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Proceedings of the Western Rock Lobster Ecological Effects of Fishing Workshop

8 – 10 August 2007

Government of **Western Australia**
Department of **Fisheries**

western australian
marine science institution

Fisheries Research Division
Western Australian Fisheries and Marine Research Laboratories
PO Box 20 NORTH BEACH, Western Australia 6920

Fish for the future

Department of Fisheries
3rd floor SGIO Atrium
168-170 St Georges Terrace
PERTH WA 6000
Telephone: (08) 9482 7333
Facsimile: (08) 9482 7389
Website: www.fish.wa.gov.au
ABN: 55 689 794 771

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Contents

Executive summary

The Western Rock Lobster Ecological Effects of Fishing Workshop was held at the Western Australian Fisheries and Marine Research Laboratories between the 8th and 10th of August, 2007. This workshop was organised and supported by the Rock Lobster Industry Advisory Committee (RLIAC) and was a component of a Western Australian Marine Science Institution (WAMSI) project. The primary objectives of the workshop were to review the results of the current deep-water rock lobster ecology research project, provide a forum for the exchange of information arising from related ecological projects and, ultimately, through round-table discussions, provide recommendations on the direction of future research relating to the ecology of rock lobster.

This document aims to summarise some of the main topics that arose from the presentations and discussions. These discussion points provided the background for a closed meeting held by the Ecological Effects of Fishing Scientific Reference Group (EcoSRG) on Friday the 10th of August. The EcoSRG were then able to provide recommendations in relation to the potential objectives of a new research project investigating the ecological effects of rock lobster fishing using research closed areas. In addition, the EcoSRG were able to develop a set of criteria that need to be satisfied during the selection of potential closed areas and comment on the benefits that research using closed areas is likely to provide industry and other stakeholders.

Background

The Western Australian Rock Lobster (*Panulirus cygnus*) fishery became the first fishery in the world to be recognised as "sustainable" by the Marine Stewardship Council (MSC) in 2000. Continued certification of the fishery requires regular ecological risk assessments (ERA) to be undertaken. The risk assessment conducted in 2003 identified that the potential ecological impact of lobster fishing, whilst being a low risk within shallow waters, was a moderate risk within deep-water regions and therefore additional research was required to address this knowledge gap. This assessment was confirmed in the most recent update of the ERA (see Stocklosa, 2007).

An Ecosystem Scientific Reference Group (EcoSRG) was formed in 2003 to provide advice on research directions to determine the effects of western rock lobster fishing on the ecosystem. The EcoSRG recognised that any new research within deeper water regions needed to occur in a structured manner and devised a strategic framework which recommended that the initial work should focus on identifying and observing any ecosystem patterns associated with levels of fishing pressure, lobster population size structure and benthic structure.

The current FRDC deep-water ecology research project was coming towards the end of its scheduled project life. August was therefore perceived as an appropriate time for the EcoSRG to meet to review the results of the project that they had such a critical hand in developing. There is a pressing need, based on information from the current deep-water ecology research project and other related work that has been initiated in recent years, to develop a new ecological research project that will address one or more of the Principle 2 criteria under the Marine Stewardship Council (MSC) action plan for the 2006 re-assessment of the western rock lobster fishery.

That MSC action plan calls for a new project to be developed that is capable of developing models that "take account of impacts from the fishery and the uncertainty surrounding the models and data" and "have a research plan that can be used to determine what impacts, if any, are occurring and the extent of the impacts". Furthermore, the action plan anticipates "that the research will be based on comparing fished and unfished areas using research closures that will need to be negotiated with Government and industry" and that the research is done "at a scale that is appropriate and robust enough to understand impacts from fishing across the entire fishery".

To get to the point of developing a new project(s), it is necessary to consider related ecological work that is either currently being undertaken, or that is planned in the near future on the western rock lobster and associated habitats or ecosystems. Therefore, the first one and a half days of the workshop's agenda was dedicated to presentations dealing with existing research related to the ecology of rock lobster. Following this workshop, participants were asked to assist in scoping the new ecological project.

This document aims to summarise some of the main topics that arose from the presentations and the round table discussions held on the second day of the workshop. These discussion points provided the background for the EcoSRG closed meeting held on Friday the 10th of August. The EcoSRG were then able to provide input and direction for the scope of a new proposal on the effects of fishing on rock lobster, incorporating fished and unfished areas, that would allow the industry to address some of the concerns of the MSC.

Summary of workshop discussions

A comprehensive list of the presentations given during the workshop is provided in the Workshop Agenda (Appendix 2). No attempt has been made in this document to summarise the content of the workshop presentations, as most were detailed and much of the information is available, or will soon be available, in various reports and peer reviewed publications. The comprehensive nature of the presentations provided useful background information for the development of a new research project investigating the ecosystem effects of fishing for western rock lobster. A number of reoccurring questions/discussion topics eventuated from workshop presentations and group discussions, some of which are considered below.

Alternatives to the use of closed areas

The 2006 action plan for MSC re-certification anticipated that research to increase understanding of the impacts of the western rock lobster fishery on trophic linkages between lobsters and their predators and prey would be based on comparing fished and unfished areas using research closures. The original research plan outlined by the EcoSRG attempted to first explore gradients in fishing effort, *i.e.* identifying differences between areas with *the same habitat characteristics* that experience either heavy, light or no fishing, and if this was not successful then to examine the need for research closure. During the current FRDC project, the gradients in lobster abundance that were identified were confounded by differences in habitat and no meaningful gradients in fishing effort could be identified. The EcoSRG also believed it was necessary to describe habitats in deep water before determining where future closed areas could be considered.

During the workshop some thought was given to whether there were still alternatives to using research closures that had not yet been considered. Four possible alternatives were discussed:

a. Manipulative experiments involving the stocking of lobsters.

b. Manipulative experiments involving the depletion of lobsters.

c. Creation of artificial reefs.

d. Ecosystem modelling.

Although the stocking of lobsters into areas to create areas of high lobster abundance might be an option in the shallow water, any results would be confounded by behavioural changes in lobsters (experimental results have shown that displaced lobsters become nomadic and data may not be representative). Similarly, although high levels of experimental fishing could selectively deplete lobster abundance, thus simulating areas of high exploitation, the results would not be representative as such an approach erroneously assumes relationships between lobsters and habitat are linear. This study would occur with a background of high level of exploitation already occurring in the fishery, i.e. there would not be a contrast of an area with low fishing pressure. The creation of artificial reefs was not considered to be a practical alternative either due to the periods of time involved and the difficulty in obtaining environmental approvals. Ecosystem models are perceived to have some value and are being examined in an FRDC study in Jurien, but are presently data deficient and will require ground truthing.

Depth of research area

A number of workshop participants stressed the difficulty associated with working in deep water. The current deep-water ecology project worked in depths of 40-60 m. Suggestions were

made that research should be carried out in depths as shallow as possible (10-40 m), based on the understanding that:

a. most of the catch comes from shallow water.

b. there is little evidence that ecosystem processes are vastly different between 10-30 m and 40-100 m. If this is the case, and the offshore ecosystem is a continuum in terms of ecosystem processes, research could be carried out in slightly shallower depths.

There was some confusion during workshop discussions surrounding the contribution each depth zone makes to the total annual catch of rock lobster and the proportions of the total biomass harvested in each depth zone. Similarly, there was a lack of a uniform understanding of the life history of western rock lobster (e.g. importance of the whites migration). There was some debate about the proportion of juvenile lobsters that would not migrate and remain in shallow water if the shallow water area was closed to fishing. It was agreed that these issues need clarification for the EcoSRG members. The Department of Fisheries resolved to provide additional information to help clarify these issues.

Although the majority of the catch comes from shallow water, this is not the main area of concern as this catch is a relatively small proportion of the total lobster biomass in shallow water, *i.e.* much of the biomass is below the legal size limit and thus not exploitable. Furthermore, much of the catch in shallow water is of lobster moving to deep water. Thus, the main concern identified in the lobster fishery is that the removal of biomass through fishing may have a substantial effect on the deep-water ecosystem as, in the absence of fishing, lobster biomass would accumulate in that ecosystem.

The point was raised that the new study is not a study of general ecology and care should be taken to ensure that it is targeted at answering concerns surrounding lobster fishing. The depth of the site should reflect this. The question of *where the deep water starts* and whether a *continuum* in ecosystem processes really exists, needs to be based on the biology/ecology of lobsters. For example, is such a continuum reflected in the lobster movement and reproductive data? Unpublished data suggest this is not the case with the majority of large/mature lobsters caught in water depths > 40 meters.

The Department of Fisheries acknowledged the practical issues related with benthic research in deep water and conceded that work in shallower water would allow the use of easier methods (*e.g.* scuba and underwater visual survey). However, it is important that the research concentrates on an area that would act as a sink for mature lobster and not an area that could act as a source. Furthermore, the Department has shown, based on the current FRDC project, that reliable research results can be achieved in deep-water environments.

Location of research area

Consideration was given to where an area closed to fishing should be situated. It was concluded that the area selected would be located toward the centre of the fishery where it would be most representative in terms of catch rates and ecosystem processes. Jurien Bay would be a good option for the closed area as Jurien is close to the middle of the fishery and any additional deep-water research at Jurien would build on the substantial knowledge obtained in shallow water by universities, CSIRO and the Department of Environment and Conservation.

The possibility of having other sites that are located toward the edge of lobster distribution / fringe of the fishery, *e.g.* Capes area or the Abrolhos, was also discussed. However, it was

decided that this would be of less benefit, as these areas may not be representative of the main fishery. It was concluded that if multiple areas were an option, replicates in the same bioregion could be more useful. However, concerns were expressed that monitoring of unfished sites is labour intensive and it may be most beneficial to sample one site extensively.

Representative lobster habitats

The location of the research area will also be dictated by catch and habitat characteristics. Selected sites need to have lobster abundance that is similar to that of breeding stock survey sites and results of the current FRDC project have shown that the abundance and size distribution of lobsters is related to habitat. Exploring the available habitat data will be important in site selection and the unfished reference area and fished control areas need to be as comparable as possible in terms of habitat characteristics and lobster abundance.

Since the current FRDC project has highlighted the influence that habitat has on the distribution of lobster, thought needs to be given to the question of what habitat should be selected. The point was raised that it is important to take habitat variation into account, particularly as it is unlikely that large areas of a single habitat type can be identified. It was concluded that the closed area requires a range of habitats to be included to overcome variations in lobster abundance/size distributions.

The general response at the meeting was that accurate, small-scale habitat information will be critical to the success of the project. It was concluded that if habitat mapping does not exist for the areas chosen to study, it is imperative that it gets done. Concern was voiced that any hydroacoustic data collected needs to be ground truthed.

Size of research areas

The size of the closed area negotiated will ultimately have an impact on the success of the project. One size consideration discussed at the workshop was the fact that any closed area would need to be large enough to account for the foraging areas of individual lobster. Data from shallow water studies show that lobsters can be attracted > 120 m to baited pots and can undertake nightly movements of up to 800 m. Preliminary acoustic tagging work from the current FRDC project illustrates that moment patterns may be similar in deep water, with some lobsters travelling > 600 m in 24 h.

In addition to encompassing foraging areas of lobsters, the closed area needs to be large enough to account for habitat variability. It is likely that this will encompass a considerably larger area. It was also recognised that the distribution of habitat within the closed areas will also influence the edge effects of the closure and whether any gradients in lobster abundance can be expected to develop around the closed area. For example, the observation of gradients (*i.e.* from high lobster abundance inside the closed area to medium near the closed area boundaries and low abundance far from the closed area) would likely require an extensive area of continuos reef, not isolated patches, to be protected. However, the use of natural barriers should be considered, *i.e.* the closed area might encompass an entire reef which is discontinuous with surrounding habitat. This may minimise edge effects. Similarly, a larger area will mitigate edge effects. The point was made that some closed areas in Tasmania and New Zealand, in which protection has been demonstrated to influence the abundance and size distribution of southern rock lobster (*Jasus edwardsii*), may encompass up to 10 km of coastline.

Considerable discussion during the workshop centred around whether the predators of lobsters

should be studied. It was recognised that this would have implications for the size of the area required as some lobster predators are far-ranging and will move in and out of a small research area. The suggestion was made that if predators are of interest, then perhaps the area required should be determined using modelling techniques such as Ecosim or similar. However, the majority of participants were of the view that it is the linkages between lobsters and lower trophic levels that are likely to be important (refer to "Trophic Dynamics" below).

Compliance issues

It was recognised that there are various compliance issues related to the size and location of closed areas and these need to be considered during the selection process. For example, compliance may be simplified if the area selected is relatively large and the area is located near existing fishery boundaries. In addition, there is a need to optimise the location of the area in terms of depth/distance from shore. One problem noted was the fact that skippers of enforcement boats are required to hold a Master V ticket if the area is > 15 nm from shore. This may be problematic in achieving compliance.

The point was made that compliance would become relatively uncomplicated if the mandatory use of vessel monitoring systems (VMS) was introduced in the fishery. Workshop participants recognised that although the introduction of VMS would be advantageous, it was unlikely to happen in the near future unless required for other management measures.

It is likely that the success of the project will largely depend on industry's acceptance of the project and the degree of self-compliance that can be generated. Acceptance of the project will require researchers/RLIAC to clearly portray the benefits of the research closure. Benefits will include the ability to obtain information that will allow the industry to addresses the ecological sustainability concerns of the MSC, give the industry input into the national marine park planning process and allow the Department of Fisheries to better manage the fishery. Furthermore, there is a great potential to mitigate cost through self-compliance.

It was also recognised that compliance would be simplified if all fishing (including finfishing) were excluded from the research area. This would also share the cost of compliance across sectors.

Finfish considerations

The merits of closing one area to all fishing activity were considered and it was noted that total exclusion would simplify compliance. Although the Department of Fisheries has jurisdiction of most fisheries in the study area, there may be benefits in terms of financial sustainability in a multi-sector approach and/or Commonwealth partnership. Such an approach would minimise the proportion of cost-recovered funding required from the lobster industry.

There was opposition to total exclusion from some workshop participants as there is a perception that this approach will make it difficult to answer the question trying to be addressed, *i.e.* what is the effect of *lobster* fishing. The suggestion was made that the greatest contrast in terms of experimental design would be achieved if multiple areas were created, some of which are closed to all fishing activity and some of which are closed only to rock lobster fishing. Although such an approach would provide the contrast to elucidate individual effects attributable to lobster fishing, it is unlikely that more than one area will be an option due to cost.

It was concluded that the preferred option should be to close one area to all fishing activity and assess the effect of the closure. If there is no effect observed in ecosystem parameters after a

considerable period of protection (> 10) years then it is unlikely that there is any significant ecological effect (although monitoring should continue). If a change in ecosystem function is observed following a total closure, then an assessment of the relative influence of lobsters and finfish needs to be carried out, e.g. using a modelling approach. One possible option suggested was to experimentally fish down the finfish while continuing to monitor what happens to lobsters and the ecosystem.

Sampling methods – general points

A recurring theme emanating from workshop presentations was that, following a closure to fishing activities, considerable time (10-30 years) may be needed before significant changes in terms of ecosystem structure or function become evident. It is unlikely, therefore, that significant changes in the deep-water ecosystem will become apparent within the three year time frame of the proposed project. Although there is a need to think in terms of a long-term resolution (10-30 years?), it must be recognised that it is still possible to get useful information in the meantime (short-term wins), e.g. change to the lobster abundance and size structure should be apparent. As well as concentrating on collecting baseline (pre closure) data, the project objectives should include the development and refinement of cost effective sampling methods that can be used in deep water.

The point was made that the sampling regime outlined in the original pre-proposal did not address the question: *How are rock lobster going to affect the ecosystem*? This should be the proximate question for experimental design. It is the change in invertebrates and the benthos that needs to be measured (not just changes in the lobster population). It is anticipated that the development of a conceptual model will aid in identifying which taxa are most likely to be influenced by changes in lobster abundance and size distribution and help refine sampling methods. It was suggested that sampling should be conducted frequently at the start, until an understanding of the variability is gained. The time scale for monitoring (*i.e.* annually or perhaps every 3-5 years) will also come out of the conceptual model.

Indicators to monitor

It was predicted that the development of the conceptual model would aid in determining which taxa (key species), to monitor for an indication of ecosystem change. For example, if predators are to be studied, which ones to monitor may be identified by the conceptual model. This will then dictate the methods to employ, *e.g.* sediment cores, benthic grabs and towed video.

It was suggested that one aim of the project should be to identify novel key indicators that can be monitored easily and cost effectively. Such an output of the 3-year project could contain the cost of a longer-term monitoring project. The need for a balance between cost considerations and the degree of sampling power required was identified. A suggestion was made that power analysis is conducted to determine the level of replication necessary as there is a need to maximise the degrees of freedom. However, it is important to remember that much of the power in the experimental design will come from time rather than replication.

Additional consideration will need to be given to the sampling of reef habitats. The use of an ROV would be advantageous in obtaining habitat information and benthic samples, however, preliminary efforts during the current project were unsuccessful due to strong currents and difficulty anchoring. The new project will require use of other remote techniques and the use of commercially trained deep-water divers. However, it was acknowledged that divers are

expensive ($1000 per day plus boat) and the suggestion was made that divers need to receive training so they can be used in a targeted way to maximise benefits and cost effectiveness. Furthermore, the need to understand the impacts of different methods, *e.g.* the biases involved with towed video *vs* divers, was also highlighted. A number of participants suggested that, where applicable, care should be taken to apply the experimental design findings from shallower waters to the deep-water project.

Acoustic tagging

Results presented during the workshop from the pilot work using acoustic tagging in deep water demonstrated that this technique provides valuable information on lobster movement and habitat usage. It was concluded that an expansion of the preliminary work should be part of any new deep-water project and that the results are fed into the conceptual model.

Trophic dynamics

Preliminary dietary and isotope analysis conducted during the current project returned interesting findings. Although sample sizes were small, the diet of lobsters in deep water was demonstrated to be different from that in shallow water. Of particular interest was the demonstration that stable isotope analysis may be useful in addressing questions surrounding the consumption of bait by lobster. The general reaction from workshop participants was that an expansion of isotope work should to be a part of any new project. The question of bait consumption should also be explored further, *e.g.* how does bait consumption vary with season and habitat? Gut analyses, however, may not be as critical in view of the high expense in obtaining samples (deep water divers) and the fact that results are heavily influenced by the different retention rates of various prey items.

It was concluded that future trophic work should continue to concentrate on the trophic levels the lobsters are affecting, *i.e.* prey rather then predators. The idea behind this is that there are more trophic levels under lobsters than above them and it is unlikely that most predators would be constrained by the abundance of rock lobsters. Trophic dynamic results also need to be fed into conceptual model.

Population dynamics of rock lobster

It was recognised that consideration needs to be given to the biases inherent in using potting as the main method for sampling rock lobster. For example, lobster behaviour may lead to certain age classes being under represented. In shallow water it is the 1+ and 2+ lobsters that are not captured by potting. As there are only small numbers of these age groups in deep water, they are unlikely to be under-represented. It was concluded that the project should not rely on one method and an effort should be made to calibrate pot catches with other methods to get data that is representative of the size structure. Other methods suggested for determining lobster densities included the use of infrared cameras or drop cameras. It was also noted that as potting is only a measurement of relative abundance, complementary techniques should be trialled, such as multiple mark recapture, in an attempt to estimate densities.

Shallow water component

It was recognised that there has been a large amount of ecological work done on rock lobster in shallow water. Although monitoring needs to continue in the shallow water closed areas,

it needs a targeted approach. In view of the results emanating from the recent Jurien Bay collaborative projects, e.g. SRFME, it was suggested that additional research closed areas in shallow water (< 10 m) would be advantageous, *i.e*. closures that cover more representative habitats and would presumably be more effective than existing areas. It was concluded that, for the time being, the effect of the current research areas in shallow water should continue to be evaluated and negotiating additional shallow water closed areas should be tackled at a later date. At this point, researchers and industry need to concentrate on obtaining appropriate closed areas in deeper water.

Perceived objectives of new project

The following objectives were suggested for the new deep-water project:

1. Identification of possible research closed areas (based on particular criteria, *e.g.* habitat, lobster abundance and size structure – see Appendix 3).
2. Development of conceptual model - identify indicators to monitor.
3. Measurement of gross processes, *e.g.* response of lobsters to closure, change in macro invertebrates and macro algal assemblages with closure.
4. Increase understanding of the role of lobsters in the ecosystem (2 components)
   a) Trophic dynamics
   b) Habitat utilisation
5. Development of cost-effective methodological strategies to ensure the monitoring of research area(s) continues over a time period beyond the life of the project

There are also other fishery-specific benefits that may also be achieved using research closed areas such as estimation of population parameters, e.g. natural mortality, growth and carrying capacity.

Project integration and other considerations

It was recognised that, ultimately, the development of the project will require the tabling of a range of options that can be presented to the rock lobster industry for consideration. These options will be based on factors including size, location, cost to industry and chances of success.

The benefits to the rock lobster industry and other stakeholders will need to be clearly stated and the suggested methodology defensible and cost effective. If the project is to return the maximum benefits, there is a need to ensure that results are integrated with the full range of projects that are underway and that there is proper collaboration between projects.

Appendices

Appendix 1: Workshop Participants

EcoSRG Members

Dr Russ Babcock	Commonwealth Scientific and Industrial Research Organisation
Prof Colin Buxton	Tasmanian Aquaculture and Fisheries Institute
Dr Ron Edwards	Rock Lobster Industry Advisory Committee
Dr Rick Fletcher	Department of Fisheries
Prof Neil Loneragan	Murdoch University
Dr Chris Simpson	Department of Environment and Conservation
Dr Simon Thrush	National Institute of Water and Atmospheric Research

EcoSRG Advisors

Dr Lynda Bellchambers	Department of Fisheries
Dr Nick Caputi	Department of Fisheries
Mr Dexter Davies	Western Rock Lobster Council
Dr Guy Leyland	Western Australian Fishing Industry Council
Dr Roy Melville-Smith	Department of Fisheries

Invited Participants

Mr Kevin Bancroft	Department of Environment and Conservation
Dr Neville Barrett	Tasmanian Aquaculture and Fisheries Institute
Dr Steve Blake	Western Australian Marine Science Institution
Dr Sam Bridgwood	Department of Fisheries
Mr Rhys Brown	Department of Fisheries
Ms Theresa Coutts	Department of Fisheries
Mr Kevin Crane	Department of Environment and Conservation
Ms Chiara Danese	Northern Agricultural Catchments Council
Mr Kevin Donohue	Department of Fisheries
Mr Scott Evans	Department of Fisheries
Mr Jason How	Department of Fisheries
Dr Glenn Hyndes	Edith Cowan University
Dr Tim Langlois	University of Western Australia
Dr Hector Lozano-Mondes	Commonwealth Scientific and Industrial Research Organisation
Mr Lachlan MacArthur	Edith Cowan University
Dr Jessica Meeuwig	University of Western Australia
Mr Peter Millington	Department of Fisheries
Dr Matt Pember	Department of Fisheries
Dr Jim Penn	Department of Fisheries
Dr Julia Phillips	Commonwealth Scientific and Industrial Research Organisation
Ms Kylie Ryan	University of Western Australia

Ms Jenny Shaw	Department of Fisheries
Mr Richard Stevens	Western Australian Fishing Industry Council
Ms Paula Tomkins	Department of the Environment and Water Resources
Dr Mat Vanderclift	Commonwealth Scientific and Industrial Research Organisation
Mr Kris Waddington	University of Western Australia
A/Prof Di Walker	University of Western Australia
Mr Andrew Winzer	Western Rock Lobster Council

Invitees unable to attend

Dr Alistair Robertson	University of Western Australia
Mr Chris Tallentire	Conservation Council of WA
Mr Crispian Ashby	Fisheries Research and Development Corporation
Dr Lynneth Beckley	Murdoch University
Dr Chet Chaffee	Scientific Certification Systems Inc.
Dr Jeff Dambacher	CSIRO
Dr Simon de Lestang	Department of Fisheries
Mr Neil Dorrington	Rock lobster industry representative
Dr Graham Edgar	University of Tasmania
Dr Dave Fairclough	Murdoch University
Dr Dan Gaughan	Department of Fisheries
Prof Norm Hall	Murdoch University
Dr Christine Hansen	Edith Cowan University
Dr Euan Harvey	University of Western Australia
Mr Andrew Hill	Department of Fisheries
Ms Alice Hurlbatt	Western Rock Lobster Council
Ms Kelsie Jackson	Murdoch University
Dr John Keesing	CSIRO
A/Prof Gary Kendrick	University of Western Australia
Dr Halina Kobryn	Murdoch University
Mr Duncan Leadbitter	Marine Stewardship Council
Dr Kathryn MacMahon	Edith Cowan University
Mr Craig McTaggart	Rock lobster industry representative
Dr Bruce Phillips	Curtin University of Technology
Mr Frank Prokop	Recfishwest
Ms Carol Sadler	Department of Fisheries
Ms Christine Shervington	Department of Fisheries
Dr Tony Smith	CSIRO
Dr Trevor Ward	University of Western Australia
Ms Di Watson	University of Western Australia
Dr Fred Wells	Department of Fisheries

Appendix 2: Workshop Agenda

Date 8-10 August 2007

Location Western Australian Fisheries and Marine Research Laboratories
Conference Room 3, 1st Floor
39 Northside Drive
Hillarys, Western Australia
(09) 9203-0111

Wednesday, 8 August 2007

09:00 Welcome (10 minutes) – (Chair) Peter Millington

09:10 Workshop objectives (15 minutes) Roy Melville-Smith

09:25 Deep-water ecology project (50 minutes) – Lynda Bellchambers

10:15 Morning tea

10:30 Overview of the Jurien shallow water ecology project (30 minutes) – Russ Babcock

11:00 Deep-water rock lobster diet research (30 minutes) – Kris Waddington

11:30 Jurien Bay shallow water trophic analysis using stable isotopes – (30 minutes) Glenn Hyndes

12:00 Habitat use and movement patterns of western rock lobster in shallow waters (30 minutes) – Lachlan McArthur

12:30 Lunch

13:30 Macro algae communities and the Jurien Bay ecology project – (30 minutes - Julia Phillips)

14:00 Jurien Bay ecology project (25 minutes – Neville Barrett)

14:25 Rottnest Island fished unfished project (25 minutes – Russ Babcock)

14:50 Afternoon tea

15:05 Fished-unfished case studies (30 minutes - Colin Buxton)

15:35 Jurien Bay modelling project overview – (10 minutes – Neil Loneragan)

15:45 Development of ecopath/ecosim model for Jurien Bay project (20 minutes - Hector Lozano-Mondes)

16:05 Qualitative eco-models for the Jurien Bay system (20 minutes – Russ Babcock)

16:25 Marmion Marine Park ecology project (30 minutes – Kylie Ryan)

16:55 Close and Refreshments

Thursday, 9 August 2007

09:00 Opening remarks

09:05 Review of progress to date (15 minutes – Rick Fletcher)

09:20 Fish communities and the Jurien Bay ecology project (30 minutes - Tim Langlois)

09:50 Overview of habitat mapping on the west coast, particularly in the Jurien Bay and Abrolhos Island vicinity (25 minutes – Jessica Meeuwig)

10:15 Morning tea

10:30 Rock lobster habitat useage at Jurien Bay – (25 minutes - Jessica Meeuwig/Lynda Bellchambers

Future research

10:55 WAMSI Node 4 and its relevance to this meeting - (20 minutes) Rick Fletcher

11:15 Fished-unfished research by DEC and its relevance to this meeting (20 minutes) Chris Simpson

Considerations for the development of western rock lobster fished-unfished research areas

11:35 Distribution of western rock lobsters and their general movement and migration patterns (Roy Melville-Smith)

12:05 Discussion of the draft research proposal aimed at understanding the ecological impacts of rock lobster fishing (Matt Pember)

12:20 Lunch

13:20 Workshop breaks into tables of approximately 10 people each, with at least one Eco-SRG member and one DoF Researcher/rapporteur. The revised research project to address the MSC Action plan will then be developed by progressing through the need statement, objectives, sampling strategy to achieve identified objectives, methods to achieve modelling component, staff requirements, risk analysis and opportunities for collaboration (Facilitated by Dr Rick Fletcher)

15:00 Afternoon tea

15:15 Continuation of the development of the revised research project to address the MSC Action plan (Facilitated by Dr Rick Fletcher)

16:15 Report back by table facilitators of outcomes from the previous day, covering each heading (e.g. need statement, objectives, sampling strategy to achieve identified objectives etc) individually so that each table's views can be captured and deliberated. (Leading of rapporteurs facilitated by Dr Rick Fletcher)

17:30 Closing message (Peter Millington)

18:30 Workshop dinner at C-Side Restaurant

Friday, 10 August 2007

09:00 Closed meeting of members of the ECO-SRG and advisors

10:15 Morning tea

12:30 Close followed by Lunch

Appendix 3: Closed area selection criteria

The discussion points above provided the background for a closed meeting held by the Ecological Effects of Fishing Scientific Reference Group (EcoSRG). The EcoSRG provided recommendations in relation to the potential objectives of a new research project investigating the ecological effects of rock lobster fishing using research closed areas and commented on the benefits that research using closed areas is likely to provide industry and other stakeholders. In addition, the EcoSRG were able to develop a set of criteria that need to be satisfied during the selection of potential closed areas. A RLIAC working group composed of researchers, fisheries managers and rock lobster industry representatives has been convened to apply these criteria in the assessment of potential closed areas. These selection criteria are reproduced below from the draft minutes of the EcoSRG meeting held on the 10th of August 2007:

1. Needs to be representative in terms of lobster demographics, *i.e.* have the potential for high adult biomass (relative to undersize biomass) as indicated by good or high catch rates of mature lobster.
2. Central to and generally representative of the fishery (*e.g.* region between Lancelin and Dongara).
3. Optimal accessibility – needs to be as close to shore as practical while satisfying other criteria.
4. Representative of lobster habitat based on information obtained from previous habitat mapping – (structure and function).
5. Optimum location for enforcing compliance of the closure.
6. Replicates of closed areas in different locations preferred option
7. Size of site-criteria
   a. Complementary to the size of the lobster's foraging area.
   b. Large enough to allow measurements of indicator responses (both up/down the lobster food web e.g. predators of lobster and key prey for lobster).
   c. Must encompass representative habitats
8. Relative level of economic loss to industry should be minimal.