17 financial year	A draft budget was supplied to industry members for comment, noting that an audit of carryover funds was being finalized. The finalized management charge of $55.32 per share is an increase of $0.70 from the previous year, attributable to CPI increase and redetermination of savings, carryover, and FRDC contribution components. **Outcome** – The draft budget was supported by the Working Group. Subsequent finalization of carryover from previous years reduced the draft charge post meeting.

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7. Research progress update	Update and discussion on key research projects was given by Dr Geoff Liggins. Summary attached. **Outcome** – Noted by Working Group. Discussion included that additional time for update and discussion would give a more comprehensive summary, discussion, and understanding of the background, aims, and benefits of current research projects, as per outcomes of Agenda item 3.
8. Tags for the 2016/17 fishing period	A total of 235,000 tags were ordered for the 2015/16 fishing period at a price of $179 + GST per thousand for the TACC of 160 tons. A tender process for a three year tag supply contract was conducted in early 2016. The successful tenderer was Mega Fortris Pty Ltd. The three year contract will assist in reducing ongoing tag costs, provide certainty of supply and economy of scale efficiencies in pricing, and ensure consistent presentation of security seals. The contract is expected to save a minimum of $12,000 over the contract period. An initial order of 200,000 tags for the 2016/17 fishing period has been received from Mega Fortris Australia Pty Ltd at a price of $165 + GST per thousand. A further order will be placed on the TACC determination by the TAC Committee. The tags will be yellow with laser engraved black text and a red NSW waratah. As with previous fishing periods, fishers are encouraged to only request enough tags that they reasonably expect that they will require, and to return excess tags when they finish fishing in the fishing period. The number of tags required will vary according to the expected average size of lobsters, influenced largely by the time and area of fishing activity. The cost of tags is recovered from industry, and forms a component of the management charge. The Department minimises the cost (number of tags ordered) as much as possible, however relies on industry to assist so fishers do not hold tags that are not expected to be used, and which are only returned after the season finishes. The potential to reduce the length of the individual tag numbers (Action item from previous meeting) was raised by industry. This was examined by the Department in 2015 and the large number of tags required for each season precludes reducing the number of digits. **Outcome** – Noted and supported by the Working Group.
9. Retaining lobsters taken in demersal fish traps	An industry member raised a proposal to be able to retain lobsters taken in demersal fish traps (DFT), when the fisher holds both Lobster and DFT endorsements at the previous industry meeting.

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(ongoing)	Retention of lobsters is prohibited under Cl7A of the *Fisheries Management (Ocean Trap and Line Share Management Plan) Regulation 2006*, which relates to the fish trap itself. Amendment would be required to the *Fisheries Management (Ocean Trap and Line Share Management Plan) Regulation 2006*. This item was progressed out of session with discussion between the Lobster and Ocean Trap & Line Fisheries Managers. A key factor in progressing this issue was recent announcements for the Business Adjustment Program regarding fishery management structures, commonality amongst fishing methods and retention of quota species, and the review and consultation process on current legislation. Discussion around commonality between lobster and fish trapping activity also included issues around by-product in the Lobster Fishery and that escape panels as required in fish traps are not required in lobster traps. The Working Group noted that bycatch of finfish, and particularly species other than leatherjackets is minor, including from independent survey data (particularly sub legal snapper and grey morwong). **Outcome** – This amendment will be considered as part of the regulation review for the implementation of outcomes of the Business Adjustment Program for demersal fish trapping arrangements. NSW DPI Science & Research will assess potential impact on by-product species, particularly juvenile snapper and grey morwong with regard to escape panels as part of that consideration.
10. The next steps for the NSW Fishery – Industry Update	Comment and discussion is sought from Working Group members on their vision for the next steps for the NSW Lobster Fishery. **Outcome** – Discussion centred on reference and target points for the longer term management strategy of the Lobster Fishery, refer item 11. Comment is welcome at any time from shareholders on their vision for the future of the fishery.
11. Economic Data – Industry support	The TAC Committee has recommended for a number of years that the collection of economic data would assist in determining a TACC which would provide the most economic benefit to industry. Industry's longer term position has been to focus on the building of biomass to ensure the sustainability of the lobster stock. At the 2015 meeting the Working Group supported in principle exploration of management options including the setting of longer term targets for the fishery (including but not limited to CPUE targets and/or progression to regimes that provide for increased economic returns e.g. MEY yields). In particular, support was driven by indications of a then temporary plateau in

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	CPUE, and considerations on the likely long term yield from the fishery (noting this is limited by available data). Research data from the 2015/16 fishing period indicated a subsequent rise in fishery wide CPUE, however strong recommendation remains that consideration of this issue is required now, before any harvest plateau (i.e. indications of nearing maximum longer term yields), in order to provide scope for harvest to meet any different modelling targets. A brief background on previous discussions was presented. The Working Group noted that consideration of economic or other targets for the fishery is a complex issue, and that the available time was too short to provide for sufficient discussion. Key discussion included whether committing to assessment of future targets was an obligation enforced by the Department, or whether this is an industry driven process. Relevant to this issue are that no explicit modelling targets exist for the fishery other than to maintain the spawning biomass above the limit reference point of 25% of the virgin biomass estimate. Assessment of alternate reference points (e.g. Maximum sustainable yield, Maximum economic yield, Catch per unit effort targets) will determine a range of targets and potential benefits which may include more cost efficient harvest (i.e. less operational costs), and/or higher gross or net returns (profit) to fishers. Different targets may also provide an increased buffer against unforseen events (e.g. successive poor recruitments), assuming that a target may provide to maintain a larger biomass or spawning biomass (as is largely the basis for an economic yield structure). **Outcome** – The Department's position is that its primary responsibility is to conserve and provide for sustainable harvest; however the Department also has responsibility to promote industry viability and social and economic benefits. As the stock has continued to rebuild, defined targets are increasingly needed to guide the setting of the TACC in each year. In particular, determining revised limit and/or reference targets of spawning biomass that are the predominant driver in determining potential benefits of different levels of fishery harvest are required. Different management strategies can be applied to maximise the benefit of harvest in different ways, including (but not limited to) maximum total harvest, maximum net profit, and/or maximum catch per unit of effort (or a combination/intermediate of these). The Department recognises that further information is required to define, and for industry to consider future management strategies for the Lobster Fishery. The Department will arrange a Working Group meeting to specifically discuss options for longer term management targets.
12. IVR and Online Systems	The Department provided an update on the progression of the Online and IVR systems. Progressive implementation of the FishOnline system is continuing.

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	There are currently 344 registered uses of FisherDirect (up from 258 last year). FisherDirect will currently allow: • lodge catch and effort log sheets for non-quota based fishing activities • see recorded catches dating back to 1 July, 2009 • get an up to date view of quota balance/s • view authorised fisher history dating back to February, 2007 • view the endorsement history of businesses dating back to February, 2007 • view licence details • receive messages • post advertisements to and review the For Sale and Trade bulletin board • manage aspects of FishOnline accounts • appoint and permission agents to act on your behalf • pay fishing business charges and fees In the future, FisherDirect will provide the following additional services: • licence renewals • the transfer of shares and fishing businesses • quota transfers • replace licence/fishing business cards • authorise/Revoke fisher • complete Quota Catch and Effort logsheets • update contact details There are currently 26 registered users of FisherMobile (up from 6 last year) operating in a pilot group mode. FisherMobile is a smartphone/tablet/iPad application for use by authorised fishers to interact with the FishOnline system in a mobile capacity. FisherMobile currently allows fishers to: • lodge catch and effort reports for non-quota based fishing activities • lodge real time fishing activity reports such as pre-fish, pre-land and/or post-land reports (implemented for spanner crab quota) • lodge threatened and protected species reports

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	• report lost and found gear reports • lodge nil returns • access quota balance information • manage PIN numbers • view FisherMobile activity log • change current user A range of information regarding access to and using available functionality has been developed, and customer support is available. **Outcome** – Noted by the Working Group
13. Administrative processes in the lobster fishery following offences	A range of administrative procedures may be triggered following offences (including in the Lobster Fishery). This includes share forfeiture and endorsement/CFL suspension or cancellation. The Department has agreed to review the arrangements for the NSW Lobster Fishery, and has commenced a background review of arrangements in place in other jurisdictions. The review will also consider development of similar provisions for all share management fisheries. The Department provided an update and discussion on process for review of the Lobster Fishery provisions and development of consistent share management fishery provisions, including involvement of all or part of the Lobster Industry Working Group. **Outcome** – The Department has commenced assessment to inform the review of the current demerit and forfeiture provisions. Once background information on potential options is collated, further advice will be provided on structure for the review and development of forfeiture and other administrative provisions out of session, with a view to scheduling and commencing meeting/s in 2016/17.
14. Vessel monitoring	Industry raised for discussion the use of vessel monitoring systems (VMS) for the Lobster Fishery to provide deterrent for offences including interference with fishing gear (trap raiding), and providing increased information for Compliance Officers for offence investigations. Members raising the issue indicate that several fishers from their regions have also raised the potential use of VMS to promote compliance in the fishery and identify and mitigate offences, particularly interference with traps. Working Group members supported assessment of the potential benefits of VMS, noting that the range of vessels used in the fishery may affect practicality of use (e.g. small vessels working around the rocks), and that cost may be a consideration.

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	Outcome – The Department to provide updated information on available technology and costs.
15. Tag end discarding	Several instances of trimmed lobster tag ends washing up on shore have been reported in 2015/16. Fishers are encouraged to ensure they have adequate systems to retain all trimmed tag ends, and prevent unintentional discards. **Outcome** – Industry noted the issue, and strongly supported retention and appropriate disposal of all fishing waste. To be recorded in minutes for industry reference; and Working Group members to bring to the attention of fishers in their regions.
16. Maximum shareholding amendment	The Department has given undertaking to review the maximum shareholding limit of 350 shares in the Lobster Fishery. Discussion included the purpose of the limit given that shares may be held in company structures, providing that an individual may have interest in share packages over the intended limit. Industry queried the reason for having a limit in this case. Discussion also included what level of maximum shareholding may be appropriate, for which there were several views expressed, and no unanimous agreement. The current maximum of 350 shares provides a maximum shareholding for a person or company of 3.6% of the total number of shares of 9727. The current maximum shareholding in the Abalone fishery is 210 shares (6.1% of total shares), and for the remaining share management fisheries the maximum is 40% of the total number of shares. **Outcome** – The maximum shareholding provision provides a limit on the number of shares one shareholder (e.g. a large company) may hold, preventing monopolisation of shares by one shareholder (person or company), and to some extent, provides for a diversity of ownership and opportunity to enter the fishery. Restrictions on foreign shareholders remain in place. Providing a different maximum shareholding will remain limited in preventing associated persons or companies from controlling more than any defined maximum, however, it would continue to prevent monopolisation of shares by one shareholder. The Department will consult on appropriate maximum shareholding in conjunction with the next review of the *Fisheries Management (Lobster Share Management Plan) Regulation 2006*.
17. Shipping trap losses	Industry reports an increase of shipping north of Newcastle, and particularly around Seal Rocks, is causing ongoing concern of loss of headgear and traps. Discussion included potential solutions, and likelihood of changing shipping patterns considering the cost to shipping companies of altering shipping routes. **Outcome** - The member reports that using a backup galvanic time release bag and float (in addition to main headgear) has

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	assisted with reducing loss of traps, and minimising time spent grappling for traps that have lost their headgear. The member will contact the Newcastle Ports Authority in the first instance with a view of options for minimising fishing gear interactions in shipping routes for the area of particular concern.
18. Whale interactions	With increasing whale populations on the east coast of NSW, the risk of interactions with set fishing gear, whilst minimal, is likely to increase as populations grow. Dr Geoff Liggins and Mr Scott Westley recently attended the International Workshop on Whale Entanglement Prevention in Portsmouth USA during May 2016 to provide presentation on acoustic release technology. Use of technology such as acoustic or galvanic releases in the Lobster Fishery is likely to contribute to a reduced risk of entanglements, as well as reduce risk of interaction and gear loss from shipping or other vessels. Attendees gave a brief summary of the workshop. Noted were ongoing research and trials of gear configurations thought to reduce the risk of entanglement and/or harm to whales. **Outcome** – The Department to continue to review current research regarding assessment of potential effective ways to reduce risk of interactions and/or entanglements.
19. Other business	A member raised a question from a shareholder on the basis for the Sydney Harbour lobster fishing closure. **Outcome** – Advice was provided out of session. The basis of the closure (and previous commercial buyout) was dioxin contamination and food safety concerns. Dioxin levels are subject to a periodic ongoing assessment, however are likely to persist for some time.
20. Meeting Close	The Department thanked all participants for attending the meeting and closed the meeting at 17:30pm.

NSW Lobster Fishery Research Program Update Summary

Monitoring, research & assessment

Catch and catch rates

Commercial catch was 149.8 t in 2014-15 representing 99.9% of the 150 t TACC and in 2015-16 is on track to approach the TACC of 160 t (158.9 ton 26 July). The TACC has essentially been caught (> 95% taken) in each of the last 12 years. This means that the TACC has effectively been limiting catch – an important factor contributing to ongoing growth of the lobster population. Catch rates (CPUE derived from logbook data) have increased substantially since the mid-1990s, albeit with some short-term decreases along the way. CPUE appears to have plateaued during the past 4 years (2012-13 to 2015-16) and is currently the greatest observed during the past 4 decades. Discarding of legal lobsters became significant during 2015-16 for the first time since the introduction of quota management with 11,566 lobsters (approx. 10 t) released at sea. This occurred when deep-water fishers filled their quotas before lifting all their traps during their final soak.

Indicators of future recruitment to the fishery

Catches of pueruli (lobster post-larvae) from the annual survey during 2015-16 were below the long-term average at Coffs Harbour, Sydney and Ulladulla and around average at Sydney. At the southern locations, Sydney and Ulladulla, this was the 3rd year in a row of relatively poor catches of pueruli compared to the preceding half-dozen years when catch rates were average or well above average. It is not at all unusual to see several years in a row of relatively good or relatively poor recruitment of pueruli. All arrangements are now in place for the 2016-17 surveys. Records of the approximate number of sub-legal sized lobsters caught and returned to the water (as reported in logbooks) provided a useful forecast of the abundance of legal (> 104 mm CL) the following year. Catch rates of sub-legals from the shallow-water fishery in 2015-16 suggest further improvement in abundance of legal-length lobsters in the shallows during 2016-17.

Fishery-independent survey of spawning stock

This survey is biennial (every 2nd year) and was not done during 2015-16. All preparations are complete for the commencement of the 2016-17 survey. As usual, the survey will be done at 2 sites at each of 4 locations (Tuncurry, Crowdy Head, Coffs Harbour, Iluka) with 13 x 1-week soaks of 4 traps at each site. Catch rates of spawners during the previous survey (2014-15) were approximately 4 times greater than those observed during the first few years of this survey in the late 1990s and early 2000s. This provides solid evidence of the rebuilding of the spawning stock of Eastern Rock Lobster and is consistent with the increases in spawning biomass estimated from the computer-based model of the population and fishery.

Modelling the population and fishery

The length-structured computer-based model of the lobster population and fishery was updated with recent data and used to: (i) provide estimates of various components of biomass over the history of the fishery and (ii) forecast likely changes in biomass during the next 6 years that would result from alternative future TACCs. This is an important part of the annual stock assessment and provides a basis for the TAC committee to set a TACC for the following year. Three model scenarios were considered for the current assessment, each making different assumptions about trends in recent recruitment. Under all scenarios, there has been a spectacular improvement in the total, exploitable and spawning components of biomass since the major management changes to the fishery in the mid-1990s. Of great importance, each scenario of the model estimated the current spawning biomass to be greater than 30% of the virgin (pre-exploitation) level. Note that the fishery management strategy treats a depletion of 25% of virgin spawning biomass as a limit reference point for the stock. In other words, this is a level that we want to stay well above – because at some point below this level, recruitment may decline markedly.

As reported to the Lobster Industry Working Group in previous years, the population of Eastern Rock lobsters has undergone a spectacular recovery over the past decade. Based on evidence from the population model and the survey components of our research and monitoring program, increased biomass in the spawning stock and increased recruitment have resulted increased abundance of lobsters in the exploitable size range (104-180 mm CL). This has provided the opportunity for the TACC to be safely increased to the current 160 t - the greatest TACC that has been set for our fishery (since the introductions of TACCs two decades ago!

Tagging study to understand movement of lobsters along the NSW coast

Toward the end of the 2015-16 fishing year, several fishing businesses were returning to the water lobsters that they captured on the mid- and outer-shelf that were surplus to their quotas. Two such businesses (one in the Jervis Bay region and one on the Central coast) allowed us to place individually-numbered research tags in lobsters before returning them to the water. Approximately 2,000 tagged lobsters were returned to these mid- and outer-shelf depths in early 2016. Subsequent recaptures of these lobsters will provide information about the subsequent movement of these animals along the NSW coast. Information about this experiment and details concerning how to report recaptures of these lobsters has been circulated to all shareholders and to local fisheries offices along the NSW coast.

Genetics project (collaborative project with La Trobe university)

The overarching aim of this project is to utilise molecular techniques to examine the population structure, larval dispersal and connectivity of Eastern rock Lobster. PhD student,

Laura Woodings, is studying the genetics of samples of lobster tissue obtained from multiple locations on the NSW coast and smaller sample sizes from Tasmania and New Zealand to answer several key questions. What is the genetic evidence for connections among the NSW, Tasmanian and New Zealand populations? Is the NSW stock a single population or are there genetic evidence sub-populations? Are there spatial patterns in the genetics of pueruli that settle at different locations along the coast that correspond with particular spatial components of the spawning stock? At present, we manage our fishery and the lobster population assuming a single unit stock in NSW. Answers to the questions above will be available in 2017 and will inform future management options for our fishery.

Crustacean direct ageing project (collaborative project with Southern Cross University & multiple other agencies)

The full title for this FRDC-funded project is "*Direct age determination with validation for commercially important Australian lobster and crab species (western, eastern, southern and ornate rock lobsters and crystal, Tasmanian giant and mud crabs)".* Principal Investigator is Dr Jesse Leland from Southern Cross University and our NSW involvement concerns a single species - Eastern Rock Lobster. The aim of the project is to see whether the age of lobsters can be directly determined from growth marks in gastric ossicles (had parts within the gut of lobsters). This would then provide an ageing method similar to counting the growth rings in trees or the growth rings in the otoliths of finfish. Preliminary results show some correlation between (i) ossicular growth mark counts and carapace length and (ii) ossicular growth mark counts and indirectly obtained age estimates (based on a length-age relationship obtained from tag return data). However, an aquarium-based experiment to investigate the timing and frequency with which growth marks were formed in the ossicles has not returned particularly useful results. Consequently, the timing of growth mark formation and the frequency of their formation remains unclear. This project winds up in 2017 and a summary of results, conclusions and "Where to from here?" will be provided to the Lobster Industry Working Group next year.

Oceanography project (collaborative project with University of New South Wales)

This project, titled *"A unique integrated approach to predicting fisheries recruitment"* involves physical oceanographers from the University of New South Wales (led by Dr Moninya Roughan), NSW DPI, and Prof. Andrew Jeffs from Auckland University and commenced several months ago. It involves developing models that combine physical oceanography (ocean currents, etc.) and biology (lobster biology and behaviour) in order to understand the processes that determine location to location and year to year differences in puerulus recruitment to the NSW coast. Why is there such year to year variability in puerulus settlement along the NSW coast? Do year to year differences in the direction and strength of ocean currents (the east Australia current and associated eddies) explain the

patterns of puerulus settlement we have observed during the last 2 decades? Do differences in these currents and eddies explain why there is an occasional recruitment of Eastern Rock Lobsters in Tasmania? Do these oceanographic models predict that any larvae are transported from the NSW coast across the Tasman Sea to New Zealand in some years? A series of models of varying complexity are being developed to address these questions and determine the importance of ocean currents, food availability for phyllosoma (and therefore the energy stores phyllosoma can accumulate) and the subsequent capacity for pueruli to survive their swim toward the coast to settle in the shallows (and on our puerulus collectors!).