



Our ref: CORP F2020/000198

8 July 2020

Hon Mark Parnell MLC
Member of the Legislative Council
Parliament House
ADELAIDE SA 5000

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Dear Mr Parnell

Determination under the *Freedom of Information Act 1991*

I refer to your application made under the *Freedom of Information Act 1991* which was received by Primary Industries and Regions SA (PIRSA) on 27 May 2020, seeking access to the following:

"Electronic copies of all agendas and minutes for all meetings of the PIRSA-convened Cuttlefish Working Group from its establishment, which we believe was in 2012, to the present day including any attachments, presentations or directly referenced materials."

Timeframe: 1/01/2012 to 27/05/2020

As per discussions between PIRSA's Freedom of Information and Privacy Officer and Emily from your office on 18 June and 19 June 2020, your application has been revised as follows:

"Electronic copies of all agendas and minutes for all meetings of the PIRSA-convened Cuttlefish Working Group from its establishment, which we believe was in 2012, to the present day including any attachments."

Timeframe: 1/01/2012 to 27/05/2020

I am advised that you agreed to an extension of two weeks to the legislative due date in which to provide a determination, ie to 10 July 2020.

Accordingly, the following determination has been finalised.

I have located thirty-seven documents that are captured within the scope of your request.

Determination

I have determined that access to the following documents is **granted in full**:

Doc No.	Description of document	No. of Pages
1	Working Notes – Government Agency Meeting – Giant Cuttlefish – 30/7/2012	2
2	Meeting Minutes – Government Agency Meeting Giant Cuttlefish Working Group – 15/8/2012	5
3	Meeting Minutes – Government Agency Meeting Giant Cuttlefish Working Group – 8/10/2012	5
4	Meeting Minutes – Giant Cuttlefish Working Group – 26/3/2013	4
5	Meeting Minutes – Giant Cuttlefish Working Group – 3/4/2013	5
6	Meeting Minutes – Giant Cuttlefish Working Group – 16/4/2013	5
7	Meeting Minutes – Giant Cuttlefish Working Group – 7/5/2013	5
8	Meeting Minutes – Giant Cuttlefish Working Group – 12/6/2013	5
9	Meeting Minutes – Giant Cuttlefish Working Group – 7/8/2013	6
10	Meeting Minutes – Giant Cuttlefish Working Group – 6/11/2013	8
10a	Attachment to Doc 10 – Reef Watch Cuttlefish Citizen Science Program	3
11	Meeting Minutes – Giant Cuttlefish Working Group – 13/2/2014	7
12	Meeting Minutes – Giant Cuttlefish Working Group – 11/4/2014	3
13	Meeting Minutes – Giant Cuttlefish Working Group – 18/7/2014	4
13a	Attachment to Doc 13 – Giant Cuttlefish Working Group – Actions from 13/2/2014	10
14	Meeting Agenda – Government Agency Meeting - Giant Cuttlefish Working Group – 8/10/2012	2
15	Meeting Agenda – Giant Cuttlefish Working Group – 26/3/2013	2
16	Meeting Agenda – Giant Cuttlefish Working Group – 16/4/2013	2
17	Meeting Agenda – Giant Cuttlefish Working Group – 7/5/2013	2
18	Meeting Agenda – Giant Cuttlefish Working Group – 12/6/2013	2
19	Meeting Agenda – Giant Cuttlefish Working Group – 7/8/2013	2
20	Meeting Agenda – Giant Cuttlefish Working Group – 6/11/2013	2
21	Meeting Agenda – Giant Cuttlefish Working Group – 13/2/2014	2
22	Meeting Agenda – Giant Cuttlefish Working Group – 11/4/2014	1
23	Meeting Agenda – Giant Cuttlefish Working Group – 18/7/2014	2
24	Meeting Agenda – Giant Cuttlefish Working Group – 12/3/2015	2
25	Meeting Minutes – Giant Cuttlefish Working Group – 12/3/2015	4
26	Meeting Agenda – Giant Cuttlefish Working Group – 17/9/2015	3
27	Meeting Minutes – Giant Cuttlefish Working Group – 17/9/2015	3
28	Meeting Agenda – Giant Cuttlefish Working Group – 1/9/2016	2
29	Meeting Minutes – Giant Cuttlefish Working Group – 1/9/2016	3
30	Meeting Agenda – Giant Cuttlefish Working Group – 21/9/2017	1
31	Meeting Minutes – Giant Cuttlefish Working Group – 21/9/2017	3
32	Meeting Agenda – Giant Cuttlefish Working Group – 7/9/2018	1
33	Meeting Minutes – Giant Cuttlefish Working Group – 7/9/2018	3

34	Agenda – Giant Cuttlefish Working Group – 16/12/2019	1
35	Meeting Minutes – Giant Cuttlefish Working Group – 16/12/2019	4

Please be advised that, despite document searches undertaken, PIRSA has been unable to locate the attachment referred to in paragraph 5.2 of Document 10.

If you are dissatisfied with this determination, you are entitled to exercise your right of review and appeal as outlined in the attached documentation <https://archives.sa.gov.au/sites/default/files/public/documents/Internal%20Review%20Application%20Form%201.pdf>, by completing the “FOI Application Form for Internal Review of a Determination” and returning the completed form to:

Freedom of Information Principal Officer
Primary Industries and Regions SA
GPO Box 1671
ADELAIDE SA 5001

or via email PIRSA.FOI@sa.gov.au

In accordance with the requirements of Department of the Premier and Cabinet Circular PC045, details of your application, and the documents to which you are given access, will be published in PIRSA’s disclosure log. A copy of PC045 can be found at http://dpc.sa.gov.au/data/assets/pdf_file/0019/20818/PC045-Disclosure-Log-Policy.pdf

If you disagree with publication, please advise the undersigned in writing within fourteen calendar days from the date of this determination.

Should you require further information or clarification with respect to this matter, please contact Ms Lisa Farley, Freedom of Information and Privacy Officer on 8429 0422 or email PIRSA.FOI@sa.gov.au.

Yours sincerely



Darren Humphrys
Accredited Freedom of Information Officer
PRIMARY INDUSTRIES AND REGIONS SA

Working Notes - Government Agency Meeting- GIANT CUTTLEFISH

Monday 30 July 2012, 2pm – 3pm

PIRSA 14th Floor Conference Room

Co-hosted by PIRSA and DENR

Meeting purposes:

- To discuss the progress of the draft government Monitoring and Evaluation Program for Giant Cuttlefish
- To consider the preliminary results of the SARDI cuttlefish spawning season survey work and the outcomes from the FRDC research project.
- To further discuss current knowledge and agree on how to address knowledge gaps regarding status of Giant Cuttlefish;
- To consider possible management responses to address current concerns over the status of the cuttlefish population.
- To agree on next steps for engagement with other stakeholders
- To develop updated advice for Ministers

Meeting attendees: Sean Sloan (PIRSA – Co-Chairperson), Alice Fistr (PIRSA), Mike Steer (SARDI), Gavin Begg (SARDI), Peter Dolan (EPA), Sam Gaylard (EPA), David Lake (SATC), Peter Short (DPTI), Leanne Burch (DEWNR - Co-Chairperson), Patricia von Baumgarten (DEWNR), Brenton Gear (DEWNR), Peter Copley (DEWNR)

Update on FRDC project outcomes and 2012 spawning season surveys:

- Sean Sloan tabled a one page PIRSA update, detailing the actions taken by PIRSA since the last Government cuttlefish meeting.
- Mike Steer gave a presentation including the preliminary results of the 2012 survey.
- Mike Steer presented a table containing information about possible causes and likelihood of cuttlefish population decline, available evidence, availability of data and possible actions. It was agreed that the table would be discussed at the next meeting.
- A general discussion was held regarding the work the museum has done and the need for further information on life cycle.
- Results of the SARDI surveys will be made available upon completion of the report for FRDC.
 - **Action:** Mike to put together a synopsis on the population biology and taxonomic work undertaken to date for consideration at the next meeting.

Update from EPA and SARDI on progress in the development of a Monitoring and Evaluation Program for Giant Cuttlefish:

- EPA and SARDI advised that they have worked together and reached agreement on the design of a comprehensive program for monitoring population abundance and biomass, water quality and habitat condition.
- The program that has been developed is currently estimated to cost around \$230,000 per year, but it was accepted that this cost could be reduced by refining the survey design.
- The 2012 surveys conducted by SARDI included the collection of water samples, however, these water samples have not yet been analysed for water quality. This work could be undertaken if additional funding becomes available.

EPA - 2012 Ecosystem Condition Monitoring - water quality & habitat condition

- EPA has sampled 70 locations in the North Spencer Gulf. Data are being processed and another sampling event will be held in Spring 2012.
 - **Action:** Leading Ministers to be advised that a Monitoring and Evaluation Program has been designed. The proposal will now be refined and integrated with other work being undertaken (for example the work being undertaken by industry/business as part of their statutory approvals).
 - **Action:** EPA and SARDI to bring detailed costs of comprehensive monitoring program for discussion at next meeting.

Consideration of CCSA proposal for establishing a task force and next steps for involving other stakeholders

- Attendees agreed that this issue is a responsibility of Government and that agencies need to be transparent about the process being undertaken to review the current status of the population.
- The merits of engaging an independent person (with scientific knowledge) as a reviewer or a chairperson was discussed.
- It was noted that PIRSA and DEWNR had discussed, at Executive Director's level, the possibility of engaging a senior scientist to assist with this process. However, no decision had been made. This issue will be discussed further following this meeting.
- Attendees agreed that options for engaging and communicating with stakeholders will need to be discussed at the next meeting, with advice to Ministers on a proposed approach to engagement.

Key Points for updating Ministers:

- Results of SARDI 2012 survey with the expectation that these would be released when the report is submitted to FRDC;
- EPA/SARDI Integrated Monitoring and Evaluation Program
- Options to engage stakeholders (needs further discussion)

Agenda item 11: Next Meeting

- DEWNR to organise the next meeting for the week starting on 13th August.

Wednesday 15 August 2012 3:00pm – 4:10pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

FISHERIES
& AQUACULTURE
PIRSA

Government Agency Meeting Giant Cuttlefish Working Group

Minutes and actions

Attendees: Ian Nightingale (Chair)
Sean Sloan (PIRSA)
Brenton Grear (DEWNR)
Peter Copley (DEWNR)
Gavin Begg (SARDI)
Michael Steer (SARDI)
Sam Gaylard (EPA)
Andrew Solomon (EPA)
Kate Rodda (PIRSA)

Apologies: Peter Dolan (EPA)
David Lake (SATC)
Peter Short (DPTI)
Lisien Loan (DEWNR)

Introduction

Ian Nightingale introduced himself as the new Chair of the Government cuttlefish working group. The Chair sought the participants input into whether any other government person with relevant expertise should be invited to join the working group. No others were nominated.

Previous minutes

Minutes from the previous meeting held 30 July 2012 were accepted as a true record with minor revision.

Discussion items

Fact Sheets and Risk Profile

SARDI tabled a fact sheet on the biology and life history characteristics of the cuttlefish, and a risk profile that lists possible causes for the decline. These documents are a good start to identify where there are gaps in knowledge and where to focus effort.

Fact Sheet - with some modification, this could be used as a public document in the future.

Action: Modify into a version that the working group is happy to release as a public document.

Risk Assessment - it was noted that cuttlefish are a short lived species characterized by high natural variations in population size, driven by environmental conditions, so it is likely that there is more than one cause to explain the decline. Currently, water quality and fishing impacts are speculated by the media and the general public as the main drivers of population changes. Fishing is not considered to be a likely cause of the observed decline in the population because limited fishing activity is directed at cuttlefish and catch records indicate that catch levels have been low since the introduction of the cuttlefish closure at Point Lowly on 28 May 2008

Need to consider if there have been any changes in any of these pressures to be able to eliminate some of the possible causes (for example, certain pressures may have always been there, or only recently changed).

The risk assessment provides some options for the working group to consider.

Research Gaps

- Genetic stock structure of the cuttlefish population in South Australian waters. This is a short term research initiative and could possibly initially be pursued through FRDC. This will help to determine if it is a state-wide protection issue or an issue confined to upper Spencer Gulf.
Action: Develop a research proposal to examine genetic structure of cuttlefish populations in Spencer Gulf.
- Movement patterns/migration within the gulf –this will inform the extent of protection required.
- Relationship between NZ fur seal and cuttlefish. The first step would be to undertake surveys to determine relative abundance of fur seals in upper Spencer Gulf. The next step would be to investigate ways to determine contribution of cuttlefish in the diet of NZ fur seals.
Action: Gavin Begg to check with Simon Goldsworthy on ways to achieve this.
Action: DEWNR to advise on what could be done from a policy perspective to mitigate any potential threats posed by NZ fur seals to the cuttlefish population.
- By-catch information.
Action: Engage prawn fishers to assist in regard to numbers and seasonality of cuttlefish in the by-catch. Can utilise the SARDI observers as well.
- Consider all stages of the life cycle in terms on impacts.
Action: SARDI to investigate further whether water temperature changes are influencing the distribution and abundance of the giant cuttlefish population in each of its life-cycle stages.

Monitoring program

Develop an ongoing integrated scientific cuttlefish monitoring program (including population abundance, habitat condition and water quality). This should be an ongoing long term monitoring initiative which will help to ensure we have a strong handle on the ongoing health of the population in northern Spencer Gulf. The monitoring program needs to be designed around the most likely risks. However the working group should be clear about justifications for inclusion and exclusion of possible causes.

Action: Develop an integrated cross-agency scientific monitoring program to cover population abundance, habitat condition and water quality.

Utilise existing data if available (EPA water quality, SARDI/BHP water data, oceanographic modelling). EPA has already collected and analysed some water samples from northern Spencer Gulf and will be sampling again in late 2012 with results available in early 2013. SARDI have some samples but require approx \$15k of funding to analyse them. Existing data will help to resolve the uncertainty over water quality impacts in the cuttlefish spawning aggregation area in northern Spencer Gulf.

Action: In terms of identifying possible causes, EPA will work through their water quality data (including industrial discharge records) to determine if there has been a change over the last 5-10 years.

A monitoring program will require an ongoing funding commitment across relevant agencies and/or stakeholders.

Collaborate with University of Adelaide who are conducting population response studies of cuttlefish to various stresses and have been conducting water temperature modelling in upper Spencer Gulf and it's possible effects on population distribution. This will help to better understand the likely effects of temperature change on the distribution and abundance of the population in upper Spencer Gulf.

Closures to protect cuttlefish in Spencer Gulf

Whilst there is no strong evidence to suggest that fishing is impacting on the giant cuttlefish population in northern Spencer Gulf, it was proposed that a precautionary approach be adopted to further protect the population from the current low level of fishing for cuttlefish that takes place outside of the existing northern Spencer Gulf cuttlefish closures adjacent to Point Lowly. This extension to the existing closures would be implemented using section 79 of the *Fisheries Management Act 2007*, whilst we work towards a better understanding of the potential causes of the population decline in upper Spencer Gulf. There would be some impact to fishers that utilise cuttlefish as bait. The closure of the entire gulf would demonstrate a precautionary approach to management until we have a better understanding of the current drivers of the observed population decline.

Action: Issue a closure to protect cuttlefish in Spencer Gulf for a temporary period of 12 months.

Current population surveys

SARDI and BHP have some survey data on population estimates but these are not yet publically available. It was agreed to make these available when the outcomes of the working group meeting are communicated to the public.

Communications

All communications to go through the Chair.

It is recognized that community perceptions/misconceptions need to be managed. The community should be engaged in the process. Utilise the non-government organisations and Fishwatch volunteers.

Be transparent, acknowledge that we are not sure what the cause is but have identified possible ones. Be clear on where we are going with a monitoring program and research options.

The Chair of the Government working group will write to key non Government stakeholders including the Conservation Council of SA and the Whyalla Council to provide an update in relation to progress and actions being taken by the Government working group. The

working group will further discuss ways to inform and engage with key non Government stakeholders on an as needs basis.

Action: Write to key non Government stakeholders to provide an update in relation to progress and actions being taken by the Government working group.

FRDC are about to publish an article on giant cuttlefish. SARDI to request reviewing before publication and inform FRDC of the actions that the working group are considering.

All communication is to remain confidential within the working group.

Minute to the relevant Ministers

Action: Prepare a briefing for Minister Caica and Minister Gago on the current progress of the Government cuttlefish working group

Include:

- An update on progress
- A proposed course of action
- Funding opportunities and combined responsibilities for research and monitoring
- Communication strategy

Agreed Outcomes

1. Develop the fact sheet to a form that is suitable for publication.
2. PIRSA and SARDI to develop a research proposal to conduct further work to determine the genetic stock structure of the giant cuttlefish population in South Australian waters.
3. Following the results of surveys of NZ fur seal population abundances in upper Spencer Gulf and the importance of cuttlefish in their diet, DEWNR to advise on what could be done from a policy perspective to mitigate any potential threats posed by NZ fur seals to the cuttlefish population.
4. SARDI to investigate further whether water temperature changes are influencing the distribution and abundance of the giant cuttlefish population.
5. Establish an on-going monitoring program that assesses population abundance, habitat condition and water quality.
6. Complete laboratory analysis of the water samples collected by SARDI during 2012 survey work.
7. Instigate a temporary protection on cuttlefish in Spencer Gulf.
8. Address the issues associated with cuttlefish as a whole of Government, cross agency responsibility, extending to requirements in relation to expertise, resourcing and funding.
9. Engage with community groups and key non-govt stakeholder groups in cuttlefish management and monitoring initiatives.
10. The Chair of the Government working group to write to key non Government stakeholders including the Conservation Council of SA and the Whyalla Council to provide an update in relation to progress and actions being taken by the Government working group.
11. Prepare a briefing for Minister Caica and Minister Gago on the current progress of the Government cuttlefish working group.

Next meeting: To be advised

Item	Actions	Responsibility	Target Date
1	Fact Sheet Modify into a version that the working group is happy to release as a public document.	SARDI	
2	Research Gaps Population genetics Develop a research proposal to examine genetic structure of cuttlefish populations in Spencer Gulf. Relationship between NZ fur seal and cuttlefish DEWNR to advise on what could be done from a policy perspective to mitigate any potential threats posed by NZ fur seals to the cuttlefish population. Investigate ways to determine contribution of cuttlefish in the diet. Gavin Begg to check with Simon Goldsworthy on ways to achieve this. By-catch information Engage prawn fishers to assist in regard to numbers and seasonality of cuttlefish in the by-catch. Can utilise the SARDI observers as well. Water temperature SARDI to investigate further whether water temperature changes are influencing the distribution and abundance of the giant cuttlefish population.	SARDI DEWNR SARDI SARDI SARDI	
3	Monitoring Program Establish an integrated cross-agency scientific monitoring program to cover population abundance, habitat condition and water quality. EPA to analyse SARDI water samples collected by SARDI during recent population survey work. In terms of identifying possible causes, EPA will work through their water quality data (specifically industrial discharge records) to determine if there has been a change over the last 5-10 years.	ALL EPA EPA	
4	Cuttlefish closure in Spencer Gulf Issue a closure to protect cuttlefish in Spencer Gulf for a temporary period of 12 months.	PIRSA	
5	Communications Write to key non Government stakeholders to provide an update in relation to progress and actions being taken by the Government working group. Prepare a briefing for Minister Caica and Minister Gago on the current progress of the Government cuttlefish working group.	Chair DEWNR, PIRSA	

Monday 08 October 2012 3:00pm – 4:45pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

FISHERIES
& AQUACULTURE
PIRSA

Government Agency Meeting Giant Cuttlefish Working Group

Minutes and actions

Attendees: Ian Nightingale (Chair)
Sean Sloan (PIRSA)
Alice Fistr (PIRSA)
Michael Cresshull (PIRSA)
Brenton Grear (DEWNR)
Peter Copley (DEWNR)
Gavin Begg (SARDI)
Michael Steer (SARDI)
Sam Gaylard (EPA)
Andrew Solomon (EPA)
David Lake (SATC)
Peter Short (DPTI)
Peter Peppin (Whyalla City Council)
Tim Kelly (CCSA)
Bronwyn Gillanders (U of A)
Cathy Preist/Joanne Tsoukalas (PIRSA)
Kate Rodda (PIRSA)

Apologies: Peter Dolan (EPA)

Introduction

The Chair reiterated the importance of considering cuttlefish a cross-government, multi-agency responsibility and that there are many unanswered questions.

A terms of reference will be developed for the group.

Action: Develop a TOR for the working group.

Previous minutes

Minutes from the previous meeting held 15 August 2012 were tabled. Actions arising from these were considered as the meeting progressed.

Confirmation of membership of the working group

Members from the Whyalla City Council (WCC) and Conservation Council of South Australia (CCSA) were invited to be members of the working group. It was noted that these non-government members may be asked to leave the room if internal government matters need to be discussed.

Other members to clarify who will be representing their agency at these meetings.

Action: Government agencies to clarify representatives of the working group.

Discussion items

Fishing Closure

In May 2012 the State Government announced an extension to the cephalopod fishing closure area under the *Fisheries Management Act 2007*, in a precautionary move to afford additional protection the Giant Cuttlefish aggregation ahead of the 2012 breeding season. This precautionary action has been taken despite there being no evidence to suggest that fishing is causing a decline in the cuttlefish population in northern Spencer Gulf. There is no immediate action to increase the existing area of closure at this point.

A Cabinet submission is being prepared to make the necessary legislative changes for a longstanding annual cuttlefish closure at Point Lowly to be made permanent.

FRDC Expression of Interest - Research project

A presentation on the research project was provided by Dr Bronwyn Gillanders.

Key areas of proposed study are:

- Community engagement
- Drivers for changes in abundance
- Genetic divergence

The project is seeking approximately \$367,000. Fisheries Research and Development Corporation (FRDC) may fund up to \$200,000 and the remaining funds need to be sourced elsewhere. It was noted that the FRDC generally funds fishery-related projects. It was noted that there is no monitoring component to the proposal as FRDC does not support monitoring programs.

FRDC is one of a number of possible funding options and the choice of FRDC for this proposal does not indicate a preconception towards the impact on cuttlefish populations being fisheries based. To date, there have been commitment from DEWNR (\$15,000/year) and in-kind support from University of Adelaide, NRM, South Australian Museum and PIRSA.

Members were asked if there were any other potential sources of support (financial and in-kind) for this project and to pass this information and potential contacts to Bronwyn. Where appropriate, members may be the best person to make first contact with potential funders and act as a liaison for Bronwyn.

Other contributors might include industries operating in Upper Spencer Gulf (e.g. OneSteel, SANTOS, Spencer Gulf Port Link Consortium, Port Bonython Fuels). Peter Peppin asked to act on our behalf to make contact with these (where appropriate). Peter Short and Sam Gaylard to provide contact details for some of these to Bronwyn as they have already developed a relationship with them.

A letter of in-principal support from WCC and CCSA would increase the chance of success of the proposal.

Action: Members to identify potential funding/support and provide details to Bronwyn.

A hypothesis being considered is that the cuttlefish may be going elsewhere to breed but we have no data on the abundance or locations of populations in the gulf. Is there one or many source populations contributing to the genetic pool? The project will involve significant community engagement through Redmap.

Redmap Australia is a national range extension database and mapping project in which the public are invited to log any sightings of uncommon marine species. Redmap records and tracks shifts in the distribution of marine species. A South Australian Redmap will be launched later this year. The addition of cuttlefish to this database will provide information on movement patterns of cuttlefish in South Australian waters, particularly the location of spawning aggregations. This information could be used to inform the location of potential study sites in Spencer Gulf. Members should promote the use of Redmap at a local level to get the best information.

Members had some comments on the content of the proposal. Please address these directly to Bronwyn.

Action: Members to direct comments on the proposal to Bronwyn by 18 October 2012 (when SAFRAB are meeting to assess projects).

Action: Incorporate cuttlefish onto the SA Redmap program.

Gap Analysis

A presentation on the gaps in knowledge was provided by Dr Michael Steer.

There are four key areas where there are gaps in knowledge:

- History
 - Understanding the natural variations in abundance.
- Movement
 - Population dynamics for all life history stages.
- Abiotic factors
 - Climate
 - Pollution
 - Fishing
 - Divers
 - Seismic activity
- Biotic factors (which can act in parallel)
 - Habitat
 - Trends in available prey and predators
 - Parasites and disease

For some of these factors, we have long-term data (e.g. climate and trends in commercial fishing catches) which can be collated to inform initial hypotheses or provide a direction for research.

A complicating factor may be the continued and new industrial developments that occur in the area. It is therefore important to collate the existing data we have to inform our decisions and direction.

Pollution data – EPA

EPA updated the working group on the available data on pollution at Point Lowly, particularly relating to arsenic and industrial development in the area.

Communications

The working group requires a combined communication strategy that provides a conduit for information flow between working group members, Ministers, local councils, NRM boards, regional boards.

Redmap

SARDI and PIRSA websites

PIRSA communications Unit to produce a public communiqué on a regular basis to keep the public informed.

Action: Develop a communiqué to inform the public on progress on an as needs basis

Resources for ongoing monitoring and assessment

Monitoring will consist of SARDI surveys and site investigations. The monitoring is not necessarily linked to research and will not be part of the proposed FRDC project.

An integrated cuttlefish monitoring program would have the following elements:

- Long-term abundance data, water quality and habitat condition
- Survey frequency - 3 times a year.
- Each survey requires 5 days with a team of three divers.
- Using standardised survey techniques, with video or divers may allow other groups (e.g. local dive groups) to undertake the surveys to reduce costs. The costs associated with sample testing would still apply. There are also risks and OHS issues (skill level, sharks, water currents, public liability) that need to be considered when using non-government personnel. Need to go through NGO's.

Agreed Outcomes

1. Develop Terms of Reference for the Working Group
2. Provide comments on FRDC research proposal to Bronwyn Gillanders by 18 October 2012.
3. Provide details of contacts for industries around Upper Spencer Gulf that may support/contribute to the project.
4. Incorporate cuttlefish into the SA Redmap program.
5. Develop a communication strategy.
6. Develop an ongoing monitoring program and manage the risks associated with its implementation.
7. Investigate how a volunteer program might work.

Meeting concluded: 4:45pm

Next meeting: To be advised

Item	Actions from 08 October 2012	Responsibility	Target Date
1	Terms of Reference Develop a TOR for the working group	PIRSA, SARDI, DEWNR, EPA	
2	Membership Government agencies to clarify representatives of the working group.	PIRSA, SARDI, DEWNR, EPA	
3	FRDC Expression of Interest research project Provide comments on FRDC research proposal to Bronwyn Gillanders. Provide details of contacts for industries around Upper Spencer Gulf that may support/contribute to the project.	ALL	18 October 2012
4	Communications Incorporate cuttlefish into the SA Redmap program. Develop a communication strategy.	PIRSA PIRSA, SARDI, DEWNR, EPA	
5	Monitoring Program Develop an ongoing monitoring program and manage the risks associated with its implementation. Investigate how a volunteer program might work.	SARDI ALL	

Tuesday 26 March 2013 11:30am – 1:40pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Scott Ashby (Chair)
 Mehdi Doroudi (PIRSA)
 Sean Sloan (PIRSA)
 Brenton Gear (DEWNR)
 Peter Copley (DEWNR)
 Michael Steer (SARDI)
 Rob Thomas (DMITRE)
 Peter Dolan (EPA)
 Sam Gaylard (EPA)
 David Lake (SATC)
 Peter Short (DPTI)
 Peter Peppin (Whyalla City Council)
 Tim Kelly (CCSA)
 Kathryn Warhurst (CCSA)
 Bronwyn Gillanders (U of A)
 Cathy Parker (PIRSA)
 Kate Rodda – EO (PIRSA)

Apologies: Alice Fistr (PIRSA)
 Andrew Solomon (EPA)
 Gavin Begg (SARDI)

Introduction

Scott Ashby (CE, PIRSA) assumed the role of Chair and introduced himself to the members of the working group (WG). It was noted that the WG is not a PIRSA WG, but a cross-agency group including members from non-government organisations and local government.

Previous minutes

Minutes from the previous meeting held 08 October 2012 were accepted as an accurate record of the meeting. Actions arising from these were considered as the meeting progressed.

Confirmation of membership of the working group

Members of the WG need to be representatives from the organisation that are empowered to make decisions on behalf of their organisation.

Action: Chair to write to other Chief Executives to confirm nominations for membership.

Discussion items

Update on FRDC Research project – Bronwyn Gillanders

Bronwyn Gillanders presented an update on the FRDC project. The project, a joint initiative between University of Adelaide, SARDI, PIRSA and the South Australian Museum, has been successful and is at the contract stage. The project has three main objectives and will be informed by the results from the FRDC tactical research project recently completed by SARDI (see below). The objectives of the FRDC project are:

- Determine the movement throughout the life history and finer scale population structure of the giant Australian cuttlefish in Upper Spencer Gulf.
- Resolve the systematic status of the USG giant Australian cuttlefish to determine the extent of its geographic boundaries.
- Develop an integrated model that assesses and evaluates the response of the USG population to environmental and anthropogenic factors and thereby assess population viability.

The steering committee is meeting 27 March 2013 and field work is scheduled to commence for this year's breeding season. Preliminary data may be available by late 2013.

Bronwyn has been communicating with the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) in regard to additional funding to enhance the project relevant to regional development. PIRSA to assist if required.

Action: Bronwyn to send Kate the proposal for circulation to members.

FRDC tactical research project update - Mike Steer

Mike Steer (SARDI) provided an update on tactical research project recently completed. The project was funded 18 months ago and aimed to:

- Develop standardised survey techniques to estimate cuttlefish abundance and biomass, and
- Explore the causes of the population decline

The final report should be released shortly. Results of this project will directly inform the FRDC project above. The project refined existing methodologies for monitoring to a standard method and provides a framework for future work. The project also looked at habitat assessment and water quality.

The project was successful at developing standardised methods but the causes of the decline remain unclear. Standardised methods are essential for engaging the community in monitoring programs. Possible causes for the decline will be further investigated in the FRDC project. There were a few indicators that demonstrated some correlation (note: correlation ≠ causation). For example correlations were found for rainfall (increased rainfall may result in increased turbidity and land-based run-off potentially impacting visual cues important for cuttlefish behavior. Correlations were also identified for blue crab (as a prey).

It was noted that there are other areas in northern Spencer Gulf that may have smaller aggregations of giant cuttlefish, but the absence of data on movement patterns makes any conclusion difficult. It was also noted that these additional areas are not scheduled for monitoring in the FRDC project which will focus on Point Lowly at this stage.

It was also noted that there are other projects that are being undertaken to investigate New Zealand fur seal populations in Spencer Gulf that will address issues of fur seal predation on cuttlefish as part of the scope of the project.

The impact to cuttlefish as a result of the prawn by-catch was discussed. The industry has agreed to provide data on by-catch of cuttlefish. However there is a need to be able to distinguish between the two species of cuttlefish in the northern Spencer Gulf. The possibility of a project to investigate the potential correlation between cuttlefish bycatch in prawn trawls with trawl intensity was raised by the CCSA. It was noted by PIRSA that the spatial distribution of prawn trawling in Spencer Gulf varies year to year and has decreased significantly in the northern part of Spencer Gulf in the last 10 years. PIRSA noted that the prawn fishery operates in a limited area (about 15%) of Spencer gulf.

It was also noted that prawn stock assessment surveys utilise scientific observers and that these surveys collect some bycatch. Periodical 'whole of gulf' bycatch surveys are also conducted to improve bycatch assessment and management. Scientific reports on this survey work are publicly available on the SARDI website.

There may also be some data available through the snapper recruitment trawls conducted by SARDI in the past. These data (prawn and snapper) may contribute to the body of data available.

CCSA Action Plan Proposal for Giant Australian Cuttlefish –Tim Kelly, CCSA

Tim Kelly presented on the proposal to develop an action plan for cuttlefish. This was presented to Minister Gago recently.

The CCSA view was noted that the decline in abundance was not representative of a natural variability in population numbers and we cannot afford to delay our response. CCSA are proposing six immediate actions:

- Protection under the *Fisheries Management Act 2007* above Wallaroo.
- Appoint an independent advocate to implement the Upper Spencer Gulf Action Plan
- Reduce by-catch
- Trial artificial habitat near One Steel sea wall.
- Release 2012 count data
- Communicate the call for action on DEWNR and PIRSA websites

In addition there are 14 other actions recommended for the next 18 months.

It was noted that the communication and information on existing websites (e.g. PIRSA) be improved.

Update on the Spencer Gulf Ecosystem Development Initiative (SGEDI) – Rob Thomas, DMITRE

The aim of SGEDI is to create a collective ownership of resources in Spencer Gulf by all sectors. It is a forum under which economic and environmental issues can be brought together, and provides a collective for data and science to inform the use of resources (e.g. development) in Spencer Gulf. An extensive consultation process with stakeholders was conducted in late 2012 and key issues relating to Spencer Gulf tabled.

An Advisory Board comprising members from the tuna and prawn industries, mining, infrastructure, conservation, community and research has been created and will meet for the first time on 8 April 2013. It was noted that this is not a regulatory board but an advisory one, with the intention being to develop better science and decision support systems for development in Spencer Gulf. A science plan has been developed.

Significant funding from the mining industry (BHP - \$600K over two years) has been provided.

Terms of Reference for working group

The WG is currently an inter-agency government WG which is chaired by PIRSA. The ultimate decisions lie with the relevant Ministers. It was discussed whether the WG should be an advisory or a technical WG to coordinate activities.

The Chair will modify the current draft TOR and circulate for comment. As part of the TOR, membership needs to be finalised.

PIRSA and DEWNR have committed funds to support the WG for the 2013/2014 financial year.

Industry involvement is critical for any action that is recommended through the WG. It was noted that efforts should be made to engage the industry in the current process. Rob Thomas can provide assistance if required.

Action: A revised draft TOR to be sent out to members for comment.

Application for EBPC listing – Kathryn Warhurst, CCSA

An application for listing the Australian Giant Cuttlefish has previously been unsuccessful (2009) as the Committee noted that "*Sepia apama* upper Spencer Gulf population has not been demonstrated at this time to be taxonomically distinct from the rest of *Sepia apama* for the purposes of the EPBC Act". Now that there are additional three years of data, the CCSA are submitting a new application for the listing of this species.

It was noted that if successful, the listing may not actually protect species from further decline (not knowing what the cause of the decline is). Further, it is likely to put industry off-side because any major development application in Spencer Gulf would require additional referral to EPBC.

It was noted that the 2013 cuttlefish breeding season is close and that some immediate actions need to be considered (e.g. commitment for monitoring of the breeding aggregation, investigation of additional surfaces/habitat for egg-laying, monitoring of additional areas considered to have some importance for spawning).

Meeting concluded: 1:40pm

Next meeting: Wednesday 3 April 2013

Item	Actions from 26 March 2013	Responsibility	Target Date
1	Terms of Reference Develop a TOR for the working group	ALL	
2	Membership Chair to write to other Chief Executives to confirm nominations for membership.	Chair	
3	FRDC research project Bronwyn Gillanders to send to Kate Rodda for circulation to members	B Gillanders K Rodda	27 March 2013

Wednesday 3 April 2013 2:30–3:40pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Scott Ashby (Chair)
 Sean Sloan (PIRSA)\
 Alice Fistr (PIRSA)
 Brenton Gear (DEWNR)
 Peter Copley (DEWNR)
 Sam Gaylard (EPA)
 David Lake (SATC)
 Peter Short (DPTI)
 Tim Kelly (CCSA)
 Bronwyn Gillanders (U of A)
 Jo Tsoukalas (PIRSA)
 Sam Walker (DMITRE proxy)
 Stewart Payne (WCC proxy)
 Kate Rodda – EO (PIRSA)

Apologies: Mehdi Doroudi (PIRSA)
 Michael Steer (SARDI)
 Peter Peppin (Whyalla City Council)
 Peter Dolan (EPA)
 Kathryn Warhurst (CCSA)
 Andrew Solomon (EPA)
 Rob Thomas (DMITRE)

Previous minutes

Minutes from the previous meeting held 26 March 2013 were accepted as an accurate record of the meeting based on a number of amendments. Actions arising from these were considered as the meeting progressed.

Confirmation of membership of the working group

Members of the WG will be nominated by the respective Chief Executives. They will need to be representatives from the organisation who are empowered to make decisions on behalf of their organisation in relation to management issue, resourcing and funding.

Action: Chair to write to other Chief Executives to confirm nominations for membership.

Discussion items

Update on recent government decisions

Closure to fishing

A recent public announcement that a temporary closure of Upper Spencer Gulf to the taking of cuttlefish effective as of 28 March 2013 was made by Minister Gail Gago as a precautionary action due to the reported low population numbers.

State Government funding

The State Government has committed \$150,000 to look at continuing the monitoring and management program for 2013.

There are a few things that can be done in the short-term:

- Temporary fishing closures (already in place).
- Increased artificial habitat – trials of effectiveness (develop a discussion paper). – consider location (creation of a refuge away from the Point Lowly aggregation site where conditions may not be optimal), but it was noted that we need to consider the possibility of disturbing the aggregations if activity occurs around the time animals are coming to the site. May need to consider the creation of artificial habitat areas for next season once the cuttlefish have left the area.
Trials of artificial habitat have been done by BHP in the EIS. These may be adequate to assess the practicality and effectiveness of an artificial habitat program for next year. Also could consider translocation of eggs to another habitat/area.
- Summarise the research to date – what are the next steps in monitoring and research and what are the gaps. With limited resources, we need to prioritise work. Include what is needed and what are the estimated costs (develop a discussion paper).

Action: Develop a discussion paper on artificial habitat - PIRSA.

Action: Develop a discussion paper on research to date and information gaps - PIRSA.

The cuttlefish monitoring program for 2013 (May-July 2013) is estimated to cost in the vicinity of \$90,000. Of the additional funding provided, this would leave \$60,000 for other potential projects.

Potential Projects:

- Artificial habitat investigation
- Survey of other sites in Spencer Gulf that have shown some evidence of giant cuttlefish aggregations. This project needs to be costed and the assistance of the recreational diving community may reduce the costs
- Follow up on testing of collected cuttlefish tissue and mantle to investigate potential stresses.

Action: Develop discussion papers on potential stressors using existing tissue and mantle samples.

Diver activity at Point Lowly

It was raised that diver activity at Point Lowly during the cuttlefish breeding season may have an impact on cuttlefish behaviour and impact on habitat. It was suggested that consideration be given to the possible closure of all (or at least a part of) the aggregation area in order to minimise impact to the cuttlefish population as a precautionary measure.

It was proposed to develop a discussion paper on the current and historical level of recreational activity at the aggregation site. Consider the number of visitors to the area, ask local dive shop, charter operators and the Whyalla City Council.

Action: Develop discussion paper on management of visitor activity at the aggregation site – DEWNR with assistance from SATC.

DSEWPaC support for regional assessment in northern Spencer Gulf

Extract from email from Peter Copley dated 03 April 2013:

The Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) Strategic Approaches Branch has been investigating whether they will become involved in developing an EPBC Act-driven regional strategic assessment for upper Spencer Gulf in parallel, and where appropriate in partnership, with the development of an upper Spencer Gulf Regional Mining and Infrastructure Plan (RMIP) (see: http://www.infrastructure.sa.gov.au/major_projects/regional_mining_and_infrastructure_planning_project).

The DSEWPaC project, if it proceeds, would link in as part of the risk assessment / sustainability planning processes for the RMIP. The DSEWPaC interest is in strategic assessment and planning to avoid or offset impacts of proposed developments on EPBC Act matters of National Environmental Significance (NES) and to obviate the need for numerous separate EPBC Act referrals for each individual development proposal that is likely to occur within the defined region.

See: <http://www.environment.gov.au/epbc/assessments/strategic.html>.

While neither entity is a listed matter of NES at the present time, both cuttlefish and coastal saltmarshes have been nominated as being "threatened" under the EPBC Act and the Commonwealth is paying attention to these along with listed coastal/terrestrial matters of NES.

DSEWPaC representatives contacted Bronwyn Gillanders about possible funding options for either value-adding to the FRDC project or complementing that project by addressing related gaps.

At the working group meeting it was noted that any support from DSEWPaC would be required to be used for this current financial year. Funding could be used as leverage for other funding opportunities.

DSEWPaC support is focussed on future possible industry impacts on cuttlefish, rather than existing impacts in order to develop solutions to avoid or offset impacts to cuttlefish. Their particular interest is in the areas of shipping, hydrocarbons and desalination. The artificial habitat project may fit in with this funding opportunity.

Terms of Reference (TOR) for working group

The TOR were discussed and amendments made as agreed by members.

Chair - The issue of an independent Chair was discussed. A government Chair was agreed because of the need to report back to relevant Ministers. The current Chair (CE, PIRSA) was prepared to continue as Chair. Members agreed.

Membership - It was agreed that membership be extended to include University of Adelaide (i.e. Bronwyn Gillanders).

Industry representation was discussed. The concern was that there are many industries and not all could be represented. DMITRE may assist through their knowledge of industry in the area and through the Spencer Gulf Ecosystem Development Initiative. The Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to the need for suitable industry representation.

Community representation (non-government other than CCSA) was discussed. The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in relation to community representation.

It was noted that the representative from the SATC believed that while SATC were still interested in being a member, they had little scientific expertise and limited contribution at

this stage. It was noted that a diver trail was being built into the scope of a monitoring program which will require significant community engagement and a role for SATC.

If members believed relevant membership or contributions were missing, they should inform the Chair. The TOR allow for additional technical expertise to be invited to meetings as required, through approval by the Chair.

It was noted that any member of the working group would need to add value to the objectives of the working group.

Action: The revised TOR to be sent out to members.

Action: Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation.

Action: The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.

Discussion papers to be developed

1. A draft work plan template on what we have already done and are currently doing – PIRSA F&A.
2. Artificial habitat – effectiveness and implementation – PIRSA F&A
3. Research to date – next steps in monitoring and information gaps and costs – PIRSA F&A.
4. Management of visitor activity at the aggregation site – DEWNR
5. Potential stressors using existing tissue and mantle samples – EPA, CCSA.

All discussion papers should be developed and circulated out-of-session for group discussion at the next meeting (scheduled for 16 April 2013). **They should be marked “Draft and without prejudice”**

It was noted that in order to inform these discussion papers, we need to understand the number of cuttlefish and the frequency and spatial distribution of cuttlefish over the aggregation site.

Meeting concluded: 3:40pm

Next meeting: Tuesday 16 April 2013, 9-10.30 am Level 17 conference Room, 25 Grenfell Street.

Item	Actions from 03 April 2013	Responsibility	Target Date
1	Terms of Reference The revised TOR to be sent out to members.	K Rodda	
2	Membership Chair to write to other Chief Executives to confirm nominations for membership.	Chair	
3	Membership Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation.	Chair	
4	Membership The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.	Chair	
5	Discussion paper 1 Draft work plan template.	PIRSA	15 April 2013
6	Discussion paper 2 Artificial habitats.	PIRSA	15 April 2013
7	Discussion paper 3 Information gaps.	PIRSA	15 April 2013
8	Discussion paper 4 Management of visitor activity at the aggregation site.	DEWNR	15 April 2013
9	Discussion paper 5 Potential stressors using existing tissue and mantle samples.	EPA, CCSA	15 April 2013

Tuesday 16 April 2013 9:30–10:40am

Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Mehdi Doroudi (PIRSA - Acting Chair)
 Sean Sloan (PIRSA)
 Peter Copley (DEWNR)
 Peter Dolan (EPA)
 Sam Gaylard (EPA)
 David Lake (SATC)
 Peter Short (DPTI)
 Rob Thomas (DMITRE)
 Jo Tsoukalas (PIRSA)
 Kate Rodda – EO (PIRSA)

Apologies: Scott Ashby (PIRSA)
 Gavin Begg (SARDI)
 Michael Steer (SARDI)
 Brenton Grear (DEWNR)
 Bronwyn Gillanders (U of A)
 Peter Peppin (Whyalla City Council)
 Tim Kelly (CCSA)
 Andrew Solomon (EPA)

Previous minutes

Minutes from the previous meeting held 03 April 2013 were accepted as an accurate record of the meeting subject to two amendments. Actions arising from these were considered as the meeting progressed.

Confirmation of membership of the working group

It was noted that the current membership of the working group may not take into account future stakeholders. The best governance to manage all possible representation was discussed. The Spencer Gulf Ecosystem Development Initiative (SGEDI) may provide an option to cover all industry expertise as it has representatives for many of the stakeholders in upper Spencer Gulf. One option discussed was inviting the Chair of SGEDI to participate. Another option may be to have a member from each peak industry body invited to participate.

Ongoing **action** – a letter has been drafted and will be sent to other Chief Executives to confirm nominations for membership.

Ongoing **action** – the Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation, indicating the option of inviting the Chair of SGEDI to participate in the cuttlefish working group.

Ongoing **action** – the Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.

Discussion items

The Acting Chair thanked those members involved in developing draft discussion papers. These papers represent potential areas for future investment (either short-term or longer-term). Given the relatively short time frame before the 2013 breeding season commences, the working group need to identify and prioritise any immediate actions that can be taken.

Discussion Paper 1 - Draft Work Plan for Cuttlefish Working Group

It was suggested that this paper be divided into separate completed actions with current actions to be clear about progress made.

It was raised that a scientific plan for cuttlefish (including causes, questions to answer and information gaps) was not included in the work plan. PIRSA noted that this was addressed through the work completed recently by Mike Steer (SARDI) and is the basis of discussion paper 3.

Data relating to biology and distribution are clear information gaps that the new (current) FRDC project will address. Actions relating to conservation and management include fishing closures (enacted), use of artificial habitat, managing visitation to the site, stock enhancement (including tracking to investigate movement patterns), laboratory based experiments to investigate the effect of stirred sediments arising from shipping activities etc.

It was noted that there are limited resources and time before the next breeding season and we need to prioritise our work plan. What actions can we take in the immediate future?

Possible immediate actions:

- Continue monitoring at Point Lowly
- Monitor other sites that have been identified as possible aggregation sites in Spencer Gulf
- Translocation of eggs to areas outside Point Lowly

Longer term actions:

- Artificial habitat
- Stock enhancement
- Other??

General discussion among members indicated that monitoring of additional suitable sites should be the highest priority followed by studies into artificial habitats and stock enhancement.

It was also noted that we should further attempt to identify the cause of the decline as well as investing in recovery actions as the former may influence the success of any recovery action.

It was discussed that a smaller sub-group of scientific members of the working group (SARDI, University of Adelaide, EPA) be formed to develop a scientific plan and make recommendations to inform priority setting by the broader working group at the next meeting (7 May 2013). Bronwyn Gillanders has already provided detailed comments on the research activities outlined in the work plan which can form the basis of discussions for this scientific group.

It was noted that it was important to consider the timing of any action that we endorse – to ensure actions are appropriate for the period of time that cuttlefish are present in the area.

Action: A scientific team consisting of members from SARDI, University of Adelaide and EPA to form and meet to develop a scientific plan to include recommended priorities for research/actions for the short and long term.

Discussion Paper 2 - Artificial habitat - effectiveness and implementation

The possibility of placing artificial habitat at Point Lowly was discussed as an immediate action. If these were successful in attracting females to lay their eggs on, it was suggested that the artificial habitat could be translocated to other areas in Spencer Gulf to complete their incubation.

It was noted that the possibility of cuttlefish being "hard-wired" to an area may influence the success of any translocation and this is being addressed in the FRDC project.

Action: A small team consisting of Alice Fistr, Sean Sloan, Peter Dolan, Peter Copley, Rob Thomas, Bronwyn Gillanders and Mike Steer, will be formed to further develop this discussion paper and present findings at the next working group meeting (7 May 2013).

It was discussed that this activity may require exemptions under several pieces of legislation (Water Quality Policy, Marine Park Management Plans, DPTI, Fisheries Management Act). This would need to be scoped as part of the discussion paper. Details on the artificial habitat experiment conducted by BHP to be requested by Rob Thomas so we can have a better idea on what may work or has already been done.

Action: Each agency to follow up on what the legislative requirements would be if an artificial habitat program was implemented.

Action: Rob Thomas to request BHP's artificial habitat experiment details to inform any future actions relating to the use of artificial habitats.

Discussion Paper 3 - Research to date – next steps in monitoring and information gaps and costs

Further work on this discussion paper was referred to the scientific team to assist the working group to identify priorities for decision and implementation.

Concurrently, all members are requested to make comment on this discussion paper by 26 April 2013.

Discussion Paper 4 - Management of visitor activity at the aggregation site

There was some discussion on the justification for extrapolating the economic value of cuttlefish for 2010 but not extending the same extrapolation to the number of divers that may have visited the area in 2010. It was generally agreed that an estimate of ~4000 divers in 2010 was probably not realistic and therefore the estimated economic value could not be valid. The 2003 tourism report referred to in the discussion paper will be forwarded to PIRSA

Action: SATC to provide PIRSA with the 2003 tourism report.

In any case, diver activity should be considered a potential threat to the remaining cuttlefish populations at Point Lowly. In particular does it impact on aggregation behaviour and egg-laying? Are there more sensitive times during the season when cuttlefish may be affected (mating or egg-laying) by the presence of divers? What are the stressors for limiting fecundity and successful breeding? It was suggested that we could consider limiting diver activity around the more sensitive periods of cuttlefish breeding season to limit disturbance to the breeding and mating behaviour.

A problem is the absence of a control area, however there is other cephalopod research that may be used to predict impacts.

Action: The implication of diver visitation should be discussed by the scientific team, with a view to scientific advice being provided on this issue.

Discussion Paper 5 - Potential stressors using existing tissue and mantle samples.

The sampling costs have been estimated at \$7,500. While this is relatively small amount of funding, it was generally agreed by members that it would not result in a clear understanding of potential stressors. It would not be possible to identify where the uptake of pollutants (and therefore the source) occurred if any pollutants were identified in tissue as cuttlefish may move throughout the gulf. This discussion paper will be still considered as an option.

Discussion Papers 1-5

Projects/actions will be discussed and prioritised with the intention of making a decision on future actions at the next meeting (scheduled 7 May 2013).

Action: All discussion papers have been circulated to members and comments are requested by Friday 26 April 2013.

Communications

The PIRSA website has been updated and there is the opportunity for other agencies to be linked into the PIRSA website.

A public communique has been drafted for release on 1 May 2013. It will be posted as a pdf on the PIRSA website but can be sent to other agencies websites. A stakeholder list is being developed by Jo Tsoukalas. If any member has stakeholders they wish to add, please let Jo know as soon as possible (Joanna.tsoukalas@sa.gov.au).

Action: All members to send details of stakeholders for circulation of communique.

Other business

Collection of prawn industry by-catch data of cuttlefish

There is limited opportunity to collect biological data on cuttlefish. It was noted that the by-catch of cuttlefish in the prawn fishery represents one avenue for biological samples to be collected. The SARDI observer program could be utilised to collect samples.

Action: PIRSA/SARDI to approach the prawn industry to record and collect cuttlefish by-catch data and biological samples.

Meeting concluded: 10:40am

Next meeting: 7 May 2013, 3-5 pm Level 14 Meeting Room 1, 25 Grenfell Street

Purpose -To prioritise the work plan and decide on immediate actions to be taken.

Item	Actions from 16 April 2013	Responsibility	Target Date
1	Membership Chair to write to other Chief Executives to confirm nominations for membership.	Chair	
2	Membership Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation and possible involvement of SGEDI.	Chair	
3	Membership The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.	Chair	
4	Discussion papers – 1-5 All members to provide input to discussion papers through the Executive Officer (K Rodda).	All members	26 April 2013
5	Discussion papers 1 + 2 + 3 + 4 A scientific team consisting of members from SARDI and University of Adelaide to form and meet to develop a scientific plan and recommend priorities for research/actions.	Science team (Mike Steer Gavin Begg Bronwyn Gillanders, Sam Gaylard)	< 7 May 2013
6	Discussion paper 2 - Artificial habitats. A small team will be formed to further develop this discussion paper and present findings at the next working group meeting (7 May 2013).	Alice Fistr, Sean Sloan Peter Dolan Peter Copley Bronwyn Gillanders Mike Steer Rob Thomas	< 7 May 2013
7	Discussion paper 2 - Artificial habitats. Each agency to follow up on what the legislative requirements would be if an artificial habitat program was implemented.	Rob Thomas Peter Copley Peter Short Sean Sloan	< 7 May 2013
8	Discussion paper 2 - Artificial habitats. Rob Thomas to request BHP's artificial habitat experiment details to inform any future actions relating to the use of artificial habitats.	Rob Thomas	< 7 May 2013
9	Discussion paper 4 - Management of visitor activity at the aggregation site. SATC to provide PIRSA with the 2003 tourism report. The implication of diver visitation should be discussed by the scientific team.	David Lake Science team	< 7 May 2013
10	Communications All members to send details of stakeholders for circulation of communique.	All members	< 1 May 2013
11	Collection of cuttlefish by-catch data PIRSA/SARDI to approach the prawn industry to record and collect cuttlefish by-catch data and possibly collection of biological samples.	PIRSA/SARDI	

Tuesday 07 May 2013 3:00–4:55pm

Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Mehdi Doroudi (PIRSA - Acting Chair)
 Sean Sloan (PIRSA)
 Gavin Begg (SARDI)
 Michael Steer (SARDI)
 Peter Copley (DEWNR)
 Brenton Grear (DEWNR)
 Andrew Solomon (EPA)
 Sam Gaylard (EPA)
 Peter Short (DPTI)
 Rob Thomas (DMITRE)
 David Lake (SATC)
 Bronwyn Gillanders (U of A)
 Peter Peppin (Whyalla City Council)
 Tim Kelly (CCSA)
 Jo Tsoukalas (PIRSA)
 Kate Rodda - EO (PIRSA)

Apologies: Scott Ashby (PIRSA)
 Peter Dolan (EPA)

Previous minutes

Minutes from the previous meeting held 16 April 2013 were accepted as an accurate record of the meeting. Actions arising from these were considered as the meeting progressed.

Previous actions

1. Other Chief Executives

Completed. A letter has been sent to other Chief Executives to confirm nominations for membership.

2. Industry representation

Ongoing **action** – the Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation, indicating the option of inviting the Chair of SGEDI to participate in the cuttlefish working group. The Acting Chair has met with the Chair of SGEDI regarding engagement with the working group.

3. Community representation

Ongoing **action** – the Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.

4. Input to discussion papers 1-5

Completed. Thanks to those who contributed.

5. Development of a science plan

Completed. See discussion below (Discussion Paper 3).

6. Artificial habitat paper

Completed. See discussion below.

7. Artificial habitats - legislative requirements

Completed. P Copley provided a short paper on relevant legislation.

8. Artificial habitats - BHP report

Completed.

9. Management of visitor activity

Completed. David Lake has revised and the updated version was sent to WG members.

10. Communications

The communique will be produced as required. Decisions arising from this meeting will form the basis of the next one.

11. Cuttlefish by-catch data

See discussion below.

Discussion items

1. Discussion Paper 1 - Draft Work Plan for Cuttlefish Working Group

It was suggested that the following be added to the draft work plan:

- FRDC seal project - Assessment of the impacts of seal populations on the seafood industry in South Australia.
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) funding to investigate future impacts to early life history stages of cuttlefish relating to increased shipping in northern SG and physiological impacts of noise on adults.
- A column to detail funding sources.

Action: K Rodda to update and circulate to WG members out-of-session

2. Discussion Paper 2 - Artificial habitat

M Steer verbally presented on the discussion by the group tasked with further developing the artificial habitat paper. It was noted that while the cuttlefish population is at a low level, the habitat at Point Lowly was not limiting. It was suggested that the issue be addressed through a two-phase project:

Phase 1: Characterise the natural spawning substrate during the 2013 spawning season. It was noted that it was of equal importance to describe the nature of habitat not utilized for egg-laying so we can have greater confidence that habitat selection was not random but based on structural design.

Phase 2: Use the 'natural spawning preference' information to design and develop artificial habitat with the intention of strategically deploying it in northern Spencer Gulf prior to the 2014 spawning season.

In addition, it was discussed that a separate project to identify possible alternative spawning areas with low habitat availability be conducted. Results from this would inform the placement of artificial habitat (Phase 2 above).

There was discussion among WG members on various ways to proceed with this issue, but it was noted by SARDI that any experiments involving the placement of artificial habitat and associated trials would need to be designed appropriately and not rushed to improve the success of any such program.

DEWNR discussed the possibility of a pilot translocation program for 2013 involving the placement of habitat at Point Lowly. If eggs are laid on this habitat, both habitat and eggs could be translocated to another location. This program could be used to advance our understanding on whether translocation was feasible and inform later activities. Translocation programs would require identification of suitable areas.

Action: SARDI to finalise the paper, complete with estimated costs.

3. Discussion Paper 3 - Research to date – next steps in monitoring and information gaps and costs

M Steer reported back to the WG on discussions held by the team tasked with identifying and ranking research priorities. It was noted that many of the parameters identified in the document have been addressed in the SARDI report which was provided to WG members. WG members to consider the document and agree on priorities. This will be finalised at the next WG meeting.

It was noted that the BHP saline discharge project was not proceeding and should be removed.

Action: M Steer to send the final document to K Rodda for circulation to WG members for their comment.

DEWNR requested the costs for the proposal to survey new areas and whether the use of other resources will reduce the costs.

Action: PIRSA to provide DEWNR with costs associated with surveying new areas.

4. Discussion Paper 4 - Management of visitor activity at the aggregation site

It was agreed that this was a low priority and would not be pursued at this stage. There was a general feeling among scientists that there is no impact from visitor activity at Point Lowly. If pursued further, studies from the Great Barrier Reef could be assessed to determine the effect of diving on fish.

There may be a need to develop guidelines on diver behaviour around cuttlefish through signage at the site and a public campaign to educate the community.

Action: P Peppin to investigate existing signage at Point Lowly.

5. Discussion Paper 5 - Potential stressors using existing tissue and mantle samples.

Further discussion on this paper resulted in a decision to progress this paper. It was discussed that any study could utilise calamari as a substitute species. EPA noted that if testing indicated high levels of contaminant, then further work would need to be done to understand what this means for cuttlefish - how do they cope with high levels of metal pollutants in the tissues? EPA believed such results may be misinterpreted without the expenditure of further funds to interpret the implication for cuttlefish. DEWNR noted the importance of testing adult and egg stages as they may be affected differently. There was some work done in the 1980's and CSIRO have conducted some work on heavy metals in fish species in Spencer Gulf, indicating no fundamental effect on the ecosystem.

Action: EPA to further develop this paper, summarising all information available and including a budget.

6. By-catch estimate

PIRSA advised that the recent SARDI report (Steer et al. 2013) notes the incidental capture of Giant Cuttlefish and Nova Cuttlefish in the Spencer Gulf Prawn Fishery. The report found no clear association between the decline in the cuttlefish population and fishing intensity.

The Spencer Gulf Prawn Fishery has been collecting information on cuttlefish by-catch through SARDI stock assessment surveys during 2011 and 2012. The Conservation Council of South Australia (CCSA) has been working with industry through the industry's research sub-committee to collect these data. In 2011, the difficulty in accurately identifying *Sepia apama* from other cuttlefish species in the field was recognised. This led to the collection of biological samples of cuttlefish by-catch in 2012 to assist in identifying the relative proportion of this species. These samples will be made available to researchers for the FRDC project 2013/010. In addition, the industry with the assistance of CCSA has recently developed a code of practice with procedures for the release of any cuttlefish incidentally caught in upper Spencer Gulf.

Additionally, the prawn industry has agreed to collect biological samples of Giant Cuttlefish during commercial fishing operations (rather than only survey trips). A sampling methodology has recently been developed and is currently being trialled as a pilot program by the prawn association's Committee-at-Sea during the May and June 2013 fishing runs. An assessment will then be undertaken by PIRSA, SARDI and the association to identify any operational or technical issues with the data sampling protocol, with the aim of implementing the sampling methodology across the fishery for the next fishing season commencing in November 2013. The data collected during the 2013/14 fishing season will be analysed to estimate the annual by-catch of Giant cuttlefish in the fishery. It will also provide biological samples to support the FRDC project 2013/010.

Action: Chair to write to the prawn industry association acknowledging their contribution and thanking them for their support.

7. Communications

A media release on FRDC project 2013/010 has been released.

The WG actions can be promoted through Redmap, encouraging community engagement.

A stakeholder list for communications is being developed by Jo Tsoukalas. If any member has stakeholders they wish to add, please let Jo know as soon as possible (Joanna.tsoukalas@sa.gov.au).

Action: All members to send details of stakeholders for circulation of communique.

8. Other business

Meeting with BHP

SARDI (G Begg) and DMITRE (R Thomas) are meeting with BHP representatives this week in relation to cuttlefish surveys that are conducted under BHP licence conditions with a view to discuss a joint monitoring program. It was discussed that SARDI surveys and reporting would need a level of independence. BHP should be acknowledged rather than be an author on any survey report.

Meeting concluded: 4:55 pm

Next meeting: Wednesday 12 June 2013, 10:30 am – 12:00 pm

Item	Actions from 16 April 2013	Responsibility	Target Date
2	Membership Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation and possible involvement of SGEDI.	Chair	
3	Membership The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.	Chair	
Item	Actions from 07 May 2013		
1	Discussion paper 1 - draft work plan K Rodda to update and circulate to WG members out-of-session	K Rodda	Done 31/05/13
2	Discussion paper 2 - Artificial habitats M Steer to finalise the paper, complete with estimated costs.	M Steer/G Begg	Done 13/05/13
3	Discussion paper 3 - Research priorities M Steer to send the final document to K Rodda for circulation to WG members for their comment. PIRSA to provide DEWNR with costs associated with surveying new areas.	M Steer/K Rodda PIRSA	Done 10/05/13
4	Discussion paper 4 - Management of visitor activity P Peppin or D Lake to investigate existing signage at Point Lowly.	P Peppin/D Lake	Done 08/05/13
5	Discussion paper 5 - Potential stressors using existing tissue and mantle samples EPA to further develop this paper, summarising all information available.	EPA	Done 28/05/13
6	Collection of cuttlefish by-catch data Chair to write to the prawn industry association acknowledging their contribution and thanking them for their support.	Chair	
7	Communication All members to send PIRSA details of stakeholders for circulation of communique.	All members	

Wednesday 12 June 2013 10:30-11:30 am

Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Scott Ashby (Chair)
 Mehdi Doroudi (PIRSA)
 Sean Sloan (PIRSA)
 Gavin Begg (SARDI)
 Peter Copley (DEWNR)
 Andrew Solomon (EPA)
 Peter Dolan (EPA)
 Sam Gaylard (EPA)
 David Lake (SATC)
 Peter Peppin (Whyalla City Council)
 Tim Kelly (CCSA)
 Sam Walker (DMITRE proxy)
 Ian Llewellyn (DPTI proxy)
 Jo Tsoukalas (PIRSA)
 Kate Rodda - EO (PIRSA)

Apologies: Peter Short (DPTI)
 Brenton Gear (DEWNR)
 Rob Thomas (DMITRE)
 Michael Steer (SARDI)
 Bronwyn Gillanders (U of A)

Previous minutes

With some changes as discussed in the meeting, minutes from the previous meeting held 7 May 2013 were accepted as an accurate record of the meeting.

Previous actions (from 16 April 2013)

1. Industry representation

Completed. Discussions with SGEDI have indicated that Rob Thomas (DMITRE) will represent SGEDI interests on the cuttlefish working group. If there is a need to engage a particular industry directly an invitation to the meeting can be made to that sector.

2. Community representation

Completed. The Working Group considered that the community is appropriately represented through CCSA and WCC and further community representation is not contemplated at this time.

Previous actions (from 7 May 2013)

1. **Discussion paper 1 - Draft work plan** - completed.
2. **Discussion paper 2 - Artificial habitats** - completed.
3. **Discussion paper 3 - Research priorities** - completed
4. **Discussion paper 4 - Management of visitor activity** - completed.
5. **Discussion paper 5 - Potential stressors** - completed.
6. **Collection of cuttlefish by-catch data**
Ongoing. Letter to be drafted to prawn industry.
7. **Communication** - ongoing.

Discussion items

1. Confirmation of membership

All agencies have responded to the request from the Chair to nominate representatives on the working group and representatives are now confirmed.

Terms of Reference to be updated to reflect membership and circulated to members for approval.

Action: PIRSA to amend the TOR regarding membership and circulate to members for approval and finalisation.

2. Update on population surveys

SARDI have completed the first population survey at Point Lowly at the end of May 2013. SARDI have been working with BHP and EPA who will provide some assistance. Initial estimates of the population are low but these results are preliminary and need to be considered in conjunction with surveys 2 (June) and 3 (July) in the area to provide an informed conclusion.

The second survey (early-mid June 2013) is currently being undertaken. Characteristics of the cuttlefish dens are being investigated concurrently with the June and July surveys.

BHP has been trialling a remote operating vehicle (ROV) survey technique. It was suggested that Greg Hill (BHP) be invited to a meeting to discuss their results.

Action: DMITRE to approach Mr Hill in relation to presenting to the working group.

Samples have been collected for the research project 2013-010 (Bronwyn's FRDC project).

Some surveys have been conducted on potential alternative aggregation sites. The western side of the Gulf has been done with preliminary results indicating no obvious aggregation sites. The eastern side of the Gulf will be surveyed in the near future (June-July 2013).

3. Update on fishing closure

Regulations making the temporary closure at Point Lowly an on-going permanent closure came into operation on 27 May 2013. A closure has been in operation (on a temporary basis and renewed annually) for ten years, so this will not represent any changes for fishers. Communication to the public regarding this closure to be included in the next cuttlefish update. It can also be included in the Whyalla City Council quarterly update.

Action: PIRSA to follow up on what media releases have been made on this issue.

4. Communications

Add the following to the next cuttlefish update:

- Temporary closure at Point Lowly made permanent
- Update on alternative aggregation site surveys
- Update on media releases
- Opportunity for logging sightings of cuttlefish on "redmapSA" and "feril or in peril"
- Research projects confirmed for the 2013 season
- Funding commitment from state government (\$200,000)
- Other funding supporting cuttlefish research (estimated \$880,000)
- Message that the government are strongly supporting cuttlefish research and recognising that an interdepartmental collaborative approach has been adopted, with involvement from conservation organisations, local council and community.

Any media seeking community assistance through sighting databases to include both "redmapSA" and "feril or in peril" programs. Data from both can assist in identifying where and when cuttlefish are in South Australia.

RedmapSA pamphlets were made available to members for distribution.

Action: Tim Kelly to provide "feril or in peril" pamphlets for distribution.

Action: Bronwyn to work with PIRSA and CCSA to collate information from sighting databases.

Neutraliser Magazine has approached PIRSA and EPA for a story on cuttlefish in northern Spencer Gulf. All inquiries of this nature should be referred to PIRSA.

5. Other business

5.1 Discussion Paper 1 - Draft Work Plan for Cuttlefish Working Group

Work plan to be updated to reflect successful funding for the SEWPaC project and prawn by-catch project added. The document will be circulated and finalised but remains a living document that can be amended through discussion.

Action: PIRSA to circulate draft final document to members for comment by COB Friday 14 June 2013.

5.2 Reef watch volunteers

Reef watch volunteers can be used to help identify alternative aggregation sites and can be used to fill information gaps.

Action: Gavin Begg, Sean Sloan and Tim Kelly to discuss the scope for utilisation of reef watch divers to assist in the collection of data in an organised approach.

5.3 Rock Lobster fishers reporting cuttlefish in pots

PIRSA have received reports that south-east rock lobster fishers are getting some large cuttlefish in their commercial pots. It was noted that the water temperature in the south-east has been above normal this season.

Action: PIRSA to follow up and see if samples were taken.

5.4 Release of research results to the public

CCSA suggested that all research data could be made available to the public as results came in, particularly information relating to population numbers, level of by-catch, and level of fishing.

Scientific advice was that the release of preliminary data before a full analysis of all surveys were completed would be counterproductive and may lead to misleading conclusions. It was discussed that it was important to complete all testing and surveys to be able to provide scientifically robust results and analysis.

The last 2013 survey is scheduled for July 2013, and a preliminary estimate on population numbers based on all three surveys would be available August-September 2013. However the rigor of the scientific process of analysis, report writing and review must be maintained prior to release of information to the public. There is a need to weigh up the provision of information to the community and the maintenance of scientific rigor of the research projects, ensuring that the data are comparable to previous years.

It was agreed to discuss the issue of what data could be released to the public and when at the next meeting. It was agreed that we were in a position to advise the public what research was being undertaken and provide the relevant information on the short-term projects, without compromising the integrity of the overall research program.

5.5 SEWPaC funding

Bronwyn Gillanders (University of Adelaide) has been successful at securing \$150,000 to investigate the impacts of future shipping on cuttlefish (egg and adult stages).

5.6 EPBC Listing of Australian Giant Cuttlefish

The application to list cuttlefish is still being considered.

Action: CCSA to update the working group.

6. Next steps

- Investigate the use of reef watch volunteers
- Updating communications
- Research results – wait for results from population surveys, artificial habitat/den characterisation and residue testing.
- Residue testing (total metal testing) can be implemented in June 2013 and results may be available by end of August 2013.
- Determine what information could be released to the public (and when) in regard to various research results.

Action: PIRSA to develop a paper that formalises the research projects with budgets decided upon by the working group as a priority in the 2013 season. Paper to be circulated out-of-session for noting.

The Chair thanked the working group for the good progress over the last few months and noted that the cooperation between agencies on this issue has been excellent.

Meeting concluded: 11:25 am

Next meeting: Mid-July (to be decided)

Item	Actions from 07 May 2013	Responsibility	Target Date
6	Collection of cuttlefish by-catch data Chair to write to the prawn industry association acknowledging their contribution and thanking them for their support.	Chair	
Item	Actions from 12 June 2013		
1	TOR PIRSA to amend the TOR regarding membership and circulate to members.	K Rodda	Circulated 27/06/13
2	BHP ROV trials DMITRE to approach Greg Hill from BHP in relation to presenting results from their ROV trials to the working group.	DMITRE	
3	Update on fishing closure PIRSA to follow up on what media releases have been made on this issue	PIRSA	
4	Communications Tim Kelly to provide feril or in peril pamphlets for distribution. Bronwyn Gillanders to work with PIRSA and CCSA to collate information from sighting databases.	CCSA UoA	
5.1	Discussion paper 1 - work plan K Rodda to update and circulate to WG members out-of-session for finalisation.	K Rodda	Circulated 13/06/13
5.2	Reef watch volunteers Gavin Begg, Sean Sloan and Tim Kelly to discuss the scope for utilisation of reef watch divers to assist in the collection of data in an organised approach.	CCSA, SARDI, PIRSA	
5.3	Rock Lobster fishers reporting cuttlefish in pots PIRSA to follow up and see if samples were taken.	PIRSA	
5.6	EPBC Listing of Australian Giant Cuttlefish CCSA to provide an update on the application.	CCSA	
6	Research projects for 2013 PIRSA to develop a paper that formalises the research projects decided upon by the working group for priority in the 2013 season.	PIRSA	Circulated 27/06/13

Wednesday 07 August 2013 10:30-11:50 am

Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Scott Ashby (Chair)
Sean Sloan (PIRSA)
Gavin Begg (SARDI)
Michael Steer (SARDI)
Bronwyn Gillanders (U of A)
Peter Copley (DEWNR)
Brenton Gear (DEWNR)
Andrew Solomon (EPA)
Sam Gaylard (EPA)
Rob Thomas (DMITRE)
Peter Short (DPTI)
David Lake (SATC)
Peter Peppin (Whyalla City Council)
Tim Kelly (CCSA)
Jo Tsoukalas (PIRSA - communications)
Kate Rodda - EO (PIRSA)

Apologies: Mehdi Doroudi (PIRSA)
Peter Dolan (EPA)

Previous minutes

Draft minutes from the previous meeting held 12 June 2013 were accepted as an accurate record of the meeting.

Previous actions (from 7 May 2013)

1. **Collection of cuttlefish by-catch data** – Completed. Letter of thanks and recognition sent to prawn industry.

Previous actions (from 12 June 2013)

1. **TOR updated and circulated** – Completed.
2. **BHP ROV trials**
Ongoing – BHP tested the ROV in June 2013. A report is currently being written.

The working group requested clarification on the outcome from discussions between SARDI, EPA and BHP on whether the BHP surveys (required by EPA as part of their environmental monitoring) could be conducted as part of the annual SARDI surveys. It was noted that the relevant Minister was required to sign off on any agreement on this issue. The working group requested evidence of sign off.

Action: DMITRE to follow up with BHP (Greg Hill) on the possibility of a presentation to the working group on their ROV trials.

Action: DMITRE to clarify the status of the agreement reached between the Minister, EPA and BHP regarding BHP survey requirements.

3. Media on fishing closure

Completed. The closure of northern Spencer Gulf was communicated to the public through a media release and an e-newsletter.

It was noted that there may be a need to update signage at key boat ramps.

Action: PIRSA to follow up on establishing appropriate signage. WCC offered assistance.

4. Communications

a) "Feril or in Peril" pamphlets

Completed. CCSA provided WG with pamphlets.

b) Collation of data from sighting databases

Removed as an action, but ongoing. Bronwyn Gillanders to work with PIRSA and CCSA to collate available information from sighting databases for the FRDC project.

5.1 Update Work Plan for Cuttlefish Working Group – Completed.

5.2 Use of Reef Watch volunteers

Removed as an action, but ongoing for the 2014/15 season as a long-term project. Gavin Begg, Sean Sloan and Tim Kelly to discuss the scope for utilisation of reef watch divers to assist in the collection of data in an organised approach.

5.3 Collection of cuttlefish samples from Rock Lobster fishers

Completed. Samples are waiting to be analysed at SARDI.

5.6 Update of EPBC Listing of Australian Giant Cuttlefish

Completed. CCSA has received advice that the nomination has not been successful at this stage. The Threatened Species Scientific Committee has however offered to consider another application in September 2013. The obstacle is the taxonomic status of the Upper Spencer Gulf population, which is not recognised as being a separate population. Results from the taxonomic investigations from the FRDC project will be vital to the nomination. CCSA will keep the working group informed of the progress.

6. Research project summary for 2013/14 developed and circulated – Completed.

Discussion items (7 August 2013)

1. Research update

Mike Steer (SARDI) presented the working group with an update on the seven projects that are currently being undertaken. All projects are progressing well and are in the various stages of completion.

a. Point Lowly population surveys

Estimates of the Point Lowly population in 2011/12 were 18,500 individuals. The results from the three surveys undertaken in May, June and July 2013 provide an estimate of population at 13,500 individuals. While this represents a decrease in population numbers of approximately 5,000 (or 27%), the numbers for 2012/13 are higher than expected given the rate of decline in previous years.

The continued presence of Giant Cuttlefish was noted to be good news as it provides some certainty for the 2014/15 season. Ongoing annual surveys are critical to understanding any natural fluctuation in population numbers.

It was observed that during the 2012/13 surveys, estimates of abundances were relatively similar each month. This is in contrast to 2011/12 surveys where a definite peak in abundance was observed in May 2012 with subsequent decline in abundance in June and July 2012.

The data for 2012/13 biomass has similarly decreased from 2011/12, falling by an estimated 37.7%.

The difference between the level of decrease of abundance (27%) and biomass (37.7%) is in part due to the presence of smaller individuals compared to previous years. Reasons for the presence of smaller individuals may be temperature related, with increasing water temperature leading to faster growth and individuals reaching sexual maturity at a smaller size and earlier age. This may have consequences on the age dynamics of the population with an increase in the proportion of one year old animals and fewer animals reaching 18 months. It is also likely that smaller animals will have a lower fecundity.

It was also observed that the general condition of animals declined as the 2012/13 spawning season progressed. This is not unusual for a species that dies soon after spawning.

The estimate of population abundance from the 2012/13 surveys are ready for release to the public following briefing of relevant Ministers.

b. Alternate site surveys

A total of 37 sites around Spencer Gulf were surveyed using video (total of 8 hours). Sites were chosen based on the presence of similar spawning habitat. No cuttlefish were observed.

Suitable habitat is uncommon in Spencer Gulf. Surveys focussed on shallow inshore areas with low profile reef habitat. While suitable habitat might exist in deeper water, it is difficult to locate. Alternate sites, particularly sites in deeper waters, will continue to be pursued through the FRDC project.

c. Artificial habitat project

Stage one – characterising the den (width, height, depth and orientation) - is in progress. To date, four dives have been undertaken in which the dimensions of 50 dens have been described. Openings to dens appear to be narrow with a strong bias towards facing the current. Data are being analysed.

d. Bioaccumulation analysis

Samples of cuttlefish and calamari have been collected from four sites (Point Lowly, Black Point west of the Santos fence, in front of Santos and Fitzgerald Bay) and are awaiting analysis. It was suggested that samples from the prawn trawl by-catch could be used as control samples to compare regions and species.

e. Prawn Industry cuttlefish by-catch project

There are currently three programs being undertaken to quantify by-catch:

- SARDI Fishery independent survey (conducted three times per year)
- SARDI By-catch survey (conducted periodically)
- Prawn Industry Fishery dependant survey (conducted every fishery run)

It was noted that two species of cuttlefish are taken in the Upper Spencer Gulf (*Sepia apama* and *S. novaehollandae*) which are difficult to distinguish by non-experts. The sampling program developed with the prawn industry aims to quantify the species of cuttlefish represented in the by-catch and determine the distribution of the two species.

It was noted that the Southern Zone Rock Lobster industry reported catching large cuttlefish last fishing season. It was suggested that this may be related to the higher than normal water temperatures observed in the south-east last year.

f. FRDC project

Sampling has commenced. Live eggs and adults have been collected and taken back to the SARDI laboratory where the effects of water temperature and salinity are being assessed. Respiratory and temperature experiments have been conducted on adults, while experiments on the effects of temperature and salinity on embryonic development are in progress. Animals are also being processed for taxonomic purposes, gut analysis and ageing (from statolith and cuttlebone).

There are some preliminary outputs from the FRDC project model using datasets from 2002-2010. It was noted that more recent fine spatial scale oceanographic data (SARDI, BHP) and temperature data from the area could be included in the model.

Data on genetic and morphometrics should be completed early 2014.

A research team is planning to revisit the Point Lowly spawning grounds in September 2013 to sample late-stage embryos as part of the initial investigation into determining patterns in Giant Cuttlefish movement and migration. Samples of statoliths and cuttlebone will be analysed to determine a Point Lowly signature. Next year adults will be sampled and the statoliths and cuttlebone analysed to determine if the adults originated from Point Lowly.

g. SEWPaC project

Physiological experiments are in progress to determine the effects of shipping activities on cuttlefish. Embryos have been collected and subjected to various levels of noise and turbidity (simulating shipping activity). A controlled laboratory trial on the effects of shipping noise on adult physiology (i.e. swimming speed and oxygen consumption rates) is in progress.

2. Status of research data – what is ready to be released?

Population estimates from 2012/13 season surveys – ready for release. Note: BHP has requested that it see the population data prior to public release so they may be prepared for any media.

Heavy metal accumulation – samples are still to be analysed – not ready for release at this time.

Den/habitat characterisation – data are still being analysed – not ready for release at this time.

Remainder of projects are still in progress - not ready for release at this time.

3. Communications

a. Cuttlefish update/ interim report

It was agreed to prepare an interim report that listed the projects, including the broad outlines and any results that the WG agreed for release (e.g. population abundance estimates).

Action: PIRSA and SARDI prepare an interim report for public release.

It was agreed that the WG should consider:

- Maintenance of the confidential nature of information (if applicable).
- Agreement on what information can be released (what form and at what stage of the project).
- The need to maintain the flow of information.
- Focus on facts, observations and avoid speculation.
- Provide some context around results/findings (e.g. while a decline in population abundance was observed, the rate of decrease was lower than expected from previous trends).

b. Media

"Scope" from Channel 10 is developing a segment about cuttlefish.

A short documentary is being made by SARDI on the SEWPaC project, specifically on cuttlefish eggs and highlighting Giant Cuttlefish WG activities.

SEWPaC media release is being prepared by SARDI communications.

It was noted that all media that involves projects that have external funding sources must go through the relevant funding body media channels and the Working Group Chair prior to final release.

5. Other business

a. Invitation to ARUP to present to WG

Representatives from ARUP, the consultancy firm undertaking the EIS for Spencer Gulf Port Link at Port Bonython, have requested (through DPTI) to present an overview of the project and findings to date to the WG. In particular they were keen to discuss any issues relating to construction operations that may impact cuttlefish.

CCSA tabled a potential conflict of interest as they were providing comment on the EIS.

Action: DPTI (Peter Short) to organise a meeting between CCSA and ARUP to finalise CCSA comments on the EIS. This should happen prior to next WG meeting (mid-October).

Action: DPTI to invite ARUP representative to the next WG meeting. It was noted that ARUP should be made aware of the WG membership affiliation prior to attendance to avoid conflicts of interest.

b. 2014/15 spawning season

It was noted that the WG should start to think about funding for the 2014/15 season abundance surveys.

Action: SARDI to develop a paper on research, monitoring needs and resources needed for the 2014/15 season for discussion at the next meeting.

Meeting concluded: 11:50 am

Next meeting: Mid-October (to be decided)

Action	Actions from 07 August 2013	Responsibility	Target Date
1	BHP DMITRE to follow up with BHP on the possibility of a presentation to the working group on their ROV trials.	DMITRE	
2	BHP DMITRE to clarify the status of the agreement reached between the Minister, EPA and BHP regarding BHP survey requirements.	DMITRE	
3	Update on fishing closure Follow up on establishing appropriate signage to reflect new closures.	PIRSA , WCC	
4	Communications - Cuttlefish update PIRSA and SARDI prepare an interim report for public release.	PIRSA, SARDI	
5	ARUP presentation to WG DPTI to organise a meeting between CCSA and ARUP to finalise CCSA comments on the EIS. This should happen prior to next WG meeting (mid-October). DPTI to invite ARUP to the next WG meeting. It was noted that ARUP should be made aware of the WG membership affiliation prior to attendance.	DPTI DPTI	
6	2014/15 season SARDI to develop a paper on research and resources needed for the 2014/15 season for discussion at the next meeting.	SARDI	

Wednesday 06 November 2013 2:00–3:45 pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Mehdi Doroudi (Acting Chair)
 Sean Sloan (PIRSA)
 Gavin Begg (SARDI)
 Michael Steer (SARDI)
 Bronwyn Gillanders (U of A)
 Peter Copley (DEWNR)
 Brenton Gear (DEWNR)
 Andrew Solomon (EPA)
 Sam Gaylard (EPA)
 Rob Thomas (DMITRE)
 Peter Short (DPTI)
 David Lake (SATC)
 Peter Peppin (Whyalla City Council)
 Tim Kelly (CCSA)
 Fontella Koleff (PIRSA - communications)
 Kate Rodda - EO (PIRSA)

Apologies: Scott Ashby (Chair)
 Peter Dolan (EPA)

Previous minutes

Draft minutes from the previous meeting held 7 August 2013 were accepted as an accurate record of the meeting.

Previous actions (from 7 August 2013)

1. BHP ROV trials

Completed. Greg Hill (BHP) and James Brook (Consultant) to present at the Working Group meeting (6 November 2013) to discuss the outcomes from initial trials using ROV to conduct surveys on cuttlefish. See later for detail.

2. BHP agreement regarding surveys – Completed.

3. Update on fishing closure

Completed. Appropriate signage has been prepared. PIRSA are waiting on a small adjustment relating to a clarification of where the Wallaroo jetty sits within the closure. As soon as the stickers communicating this information are prepared, the signs will be deployed at Wallaroo and Port Pirie.

4. Communications - Cuttlefish update

On-going. An update will be prepared out of session from information tabled at today's meeting for consideration by the WG.

Action: PIRSA and SARDI to prepare a cuttlefish update for public release.

5. ARUP presentation on Port Bonython Bulk Export Facility

Completed. Representatives from ARUP met with CCSA. ARUP to present at meeting held 6 November 2013. See later for detail.

6. Planning for the 2014/15 season - On-going.

Action: SARDI to prepare a paper on research and resources required for discussion at the next meeting.

Discussion items (6 November 2013)

1. Presentation from BHP on ROV trials (2.15-2.35 pm)

Greg Hill (BHP) and James Brook (Consultant) presented the results from the initial trials using a Remote Operated Vehicle (ROV) to undertake cuttlefish surveys at Point Lowly. The main driver to use ROV methods was to minimise the safety risks associated with diving. In addition, the video data from the ROV provides the opportunity to collect habitat/mapping data from the area surveyed.

The study was undertaken at Black Point, which has relatively high densities and accounts for 18% of the total spawning area. The abundance, size and sex of cuttlefish recorded using the ROV were compared with:

- independent diver transects
- a shadow diver (following the ROV and covering the same area)

The sampling effort was similar to the standard diver-based method (approximately 1% of the site).

The relative efficiencies of the ROV and diver-based methods were also compared.

Abundance could be estimated at the time of video through a direct video link to the surface. This method was successful at identifying 90% of the total number of individuals on the video. Further analysis of the video (with the benefit of time to examine the footage) on shore-based facilities improved the estimate, although the additional analysis was time consuming.

Overall, results showed no significant differences between the ROV and divers in abundance data, although some differences in the ability to pick up all individuals under ledges was identified as a limitation of the ROV method. The ROV method to estimate size (using lasers) was found to be limiting but could be improved through the use of stereo video techniques.

The next step would be to conduct a full scale survey of the spawning grounds. It was estimated that a full scale survey using the method adopted during the first trial would take 26 person days (with the ROV) compared to 10 person days using divers. However, modifications to the method, increased operator experience (allowing the ROV to be driven faster without compromising the ability to identify camouflaged cuttlefish) and technology would increase the efficiencies of the ROV method such that a survey may take 13 person days to complete.

2. Invitation to ARUP to present to WG (2.40-3.05 pm)

A representative from ARUP, the consultancy firm undertaking the EIS for Spencer Gulf Port Link at Port Bonython presented an overview of the project with specific reference to mitigation measures relating to cuttlefish. Present were John Haese (ARUP), Paul Manning (ARUP Consultant), Sean Reardon (Flinders Ports – the proponent) and Karen Ferguson (DPTI).

It was noted that all information provided by ARUP was in the public domain (the EIS is currently undergoing a public consultation period) and would be available for agencies to use.

The project involves the construction and on-going use of three major infrastructures:

- A 17.5 km rail spur (to transport iron ore to Port Bonython)
- An iron ore handling and storage facility
- A 3 km jetty (to transport ore to ships – will extend to a water depth of 20 m)

The key potential impacts identified for cuttlefish are:

- Habitat removal
- Changes to water quality (direct and indirect)
- Underwater noise associated with construction/piling and operations)

A number of mitigation measures are being proposed to minimise the impacts:

- The jetty construction footprint will be minimised by using a Canti-traveler Crane.
- Construction will be avoided at inshore locations during the aggregation period with minimal activity when juveniles are present in the area.
- Boat speed limits will be imposed to reduce the noise during construction and port rules adopted for operations.
- Lighting at the site will be regulated through a Light Management Plan, construction will occur during daylight hours (where possible) and any lighting (required for navigation or safety reasons) will be shielded.
- Development and implementation of Waste Management Plans.
- Development of an Environmental Monitoring Program including the collection of storm water and no discharge of water from the land-based facility or from bulk carriers.
- Production of underwater noise will be limited to an approximately 30 minute period four times a day (to drive pilings). Noises associated with piling and any underwater activity will be implemented gradually to avoid a sudden noise.
- Vessel noise is estimated to be minimal and located in excess of 1200m from the aggregation site (and outside the hearing range of cephalopods).
- There will be no fueling of bulk carriers at the site.
- Development of an iron ore spill procedure and contingency plan.
- Enforcement of Australian Quarantine and Inspections Service (AQIS) marine pest inspections and restrictions to minimise the risk of marine pests.

It was noted that the research being conducted by the University of Adelaide, EPA and SARDI (funded by SEWPaC) in relation to turbidity and shipping noise impacts on adult and eggs of Giant Cuttlefish may be of use to ARUP and could be made available when the research was finalised and a final report is made available to the public.

The EBPC referral for this project is currently being considered.

In terms of access to aggregation sites, it was noted that public access along Cuttlefish Drive will still be available. Jetty pylons will have a 50 m buffer zone for safety reasons.

3. Research update

Mike Steer (SARDI) presented the working group with an update on the seven projects that are currently being undertaken. All projects are progressing well and are in the various stages of completion.

a. Point Lowly cuttlefish population surveys

- Diver-based surveys were successfully undertaken in May, June and July 2013.
- Cuttlefish abundance peaked at an estimated 13,492 animals in June 2013. This represented a 27% decrease in comparison to 2012 (18,531). The estimated biomass of spawning cuttlefish was 6.8 t, 38% lower than 2012.
- The habitat was assessed and water samples were collected throughout the spawning area over the three surveys and are currently being analysed.
- The 2014 survey is currently being planned.

b. Alternate site surveys

The continuous rocky reef that fringes Point Lowly is considered to be the only area capable of supporting high densities of spawning cuttlefish in northern Spencer Gulf as the remaining coastline is largely dominated by mangroves, tidal flats and saltmarshes. However, the possibilities of the cuttlefish aggregating to spawn elsewhere, or widely distributing their spawning activity within Spencer Gulf, needs to be considered as an alternate hypothesis in explaining the decline of the Point Lowly.

- A towed underwater camera was used to search for evidence of cuttlefish spawning activity throughout northern Spencer Gulf.
- Thirty-seven sites, that were considered to have appropriate spawning habitat (i.e. low profile reef), were surveyed in early June 2013 culminating in approximately 8hrs of video footage.
- The digital footage is currently being reviewed and analysed for any evidence of cuttlefish and to provide an assessment of the 'potential' spawning habitat in northern Spencer Gulf.
- The scope of this project has been extended through close collaboration with the Conservation Council of SA and Reef Watch Volunteers where they will survey four additional sites outside of the Point Lowly area for spawning cuttlefish during winter 2014.

c. Artificial habitat project

The sub-tidal rocky reef fringing from Black Point to Point Lowly is unique in northern Spencer Gulf and its heterogeneous structure along with its west to east aspect, are likely to be the underlying factors that attract high densities of spawning cuttlefish to the area. The plate-like fragmented slabs of bedrock that comprise the reef create numerous dens and crevices in which the female cuttlefish attach their eggs. These dens are vital for successful reproduction and recruitment as they provide both a stable structure for egg attachment over a long embryonic developmental period (up to four months) and a refuge for resultant hatchlings.

- Approximately 40 dens have been successfully characterised. Each den was digitally photographed and its dimensions measured in situ. Den measurements included maximum width, height and depth; the number of entrances; orientation; substrate type; water depth and the number of eggs.
- It is anticipated that the 'preferred' den dimensions will provide the basis for the design and construction of artificial dens. The capability of these artificial dens in attracting spawning cuttlefish and supporting developing eggs will be trialed and assessed in 2014.
- SA's conservation Council and Reefwatch volunteers have also agreed to monitor additional artificial reefs for any cuttlefish spawning activity once they have been deployed in April 2014.

d. Bioaccumulation analysis

There are numerous input sources of metals into the nearshore marine environment both historical and current. The majority of these are located 20 km+ away from the Point Lowly aggregation area but two large sources have historically discharged significant loads of metals into coastal waters. These discharges have had widespread impacts of biota and have left a lasting legacy of metal contamination in sediments. The lead and zinc smelter has been shown to have contaminated approximately 600 km² of the marine environment adjacent Port Pirie and the steelworks at Whyalla has similarly shown to have contributed significant loads of metals into False Bay. It has been speculated that cuttlefish may be exposed to persistent contaminants which may accumulate in their tissue, perhaps contributing to their observed population decline. This study will include a small investigation to assess whether there are abnormally high levels of metals accumulating in giant cuttlefish and whether these levels are replicated in other local cephalopod species (i.e. Southern Calamari) that have not undergone a comparable decline.

- Replicate samples of giant Australian Cuttlefish and Southern Calamari were collected from four sites along the Point Lowly peninsula (Point Lowly, Black Point west of the Santos fence, in front of Santos and Fitzgerald Bay) in July 2013.
- These samples have been prepared by the EPA for biochemical analysis.
- Additional cuttlefish samples have been collected from Wallaroo and have also been sent off for biochemical analysis.

EPA requested funding to complete the analysis (will formally request out of session).

e. Prawn Industry cuttlefish by-catch project

Cuttlefish are incidentally caught as by-catch in a number of commercial fisheries. A monitoring program that aims to quantify cuttlefish by-catch in South Australia's prawn fishery has been established through strong collaboration with the industry. Of particular interest is the relative impact of the prawn fishery on giant Australian Cuttlefish in northern Spencer Gulf. Two sampling and data collection protocols have been implemented for this fishery: 1) a fishery-independent protocol that assessed catches of cuttlefish during routine stock assessment surveys conducted by SARDI throughout the fishing year, and 2) a fishery-dependent protocol which requires the industry to collect samples/data during commercial fishing.

- Both fishery-dependent and independent samples have been collected over the 2012/13 fishing season and are currently stored frozen at SARDI Aquatic Sciences.
- Research staff are currently processing and analyzing the samples, with collections from April, May and June complete.
- Information on the size, sex, maturity status is being recorded for each of the two cuttlefish species (i.e. Giant Australian and Nova cuttlefish) that are incidentally caught in the prawn fishery.
- Additional biological material is being collected from these samples for concurrent genetic, trophodynamic and population dynamic studies.
- The Spencer Gulf Prawn Fishing Association has collected the November 2013 fishery-dependent samples and they are currently being delivered to SARDI (Aquatic Sciences) for processing.

It was noted that the Southern Zone Rock Lobster industry has previously reported catching large cuttlefish and now that the fishing season has commenced, it was agreed that some cuttlefish samples be collected.

Action: SARDI to facilitate collection of cuttlefish caught as by-catch in the Rock lobster fishery.

f. FRDC project

This project is led by the University of Adelaide in collaboration with SARDI and the South Australian Museum and is funded by the Fisheries Research and Development Corporation (FRDC). It commenced in March 2013 and is a two year project which aims to: (1) determine the movement throughout the life history and finer-scale population structure of the giant Australian cuttlefish in northern Spencer Gulf; (2) Resolve the systematic status of giant Australian cuttlefish to determine the extent of its geographic boundaries; and (3) to develop an integrated model that assess and evaluate the response of the northern Spencer Gulf population to environmental and anthropogenic factors and thereby assess population viability.

- To date, researchers have commenced collecting tissue samples from the various, aforementioned projects for genetic and population analysis.
- Laboratory trials to assess the effects of changes in temperature and salinity on the development of cuttlefish embryos have been completed and the data are currently being analysed.
- Similarly, a concurrent laboratory experiment investigating the effect of temperature on adult cuttlefish physiology (i.e. swimming speed and oxygen consumption rates) has also been recently completed. These results will feed into the population viability model.
- A research team revisited the Point Lowly spawning grounds in September 2013 and successfully collected late-stage embryos as part of the initial investigation into determining patterns in cuttlefish movement and migration. Samples of statoliths and cuttlebone will be analysed to determine a Point Lowly signature. Next year adults will be sampled and the statoliths and cuttlebone analysed to determine if the adults originated from Point Lowly.

It was agreed that the milestone reports from the FRDC project be made available to the Working Group. The final report is due end of 2014.

Action: Bronwyn Gillanders to provide the milestone report for the FRDC project for circulation to the WG.

g. SEWPaC project

This project is led by the University of Adelaide in collaboration with SARDI and is funded by the Department for Sustainability, Water, Population and Communities (DSEWPaC). The objectives of this project are to: (1) undertake a desktop review of any cuttlefish research including population trends, threats, shipping impacts and management; (2) investigate the potential impacts of shipping on cuttlefish through field/laboratory experimentation and analysis; (3) incorporate outcomes from experimental research into an integrated model assessing population viability; (4) discuss associated conservation and management implications for cuttlefish in northern Spencer Gulf including a section of future research needs.

- A laboratory experiment investigating the effects of various shipping noise and turbidity levels on the development of cuttlefish embryos has been completed and the data are currently being analysed.
- A controlled laboratory trial on the effects of shipping noise on adult physiology (i.e. swimming speed and oxygen consumption rates) has also been completed.

4. Media

It was noted that, where possible, media releases are circulated to WG members prior to public release in order for members to be prepared for any media response.

Bronwyn Gillanders received a request from the NRM for an update on research. A response will be prepared and passed through the WG for comment prior to release.

5. Other business

5.1 Use of Reef Watch volunteers

SARDI and CCSA met to discuss the use of Reef Watch volunteers to assist in surveying alternate spawning sites in Spencer Gulf. A Reef Watch Cuttlefish Citizen Science program was tabled (see attached).

5.2 Port Bonython jetty maintenance

Chrys Triantafillou (DPTI) presented on the proposed Port Bonython Jetty maintenance program (see attached).

The proposal includes removal of concrete, reinforcement and fenders from existing dolphins using hydro-blasting techniques. SARDI have provided advice in relation to potential impacts to cuttlefish. The maintenance (to start in August 2014) will take approximately 12 months and will overlap with the cuttlefish spawning season.

DPTI are conducting research on the noise levels associated with hydro-blasting, how noise travels through water and comparing with noise associated with shipping in order to assess any impacts to cuttlefish. Flinders Ports may have some relevant data relating to noise and cuttlefish which might be available. DMITRE to follow up.

Action: DMITRE to follow up on the availability of noise data from Flinders Ports.

5.3 Next steps (items to be discussed at the next meeting)

- a. Planning for the 2014/15 spawning season (SARDI)
- b. Update of EPBC Listing of Australian Giant Cuttlefish (CCSA)
- c. Feasibility of stock enhancement programs

Meeting concluded: 03:45 pm

Next meeting: Late January/early February 2014

Action	Actions from 06 November 2013	Responsibility	Target Date
1	Communications - Cuttlefish update PIRSA and SARDI prepare a cuttlefish update for public release.	PIRSA, SARDI	
2	2014/15 season SARDI to develop a paper on research and resources needed for the 2014/15 season for discussion at the next meeting.	SARDI	
3	Prawn Industry cuttlefish by-catch project SARDI to facilitate collection of cuttlefish caught as by-catch.	SARDI	
4	FRDC project Bronwyn Gillanders to provide the milestone report for the FRDC project for circulation to the WG.	U of A	
5	Port Bonython jetty maintenance DMITRE to follow up on the availability of noise data from Flinders Ports.	DMITRE	

Reef Watch Cuttlefish Citizen Science Program

Background

Recent surveys have indicated that the cuttlefish spawning population which aggregates on the shallow reef fringing Point Lowly each winter has declined. The nature and extent of this decline has become a concern for the general public, government and non-government agencies given the iconic status of the species. Consequently, a variety of research projects have been developed and are currently in progress to address key knowledge gaps in our understanding of Giant Cuttlefish in northern Spencer Gulf. The main objectives of these projects relate to surveying, searching and promoting cuttlefish spawning activity within the region. There is a fundamental need to determine whether there are alternate spawning grounds for Giant Cuttlefish in northern Spencer Gulf to determine the relative significance of Point Lowly and whether other areas within the region may require additional management consideration. It is clear that cuttlefish aggregate on the reef fringing Point Lowly, however, the specific characteristics of the spawning habitat is unknown. For example, the preferred orientation, surface texture, depth range and exposure of natural spawning dens is not understood. This level of information is required prior to the construction and deployment of artificial spawning habitat that may be required to either mitigate habitat loss in the future or promote spawning in other areas where habitat may be limited.

Two of the current projects have the potential to extend beyond their initial obligations through strategic collaboration with South Australia's Conservation Council and Reef Watch volunteers. These projects include searching and documenting alternate cuttlefish spawning sites within northern Spencer Gulf and monitoring the success of artificial spawning habitats within the region. This collaboration will add significant value to our overall understanding of cuttlefish spawning dynamics.

Methods

Searching for Alternate Spawning Aggregations

The continuous rocky reef that fringes Point Lowly is considered to be the only area capable of supporting high densities of spawning cuttlefish in northern Spencer Gulf as the remaining coastline is largely dominated by mangroves, tidal flats and saltmarshes. However, the possibilities of the cuttlefish aggregating to spawn elsewhere, or widely distributing their spawning activity within Spencer Gulf, needs to be considered as an alternate hypothesis in explaining the decline of the Point Lowly population.

In recent years, several coastal residents and local fishers have reported large quantities of cuttlefish turning up in areas where they were not expected, however, it is not known whether these animals were actively spawning. Douglas Point and Two Hummock Point, which are located approximately 30 km north of Point Lowly, are two areas where locals have observed high numbers of cuttlefish in 2011 and 2012 (Fig. 1). Similarly, commercial and recreational fishers have reported increased catches of cuttlefish around Port Augusta during the last winter spawning season. Point Riley (approximately 6 km north of Wallaroo) has also been reported to support commercial quantities of cuttlefish in the past (Fig. 1). Given these anecdotal reports it can be speculated that there are other areas within northern Spencer Gulf that can successfully accommodate smaller pockets of spawning cuttlefish, similar to those observed in Backy Point and Fitzgerald Bay, and more typical of *S. apama* that occurs outside of northern Spencer Gulf and other cuttlefish species worldwide.

Regular, or *ad hoc*, dive/snorkel surveys by Reef Watch volunteers along the OneSteel sea wall, Point Douglas, Hummock Point and Point Riley during the winter spawning season would significantly benefit the current research program that has limited scope for on-going exploration. Volunteer divers would be asked to record:

- Dive site (e.g. Point Riley, or GPS waypoint if able to);
- Time and date;

- Max depth;
- Water temperature;
- Duration of dive/snorkel;
- Number of cuttlefish observed;
- Behaviour of observed cuttlefish (e.g. mating, spawning, feeding);
- Whether any cuttlefish eggs were seen;
- Volunteers are also encouraged to take digital photos of observed cuttlefish and their associated habitat.

Development and Deployment of Artificial Spawning Habitat

The sub-tidal rocky reef fringing from Black Point to Point Lowly is unique in northern Spencer Gulf and its heterogeneous structure along with its west to east aspect, are likely to be the underlying factors that attract high densities of spawning cuttlefish to the area. The plate-like fragmented slabs of bedrock that comprise the reef create numerous dens and crevices in which the female cuttlefish attach their eggs. These dens are vital for successful reproduction and recruitment as they provide both a stable structure for egg attachment over a long embryonic developmental period (up to four months) and a refuge for resultant hatchlings. Artificial structures have also provided suitable substrates for cuttlefish to spawn, the most significant of which has been the OneSteel (formerly BHP) sea wall in Whyalla which has supported relatively high densities of cuttlefish during the spawning season (Hall and Fowler 2003, Steer and Hall 2006). A pilot study undertaken by BHP Billiton as part of their Olympic Dam expansion EIS investigated the potential for establishing artificial habitat to mitigate habitat loss associated with the construction of a desalination plant at Point Lowly (BHP Billiton 2009). Their artificial habitats, constructed from stone pavers, were successful in attracting spawning cuttlefish and provided an appropriate substrate for egg attachment.

There is currently no evidence to suggest that habitat loss has contributed to the decline in cuttlefish abundance. Extensive habitat surveys carried out by SARDI and BHP during the 2012 spawning season provided no clear indication that the spawning habitat has been structurally compromised (Steer et al. 2013). Although spawning habitat does not currently appear to be a limiting factor for cuttlefish aggregating around Point Lowly there may be a requirement to provide an artificial alternative in the future. This requirement may be due to the mitigation of habitat loss through coastal development, or to be used to promote spawning in other areas where habitat may be limited.

SARDI researchers are in the process of designing and constructing replicate artificial spawning substrates with the intention of deploying them prior to the 2014 spawning season (March/April). Initially, only sites along Point Lowly were considered to test the effectiveness of the artificial substrates; however, the opportunity to collaborate with Reef Watch volunteers allows this investigation to be replicated outside of the main spawning area. Additional replicate artificial spawning substrates will be deployed at the OneSteel sea wall, Point Douglas, Two Hummock Point and Point Riley in March/April 2014 (Fig. 1). It is suggested that Reef Watch volunteers monitor these structures for the presence of cuttlefish eggs as part of their routine, or *ad hoc* diver/snorkel surveys at each of these sites. Volunteers will be asked to additionally record:

- Whether the artificial structures were inspected;
- Condition of the structure (e.g. stable, storm damaged etc...);
- Presence or absence of cuttlefish eggs;
- An estimate or count of number of eggs present (if possible);
- Volunteers are also encouraged to take digital photos of deposited eggs on the artificial structure.

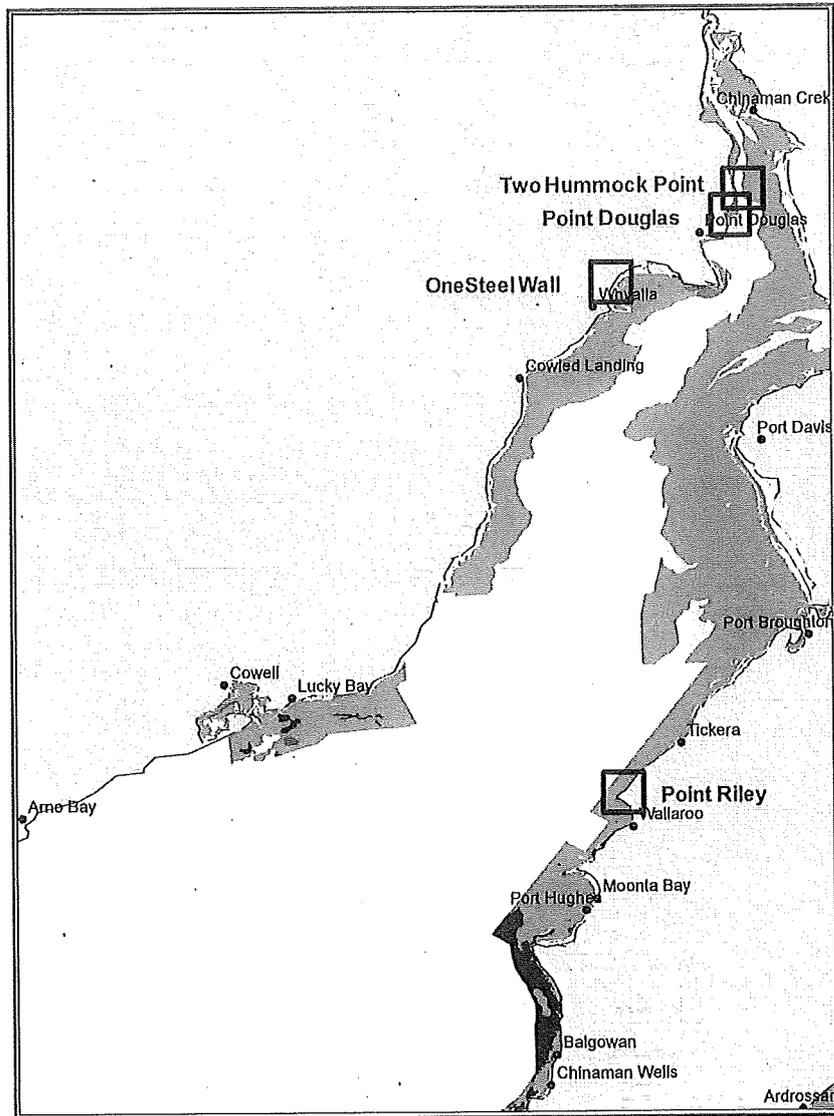
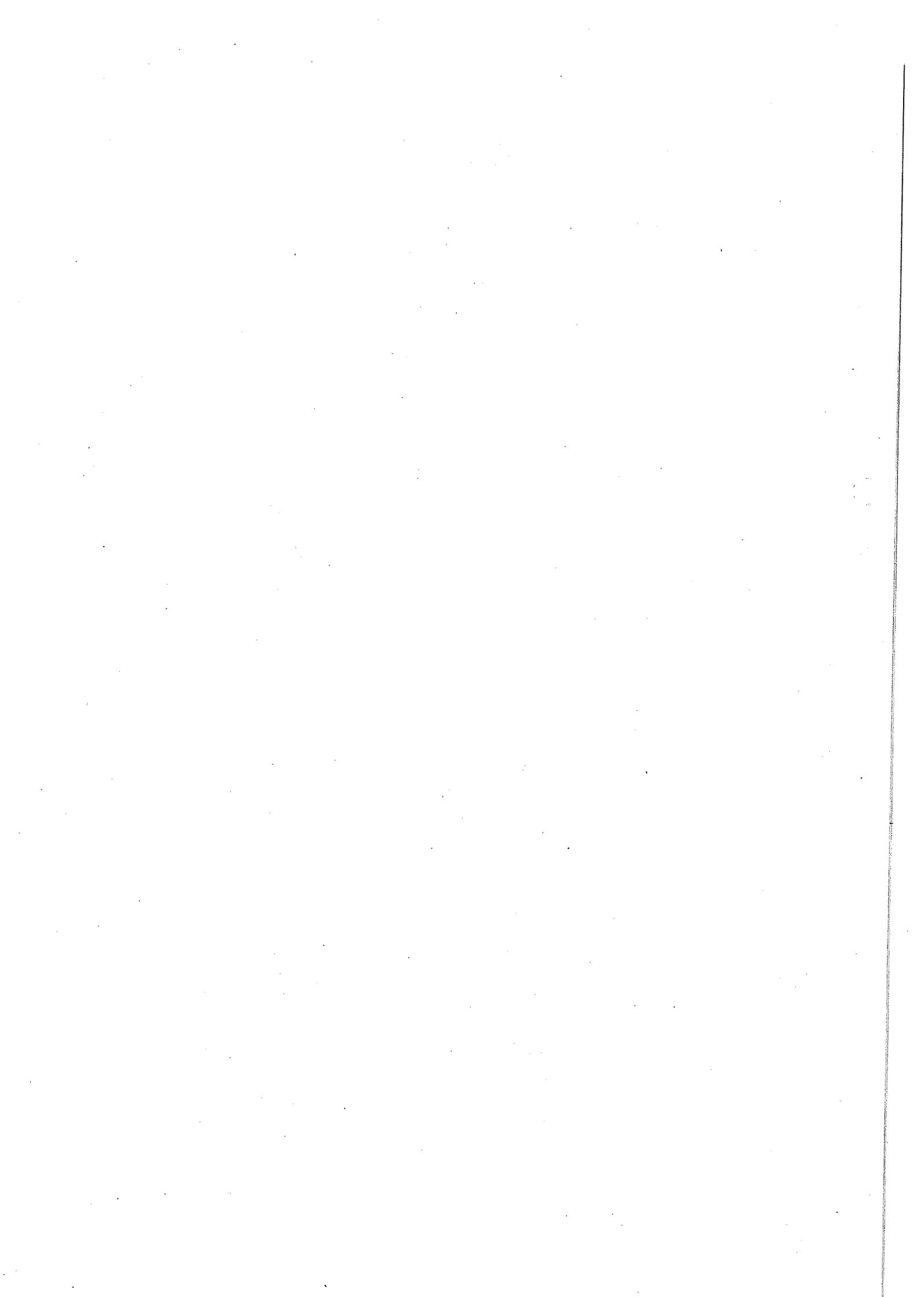


Figure 1. Reef Watch volunteer survey sites.

Communication/Coordination

To ensure the successful execution and delivery of this volunteer program it is essential that the CCSA, Reef Watch coordinators and SARDI continue to maintain strong communication links. All data received through this program should be entered and maintained on a common database.



Thursday 13 February 2014 9:30 – 11:00 am

Conference Room, Level 17, 25 Grenfell Street, Adelaide

FISHERIES
& AQUACULTURE
PIRSA

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Scott Ashby (Chair)
Mehdi Doroudi (PIRSA)
Sean Sloan (PIRSA)
Gavin Begg (SARDI)
Michael Steer (SARDI)
Bronwyn Gillanders (U of A)
Brenton Grear (DEWNR)
Vera Hughes (DEWNR)
Andrew Solomon (EPA)
Rob Thomas (DMITRE)
David Lake (SATC)
Peter Peppin (Whyalla City Council)
Tim Kelly (CCSA)
Fontella Koleff (PIRSA - communications)
Kate Rodda - EO (PIRSA)

Apologies: Peter Copley (DEWNR)
Peter Short (DPTI)
Peter Dolan (EPA)
Sam Gaylard (EPA)

Caretaker period

The Chair informed members that the Caretaker period will commence 15 February 2014. A briefing on cuttlefish and the role of the Giant Cuttlefish Working Group will be prepared for the incoming government. The recommendation will be to continue the working group.

Previous minutes

Draft minutes from the previous meeting held 6 November 2013 were accepted as an accurate record of the meeting.

Previous actions (from 6 November 2013)

1. Communications - Cuttlefish update

A draft communique has been prepared and will be updated from today's discussions and circulated to members today for comment. Comment is sought by Friday 14 February 2014

Action: PIRSA to update and circulate the cuttlefish update to members for comment.

2. Prawn industry cuttlefish by-catch collection

To be removed as an action. The collection of cuttlefish samples is ongoing.

3. FRDC project 2013/010 milestone report (UoA led)

Completed. Circulation of the report to be limited to members as per FRDC requirements.

4. Port Bonython jetty - data on effects of noise - Removed as an action.

Discussion items (13 February 2014)

1. Research update

Mike Steer (SARDI) presented the working group with an update on the seven projects that are currently being undertaken. All projects are on track within the scheduled timelines and are in the various stages of completion. Some projects were the subject of further discussion as indicated below.

a. Point Lowly cuttlefish population surveys

- Results from the 2013 season surveys have been publically released. The results from the water samples collected in the spawning area have been analysed and are being written up. The final report is due November 2014.
- The 2014 survey is scheduled to commence in late May 2014 (more detail provided below see "Planning for the 2014 season").

b. Alternate site surveys

- Video footage from a towed underwater camera covering 37 sites and 8 hours of video has been analysed. The data provided good information on habitat in the area but no cuttlefish were observed.
- There will be the opportunity for the ongoing reporting of cuttlefish sightings in Spencer Gulf through the Feril or in Peril and SA Redmap sighting databases.

c. Artificial habitat project

- Approximately 40 dens were successfully characterised during the 2013 spawning season.
- A prototype den structure has been developed. Subject to approval by the appropriate authority, three structures will be deployed at each of five sites in Spencer Gulf in March 2014 (prior to the 2014 spawning season).
- The capability of these artificial dens in attracting spawning cuttlefish and supporting developing eggs will be monitored in 2014.
- SA's Conservation Council and Reefwatch volunteers have agreed to monitor the artificial reefs for any cuttlefish spawning activity.
- Members raised the question of which government agency provides the authority to place artificial structures on the seafloor. SARDI to follow up with DEWNR before caretaker period commences.

Action: SARDI to seek permission from the appropriate authority (DEWNR) to deploy artificial habitats. Note this is a matter of urgency as the caretaker period commences 15 February 2014 and deployment is March 2014.

d. Bioaccumulation analysis

Update

- A report on the research will be peer reviewed (local and international reviewers) before being finalised.
- Samples from the digestive gland, mantle and viscera were taken from a number of southern calamari and giant Australian cuttlefish from Point Lowly and Wallaroo.
- Results indicated differences between sites.
- Results showed differences in the metal burden between the two species. Southern calamari was frequently higher in metal burden than the giant Australian cuttlefish, with the exception of cadmium, lead and zinc, which was higher in the giant Australian cuttlefish.

- There is scientific evidence to show that these metals, when taken up in cephalopods, are transported into the digestive gland where >80% are detoxified by binding with proteins and stored. Consistent with this, the digestive gland was the major site of metal accumulation for all metals in both species in this study.
- The levels found in the mantle were lower than that reported in the 1975 study (noting that sample size in 1975 was small).
- Metal levels found in this study were comparable to other studies world-wide.
- The results were demonstrated that any metal burden found in the mantle and viscera of both the giant Australian cuttlefish and southern calamari was well below food safety standards.
- Additional work could be undertaken but would be challenging as the process of detoxifying metals makes any impact difficult to observe.

Discussion

- Members were keen to have results made public as soon as possible. It was noted that as the project is part of the larger SARDI led FRDC project, consideration must be made of FRDC reporting requirements.
- As there is a reference to squid (a popular seafood) it is important to consider food safety issues. In the final report, EPA to include optimum levels found in squid and how these fall within food safety levels. It was recommended that EPA discuss this issue with Alison Turnbull of SARDI - leader of the Safefish Program.

Action: SARDI to follow up with FRDC on guidelines regarding reporting individual project results.

Action: EPA to contact Alison Turnbull (SARDI) regarding food safety comment for report.

e. Prawn Industry cuttlefish by-catch project

Update

- SARDI have received the samples of cuttlefish from the Spencer Gulf Prawn Fishing Association from the November 2013 fishing season.
- Samples will continue to be collected during the fleet's fishing activity in March, April and May 2014.

Discussion

- A draft report by SARDI on an Ecosystem Based Fisheries Management (EBFM) framework for the Spencer Gulf Prawn Fishery was briefly discussed, as a potential source of giant Australian cuttlefish data. This report will not be an archive for all cuttlefish data.

f. FRDC project (2013/010 - UoA et al.)

- To date, researchers have commenced collecting tissue samples from the various, aforementioned projects for genetic and population analysis.
- Laboratory experiments to assess the effects of changes in temperature and salinity on the development of cuttlefish embryos have been completed and the data are currently being analysed.
- Laboratory experiments investigating the effect of temperature on adult cuttlefish physiology (i.e. oxygen consumption rates) have been completed and the data are currently being analysed.
- Samples of viscera and genetic material are currently being processed by the University of Adelaide in consultation with the South Australian Museum.

- A research team revisited the Point Lowly spawning grounds in September 2013 and successfully collected late-stage embryos as part of the initial investigation into determining patterns in cuttlefish movement and migration. Samples of statoliths have been extracted and are waiting analysis to determine whether there are any regional chemical signatures. Next year adults will be sampled and the statoliths and cuttlebone will also be analysed to determine if the adults originated from Point Lowly.

g. Department of the Environment project

- A laboratory experiment investigating the effects of various shipping noise and turbidity levels on the development of cuttlefish embryos has been completed and the data analysed.
- A controlled laboratory trial on the effects of shipping noise on adult physiology (i.e. swimming speed and oxygen consumption rates) has also been completed.
- The draft final report has been written and is due in February 2014, with the final report due in April 2014.

Timelines around existing research projects

Members requested information on timelines for the various projects.

SARDI noted that research projects "a-e" are encompassed within a FRDC project which has a final report due November 2014. Individual milestones for these projects are bound within the framework of the FRDC project milestones but are all well on track. Project "f" is due early 2015 while project "g" is due to be finalised in April 2014.

Action: SARDI to develop a table indicating how each project is tracking against its timeline. A suggestion was made to use a traffic light system with "green" on track and "red" running late.

It was noted that by November 2014, the WG would have a repository of information. It would be necessary to develop a clear set of observations and potential recommendations and/or options in a paper.

2. 2014 spawning season

Surveys for the 2014 season have been planned. The work will be done in collaboration with BHPB using the trial ROV method in conjunction with traditional methods. BHPB will be providing a staff member to assist in the surveys. The artificial habitats placed in the survey area will be examined as part of the survey.

Surveys (each 5 days in duration) are scheduled for last week in May 2014, mid-June 2014 and the second week of July 2014.

3. EPBC listing update

The nomination for listing the Giant Australian Cuttlefish is not progressing until further research is available to support genetic differentiation of northern Spencer Gulf population.

Members requested formal notification from the commonwealth on their position.

Action: CCSA to provide the letter of response from the Commonwealth on the application to nominate Giant Australian Cuttlefish.

4. Stock enhancement

Members discussed the feasibility of using stock enhancement techniques to increase the population of Giant Australian in northern Spencer Gulf.

Historically, PIRSA Fisheries and Aquaculture have not undertaken marine stock enhancement programs. Recently a draft stock enhancement policy was developed by PIRSA Fisheries and Aquaculture and endorsed by the Minister. The next stage is a period of public consultation. The policy covers marine and inland waters and each application would be considered on a case-by-case basis. Under this policy, stock enhancement has two purposes; 1) increase fishing opportunities and 2) conservation. Enhancement of cuttlefish falls under conservation.

The rationale for considering stock enhancement for cuttlefish is that the population is already at a low level regardless of the cause of decline and a stock enhancement program can not cause further harm. It was noted that the short life span of cuttlefish would mean that if enhancement was trialed, it would need to be done sooner rather than later. Even a low level of success would contribute to future generations.

There was (in principal) general agreement that the concept should be further investigated with consideration of the issues below.

Consider the following:

- The population may be at such a low level that even if the cause of the decline is identified and rectified, that the population cannot recover. Any recovery may require anthropogenic intervention.
- Stock enhancement using both eggs and juveniles.
- There is a risk associated with artificially increasing the number of cuttlefish to an area where the cause of decline is unknown. May be just condemning those individuals or wasting resources.
- To measure the success of any restocking program, we would need to be able to identify restocked individuals from wild stock.
- What level of funding and resources would be required?

Benefits

- A restocking project would indirectly generate further science/biological data on cuttlefish.

Concerns/challenges

- High risk and expensive to propagate cephalopods in a laboratory.
- Issues relate to the difficulty in successful mating, low fecundity, successful laying and hatching of eggs, feeding juveniles, survival of juveniles and disease in the laboratory as well as transport from the laboratory to translocation sites.

It was agreed that the first step is to develop a project concept paper that:

- identifies clear objectives
- identifies benefits and challenges
- identifies any other research conducted
- includes a business risk assessment
- considers a staged approach
- recommends a pilot trial to test the feasibility (SGEDI funding?)
- identifying potential funding sources (noting that FRDC funding generally not for conservation purposes)

It was noted that if researchers were successful at breeding cuttlefish in the laboratory that aquaculture for this species might be feasible.

Action: PIRSA/SARDI to develop a concept paper outlining the above issues to be presented to FRDC and further discussed at the next working group meeting (June 2014).

4. Media

A communique has been developed and will be updated from today's information, to include dates of completion for research projects.

5. Other business

5.1 Fishing closure in northern Spencer Gulf

PIRSA noted that the temporary fishing closure in northern Spencer Gulf is due to expire 27 March 2014. This closure will be extended to 14 February 2015.

5.2 Cuttlefish forums

As part of FRDC project 2013/010 Communication Plan, a public forum will be conducted later in the year when more results and outcomes were available.

5.3 Historical video footage at Point Lowly

Peter Short recently provided some historical video footage of the spawning grounds at Point Lowly taken in 1986. This footage indicates that the spawning population was relatively low, however the footage is yet to be critically analysed.

Nevertheless, this historic footage provides us with some information of the spawning population prior to its peak in the late 1990s. SARDI is currently sourcing video that coincides with the peak in abundance and has footage taken over recent years (2012/13). Therefore, we will be able to assess before, during, and after the peak in spawning abundance.

There are three hypotheses for the low population numbers currently recorded:

1. The population is truly declining
2. The population is experiencing a natural cyclic variation in numbers
3. The population has been this low in the past and current levels are actually not too different

Using a weight-of-evidence approach which will incorporate the available footage in conjunction with all available research results to-date (i.e. various FRDC projects), we can further investigate whether the decline we are observing now is a real decline, the product of natural variations or a natural low in abundance.

Action: SARDI to discuss further at next meeting

5.4 SGEDI meetings at Eyre Peninsula

The Spencer Gulf Ecosystem Development Initiative is conducting meetings on Eyre Peninsula in the next few weeks.

Meeting concluded: 11:00 am

Next meeting: June 2014

Action List

Item	Actions from 13 February 2014	Responsibility	Target Date
1	Communications - Cuttlefish update PIRSA to update and circulate the cuttlefish update to members for comment.	PIRSA	14 Feb 2014
2	Research update - Artificial habitat project SARDI to seek permission from the appropriate authority to deploy artificial habitats.	SARDI	Before deployment in March 2014
3	Research update – Bioaccumulation of metals SARDI to follow up with FRDC on guidelines regarding reporting individual project results. EPA to contact Alison Turnbull (SARDI) regarding food safety comment for report.	SARDI EPA	
4	Research update – Research project timelines SARDI to develop a table indicating how each project is tracking against its timeline.	SARDI	
5	EPBC listing update CCSA to provide the letter of response from the Commonwealth on the application to nominate Giant Australian Cuttlefish.	CCSA	
6	Stock Enhancement Develop a concept paper outlining the above issues to be submitted to FRDC and discussed at the next working group meeting (June 2014).	PIRSA/SARDI	June 2014
7	Historical video footage at Point Lowly SARDI to discuss historical information at next meeting	SARDI	

Friday 11 April 2014 9:30 – 10:30 am

Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Extraordinary Meeting - Minutes and actions

Participants: Mehdi Doroudi (A/Chair), Gavin Begg (SARDI), Mike Steer (SARDI), Sam Gaylard (EPA), Rob Thomas (DMITRE), Vera Hughes (DEWNR), Peter Short (DPTI), Peter Peppin (WCC), Tim Kelly (CCSA), Bronwyn Gillanders (UoA), Fontella Koleff (PIRSA communications)

Invited attendees: Sean Reardon (Flinders Ports), John Haese (ARUP), Paul Manning (consultant to ARUP)

Apologies: Scott Ashby (PIRSA), Sean Sloan (PIRSA), Brenton Gear (DEWNR), Peter Copley (DEWNR), Peter Dolan (EPA), David Lake (SATC), Andrew Solomon (EPA)

Discussion items

1. Port Bonython EIS

Background

An Environmental Impact statement (EIS) for the Port Bonython deep sea port development at Point Lowly was prepared by ARUP and released for government agency and public comment in late 2013. The EIS included a number of mitigation strategies relating to potential impacts from the construction and operation of the facility to cuttlefish.

Concerns raised by PIRSA included marine pests, water quality and impact to cuttlefish moving in and out of the area outside the breeding season. Flinders Ports have undertaken additional consultation with various divisions within PIRSA to discuss these concerns, however there were still some issues that were unresolved (e.g. impacts to cuttlefish moving in and out of the region outside the breeding season). Representatives from Flinders Ports and ARUP addressed the working group on mitigation strategies relating to these issues.

The Acting Chair noted that each agency reserves the right for individual responses and processes in regard to any cabinet submission.

Discussion with Flinders Ports and ARUP (9:40-10:10 am)

Specific issues raised by PIRSA that may present a barrier to the migration of adults and juveniles:

- a. Underwater noise during construction
- b. Increased turbidity during construction and on-going operations

Mitigation measures in place to minimise noise and turbidity impacts include the following:

- Piling method - construction will utilise a Canti traveller crane which removes a majority of the construction process from the marine environment. The jetty is physically constructed above sea level.
- Timing of activity - no construction during the aggregation period in the first year (when infrastructure is less than 1000m from the shore). Subsequent years construction is expected to continue year round but activities will be >1000m from shore and the cuttlefish aggregation.
- The Canti traveller crane removes issues relating to poor weather, thus increasing confidence that the construction will proceed as scheduled and goals relating to distance offshore can be reached.

- Piles will be hollow which reduces incidence of turbidity. During construction, the driving of hollow piles will generate minimal turbidity which will be localised and transitory.
- Noise - Piling activity will be intermittent; a typical piling day consisting of 60 minutes per day (30 minutes of gradual build up "soft piling" of noise followed by 30 minutes of the highest noise associated with driving the piles). It is anticipated that 8 piles a fortnight will be constructed.
- Impacts to cuttlefish from generation of noise have been researched. Based on continuous noise, there is 90% avoidance at a distance of 400 m and temporary hearing damage at 300 m. Construction is planned to commence in late February. By May the same year, pilings should be 1000-1550 m offshore.
- Turbidity - it is more likely that on-going operations (ship movements and propeller wash at the jetty head) will impact turbidity and suspended solids however this is likely to be in the order of 0.35 mg/L compared to background turbidity of 2-22 mg/L. Plume modelling has also indicated that turbidity impacts are directed away from nearby seagrass and aggregation habitat close to shore.

Flinders ports and ARUP representatives left the meeting at 10:10 am. The working group continued to discuss the matter and develop a response to DPTI.

Things to consider (from Working Group members):

- Any decision will be a risk-based one based. Patterns of migration of adults and juveniles and the timing of these movements in and out of the aggregation are not known.
- It was generally agreed that the impacts related to construction were manageable. It is the on-going operations that pose the greatest risk (due to increased shipping).
- The activity requires a rigorous monitoring program, with agreed thresholds and management actions. All monitoring relating to construction and on-going operations needs to be approved by EPA prior to construction commencing.
- Monitoring of noise and turbidity and water quality is a component of the conditions set by EPA for this activity. The proposed EPA condition that went to DPTI reads "*Piling any closer than 550 m offshore from lowest astronomical tide (LAT) must be undertaken outside of cuttlefish aggregation season (01 May – 01 October). Additionally any piling undertaken within the cuttlefish breeding aggregation season must be accompanied by in situ underwater noise monitoring while piling is underway until predictions of underwater noise are validated and noise is observed to be compliant with the thresholds at the nearest cuttlefish breeding habitat*".
- Monitoring of cuttlefish behaviour relative to noise/turbidity is not a component of the conditions set by EPA – we need to consider how this can happen. Research on effects of shipping noise on cuttlefish eggs was focused only on the sound pressure component of noise and indicated this component not likely to have an impact. Need to consider possibility that offshore noise may still impact the behaviour of cuttlefish. Will it alter their migration path, prevent pairing up etc.?
- Need to consider actions undertaken if construction does not meet its goal to be 1000 m offshore and outside the aggregation area by the start of breeding season in year 2. Need a condition relating to work needs to be stopped and relevant government agencies consulted.
- There are other significant projects in Spencer Gulf that all require some degree of monitoring. Need to consider developing a monitoring/management program suitable for all.
- Construction could start earlier than February and still avoid impacting juveniles moving out of the area. Flinders Ports to consider this as a strategy to give greater confidence of meeting offshore construction goals.
- It was noted that the previous jetty was constructed using barges in 1986 prior to the peak in abundance.

A response to DPTI should include:

- Commence work before February (e.g. December) as this will allow a greater time to construct pilings and jetty, so that the activity is further offshore prior to the next breeding season.
- Develop a contingency plan in the event construction is delayed and the jetty is not 1000 m from shore by the time the next breeding season commences. If construction has not met the desired distance from shore by the start of the breeding season, there may be limitations/changes on the activity (e.g. work at night) or conditions placed on the proponent (e.g. cease activity and consult with relevant agencies).
- There is a need to monitor cuttlefish behaviour in relation to noise and turbidity and develop immediate corrective actions.

The additional effort to monitor cuttlefish behaviour can be included around the annual population surveys but would require resourcing.

2. Other business

2.1 Communication

Bronwyn Gillanders is presenting at the NRM Science Conference in mid-April 2014 and to the Federal Department of Environment in Canberra at the end of April 2014.

2.2 Consideration of Australian Geographic offer of funding

Australian Geographic recently published an article on Cuttlefish, interviewing Mike Steer. They have identified cuttlefish as one of their priorities and are keen to set up collection boxes in all their stores to support cuttlefish research. SARDI is proposing that the funds assist CCSA in field operations around the artificial den project.

Meeting concluded: 10:30 am

Next meeting: June 2014

Action List

Item	Actions from 11 April 2014	Responsibility	Target Date
1	Response to DPTI on EIS PIRSA and SARDI to draft a response to DPTI based on discussions from today's meeting.	PIRSA, SARDI	16 April 2014 - Completed

Friday 18 July 2014 10:30 – 11:25 am

Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees: Scott Ashby (Chair)
Sean Sloan (PIRSA)
Michael Steer (SARDI)
Bronwyn Gillanders (UoA)
Peter Short (DPTI)
Brenton Grear (DEWNR)
Vera Hughes (DEWNR)
Andrew Solomon (EPA)
Rob Thomas (DSD)
David Lake (SATC)
Peter Peppin (Whyalla City Council)
Tim Kelly (Conservation)
Fontella Koleff (PIRSA - communications)
Kate Rodda - EO (PIRSA)

Apologies: Mehdi Doroudi (PIRSA)
Gavin Begg (SARDI)
Peter Copley (DEWNR)
Peter Dolan (EPA)
Sam Gaylard (EPA)

1. Welcome and apologies

2. Previous minutes

Draft minutes from the previous meeting held 13 February 2014 were accepted as an accurate record of the meeting.

3. Previous actions (from 13 February 2014)

1. Communications - Cuttlefish update

Completed. Update was released in February 2014.

2. Research update - Artificial habitat project

Completed. A permit was obtained through DEWNR (see Attachment 1 for more detail).

3. Research update - Bioaccumulation of metals

Completed. An appropriate procedure for release of projects needs to be developed with FRDC (see Attachment 1 for more detail).

4. Research update - Research project timelines

Completed. See Attachment 1 for detail.

5. EPBC listing update

Completed. Tim Kelly provided the letter from the commonwealth on 17 July 2014.

6. Stock Enhancement

Completed. SARDI prepared and submitted an Expression of Interest "*Giant Australian Cuttlefish stock enhancement feasibility study*" to FRDC for the 2015 round of funding (see Attachment 1).

It was noted at the meeting that the EOI did not receive a high priority for 2014/15.

It was agreed by members of the GCWG that the concept has now been developed and is readily available should it be required in the future.

It was also discussed by the GCWG that elements of the proposal could potentially be the focus of post-graduate studies.

7. Historical video footage at Point Lowly

Completed. SARDI have made initial assessment of this footage and plan to include their findings into a "weight-of-evidence" review (see Attachment 1).

Discussion items (18 July 2014)

4. Research update

Mike Steer (SARDI) tabled an update on current research projects prior to the meeting (Attachment 1). Members had the opportunity to read the update prior to the meeting and ask questions at the meeting.

a. Point Lowly cuttlefish population surveys

- Three abundance and biomass surveys for the 2014 season have been completed. Preliminary results indicate that peak abundance occurred in June and was 57,317 individuals (representing a 325% increase from 2013). Peak biomass was 47.09 tonnes (representing a 589% increase from 2013). It was noted that the 2014 surveys also recorded a return of larger animals.
- In late June, a local citizen science group conducted a survey in one area of the aggregation site using methodology developed by SARDI. The results were similar to that recorded by SARDI, supporting the suitability of methodology. It was discussed that this provided the opportunity to utilise citizen science groups to fill gaps and assist the population surveys.

Action: The Chair of GCWG to write to the citizen science group thanking them for their contribution and seeking further involvement in future.

- The Department of State Development (DSD - formally DMITRE) raised the possibility of conducting research into the natural cycles in cuttlefish abundance to allow a predictive capability in future. SARDI and the University of Adelaide (UoA) noted that there was already a significant amount of data available or being collected through current research projects. In particular the population model component of the FRDC project led by UoA has a predictability function for populations.
- The 2014 results allow us to be cautiously optimistic for the Point Lowly population of cuttlefish however we still need to retain focus on the population and maintain the ongoing monitoring and research.
- 2014 population estimates will be ready to be publically released early next week (following final data check, engagement with BHP as per agreement with them, and any administrative processes).

Action: PIRSA to prepare a media release and a cuttlefish update reflecting the 2014 data and progress against research projects.

b. Bioaccumulation analysis

- A report on the research has been peer reviewed and comments are currently being addressed by EPA before the report can be finalised and released.
- The results demonstrated that any metal burden found in the mantle and viscera of both the giant Australian cuttlefish was unremarkable and did not suggest impacts that relate to the decline in abundance.
- It was suggested that cuttlefish juveniles and eggs may be more vulnerable to bioaccumulation effects than adults and that research should also be directed towards these life stages. As the 2014 season is near the end, collection of eggs and juveniles would need to take place soon if this was to be pursued.

Action: EPA to seek advice on eco-testing eggs and juveniles (specifically the feasibility, necessity and cost).

c. FRDC project (2013/010 - UoA et al.)

- Research is tracking well.
- Preliminary genetic data supports previous data that a division in the population exists around Wallaroo however more data from this region is required to confirm.
- While there are some data on movement patterns through the genetic and statolith components of this project, but there is still a knowledge gap relating to where cuttlefish go during their life cycle. WG members raised the question about suitability of acoustic tracking of individuals. There has been some past research conducted at the aggregation site but a broader area would require significant resources in terms of receivers and tags. The difficulty in tagging smaller individuals is also a problem.

d. Department of the Environment project

- The final report has been completed and released. It can be found at the Department of the Environment website: <http://www.environment.gov.au/sustainability/regional-development/upper-spencer-gulf>

5. Update on Port Bonython Bulk Export Facility

Flinders Ports have had several meetings with relevant agencies on issues arising from the EIS for this development. The final report is being currently prepared by DPTI and possibly be available late August 2014.

6. Communication

6.1 Cuttlefish update and media release - will be prepared reflecting 2014 survey results, progress against research projects and the contribution of citizen science groups.

6.2 Whyalla Cuttlefish Capers – an educational school holiday program about cuttlefish attracted 60 participants.

6.3 Whyalla Underwater shootout – a photographic competition to increase awareness about the marine environment, particularly the cuttlefish. The event attracted 11 entries. There is potential for this event to be conducted annually.

6.4 Presentation at the Upper Spencer Gulf Forum – 5 June 2014 – SARDI presented a short talk on cuttlefish and the research being conducted to the Upper Spencer Gulf Common Purpose Group.

7. Other business

7.1 2015 spawning season – citizen science participation

Surveys for the 2015 season should be planned in collaboration with citizen science groups. It was noted by WG members that for it to be effective that there would need to be a consistency in the area and timing for citizen science surveys. It would be beneficial to have them conduct surveys at the same time and over the same area as SARDI/BHPB to validate their results.

Action: SARDI to discuss with citizen science groups the potential for participating in future cuttlefish population surveys in a greater capacity.

7.2 Predator-prey relationship studies

DSD raised the potential for investing research effort into examining predator-prey relationships involving cuttlefish (e.g. snapper preying on cuttlefish) and suggested that snapper and other predators should be built into the cuttlefish model. Cuttlefish prey items are being addressed in FRDC project 2013-010 which will allow some knowledge on trophic impacts.

Meeting concluded: 11:25 am

Next meeting: to be advised

Action List

Item	Actions from 18 July 2014	Responsibility	Target Date
1	Communications - Cuttlefish update and media release PIRSA to prepare a media release and a cuttlefish update reflecting the 2014 data and progress against research projects.	PIRSA	21 July 2014
2	Research update – Citizen science group The Chair of GCWG to the citizen science group thanking them for their contribution.	SARDI	
3	2015 spawning season – citizen science participation SARDI to discuss with citizen science groups the potential for participating in future cuttlefish population surveys in a greater capacity.	SARDI	
4	Research update – Bioaccumulation of metals EPA to seek advice on eco-testing eggs and juveniles (specifically the feasibility, necessity and cost).	EPA	

GIANT AUSTRALIAN CUTTLEFISH WORKING GROUP

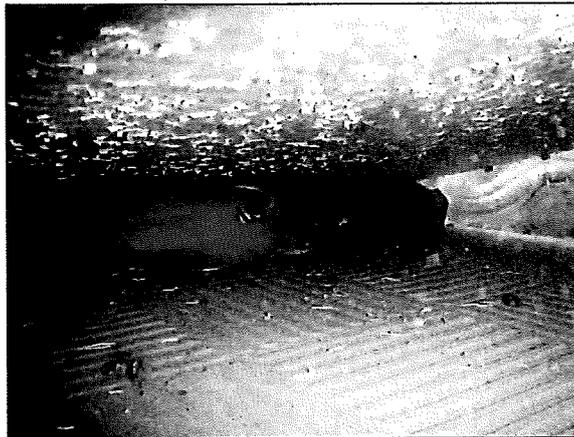
ACTIONS FROM 13 FEBRUARY 2014

Item 2:

Research up-date – Artificial habitat project

SARDI to seek permission from the appropriate authority to deploy artificial habitat.

- An appropriate permit was obtained through DEWNR: Marine Parks Permit to undertake scientific research (MR00010-0).
- It must be noted that Brenton Grear, Sarah Laurence and Chris Thomas worked fast and delivered the permit within a few days prior to the 'caretaker' period.
- The artificial habitat was deployed at five northern Spencer Gulf sites in March 2014.
- Reefwatch/CCSA will be monitoring the habitat in August, and will be supported by external funding from Australian Geographic.
- Preliminary observations by SARDI divers indicate that the structures are accommodating cuttlefish on the main spawning grounds (Black Point), however, it is not known whether they are supporting any eggs.



Item 3:

Research up-date – Bioaccumulation of metals

SARDI to follow up with FRDC on guidelines regarding individual project results.

- Patrick Hone (FRDC) was contacted on 8th July 2014 in relation to this matter.
- The GCWG needs to consider the document and endorse its release through FRDC, who will determine its need to pass through either an internal or external review process. It is important that FRDC are engaged throughout the entire dissemination process.

Item 4:

Research up-date – Research project timelines

SARDI to develop a table indicating how each project is tracking against its timeline.

	PROJECT	MILESTONE 1	MILESTONE 2	MILESTONE 3	MILESTONE 4	DRAFT FINAL	FINAL
1	FRDC 2013/10 GIANT AUST CUTLEFISH IN SA WATERS (Gillanders)	Media release RedMap brochures (19APR2013)	Initial integrated model	Morphological/DNA-based id of gut contents	Movement & catch history completed	18 Dec-13	27 Feb-14
			Adults/embryos collected for genetics	RAD-Seq population analysis close to	RAD-Seq population analysis completed		
			Gut contents collected	elemental signatures determined	Physiological experiments on eggs/adults completed		
			Physiological tolerance of eggs (MIOCT2013)	Physiological tolerance data available	data provided to modelling group		
2	FRDC 2013/32 SURVEYING, SEARCHING, AND PROMOTING CUTLEFISH SPAWNING ACTIVITY... (Steer)	Provide interim cuttlefish survey report	Search for alternate spawning in NSG Engage with the community	Deploy Artificial Habitat	Quantify fishery by-catch	25 Nov-13	28 Feb-14
		Characterise successful dens (31OCT2013)	Design & construct artificial habitat Develop by-catch sampling program	Assess metal bioaccumulation	Assess effectiveness of artificial habitat		
3	SEWPAC: INVESTIGATING POTENTIAL IMPACTS OF SHIPPING ON GIANT AUST. CUTLEFISH (Gillanders)	Collect eggs	Begin aquarium experiments (JUNE 2013)	Complete aquarium experiments (NOV 2013)	Data analysis (JAN 2014)	Feb-14	Apr-14
		Collect Adults					
		Record shipping traffic noise					
		Desktop review (JUNE 2013)					
4	SLA: 2014 Cuttlefish Survey	May Survey	June Survey	July Survey	Peak abundance/biomass estimates	22 Sep-13	20 Oct-14
		BHP ROV Trial			Water chemistry & Habitat Analysis		
			Complete	In Progress	Incomplete		

Item 6:

Stock Enhancement

Develop a concept paper to be submitted to FRDC and discussed at the next working group meeting.

- A project entitled "Giant Australian Cuttlefish stock enhancement feasibility study" was developed and submitted to FRDC as an Expression of Interest (EOI) for the 2015 round (See attached).

Item 7:

Historic video footage at Point Lowly

SARDI to discuss historical footage at next meeting

- Paul Manning supplied footage from dive surveys along Port Bonython on 18/19 June 1986.
- The aim of these surveys was to gain baseline information of the marine environment/biodiversity and to identify potential indicator species that may be assessed in the unlikely event of an oil spill.
- The quality of footage is relatively good.
- Approximately 1.5 hrs of footage of which ~1 hr is clearly of the prime cuttlefish habitat extending from Black Point to the western SANTOS boundary fence.
- 13 cuttlefish were recorded.
- Additional information from historic pre-1990 dive logs (S. Reardon and J. Watson) has been received.
- The intention is to collate this information and include it along with all other information (from the various projects) into a 'weight-of-evidence' review that addresses the cause of the decline.



Expression of Interest Template

Project Details

Project Title:	Giant Australian Cuttlefish stock enhancement feasibility study.
Start Date:	1 st July 2015
End date:	30 th June 2018
Applicant:	SARDI – Aquatic Sciences
Principal Investigator:	Mike Steer
Co-Investigator(s):	Wayne Hutchinson

Program:

Theme	<input checked="" type="checkbox"/>
Communities	<input type="checkbox"/>
Environment	<input checked="" type="checkbox"/>
Extension and Adoption	<input type="checkbox"/>
Industry	<input type="checkbox"/>
Extension and adoption	<input type="checkbox"/>
People Development	<input type="checkbox"/>

Need: Define succinctly, in no more than 250 words, the need for the project and how it relates to relevant RD&E plans, stakeholder needs and strategies. The need should describe why the application is needed.

A large spawning aggregation of Giant Australian Cuttlefish (*Sepia apama*) normally occurs in areas adjacent to Point Lowly in False Bay in northern Spencer Gulf between May and August each year. This spawning aggregation is the largest aggregation of Giant Cuttlefish known worldwide and is highly valued by the local residents, tourism industry and recreational diving sector. In recent years, a significant decline in the population has been observed, where the annual spawning aggregation around Point Lowly dropped from a peak in abundance of approximately 183,000 animals in 1999 to approximately 13,500 in 2013; representing a 93% reduction in population size over 14 years. While there has been significant speculation on the potential cause for the decline, it has not been possible to identify any contributory factors. Consequently, the nature and extent of this decline has become a priority concern amongst the South Australian community, and the focus of several integrated research projects to address key gaps in our understanding of the biology and ecology of the species. Furthermore, conservational issues surrounding this species have been elevated as the spawning aggregation occurs in an area which currently supports numerous high value coastal industries that are expected to expand in the near future. Separate to understanding the causal link with declining numbers, is the potential for a stock enhancement program to support the natural population, particularly in times of low abundance. Determining the feasibility of such a program is the next precautionary step towards ensuring that the iconic cuttlefish population is sustained in perpetuity.

Outputs and outcomes: Describe the outputs that will arise from the project and the extension activities that will be undertaken and how they will assist in achieving the planned outcomes. Outputs may be knowledge, skills, processes, practices, items/artefacts, publications, workshops, models, electronic media or technology that when adopted will contribute to achieving planned outcomes. Also detail any direct or related intellectual property. Outcomes are the events or results that will occur with the adoption of the outputs. Note – end users, particularly fisheries management agencies, are often in the best position to decide the need or intended outcome, so consider having them describe their needs and the outputs should address these needs.

Although challenging, considerable advances have been made in cuttlefish aquaculture, with two species being successfully cultured through multiple generations (i.e. *S. pharaonis* (Minton et al. 2001), *S. officinalis* (Domingues et al. 2002)) and another, *S. latimanus*, used in a stock enhancement program (Oka et al. 2004). This study will build upon the available knowledge and adopt a multi-stage, 'stop-and-go' approach, involving (1) collecting eggs from the wild and rearing juveniles in captivity; (2) batch-marking reared juveniles to distinguish them from wild stock; (3) conditioning second generation brood stock; (4) optimising release strategies; (5) broad-scale screening of cuttlefish to assess the success of the program, and (6) determining the cost-effectiveness of a dedicated stock enhancement venture.

The ultimate output of the project will deliver either a stock-enhancement program for cuttlefish that is, or is not, a feasible means of securing the iconic population. The 'stop-and-go' nature of this project ensures that its progression will fundamentally depend on the success and acquired knowledge of each of the successive components. Regardless of the overall outcome, it is anticipated that there will be significant advancement in our understanding of cuttlefish aquaculture in terms of the necessary capability, infrastructure, cost and technology required to undertake a practical stock enhancement program. This level of knowledge may also be transferable to other cephalopod species that have commercial aquaculture potential (e.g. Octopus and Squid).

If a cuttlefish stock enhancement program is deemed feasible, then it is anticipated that the State Government's Cuttlefish Working Group will critically discuss a range of adoption strategies. These strategies will also be of particular interest to the high value coastal industries that are currently operating, or expected to operate in close proximity to the spawning grounds. The requirement to undertake a 'full scale' stock enhancement program will be exacerbated if the cuttlefish population continues to decline. Given the high-level awareness and concerns surrounding the iconic population it is anticipated that there will be considerable national and international media interest throughout every stage of this project.

Objectives: Outline the objectives for your project.

No.	Objective
1	To explore whether a stock enhancement program is a practical and cost-effective option for Giant Australian Cuttlefish in northern Spencer Gulf.

Methods: Outline in fewer than 1000 words the methods to be used including types of experiments, protocols or activities; the data to be obtained or knowledge, skills or capacity to be generated. Provide support for any new methods and/or techniques to be employed.

Egg collection and juvenile rearing

Previous studies that have attempted to mate adult Giant Australian Cuttlefish in captivity have been unsuccessful (Hall and Fowler 2003). Juveniles, however, have been successfully reared from eggs collected from the wild on numerous occasions (Hall and Fowler 2003, Dupavillon & Gillanders 2009, Steer unpub.). Rather than invest considerable time and energy into captive breeding, this study will adopt the low risk approach and concentrate on optimising the hatchery-production of juveniles from eggs collected from the field.

This component of the project will assess whether juveniles can be successfully reared in captivity to a level where they can be released and competently contribute to the natural population. The sophisticated aquaculture facilities at SARDI (Aquatic Sciences) will be relied on to incubate approximately 800 field-collected eggs and rear the resultant hatchlings to four age classes; 14, 60, 120 and 200+ days. Ambient conditions will be maintained throughout the entire experiment to correspond with the 'expected' natural environment. Growth, mortality rates, relative condition, feed conversion rates, and pathology will be assessed for the first three age classes. These assessments will be made through destructive sampling a maximum of 200 cuttlefish at each time interval and will also contribute to reducing the program's overall stocking density. The 200+ day old cuttlefish will be maintained as potential brood stock for as long as possible to investigate whether they can produce a second viable generation that can be used for stock enhancement. This experimental design will provide the first indication as to whether enough promulgated juveniles can be produced for a stock enhancement program without placing considerable strain on an already depressed natural population through excessive egg and adult collection.

Batch-marking

It is imperative to assess whether the release of cultured individuals had achieved their objective of effectively contributing to the natural population. This is typically assessed through batch-marking hatchery-reared individuals and assessing their prevalence within the wild stock. The inexpensive calcium-specific staining solution, "Alizarin red S", has been successfully used in the Giant Cuttlefish, *S. latimanus*, in the past, where researchers were able to identify hatchery-reared juveniles in a wild population through the widespread screening of cuttlebones (Oka et al. 2004). Cuttlebones were collected through fishery-dependent and independent programs and approximately 5% of the released cuttlefish were recaptured. This study will assess the effectiveness of Alizarin red S on the Giant Australian Cuttlefish as a batch-specific staining agent across each of the three reared age-classes (i.e. 14, 60 and 120 day old cuttlefish). One week prior to sampling the cuttlefish will be subjected to a staining experiment, where they will be equally allocated to one of four soaking treatments (i.e. 0 (control), 100, 200, 400 ppm) of Alizarin red S solution for 48 hrs. The cuttlebone from each cuttlefish will be inspected post sampling to assess the effectiveness of the staining treatments. This experimental design will also determine whether the stain is capable of differentiating between the three age-classes.

Second generation brood stock

This component of the study will attempt to condition a second generation of brood stock through maintaining individuals for as long as possible (i.e. 200+ days) on a frozen diet and at various stocking densities (to be determined depending on the number of surviving individuals). The relative 'health', reproductive success and viability of offspring will be regularly assessed.

Optimising release strategies

This component of the study depends on whether adequate quantities of cuttlefish can be either promulgated from the second generation brood stock, or competently reared from field collected eggs. Similarly, it will depend on whether the promulgated juveniles are considered to be appropriately conditioned and have the potential to viably contribute to the wild population.

Although cuttlefish hatch as competent 'miniature adults' their early life history stages are still susceptible to high mortality rates. Reducing this risk is fundamental to ensuring a successful stock enhancement program. The laboratory component of this study has been designed to investigate the most appropriate age class at which reared-cuttlefish can be released into the wild (i.e. 14, 60, or 120 day old cuttlefish). However, how these age-classes are released is likely to play a significant role in their survival. Previous work has temporarily accommodated recent cuttlefish hatchlings in bottom set nets positioned over appropriate habitat for

approximately 1 week (Oka et al. 2004), other studies generally suggest undertaking a series of low density releases where predators are in low abundance and there is adequate refuge (Bell et al. 2005). This study will stagger the release of reared-animals through distributing small quantities of individuals (i.e. <20) across the extensive shallow heterogeneous reef habitat that fringes Point Lowly, specifically in areas where high densities of cuttlefish are known to reliably spawn.

Broad-scale screening

Batch-staining the cuttlebones of hatchery-reared cuttlefish eliminates the need for an extensive destructive sampling program to re-capture individuals. Cuttlefish are semelparous, where they die after a single spawning season. Their cuttlebones are positively buoyant and are typically rejected by most predators and scavengers, consequently they frequently accumulate in high densities along the coast. This project plans to engage volunteers to comb local beaches in northern Spencer Gulf for cuttlebones as it would be an ideal 'passive' sampling program that does not compromise the viability of the spawning population. Collected cuttlebones will be stockpiled and rapidly screened for Alizarin marks from which re-capture rates will be determined. If batch-staining effectively differentiates the three age-classes, it will be possible to infer whether the effectiveness of the stock enhancement program is influenced by the age of the released cuttlefish.

Cost/Benefit Analysis

This component of the study will assess whether the financial investment into the infrastructure and resources required to undertake this stock enhancement program is worthwhile. The extent of this cost benefit analysis will clearly depend on whether the underpinning components of this project indicate that a stock enhancement program is practical from a biological perspective. If so, the viability of the program will be assessed in relation to the overall benefit to the State's economy (i.e. eco-tourism and fishery potential, impacted industries). Furthermore, it will identify areas that may be able to be executed more efficiently, consequently improving the cost effectiveness of any potential stock enhancement program.

Research Capability: Outline the capacity and capability of the project's team to achieve the objectives of the project.

Dr Mike Steer (PI) has 15 years experience researching cephalopod biology and ecology and has published numerous peer-reviewed articles and reports on the subject. Consequently, he has gained an international and national reputation as a cephalopod specialist and in recent years has focussed his attention on South Australia's iconic Giant Australian Cuttlefish population. He recently led FRDC Project 2011/054 which established a standard methodology to monitor the cuttlefish population and also provided a preliminary assessment into the cause of the recent decline. He is currently leading FRDC 2013/032 surveying, searching and promoting cuttlefish spawning activity in northern Spencer Gulf and is a co-investigator on FRDC 2013/040 which is exploring some of the finer-scale population structure of Giant Australian cuttlefish in South Australian waters.

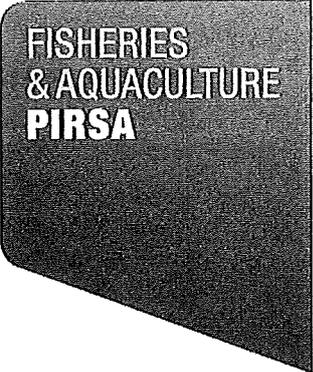
Wayne Hutchinson (CI) has a Master of Applied Science in Aquaculture (by Research) qualification from the University of Tasmania. Since 1994 he has accumulated a range of research and technical skills relevant to evaluate and develop new species with potential for marine aquaculture and stock enhancement. Wayne Hutchinson's principal areas of expertise are conducting marine finfish larval rearing R&D; reproductive biology and controlled spawning of marine fish; stock enhancement; and the design, construction and operation of marine hatcheries and culture systems, including live feed production and nutritional enrichment processes. Species he has worked on to date include yellowtail kingfish, southern bluefin tuna, yellowfin tuna, King George whiting, snapper, mulloway, greenback flounder and striped trumpeter. Within the Australian Seafood CRC, he has managed a number of research projects and participated in a range of larval rearing trials on topics identified by industry and research collaborators, to be likely factors affecting survival and quality of propagated yellowtail kingfish and southern bluefin tuna.

Extension: Outline the intended end user/audience and how the project outputs will be extended to them.

Although a stock enhancement program does not offer a 'silver-bullet' solution to the declining cuttlefish population, it can be considered a precautionary strategy that would complement other management options, such as: fishing closures, deployment of artificial spawning habitat, and restricting industrial development in the area during the spawning season. Such a program would provide the State Government with another strategy to ensure the long-term sustainability of the population.

The ecotourism, fishing and industrial sectors would benefit most from a successful cuttlefish enhancement program. Promoting the increase of the natural population through stock enhancement will ensure that the ecotourism sector can rely on visiting an 'iconic species' annually and reduce some of the pressure amongst the commercial fishing sector that may incidentally capture cuttlefish as by-catch within northern Spencer Gulf (eg. Spencer Gulf Prawn Fishery). Similarly, high value industries operating within the area could consider contributing to a stock enhancement program to offset their respective operations and future planning.

Monday, 8 October 2012, 3.00 – 5.00pm
Conference Room, Level 17, 25 Grenfell Street, Adelaide



FISHERIES
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Government Agency Meeting Giant Cuttlefish Working Group

Participants: Ian Nightingale (Chair), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Brenton Grear (DEWNR), Peter Copley (DEWNR), Gavin Begg (SARDI), Michael Steer (SARDI), Sam Gaylard (EPA), Andrew Solomon (EPA), David Lake (SATC), Peter Short (DPTI), Lisien Loan (DEWNR)

Invited attendees: Peter Peppin (CEO, Whyalla City Council), Tim Kelly (CEO, CCSA), Bronwyn Gillandes (UoA), Michael Cresshull (PIRSA), Joanne Tsoukalas (PIRSA)

Apologies: Peter Dolan (EPA)

Agenda

1. Welcome and apologies - Chair
2. Action Items from previous meeting (15 August 2012) - Chair
3. Confirmation of membership of Working Group - Chair
4. FRDC EOI Research project - University of Adelaide/SARDI
5. Gap Analysis - SARDI
6. Communication issues
 - a. Redmap
7. Resourcing for ongoing monitoring and assessment
8. Confirmation of minutes from previous meeting (15 August 2012) - Chair
9. Other Business

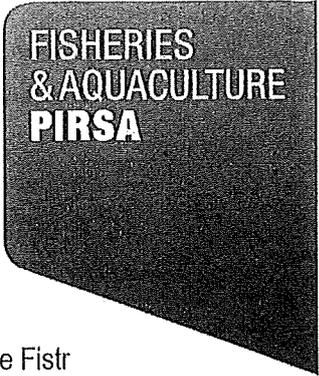
Meeting close

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Item	Actions from previous meeting (15 August 2012)	Responsibility	Target Date
1	<p>Fact Sheet Modify into a version that the working group is happy to release as a public document.</p>	SARDI	
2	<p>Research Gaps</p> <p>Population genetics Develop a research proposal to examine genetic structure of cuttlefish populations in Spencer Gulf.</p> <p>Relationship between NZ fur seal and cuttlefish DEWNR to advise on what could be done from a policy perspective to mitigate any potential threats posed by NZ fur seals to the cuttlefish population.</p> <p>Investigate ways to determine contribution of cuttlefish in the diet. Gavin Begg to check with Simon Goldsworthy on ways to achieve this.</p> <p>By-catch information Engage prawn fishers to assist in regard to numbers and seasonality of cuttlefish in the by-catch. Can utilise the SARDI observers as well.</p> <p>Water temperature SARDI to investigate further whether water temperature changes are influencing the distribution and abundance of the giant cuttlefish population.</p>	<p>SARDI</p> <p>DEWNR</p> <p>SARDI</p> <p>SARDI</p> <p>SARDI</p>	
3	<p>Monitoring Program Establish an integrated cross-agency scientific monitoring program to cover population abundance, habitat condition and water quality.</p> <p>EPA to analyse SARDI water samples collected by SARDI during recent population survey work.</p> <p>In terms of identifying possible causes, EPA will work through their water quality data (specifically industrial discharge records) to determine if there has been a change over the last 5-10 years.</p>	<p>ALL</p> <p>EPA</p> <p>EPA</p>	
4	<p>Cuttlefish closure in Spencer Gulf Issue a closure to protect cuttlefish in Spencer Gulf for a temporary period of 12 months.</p>	PIRSA	
5	<p>Communications Write to key non Government stakeholders to provide an update in relation to progress and actions being taken by the Government working group.</p> <p>Prepare a briefing for Minister Caica and Minister Gago on the current progress of the Government cuttlefish working group.</p>	<p>Chair</p> <p>DEWNR, PIRSA</p>	

Tuesday, 26 March 2013, 11.30 am – 1.30 pm
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Conference Room, Level 17, 25 Grenfell Street, Adelaide



FISHERIES
& AQUACULTURE
PIRSA

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Brenton Grear (DEWNR), Peter Copley (DEWNR), Gavin Begg (SARDI), Michael Steer (SARDI), Sam Gaylard (EPA), Peter Dolan (EPA), Andrew Solomon (EPA), David Lake (SATC), Peter Short (DPTI), Peter Peppin (CEO, Whyalla City Council), Tim Kelly (CEO, CCSA).

Invited attendees: Rob Thomas (DMITRE)

Apologies: Andrew Solomon, Gavin Begg

DRAFT Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (08 October 2012) - Chair
3. Action Items from previous meeting (08 October 2012) – Chair
4. Terms of Reference for working group
5. Update on FRDC EOI Research project - University of Adelaide/SARDI
6. Preliminary data – SARDI - Mike Steer
7. Communication issues
8. Application for EBPC listing – Tim Kelly
9. CCSA's Proposal for an Emergency Cuttlefish Recovery Plan – Tim Kelly
10. Next steps
11. Other Business
12. Meeting close

Item	Actions from 08 October 2012	Responsibility	Target Date
1	Terms of Reference Develop a TOR for the working group	PIRSA, SARDI, DEWNR, EPA	
2	Membership Government agencies to clarify representatives of the working group.	PIRSA, SARDI, DEWNR, EPA	
3	FRDC Expression of Interest research project Provide comments on FRDC research proposal to Bronwyn Gillanders. Provide details of contacts for industries around Upper Spencer Gulf that may support/contribute to the project.	ALL	18 October 2012
4	Communications Incorporate cuttlefish into the SA Redmap program. Develop a communication strategy.	PIRSA PIRSA, SARDI, DEWNR, EPA	Redmap done 08/12/12
5	Monitoring Program Develop an ongoing monitoring program and manage the risks associated with its implementation. Investigate how a volunteer program might work.	SARDI ALL	

Tuesday, 16 April 2013, 9.00 – 10:30 am
Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Peter Copley (DEWNR), Peter Dolan (EPA), Sam Gaylard (EPA), David Lake (SATC), Peter Short (DPTI), Tim Kelly (CEO, CCSA), Rob Thomas (DMITRE), Jo Tsoukalas (PIRSA communications).

Invited attendees:

Apologies: Gavin Begg, Michael Steer, Bronwyn Gillanders, Andrew Solomon, Peter Peppin, Brenton Grear, Cathy Parker.

DRAFT Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (03 April 2013) - Chair
3. Action Items from previous meeting (03 April 2013) - Chair
4. Paper 1 – Draft work plan
5. Paper 2 - Artificial habitats.
6. Paper 3 - Information gaps.
7. Paper 4 – Management of visitor activity at the aggregation site.
8. Paper 5 - Potential stressors using existing tissue and mantle samples.
9. Communication issues
10. Next steps
11. Other Business
12. Meeting close

Item	Actions from 03 April 2013	Responsibility	Target Date
1	Terms of Reference The revised TOR to be sent out to members.	K Rodda	
2	Membership Chair to write to other Chief Executives to confirm nominations for membership.	Chair	
3	Membership Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation.	Chair	
4	Membership The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.	Chair	
5	Discussion paper 1 Draft work plan template.	PIRSA	15 April 2013
6	Discussion paper 2 Artificial habitats.	PIRSA	15 April 2013
7	Discussion paper 3 Information gaps.	PIRSA	15 April 2013
8	Discussion paper 4 Management of visitor activity at the aggregation site.	DEWNR	15 April 2013
9	Discussion paper 5 Potential stressors using existing tissue and mantle samples.	EPA, CCSA	15 April 2013

Tuesday, 7 May 2013, 3.00 – 5:00 pm

Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide

**FISHERIES
& AQUACULTURE
PIRSA**

Giant Cuttlefish Working Group

Participants: Mehdi Doroudi (Acting Chair), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Gavin Begg (SARDI), Mike Steer (SARDI), Bronwyn Gillanders (UoA), Peter Copley (DEWNR), Brenton Grear (DEWNR), Andrew Solomon (EPA), Sam Gaylard (EPA), David Lake (SATC), Peter Short (DPTI), Peter Peppin (WCC), Tim Kelly (CEO, CCSA), Rob Thomas (DMITRE), Jo Tsoukalas (PIRSA communications).

Invited attendees:

Apologies: Scott Ashby, Peter Dolan

DRAFT Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (16 April 2013) - Chair
3. Action Items from previous meeting (16 April 2013) - Chair
4. Paper 1 - Draft work plan
5. Paper 2 - Artificial habitats
6. Paper 3 - Information gaps
7. Paper 4 - Management of visitor activity at the aggregation site
8. Paper 5 - Potential stressors using existing tissue and mantle samples
9. By-catch estimate
10. Communication issues
11. Next steps
12. Other Business
13. Meeting close

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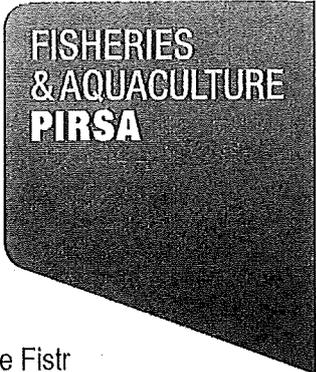


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MEETING

Item	Actions from 16 April 2013	Responsibility	Target Date
1	Membership Chair to write to other Chief Executives to confirm nominations for membership.	Chair	
2	Membership Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation and possible involvement of SGEDI.	Chair	
3	Membership The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.	Chair	
4	Discussion papers – 1-5 All members to provide input to discussion papers through the Executive Officer (K Rodda).	All members	26 April 2013
5	Discussion papers 1 + 2 + 3 + 4 A scientific team consisting of members from SARDI and University of Adelaide to form and meet to develop a scientific plan and recommend priorities for research/actions.	Science team (Mike Steer Gavin Begg Bronwyn Gillanders, Sam Gaylard)	< 7 May 2013
6	Discussion paper 2 - Artificial habitats. A small team will be formed to further develop this discussion paper and present findings at the next working group meeting (7 May 2013).	Alice Fistr, Sean Sloan Peter Dolan Peter Copley Bronwyn Gillanders Mike Steer Rob Thomas	< 7 May 2013
7	Discussion paper 2 - Artificial habitats. Each agency to follow up on what the legislative requirements would be if an artificial habitat program was implemented.	Rob Thomas Peter Copley Peter Short Sean Sloan	< 7 May 2013
8	Discussion paper 2 - Artificial habitats. Rob Thomas to request BHP's artificial habitat experiment details to inform any future actions relating to the use of artificial habitats.	Rob Thomas	< 7 May 2013
9	Discussion paper 4 - Management of visitor activity at the aggregation site. SATC to provide PIRSA with the 2003 tourism report. The implication of diver visitation should be discussed by the scientific team.	David Lake Science team	< 7 May 2013
10	Communications All members to send details of stakeholders for circulation of communique.	All members	< 1 May 2013
11	Collection of cuttlefish by-catch data PIRSA/SARDI to approach the prawn industry to record and collect cuttlefish by-catch data and possibly collection of biological samples.	PIRSA/SARDI	

Wednesday 12 June 2013, 10:30am – 12:00 pm
Conference Room, Level 17, 25 Grenfell Street, Adelaide



**FISHERIES
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PIRSA**

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Peter Copley (DEWNR), Gavin Begg (SARDI), Andrew Solomon (EPA), Peter Dolan (EPA), Sam Gaylard (EPA), David Lake (SATC), Peter Peppin (WCC), Tim Kelly (CEO, CCSA), Jo Tsoukalas (PIRSA communications), Ian Llewellyn (proxy for P Short), Sam Walker (proxy for R Thomas)

Invited attendees:

Apologies: Mike Steer (SARDI), Bronwyn Gillanders (UoA), Rob Thomas (DMITRE), Peter Short (DPTI), Brenton Gear (DEWNR)

DRAFT Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (7 May 2013) - Chair
3. Action Items from previous meetings - Chair
4. Confirmation of working group membership
5. Update on population surveys
6. Update on fishing closure
7. Communication issues
8. Next steps
9. Other Business
10. Meeting close

Item	Actions from 16 April 2013	Responsibility	Target Date
2	Membership Chair will communicate with the Chief Executive of DMITRE (Geoff Knight) in regard to industry representation and possible involvement of SGEDI.	Chair	
3	Membership The Chair will communicate with the Chief Executive of Whyalla City Council (Peter Peppin) in regard to community representation.	Chair	
Item	Actions from 07 May 2013		
1	Discussion paper 1 - draft work plan K Rodda to update and circulate to WG members out-of-session	K Rodda	Done 31/05/13
2	Discussion paper 2 - Artificial habitats M Steer to finalise the paper, complete with estimated costs.	M Steer/G Begg	Done 13/05/13
3	Discussion paper 3 - Research priorities M Steer to send the final document to K Rodda for circulation to WG members for their comment. PIRSA to provide DEWNR with costs associated with surveying new areas.	M Steer/K Rodda PIRSA	Done 10/05/13
4	Discussion paper 4 - Management of visitor activity P Peppin or D Lake to investigate existing signage at Point Lowly.	P Peppin/D Lake	Done 08/05/13
5	Discussion paper 5 - Potential stressors using existing tissue and mantle samples EPA to further develop this paper, summarising all information available.	EPA	Done 28/05/13 and circulated 30/05/13
6	Collection of cuttlefish by-catch data Chair to write to the prawn industry association acknowledging their contribution and thanking them for their support.	Chair	
7	Communication All members to send PIRSA details of stakeholders for circulation of communique.	All members	

Wednesday 07 August 2013, 10:30am – 12:00 pm

Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide

**FISHERIES
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PIRSA**

MEETING

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Peter Copley (DEWNR), Brenton Gear (DEWNR), Gavin Begg (SARDI), Mike Steer (SARDI), Andrew Solomon (EPA), Peter Dolan (EPA), Sam Gaylard (EPA), Rob Thomas (DMITRE), Peter Short (DPTI), David Lake (SATC), Peter Peppin (WCC), Tim Kelly (CEO, CCSA), Bronwyn Gillanders (UoA), Jo Tsoukalas (PIRSA communications),

Apologies:

DRAFT Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (12 June 2013) - Chair
3. Action items from previous meetings - Chair
4. Research update
 - a. Point Lowly population surveys (SARDI)
 - b. Alternate site surveys (SARDI)
 - c. Artificial habitat project (SARDI)
 - d. SEWPaC and FRDC project (UoA)
 - e. Bioaccumulation analysis (EPA)
5. Discussion on what information can be publically released (and when)
6. Communication issues
 - a. Communique
 - b. Media
7. Other Business
 - a. Discussion on invitation to Arup (consultancy undertaking the EIS for Spencer Gulf Port Link at Port Bonython) to present an overview of project and findings to date to the WG.
8. Meeting close
9. Next meeting

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Item	Actions from 07 May 2013	Responsibility	Target Date
6	Collection of cuttlefish by-catch data Chair to write to the prawn industry association acknowledging their contribution and thanking them for their support.	Chair	Draft prepared 02/07/13
Item	Actions from 12 June 2013		
1	TOR PIRSA to amend the TOR regarding membership and circulate to members.	PIRSA	Circulated 27/06/13
2	BHP ROV trials DMITRE to approach Greg Hill from BHP in relation to presenting results from their ROV trials to the working group.	DMITRE	
3	Update on fishing closure PIRSA to follow up on what media releases have been made on this issue	PIRSA	
4	Communications Tim Kelly to provide feril or in peril pamphlets for distribution. Bronwyn Gillanders to work with PIRSA and CCSA to collate information from sighting databases.	CCSA UoA	
5.1	Discussion paper 1 - work plan K Rodda to update and circulate to WG members out-of-session for finalisation.	PIRSA	Circulated 14/06/13
5.2	Reef watch volunteers Gavin Begg, Sean Sloan and Tim Kelly to discuss the scope for utilisation of reef watch divers to assist in the collection of data in an organised approach.	CCSA; SARDI, PIRSA	
5.3	Rock Lobster fishers reporting cuttlefish in pots PIRSA to follow up and see if samples were taken.	PIRSA	
5.6	EPBC Listing of Australian Giant Cuttlefish CCSA to provide an update on the application.	CCSA	
6	Research projects for 2013 PIRSA to develop a paper that formalises the research projects decided upon by the working group for priority in the 2013 season.	PIRSA	Circulated 27/06/13

Wednesday 06 November 2013, 2:00 – 3:30 pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

MEETING

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Peter Copley (DEWNR), Brenton Grear (DEWNR), Gavin Begg (SARDI), Mike Steer (SARDI), Andrew Solomon (EPA), Peter Dolan (EPA), Sam Gaylard (EPA), Rob Thomas (DMITRE), Peter Short (DPTI), David Lake (SATC), Peter Peppin (WCC), Tim Kelly (CEO, CCSA), Bronwyn Gillanders (UoA), Fontella Koleff (PIRSA communications),

Apologies:

DRAFT Agenda

1. Welcome and apologies - Chair
2. Presentation from BHP on ROV trials (Greg Hill, BHP) (~2.15 pm)
3. Presentation from Arup on the EIS for Spencer Gulf Port Link at Port Bonython (~2.35 pm)
4. Confirmation of minutes from previous meeting (7 August 2013) - Chair
5. Action items from previous meetings - Chair
6. Research updates
 - a. Point Lowly population surveys (SARDI)
 - b. Alternate site surveys (SARDI)
 - c. Artificial habitat project (SARDI)
 - d. SEWPaC and FRDC project (UoA)
 - e. Bioaccumulation analysis (EPA)
7. Communication issues
8. Other Business
 - a. Port Bonython jetty maintenance (DPTI)
 - b. Reef watch volunteers
9. Meeting close
10. Next meeting

Action	Actions from 07 August 2013	Responsibility	Target Date
1	BHP DMITRE to follow up with BHP on the possibility of a presentation to the working group on their ROV trials.	DMITRE	
2	BHP DMITRE to clarify the status of the agreement reached between the Minister, EPA and BHP regarding BHP survey requirements.	DMITRE	
3	Update on fishing closure Follow up on establishing appropriate signage to reflect new closures.	PIRSA , WCC	
4	Communications - Cuttlefish update PIRSA and SARDI prepare an interim report for public release.	PIRSA, SARDI	
5	ARUP presentation to WG DPTI to organise a meeting between CCSA and ARUP to finalise CCSA comments on the EIS. This should happen prior to next WG meeting (mid-October). DPTI to invite ARUP to the next WG meeting. It was noted that ARUP should be made aware of the WG membership affiliation prior to attendance.	DPTI DPTI	
6	2014/15 season SARDI to develop a paper on research and resources needed for the 2014/15 season for discussion at the next meeting.	SARDI	

Thursday 13 February 2014, 9:30 – 11:00 am

Conference Room, Level 17, 25 Grenfell Street, Adelaide

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MEETING

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Alice Fistr (PIRSA), Peter Copley (DEWNR), Brenton Grear (DEWNR), Gavin Begg (SARDI), Mike Steer (SARDI), Andrew Solomon (EPA), Peter Dolan (EPA), Sam Gaylard (EPA), Rob Thomas (DMITRE), Peter Short (DPTI), David Lake (SATC), Peter Peppin (WCC), Tim Kelly (CEO, CCSA), Bronwyn Gillanders (UoA), Fontella Koleff (PIRSA communications),

Apologies:

DRAFT Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (6 November 2013) - Chair
3. Action items from previous meetings - Chair
4. Research updates
 - a. Point Lowly population surveys (SARDI)
 - b. Alternate site surveys (SARDI)
 - c. Artificial habitat project (SARDI)
 - d. SEWPaC and FRDC project (UoA)
 - e. Bioaccumulation analysis (EPA)
5. Planning for 2014 spawning season (SARDI)
6. Update of EPBC Listing of Australian Giant Cuttlefish (CCSA)
7. Stock enhancement – discussion on feasibility
8. Communication issues
9. Other Business
10. Meeting close
11. Next meeting (scheduled early June 2014)

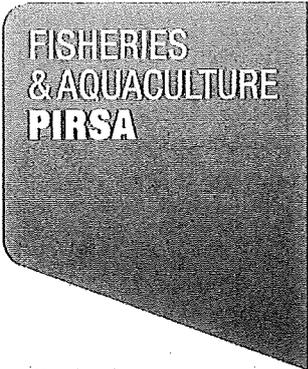
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Action	Actions from 06 November 2013	Responsibility	Target Date
1	Communications - Cuttlefish update PIRSA and SARDI prepare a cuttlefish update for public release.	PIRSA, SARDI	In draft
2	Prawn Industry cuttlefish by-catch project SARDI to facilitate collection of cuttlefish caught as by-catch.	SARDI	Ongoing
3	FRDC project Bronwyn Gillanders to provide the milestone report for the FRDC project for circulation to the WG.	U of A	Completed
4	Port Bonython jetty maintenance DMITRE to follow up on the availability of noise data from Flinders Ports.	DMITRE	Rob Thomas to advise

Friday 11 April 2014, 9:30 – 10:30 am
Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide



FISHERIES
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Giant Cuttlefish Working Group

Participants: Mehdi Doroudi (A/Chair), Gavin Begg (SARDI), Mike Steer (SARDI), Sam Gaylard (EPA), Rob Thomas (DMITRE), Vera Hughes (DEWNR), Peter Short (DPTI), Peter Peppin (WCC), Tim Kelly (CCSA), Bronwyn Gillanders (UoA), Fontella Koleff (PIRSA communications)

Invited attendees: Sean Reardon (Flinders Ports)

Apologies: Scott Ashby (PIRSA), Sean Sloan (PIRSA), Brenton Grear (DEWNR), Peter Copley (DEWNR), Peter Dolan (EPA), David Lake (SATC), Andrew Solomon (EPA)

DRAFT Agenda - Extraordinary Meeting

1. Port Bonython

Purpose: Flinders Ports to address mitigation strategies relating to Australian Giant cuttlefish in response to submissions submitted by PIRSA to the Environmental Impact Statement for the Port Bonython Bulk Export Facility at Point Lowly.

2. Other Business (WG members only)

- Consideration of Australian Geographic offer of funding (CCSA and SARDI)

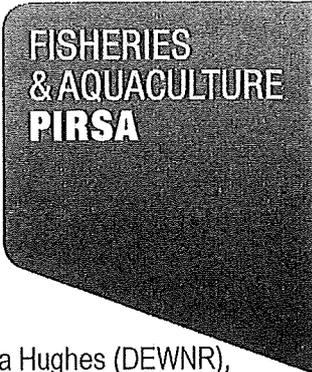
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MEETING

Friday 18 July 2014, 10:30 am – 12:00 pm
Conference Room, Level 17, 25 Grenfell Street, Adelaide



FISHERIES
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PIRSA

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Vera Hughes (DEWNR), Brenton Grear (DEWNR), Mike Steer (SARDI), Andrew Solomon (EPA), Peter Dolan (EPA), Sam Gaylard (EPA), Rob Thomas (DMITRE), Peter Short (DPTI), David Lake (SATC), Peter Peppin (WCC), Tim Kelly (CCSA), Bronwyn Gillanders (UoA), Fontella Koleff (PIRSA communications),

Apologies: Gavin Begg (SARDI)

DRAFT Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (13 February 2014) - Chair
3. Action items from previous meetings - Chair
4. Research updates
 - a. Point Lowly population surveys (SARDI)
 - b. Alternate site surveys (SARDI)
 - c. Artificial habitat project (SARDI)
 - d. SEWPaC and FRDC project (UoA)
 - e. Bioaccumulation analysis (EPA)
5. Update on Port Bonython Bulk Export Facility - PIRSA
6. Communication issues
 - a. Cuttlefish capers at Whyalla (school holiday program) - event - WWC
 - b. Underwater shootout (Whyalla 7-9 June 2014) - event - WCC
 - c. USG Environment Forum (5 June 2014) - presentation - SARDI
7. Other Business
 - a.
 - b.
8. Meeting close
9. Next meeting (to be confirmed)

Item	Actions from 13 February 2014	Responsibility	Target Date
1	Communications - Cuttlefish update PIRSA to update and circulate the cuttlefish update to members for comment.	PIRSA	Completed - sent Feb 2014
2	Research update - Artificial habitat project SARDI to seek permission from the appropriate authority to deploy artificial habitats.	SARDI	Completed (refer to notes)
3	Research update – Bioaccumulation of metals SARDI to follow up with FRDC on guidelines regarding reporting individual project results. EPA to contact Alison Turnbull (SARDI) regarding food safety comment for report.	SARDI EPA	Completed Completed
4	Research update – Research project timelines SARDI to develop a table indicating how each project is tracking against its timeline.	SARDI	Completed (refer to notes)
5	EPBC listing update CCSA to provide the letter of response from the Commonwealth on the application to nominate Giant Australian Cuttlefish.	CCSA	
6	Stock Enhancement Develop a concept paper outlining the above issues to be submitted to FRDC and discussed at the next working group meeting (June 2014).	PIRSA/SARDI	Completed - EOI to FRDC
7	Historical video footage at Point Lowly SARDI to discuss historical information at next meeting	SARDI	Completed (refer to notes)

Thursday 12 March 2015, 13:00 pm – 15:00 pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

**FISHERIES
& AQUACULTURE
PIRSA**

Giant Cuttlefish Working Group

Participants: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Sean Sloan (PIRSA), Vera Hughes (DEWNR), Brenton Grear (DEWNR), Mike Steer (SARDI), Andrew Solomon (EPA), Rob Thomas (DMITRE), Peter Short (DPTI), Phillip Stratton (DPTI), David Lake (SATC), Peter Peppin (WCC), Craig Wilkins (CCSA), Bronwyn Gillanders (UoA), Fontella Koleff (PIRSA communications), Jo Tsoukalas (PIRSA communications), Gavin Begg (SARDI).

Apologies: Sam Gaylard (EPA), Peter Dolan (EPA),

Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (18 July 2014) - Chair
3. Action items from previous meetings – Chair
4. Presentation by BHP on the results of the ROV Survey - BHP
5. Research updates
 - a. Surveying, Searching and Promoting Cuttlefish Spawning Activity in Northern Spencer Gulf
 - i. Point Lowly population surveys (SARDI)
 - ii. Alternate site surveys (SARDI)
 - iii. Artificial habitat project (SARDI)
 - iv. Quantification of by-catch (SARDI)
 - v. Bioaccumulation analysis (SARDI)
 - b. FRDC project (UoA)
6. Communication Update
 - a. Extension of the Upper Spencer Gulf Cuttlefish closure – Sean
 - b. Next update of Cuttlefish newsletter – Fontella / Jo
7. Other Business
 - a. Upcoming Cuttlefish surveys and involvement of BHP Billiton.
8. Meeting close
9. Next meeting (to be confirmed)

growing
sustainable
regions

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Item	Actions from 18 July 2014	Responsibility	Target Date
1	<p>Communications - Cuttlefish update and media release</p> <p>PIRSA to prepare a media release and a cuttlefish update reflecting the 2014 data and progress against research projects.</p>	PIRSA	Completed – 25 July 2014
2	<p>Research update – Citizen science group</p> <p>The Chair of GCWG to write to the citizen science group thanking them for their contribution and seeking further involvement in future.</p>	SARDI	Completed
3	<p>2015 spawning season – citizen science participation</p> <p>SARDI to discuss with citizen science groups the potential for participating in future cuttlefish population surveys in a greater capacity.</p>	SARDI	Incomplete
4	<p>Research update – Bioaccumulation of metals</p> <p>EPA to seek advice on eco-testing eggs and juveniles (specifically the feasibility, necessity and cost).</p>	EPA	Completed – EPA sent a briefing via email to GCWG on 30 September 2014

Thursday 12 March 2015 13:00 – 15:00 pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Minutes and actions

Attendees:

- Scott Ashby (Chair)
- Sean Sloan (PIRSA)
- Gavin Begg (SARDI)
- Michael Steer (SARDI)
- Bronwyn Gillanders (UoA)
- Phillip Stratton (DPTI)
- Vera Hughes (DEWNR)
- Andrew Solomon (EPA)
- David Lake (SATC)
- Peter Peppin (Whyalla City Council)
- Craig Wilkins (Conservation)
- Jo Tsoukalas (PIRSA - communications)
- Lucy Stark - EO (PIRSA)

Apologies:

- Mehdi Doroudi (PIRSA)
- Peter Copley (DEWNR)
- Peter Dolan (EPA)
- Sam Gaylard (EPA)
- Brenton Grear (DEWNR)
- Rob Thomas (DSD)

1. Welcome and apologies

2. Previous minutes

Draft minutes from the previous meeting held 18 July 2014 were accepted as an accurate record of the meeting.

3. Previous actions

1. Communications - Cuttlefish update

Completed. Update was released in July 2014.

2. Research update – Citizen Science Group

Completed.

3. 2015 Spawning Season – Citizen Science Group Participation

Completed. An invitation has been extended to the Citizen Science group to participate in future cuttlefish population surveys where deemed appropriate.

4. Research update – Bioaccumulation of Metals

Completed. Email sent to working group members via email on 30 September 2014.

Discussion items

4. Presentation by BHP on the results of the ROV Survey

Representatives from BHP provided a presentation on the results of the Remotely Operated Vehicle survey for members to note.

5. Research update

a) Surveying, Searching and Promoting Cuttlefish Spawning Activity in Northern Spencer Gulf

Mike Steer (SARDI) provided a presentation of the results from several survey and research activities. Members will be provided with a copy of the final document when it has been approved by FRDC.

i. Point Lowly cuttlefish population surveys

The Giant Australian Cuttlefish spawning population increased by 325% (abundance) and 589% (biomass) in 2014 compared with the 2013 estimates. This increase occurred after a steady period of decline and coupled with the return of larger animals, indicated that 2013/2014 was a relatively favourable year for Giant Australian Cuttlefish reproduction, growth and survival. An investigation of the daily average temperature over an estimated 120 day embryo development period, has, so far, provided the strongest signal for explaining the recent inter-annual variation in both abundance and biomass of the Point Lowly spawning population. Although important, the temperature regime during the early life history is not the exclusive determinate of favourable conditions. Other factors such as predatory/prey abundance and water quality are likely to contribute in shaping the population.

ii. Alternate Site Surveys

An exploratory survey found no evidence of Giant Australian Cuttlefish spawning activity outside of the known spawning grounds. Considerable effort was made to target the most likely areas within northern Spencer Gulf that could support spawning Giant Australian Cuttlefish and at a time when they were expected to be in peak reproductive condition (June). Although no Giant Australian Cuttlefish were observed outside of the Point Lowly spawning grounds, this survey clarified the extent of available spawning habitat throughout northern Spencer Gulf. In particular, it reaffirmed that the continuous, shallow, boulderous reef that fringes Point Lowly is not widespread. This was exemplified by the difficulties encountered in this study to find similar habitats within the region.

iii. Artificial Habitat Project

There is currently no evidence to suggest that habitat loss has contributed to the decline in Giant Australian Cuttlefish abundance. Extensive habitat surveys carried out by SARDI over the past three spawning seasons has provided no clear indication that the spawning habitat has been structurally compromised. The deployment of artificial spawning habitat is unlikely to significantly promote the recovery of the population to the levels that were observed in the late 1990s. The effectiveness and relative ecological value of the artificial dens used in this study in mitigating habitat loss is unknown as none of the structures supported spawning animals during the 2014 spawning season. They have, however, been left in situ and will be assessed again throughout next year's spawning period.

iv. Quantification of By-Catch

Estimates of total annual cuttlefish (all species) catch from the Blue Crab Fishery were negligible, with fishers recording a maximum catch of 2,483 cuttlefish in 2004 at a rate of approximately 0.02 per pot lift. Estimated catches from the prawn fishery were greater (up to 73,176 in May 2014), however, Giant Australian Cuttlefish rarely constituted more than 20% of the total cuttlefish by-catch. The prawn fishery was estimated to harvest up to 9.6% (2013) of the spawning population. The estimated harvest fraction dropped to 6.5% in 2014. Given the 2014 spawning population was 325% larger than the previous year, the inverse trend in the prawn fishery's estimated incidental annual harvest fraction suggested that the recent dynamics of the trawl fleet has not adversely affected the Giant Australian Cuttlefish population in Northern Spencer Gulf.

v. Bioaccumulation Analysis

A significant regional difference in metal burden was detected in Giant Australian Cuttlefish, with the relative concentration of many metals (i.e. Cd, Zn, Pb, Au, Cu) being more pronounced in animals collected from the Point Lowly spawning grounds compared to those collected further south (Wallaroo). This finding was not surprising given the long history of metal contamination in Northern Spencer Gulf (Gaylard 2014). Despite this, however, the observed concentrations were comparable to other cuttlefish species (European Cuttlefish, *Sepia officinalis*), suggesting that they were not likely to exceed the physiological tolerance of cephalopods. Cephalopods typically detoxify metals through the digestive gland, and this study indeed confirmed this organ constituted >90% of the animal's total metal burden, whereas the metal concentration in the mantle (edible portion) was well within food safety standards. The limits of physical tolerance of the Giant Australian Cuttlefish are not known, but given no clear association was found between the recent decline in the population and reported levels of anthropogenic discharges of heavy metals from 1994 to 2012 (Steer et al. 2013), they do not appear to be currently adversely affected by metal contamination within Northern Spencer Gulf.

b) FRDC Project

Bronwyn Gillanders provided an update on the FRDC Cuttlefish report which covers three key objectives; movement throughout the life history, systematic status of Giant Australian Cuttlefish and development of population viability model for cuttlefish in Northern Spencer Gulf. The report has been delayed due to a delay in processing molecular samples by an external provider.

6. Communication Update

a) Extension of the Upper Spencer Gulf Cuttlefish Closure

The temporary closure to all fishing for Cuttlefish in the Northern Spencer Gulf has been extended until 15 February 2016.

b) Cuttlefish update and media release

The next newsletter will include the survey results, the extension of the fishing closure, and involvement of the Citizen Science group, as well as reporting the continuation of the working group. The release of the newsletter is dependent on FRDC's approval of the survey results.

7. Other business

a) Upcoming Cuttlefish Surveys and involvement of BHP Billiton

The Chair noted that the collaboration between all agencies involved was proving successful, and that this ongoing commitment, including for funding of surveys, was critical. The Chair indicated he would be in contact with all relevant CE's to seek funding for future surveys.

Meeting concluded: 2.30pm

Next meeting: August – date to be advised.

Action List

Item	Actions from 12 March 2015	Responsibility	Target Date
1	Communications - Cuttlefish update and media release PIRSA to prepare a media release and a cuttlefish update reflecting the 2014 data and progress against research projects.	PIRSA	
2	Research update – FRDC Update on FRDC Project and provide an assessment of cumulative impacts of emerging industries.	UoA	Next Meeting

Thursday 17 September 2015 13:00 – 14:30 pm
Conference Room, Level 17, 25 Grenfell Street, Adelaide

MEETING MINUTES

Giant Cuttlefish Working Group

DRAFT Minutes and actions

Attendees: Scott Ashby (Chair)
Sean Sloan (PIRSA)
Professor Gavin Begg (SARDI)
Dr Michael Steer (SARDI)
Phillip Stratton (DPTI)
Peter Peppin (Whyalla City Council)
Craig Wilkins (Conservation)
Brenton Grear (DEWNR)
Jo Tsoukalas (PIRSA - communications)
Lucy Stark - EO (PIRSA)

Apologies: Professor Mehdi Doroudi (PIRSA)
Professor Bronwyn Gillanders (UoA)
Peter Copley (DEWNR)
Peter Dolan (EPA)
Sam Gaylard (EPA)
Rob Thomas (DSD)
Vera Hughes (DEWNR)
Andrew Solomon (EPA)
David Lake (SATC)

1. Welcome and apologies

2. Previous minutes

Draft minutes from the previous meeting held on 12 March 2015 were accepted as an accurate record of the meeting.

1. Communications - Cuttlefish update

Completed. A media release and Cuttlefish Update were released in June 2015.

2. Research update – FRDC

Completed. An update was provided to the group at this meeting.

Discussion items

4. Research update

a) Point Lowly cuttlefish population surveys

SARDI diver-based surveys were successfully undertaken in May, June and July 2015. Cuttlefish abundance peaked at 130,771 animals in June 2015; representing a 128% increase in comparison to 2014 and the highest estimate since 2001. The estimated biomass of spawning Cuttlefish was 88.1 t; 87.1% higher than in 2014. This was the first time on

record where the population has undergone two consecutive annual increases, indicating that 2015 was another favourable year for Cuttlefish recruitment.

Whyalla's Cuttlefish Citizen Scientist Group, which consists of 17 local divers, undertook a series of ad hoc surveys throughout the spawning season to complement SARDI's formal monitoring program. Poor weather and the availability of volunteers often prevented the Citizen Scientist Group from undertaking regular surveys. Estimates of Cuttlefish density by the Citizen Science Group were up to 67% lower than those obtained by SARDI.

Artificial structures were placed throughout Northern Spencer Gulf in 2013 and left in situ. Structures within the Point Lowly spawning area were assessed in 2015 and found to support large quantities of eggs. The remaining structures outside of the spawning area were assessed by South Australia's Conservation Council and Reef Watch Volunteers in August 2015, the results are yet to be received.

b) Water quality sampling

EPA have analysed the water samples from the 2015 survey. There was little variation in water quality among the sites and ambient water quality was observed to be typical of the area.

c) FRDC project

The most notable outcome from the project to date is the determination of the genetic stock structure of the northern Spencer Gulf population as a separate 'species' rather than a separate 'population'. The group noted the documents provided by Professor Gillanders and agreed that the proposed modelling scenarios were suitable and that the 'temperature variation' and 'catastrophes' scenarios should be tested as a priority. If time/resources allows, the other scenarios should also be tested, particularly the desalination scenario.

5. Communication update

A media release will be issued shortly, focusing on the 2015 survey results. Comments will be sought from the Conservation Council for the media release. The next Cuttlefish Update newsletter will be released after the Cuttlefish symposium that is proposed to take place at SARDI towards the end of the year.

6. Other business

a) Funding for 2016 survey

The group agreed to continue the collaborative cost sharing approach between the departments and that funding will be requested (from DSD, DEWNR and PIRSA, with water quality sampling undertaken by EPA) to fund a further two years of the survey.

The group agreed to continue the temporary closure to all fishing for Cuttlefish in the Northern Spencer Gulf until 15 February 2017.

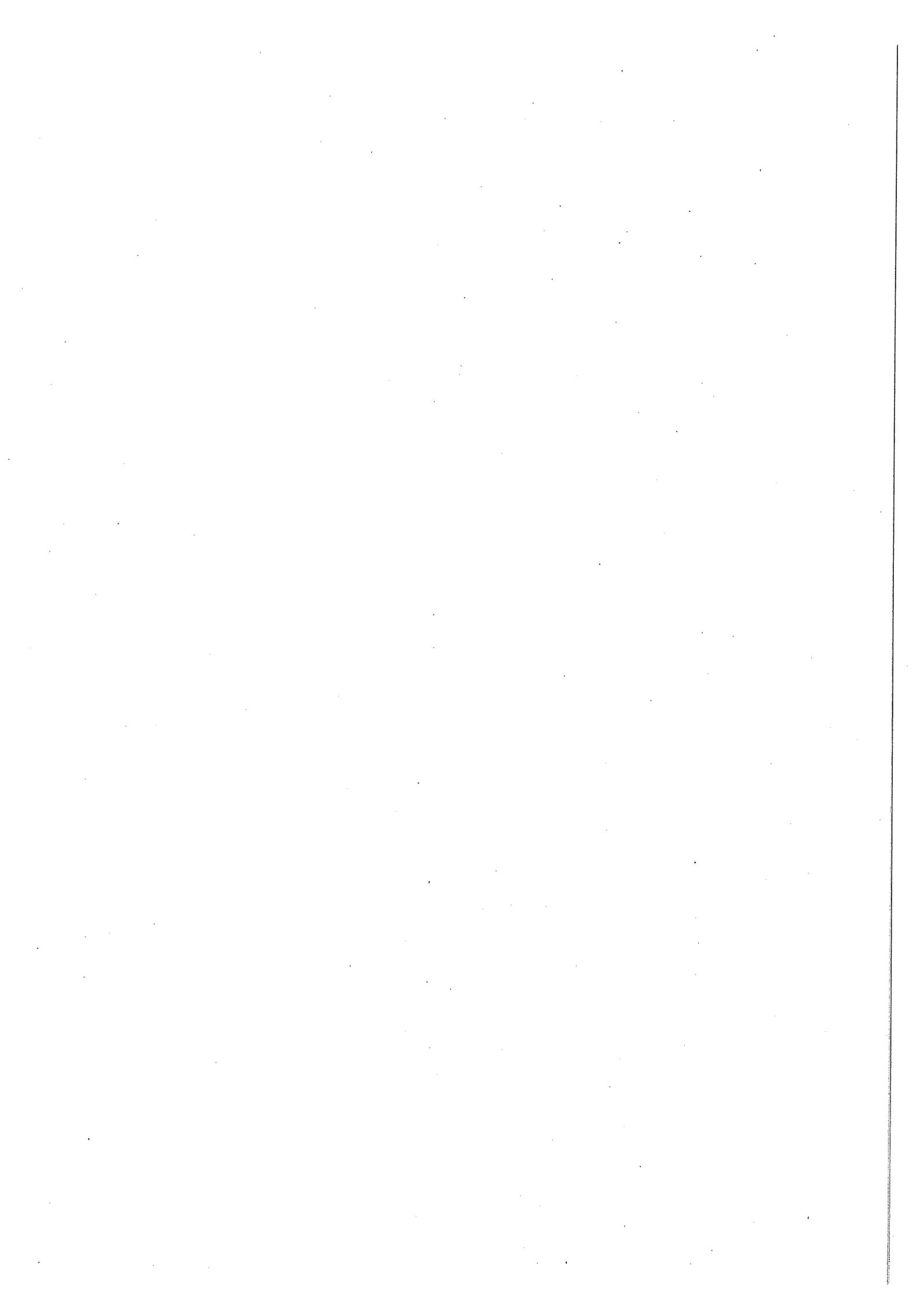
Meeting concluded: 1:45pm

Next meeting: A month prior to the beginning of the 2016 survey – date to be advised.

Action List

Item	Actions from 17 September 2015	Responsibility	Target Date
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5	Communications - Cuttlefish update and media release PIRSA to prepare a media release and a cuttlefish update reflecting the 2015 data and progress against research projects.	PIRSA	
6a	Funding for 2016 Survey Funding to be requested from DSD and DEWNR to fund a further two years of the survey	PIRSA	



Thursday 17 September 2015 13:00 – 14:30 pm

Conference Room, Level 17, 25 Grenfell Street, Adelaide

MEETINGMINUTES

Giant Cuttlefish Working Group

DRAFT Minutes and actions

Attendees: Scott Ashby (Chair)
Sean Sloan (PIRSA)
Professor Gavin Begg (SARDI)
Dr Michael Steer (SARDI)
Phillip Stratton (DPTI)
Peter Peppin (Whyalla City Council)
Craig Wilkins (Conservation)
Brenton Grear (DEWNR)
Jo Tsoukalas (PIRSA - communications)
Lucy Stark - EO (PIRSA)

Apologies: Professor Mehdi Doroudi (PIRSA)
Professor Bronwyn Gillanders (UoA)
Peter Copley (DEWNR)
Peter Dolan (EPA)
Sam Gaylard (EPA)
Rob Thomas (DSD)
Vera Hughes (DEWNR)
Andrew Solomon (EPA)
David Lake (SATC)

1. Welcome and apologies

2. Previous minutes

Draft minutes from the previous meeting held on 12 March 2015 were accepted as an accurate record of the meeting.

1. Communications - Cuttlefish update

Completed. A media release and Cuttlefish Update were released in June 2015.

2. Research update – FRDC

Completed. An update was provided to the group at this meeting.

Discussion items

4. Research update

a) Point Lowly cuttlefish population surveys

SARDI diver-based surveys were successfully undertaken in May, June and July 2015. Cuttlefish abundance peaked at 130,771 animals in June 2015; representing a 128% increase in comparison to 2014 and the highest estimate since 2001. The estimated biomass of spawning Cuttlefish was 88.1 t; 87.1% higher than in 2014. This was the first time on

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EPA have analysed the water samples from the 2015 survey. There was little variation in water quality among the sites and ambient water quality was observed to be typical of the area.

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The most notable outcome from the project to date is the determination of the genetic stock structure of the northern Spencer Gulf population as a separate 'species' rather than a separate 'population'. The group noted the documents provided by Professor Gillanders and agreed that the proposed modelling scenarios were suitable and that the 'temperature variation' and 'catastrophes' scenarios should be tested as a priority. If time/resources allows, the other scenarios should also be tested, particularly the desalination scenario.

5. Communication update

A media release will be issued shortly, focusing on the 2015 survey results. Comments will be sought from the Conservation Council for the media release. The next Cuttlefish Update newsletter will be released after the Cuttlefish symposium that is proposed to take place at SARDI towards the end of the year.

6. Other business

a) Funding for 2016 survey

The group agreed to continue the collaborative cost sharing approach between the departments and that funding will be requested (from DSD, DEWNR and PIRSA, with water quality sampling undertaken by EPA) to fund a further two years of the survey.

The group agreed to continue the temporary closure to all fishing for Cuttlefish in the Northern Spencer Gulf until 15 February 2017.

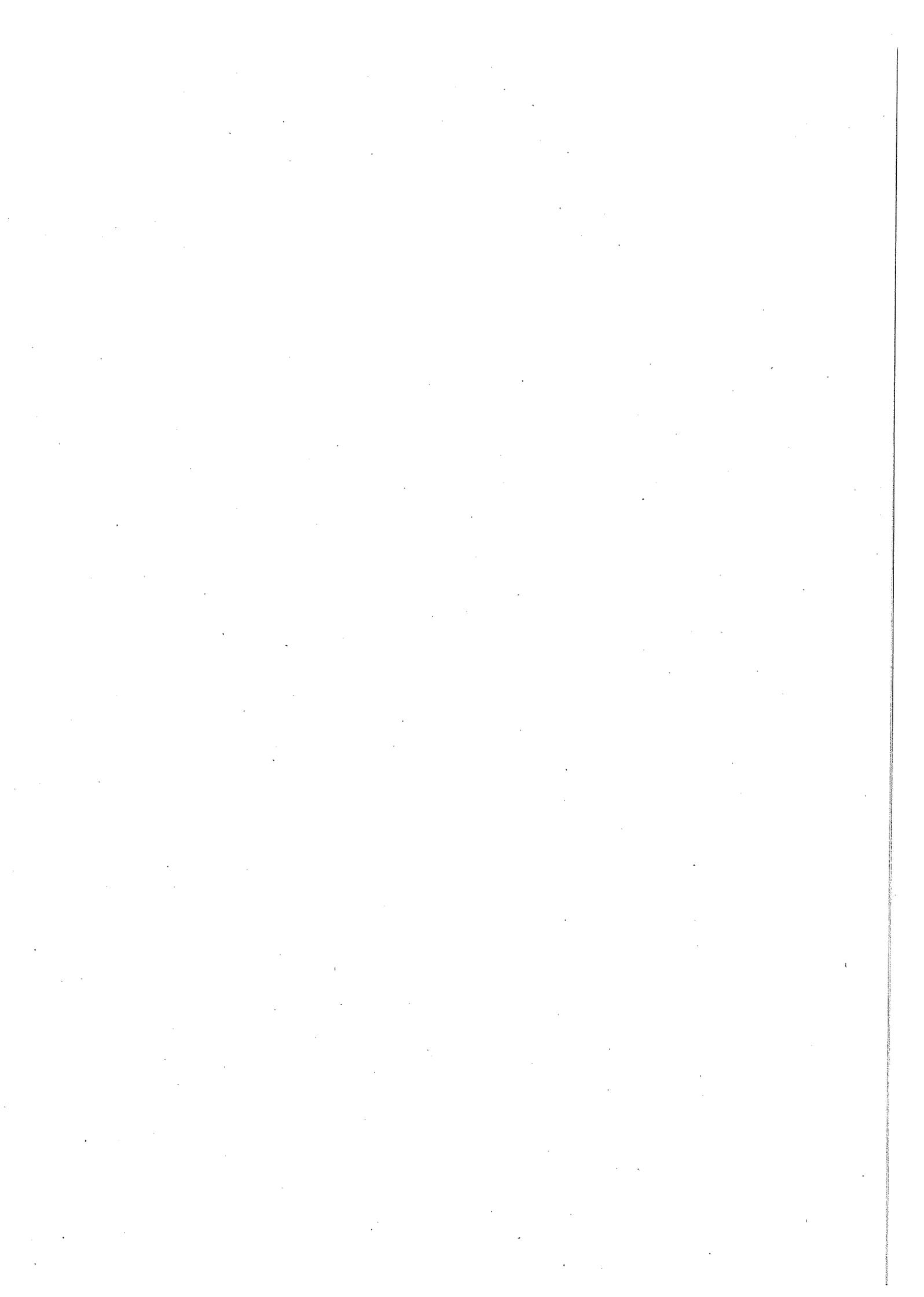
Meeting concluded: 1:45pm

Next meeting: A month prior to the beginning of the 2016 survey – date to be advised.

Action List

Item	Actions from 17 September 2015	Responsibility	Target Date
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5	<p>Communications - Cuttlefish update and media release</p> <p>PIRSA to prepare a media release and a cuttlefish update reflecting the 2015 data and progress against research projects.</p>	PIRSA	
6a	<p>Funding for 2016 Survey</p> <p>Funding to be requested from DSD and DEWNR to fund a further two years of the survey</p>	PIRSA	



Thursday 1 September 2016, 2:00 pm – 3:00 pm
Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide



PRIMARY
INDUSTRIES
& REGIONS SA
PIRSA

Giant Cuttlefish Working Group

Participants: Sean Sloan (PIRSA), Vera Hughes (DEWNR), Dr Mike Steer (SARDI), Dr Craig Noell (SARDI) Rob Thomas (DMITRE), Craig Wilkins (CCSA), Jo Tsoukalas (PIRSA Communications), Sam Gaylard (EPA), David Lake (SATC)

Apologies: Scott Ashby (Chair), Mehdi Doroudi (PIRSA), Vicki Linton for Matt Ward (DEWNR), Peter Dolan (EPA), Gavin Begg (SARDI), Phillip Stratton (DPTI), Bronwyn Gillanders (UoA), Peter Peppin (WCC),

Agenda

1. Welcome and apologies - Chair
2. Confirmation of minutes from previous meeting (17 September 2015) - Chair
3. Action items from previous meetings – Chair
4. Research updates
 - a. Point Lowly population surveys (SARDI)
 - b. Water quality sampling (EPA)
 - c. FRDC project (SARDI)
5. Communication Update
6. Other Business
7. Meeting close
8. Next meeting

Item	Actions from 17 September 2015	Responsibility	Target Date
5	Communications - Cuttlefish update and media release PIRSA to prepare a media release and a cuttlefish update reflecting the 2015 data and progress against research projects.	PIRSA	
6a	Funding for 2016 Survey Funding to be requested from DSD and DEWNR to fund a further two years of the survey	PIRSA	

Thursday 1 September 2016 2pm to 3pm

Meeting Room 1 Level 14, 25 Grenfell Street, Adelaide

Giant Australian Cuttlefish Working Group

Minutes and Actions

Attendees: Sean Sloan (Chair)
 Dr Michael Steer (SARDI)
 Craig Wilkins (Conservation SA)
 Jo Tsoukalas (PIRSA - communications)
 Lucy Stark - EO (PIRSA)
 Sam Gaylard (EPA)
 Peter Copley (DEWNR)
 David Lake (SATC)
 Vera Hughes (DEWNR)
 Alice Fistr (SARDI)

Apologies: Scott Ashby (PIRSA)
 Professor Bronwyn Gillanders (UoA)
 Peter Dolan (EPA)
 Rob Thomas (DSD)
 Phillip Stratton (DPTI)
 Professor Gavin Begg (SARDI)

Presenter: Dr Craig Noell

1. Welcome and apologies

Mr Sean Sloan welcomed all present and noted the apologies. It was noted that Mr Sloan will take over as Chair of the working group.

PIRSA was notified by the Whyalla City Council that Mr Peter Peppin has resigned from Council and at this time Council will not be replacing him on the Working Group.

2. Previous minutes

Draft minutes from the previous meeting held on 17 September 2015 were accepted as an accurate record of the meeting.

3. Action items from previous meeting

1. Communications - Cuttlefish update and media release

Completed. A media release was issued in September 2015 regarding the 2015 survey results.

2. Funding for 2016 Survey

Completed. DSD indicated that they would no longer contribute funding towards the survey. PIRSA and DEWNR have agreed to fund the Giant Cuttlefish survey for 2016 and 2017.

Discussion items

4. Research update

a) Point Lowly cuttlefish population surveys

Dr Mike Steer from SARDI provided an update to members.

The overall estimates of Giant Australian Cuttlefish abundance of the spawning population in 2016 peaked in June at 177,091 individuals.

Annual peak estimates of Giant Australian Cuttlefish abundance have increased over three consecutive years increasing from a record low of 13,492 individuals in 2013 to 177,091 individuals in 2016. The 2016 Cuttlefish spawning aggregation was similar in abundance to the 2001 estimate and 3% less than the peak estimate of 182,585 animals in 1999.

The increase in biomass was bolstered by a return of relatively large animals. The average size of females was the largest recorded since 2010, and males continue to dominate the spawning population by approximately 4:1.

b) Water quality sampling

EPA provided an update noting they haven't received the 2016 results from the lab yet but expect little variation in water quality among the sites and expect ambient water quality will continue to be typical of the area.

c) FRDC project

The Working Group noted the presentation provided by Dr Craig Noell from SARDI titled '*Refining a Nordmøre-grid for an Australian prawn-trawl fishery*' a report on this project is due to be finalised in early 2017.

The '*Giant Australian Cuttlefish in South Australian waters*' FRDC project lead by Professor Bronwyn Gillanders has now been finalised and published. The most notable outcome from the project is the determination that the northern Spencer Gulf population is a separate 'species' rather than a separate 'population'. The project found that an increase in levels of salinity would result in a rapid decline of the population and that if the area were to be opened for fishing this would also result in a decline.

5. Communication update

A media release was issued on 17 August 2016 regarding the latest results. The web content on the PIRSA website will be updated and distributed to members of the Working Group to ensure consistent messaging and to assist in managing messaging regarding potential future population fluctuations.

6. Other business

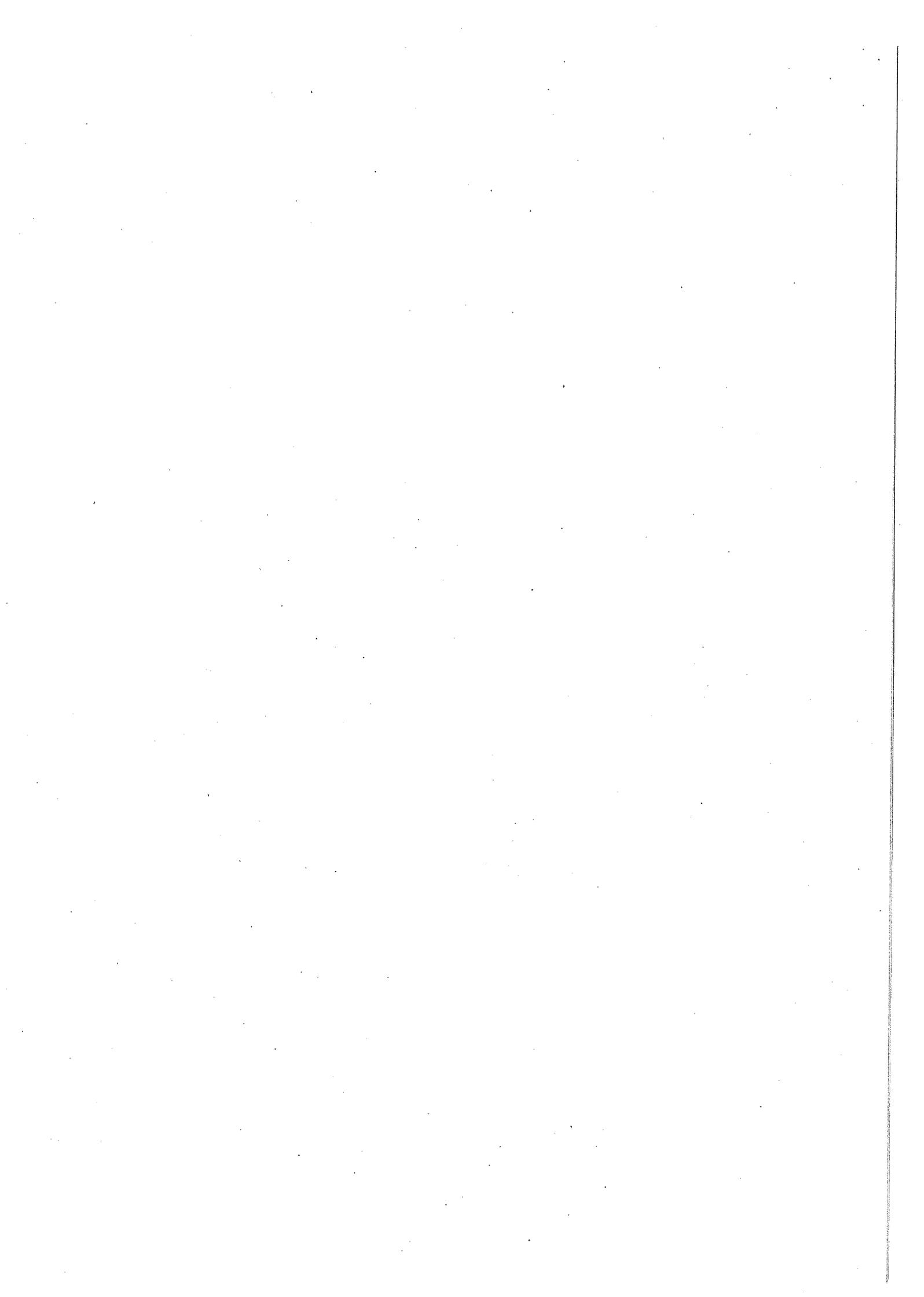
Meeting concluded: 2:45pm

Next meeting: September 2017

Action List

Item	Actions from 1 September 2016	Responsibility	Target Date
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4a	Reef Watch feedback Mr Craig Wilkins (CCSA) to request feedback from Reef Watch regarding observations made at the artificial spawning sites	Craig Wilkins	ASAP
5	Communications – PIRSA Web content PIRSA Cuttlefish web content to be updated and distributed to the Working Group.	PIRSA	ASAP
5	Communications Media release and 'Out of the Blue' segment to be distributed to the Working Group	PIRSA	Completed



Thursday 21 September 2017, 1:00 pm – 2:30 pm

Meeting Room 1, Level 14, 25 Grenfell Street, Adelaide
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Giant Cuttlefish Working Group

Participants: Sean Sloan (PIRSA), Jon Presser (PIRSA), Vera Hughes (DEWNR), Dr Mike Steer (SARDI), Craig Wilkins (CCSA), Sam Gaylard (EPA), Peter Dolan (EPA), Phillip Stratton (DPTI), Bronwyn Gillanders (UoA), Andrew Solomon (EPA), Tina Smith (PIRSA)

Apologies: Peter Copley (DEWNR), Gavin Begg (SARDI), David Lake (SATC), Emily Holyoak (PIRSA Communications), Rob Thomas (DMITRE),

Agenda

1. Welcome and apologies - Chair
2. Noting of minutes from previous meeting (1 September 2016) - Chair
3. Action items from previous meetings – Chair
4. Presentation on Population Estimate 2017 – Dr Mike Steer
5. Future Management Arrangements
6. Other Business
7. Meeting close
8. Next meeting

Thursday 21 September 2017 1.00pm to 2.30 pm

Meeting Room 1 Level 14, 25 Grenfell Street, Adelaide

MEETINGMINUTES

Giant Australian Cuttlefish Working Group

Minutes and Actions

Attendees: Sean Sloan (Chair)
Craig Wilkins (Conservation SA)
Tina Smith - EO (PIRSA)
Andrew Solomon (EPA)
Vera Hughes (DEWNR)
Jon Presser (PIRSA)

Apologies: Professor Bronwyn Gillanders (UoA)
Peter Dolan (EPA)
Rob Thomas (DPC)
Phillip Stratton (DPTI)
Professor Gavin Begg (SARDI)
Sam Gaylard (EPA)
Peter Copley (DEWNR)
David Lake (SATC)
Emily Holyoak (PIRSA Communications)

Presenter: Dr Michael Steer (SARDI)

1. Welcome and apologies

Mr Sean Sloan welcomed all present and noted the apologies. It was noted that Peter Dolan will be replaced by Keith Baldry for future meetings due to a change in roles at EPA.

2. Previous minutes

It was noted the Draft minutes from the previous meeting held on 1 September 2016 were accepted out of session as an accurate record of the meeting and all actions were completed.

3. Action items from previous meeting

Item	Actions from 1 September 2016	Responsibility	Target Date
4a	Reef Watch feedback Mr Craig Wilkins (CCSA) to request feedback from Reef Watch regarding observations made at the artificial spawning sites	Craig Wilkins	Completed

5	Communications – PIRSA Web content PIRSA Cuttlefish web content to be updated and distributed to the Working Group.	PIRSA	Completed
5	Communications Media release and 'Out of the Blue' segment to be distributed to the Working Group	PIRSA	Completed

4. Presentation

A presentation was given by Dr Mike Steer from SARDI on the Point Lowly cuttlefish population Surveys.

The overall estimates of Giant Australian Cuttlefish abundance of the spawning population in 2017 peaked in June at 127,992 individuals, which was 44% more than the May estimate and subsequently declined by 68% to 39,525 in July.

Annual peak estimates of Giant Australian Cuttlefish abundance have increased over four consecutive years increasing from a record low of 13,492 individuals in 2013 to 177,091 individuals in 2016, representing a 1,213% increase at a rate of approximately 56,425 cuttlefish per year. This declined by 29% to 124,992 cuttlefish in 2017. The 2017 Cuttlefish spawning aggregation was similar in abundance to the 2015 estimate and 32% less than the peak estimate of 182,585 animals in 1999.

Estimated biomass of Cuttlefish conformed to a similar trend, increasing from 6.8 t in 2013 to 165 t in 2016, a 2,317% increase. This declined by 49% in 2017 to 84 t. This decrease was exaggerated by the occurrence of smaller than average size animals. The average size of females was 154.04 mm ML (Mantle Length) in 2017, 12.6% smaller than the long-term average of 179.45 mm and 24% smaller than the largest average size of 201.8 mm recorded in 2000. Average male size in 2017 was 189.7 mm ML, 5.6% smaller than the long-term average of 189.7 mm (Figure 3). Males continue to dominate the spawning population by approximately 5.5:1. The composition of the 2017 spawning population was similar to that observed in 2015.

The committee noted the current co-funding arrangement shared between PIRSA, DPTI, and DEWNR for the annual surveys has ceased.

The committee agreed consideration should be given to the need for future monitoring of cuttlefish in the Point Lowly area. SARDI advised as the cuttlefish were consistently most abundant in June, the survey method could be shortened to the one survey in this month. It was agreed for SARDI to develop a Service Level Agreement to undertake a 2-day survey in June 2018 and submit this to PIRSA for consideration for co-funding by PIRSA and DEWNR.

It was suggested that in the future, alternative sources of funding could be sought. Members suggested approaching NRM boards, District Council of Whyalla and the new owners of the Whyalla Steelworks.

5. Future Management Arrangements

The Committee noted that while the abundance of cuttlefish remains at high levels, it appears to be vulnerable in fishing pressures and environmental factors. It was agreed to maintain the broad closure and continue the current management for a further 12 months to 15 February 2019, and to trial to modified survey in 2018.

6. Other Business

N/A

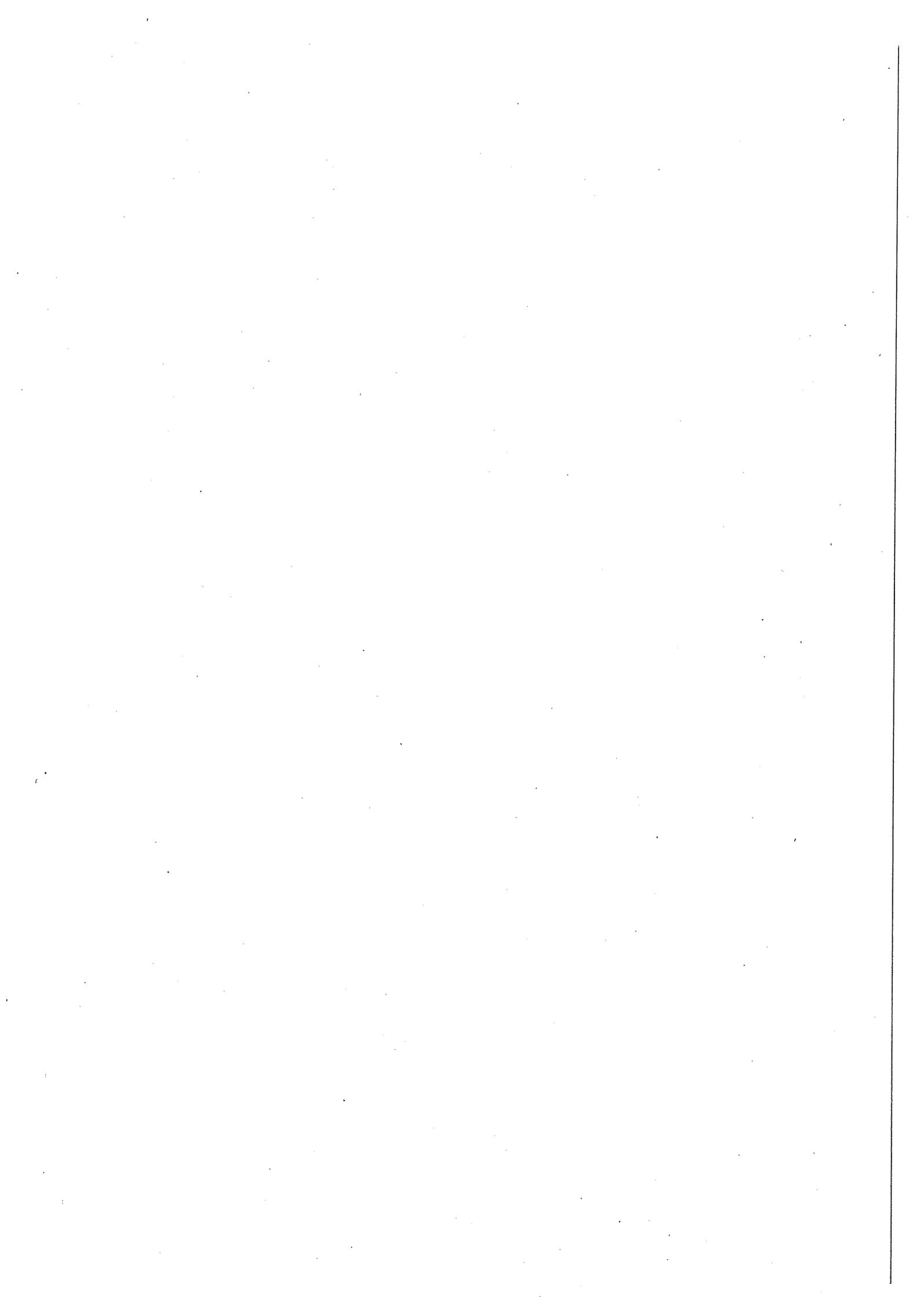
7. Meeting concluded: 2:45pm

8. Next meeting:

September 2018 unless the need arises for an earlier meeting.

Action List

Item	Actions from 21 September 2017	Responsibility	Target Date
	Dr Mike Steer to prepare an SLA for a 2-day survey in June 2018.	Dr Mike Steer	ASAP
	PIRSA to extend the current closure for North of Wallaroo for a further 12 months to February 2019.	PIRSA	ASAP
	SARDI to publish a paper on these results of the survey in a suitable journal.	Dr Mike Steer	ASAP
	Collectively, to engage others in the partnership and funding support for the future monitoring of cuttlefish, e.g Eyre Peninsula NRM Board, District Council of Whyalla, GFG Australia (Whyalla Steelworks)	Working Group	
	PIRSA to update public information on its web site.	PIRSA	ASAP



Friday 7 September 2018, 11:00 am – 12.30 pm
Meeting Room 1 & 2, Level 14, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Participants:

Sean Sloan (PIRSA), Jon Presser (PIRSA), Tina Smith (PIRSA), Mike Steer (SARDI), Cathy Parker (PIRSA Communications), Gavin Begg (SARDI), James Brook (CCSA) proxy for Craig Wilkins (CCSA), Sam Gaylard (EPA), Bronwyn Gillanders (UoA), Shelley Paull (DEW) proxy for Matthew Ward, Andrew Larwood (DPTI) proxy for Phillip Stratton, Andrew Solomon (EPA),

Apologies: Joanne Davidson (SATC) Sarah Laurence (DEW), Rob Thomas (DPC), Phillip Stratton (DPTI), Peter Copley (DEW), Craig Wilkins (CCSA),

Skype: Hayden Zammit (SATC) proxy for Joanne Davidson, Shelley Paull (DEW)

Agenda

1. Welcome and apologies - Chair
2. Noting of minutes from previous meeting (21 September 2017) - Chair
3. Action items from previous meetings – Chair
4. Presentation on Population Estimate 2018 – Dr Mike Steer
5. Future Management Arrangements
6. Other Business
7. Meeting close
8. Next meeting

Friday 7 September 2018 1.30 - 2.30 pm

Meeting Room 1 Level 14, 25 Grenfell Street, Adelaide

MEETING MINUTES

Giant Australian Cuttlefish Working Group

Minutes and Actions

Attendees: Sean Sloan (Chair)
Tina Smith - EO (PIRSA)
Professor Gavin Begg (SARDI)
Dr Mike Steer (SARDI)
Cathy Parker (PIRSA Communications)
James Brook (CCSA) proxy for Craig Wilkins
Sam Gaylard (EPA)
Andrew Solomon (EPA)
Shelley Paull (DEW) proxy for Sarah Laurence & Matt Ward
Hayden Zammit (SATC) - proxy for Joanne Davidson
Jon Presser (PIRSA)
Professor Bronwyn Gillanders (UoA)
Andrew Larwood (DPTI) proxy for Phillip Stratton

Apologies: Keith Baldry (EPA)
Rob Thomas (DPC)
Matt Ward (DEW)
Phillip Stratton (DPTI)
Craig Wilkins (Conservation SA)
Peter Copley (DEW)
Joanne Davidson (SATC)
Sarah Laurence (DEW)

Presenter: Dr. Mike Steer (SARDI)

1. Welcome and apologies

Mr Sean Sloan welcomed all present and noted the apologies. The Working Group was advised of the following changes to members of the committee and introduced proxies that were in attendance. Vera Hughes has left (DEW) replaced by Sarah Laurence; David Lake has left (SATC) replaced by Joanne Davidson; Peter Dolan (EPA) replaced by Keith Baldry.

2. Previous minutes

It was noted the draft minutes from the previous meeting held on 21 September 2017 were accepted out of session as an accurate record of the meeting and all actions were completed.

3. Action items from previous meeting

Item	Actions from 21 September 2017	Responsibility	Target Date
	Dr Mike Steer to prepare an SLA for a 2-day survey in June 2018.	Dr Mike Steer	ASAP
	PIRSA to extend the current closure for North of Wallaroo for a further 12 months to February 2019.	PIRSA	ASAP
	SARDI to publish a paper on these results of the survey in a suitable journal.	Dr Mike Steer	ASAP
	Collectively, to engage others in the partnership and funding support for the future monitoring of cuttlefish, e.g. Eyre Peninsula NRM Board; District Council of Whyalla, GFG Australia (Whyalla Steelworks)	Working Group	
	PIRSA to update public information on its web site.	PIRSA	ASAP

4. Presentation

A presentation was given by Dr Mike Steer from SARDI on the 2018 Point Lowly Cuttlefish population survey.

The 2018 spawning population of Giant Australian Cuttlefish was estimated to consist of 150,408 cuttlefish, with a collective biomass of 89.9 t.

The Giant Australian Cuttlefish spawning population at Point Lowly has remained relatively strong since 2015, with annual estimates consistently exceeding 120,000 cuttlefish. The population, however, consisted of a high proportion of small animals, with the estimated size of both males and females measuring below their respective long-term averages. Greater emphasis is placed upon cuttlefish abundance rather than biomass as an indication of population strength. These last eleven consecutive survey years have illustrated the population's capacity to fluctuate over short time-scales, as emphasised by the rapid population increase from a record low of 13,492 individuals in 2013 to the most recent peak of 177,091 individuals in 2016. The contemporary estimates of cuttlefish abundance indicate that the population has sufficiently recovered from the historical low observed in 2013, and reminiscent of the high densities observed in the late 1990s and early 2000s.

5. Future Management Arrangements

The Working Group noted that while the abundance of cuttlefish remains at high levels, it was agreed, as a precautionary measure to maintain the broad spatial closure and continue the current temporary management arrangements for a further 12 months from 15 February 2019. It was noted that the regulated permanent fishing closure in the northern part of the Gulf remains unchanged.

6. Other Business

The Chair advised that PIRSA Fisheries & Aquaculture had received an enquiry from a member of the public who is proposing to have the Cuttlefish spawning grounds listed as a national heritage

area. The letter requested support from various stakeholders to gain approval for the proposal to the Federal Government. It was noted by the Working Group that several agencies have been contacted in regards to this matter. It was agreed that at this stage the Working Group note the proposal and that it was premature for any other action to be taken. It was noted that any response from government agencies would be conducted through the normal whole of government approach.

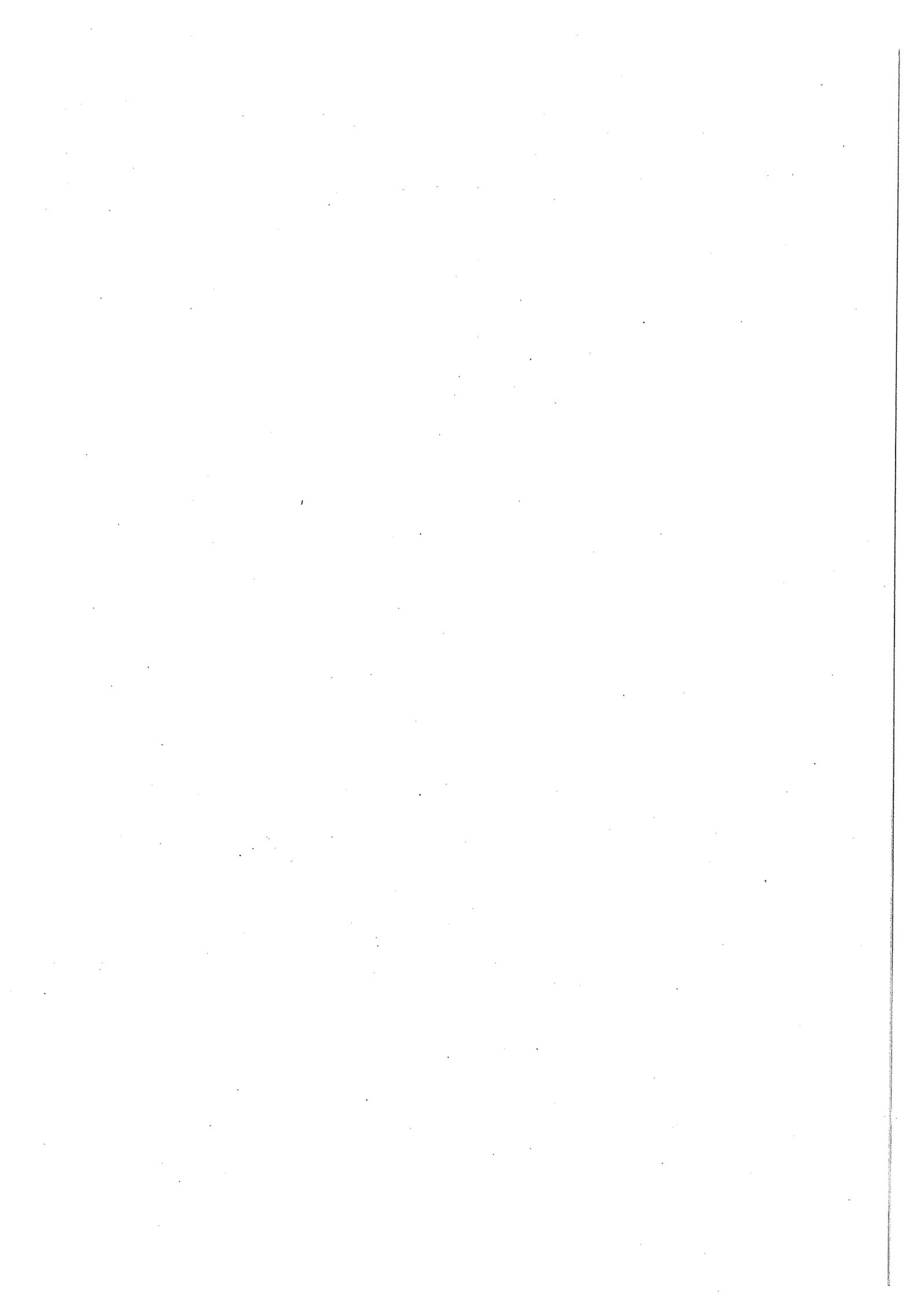
7. Meeting concluded: 2:30pm

8. Next meeting:

The Chair informed the Working Group that the agreed approach of having a single meeting each year to consider survey results will continue. September 2019 will be when the Working Group meets next unless the need arises for an earlier meeting.

Action List

Item	Actions from 7 September 2018	Responsibility	Target Date
1	Provide Shelley Paul with links to previous dive surveys	Mike Steer	
2	Funding for future survey. Consider potential partnerships with other NGO's and collaborate with Experiencing Marine Science (EMS) towards a citizen science approach & run workshops.	Shelley Paul/Mike Steer	
3	Provide a copy of the SARDI research report to CCSA which covered a range of potential risks to the cuttlefish population including nutrients from Aquaculture. To liaise with Mike Steer if any concerns.	Mike Steer	
4	Communications Draft a media release on the SARDI advice for 2018	Cathy Parker	
5	Communications Connect with the working group once the Minister has endorsed the approach.	Cathy Parker	
6	Communications Provide key information from the Cuttlefish population surveys to EPA Communications for the annual EPA Road Show in Whyalla.	Cathy Parker	
7	PIRSA to provide a briefing to the Minister on recommendation of a temporary closure for a further 12 months	Jon Presser	



Agenda

PIRSA

Monday 16 December 2019, 1:00pm – 3:00pm
PIRSA – Meeting Room 1, Level 14, 25 Grenfell Street Adelaide

Giant Cuttlefish Working Group

We would like to acknowledge this land that we meet on today as the traditional lands for the Kurna People and we respect their spiritual relationship with their country. We also acknowledge the Kurna people as the custodians of the greater Adelaide region and that their cultural and heritage beliefs are still as important to the living Kurna people today.

Participants: Gavin Begg (Chair), Keith Rowling, Jon Presser (PIRSA), Nathan Bicknell (MSF), Simon Bryars (DEW), Sam Gaylard (EPA), Jason Higham (DEW), Lisien Loan (DEW), Andrew Solomon (EPA), Michael Steer (SARDI), Philip Stratton (DPTI), Craig Wilkins (CCSA), Nathan Bicknell (MFA), Skye Barrett (Proxy for Graham Keegan), Greg Palmer (Proxy for Simon Clark)

Apologies: Keith Baldry (EPA), Joanne Davidson (SATC), Graham Keegan (MRFAC), Bronwyn Gillanders (UofA), Peter Appleford (SARDI), Simon Clark (SG&WCPFA),

	Agenda Item	Paper/Verbal	Officer
1.	Welcome and Apologies	Verbal	G Begg
2.	Minutes and Actions 2.1 Meeting Minutes and Action items (September 2018)	Papers	G Begg
3.	Presentation on Population Estimate 2019	Verbal	Dr M Steer
4.	Future Management Arrangements	Verbal	All
5.	New Business	Verbal	G Begg
6.	Other Business	Verbal	G Begg
7.	Meeting Close	Verbal	G Begg

Meeting Minutes

PIRSA

Monday 16 December 2019, 1:00pm to 3:00pm
Level 14, 25 Grenfell Street, Adelaide

Giant Cuttlefish Working Group

Attendees: Gavin Begg (Chair), Keith Rowling (PIRSA) Simon Bryars (DEW), Lisien Loan (DEW), Andrew Solomon (EPA), Michael Steer (SARDI), Craig Wilkins (CCSA)

Apologies: Keith Baldry (EPA), Joanne Davidson (SATC), Graham Keegan (MRFAC), Bronwyn Gillanders (UofA), Peter Appleford (SARDI), Simon Clark (SGWCPFA), Nathan Bicknell (MSF), Phillip Stratton (DPTI), Sam Gaylard (EPA), Jason Higham (DEW)

Guest James Brook (CCSA)

1. Welcome and Introduction

The Chair welcomed members and noted apologies.

2. Minutes and Actions

2.1 Minutes and actions

The minutes from the previous meeting held on 7 September 2018 were accepted as an accurate record of the meeting and all actions were completed.

Item	Actions from 7 September 2018	Responsibility	Target Date
1	Provide Shelley Paul with links to previous dive surveys	Mike Steer	Completed
2	Funding for future survey. Consider potential partnerships with other NGO's and collaborate with Experiencing Marine Science (EMS) towards a citizen science approach & run workshops.	Shelley Paul/Mike Steer	Completed

3	Provide a copy of the SARDI research report to CCSA which covered a range of potential risks to the cuttlefish population including nutrients from Aquaculture. To liaise with Mike Steer if any concerns.	Mike Steer	Completed
4	Communications Draft a media release on the SARDI advice for 2018	Cathy Parker	Completed
5	Communications Connect with the working group once the Minister has endorsed the approach.	Cathy Parker	Completed
6	Communications Provide key information from the Cuttlefish population surveys to EPA Communications for the annual EPA Road Show in Whyalla.	Cathy Parker	Completed
7	PIRSA to provide a briefing to the Minister on recommendation of a temporary closure for a further 12 months	Jon Presser	Completed
8	SARDI to publish a paper on the results of the survey in a suitable journal	Mike Steer	Not required, see minutes

3. Presentation

A presentation was given by Dr Mike Steer from SARDI on the 2019 Point Lowly Cuttlefish population estimate.

The 2019 spawning population of Giant Australian Cuttlefish is estimated to consist of 114,596 cuttlefish, with a collective biomass of 70.7 t.

The Giant Australian Cuttlefish spawning population at Point Lowly has remained relatively strong since 2015, with annual estimates consistently exceeding 110,000 cuttlefish. The population consists of a high proportion of small animals, with the estimated size of both males and females measuring below their respective long-term averages. This reduction in individual body size was reflected in the moderate biomass estimate of 70.7 t in 2019.

Greater emphasis is placed upon cuttlefish abundance (more accurately measured) rather than biomass as an indication of population strength. These last twelve consecutive survey years have illustrated the population's capacity to fluctuate over short time-scales, as emphasised by the rapid population increase from a record low of 13,492 individuals in 2013 to the most recent peak of 177,091 individuals in 2016. The contemporary estimates of cuttlefish abundance indicate that the population has sufficiently recovered from the historical low observed in 2013.

The Working Group discussed the relationship between temperature and individual body size and agreed there may be opportunities for a university intern, or student, to undertake a project to investigate any relationship.

The Working Group also discussed the need to publish a scientific paper on the results of the survey, and it was agreed that this would no longer be required, and would be left to SARDI to progress, as they determined. If a paper was developed it would be circulated to the Working Group for comment prior to being submitted for publication.

4. Future Management Arrangements

The Working Group noted that there is currently a permanent closure to the take of all cephalopods in False Bay that protects the spawning aggregation of cuttlefish, and a temporary closure in northern Spencer Gulf that prohibits the take of cuttlefish (*Sepia* spp.). This temporary closure was implemented as a result of the low abundance and biomass in 2013 and 2014 as a temporary management arrangement. PIRSA advised that, from a fisheries management perspective, this temporary management arrangement may no longer be required due to the recovery and maintenance of reasonable cuttlefish numbers in the aggregation, which meets the sustainability object in fisheries legislation.

The Chair sought comments from the Working Group members regarding their views on the need for the closure to be maintained.

Working Group members agreed that the permanent closure protected the spawning aggregation, but discussed a number of factors which some members believed should be considered in maintaining the temporary closure in northern Spencer Gulf. These included:

- Perceptions of the public and the need to balance the fishing and tourism needs.
- That any communication and messaging regarding the removal of the temporary closure is important, if it is decided to go that way.
- A number of members suggested community consultation may be required to meet some of the communication and perception needs above.
- Members noted the decline in abundance for 2019, but acknowledged the fact that cephalopod population numbers often vary on an annual basis due to the life history of the species.
- Due to the snapper closure there may be a shift in effort to other species (including cuttlefish) from commercial Marine Scalefish Fishery and charter fisheries; this should be recognised when making a decision on lifting the closure.
- If the closure is removed and yellowtail kingfish aquaculture commences at the same time then it may be difficult to interpret future changes in cuttlefish numbers and potential causes, e.g. if the population declines again over the next 3 years it may be difficult to correlate it with the timing of the removal of the closure vs the re-commencement of finfish aquaculture.
- PIRSA advised that, for the commercial and charter sector the amount of catch and effort can be monitored on a monthly basis, due to the catch and effort returns they are required to provide.

The Chair summarised that PIRSA will be providing advice to the Minister re. the temporary management arrangements and the recovery of the stock, ongoing sustainability and the fact the spawning aggregation is protected by the False Bay closure; including the divergent views of the Working Group.

4. New Business

Nil

5. Other Business

The Working Group agreed a survey should be conducted in 2020 particularly if the temporary closure is removed. Further discussion will occur on how this survey will be funded.

The Working Group discussed contrasting information on correlations that have been undertaken to investigate the impact of kingfish aquaculture in Fitzgerald Bay with cuttlefish abundance. It was agreed the CCSA, SARDI and EPA would validate the dataset and information, then prepare an out of session paper for the Working Group to consider if required

There was a discussion of cumulative impacts and ecosystem condition decline linked to nutrient inputs and other factors. It was reiterated any rationale for change should include information on the considerations that were taken into account, consistent with the discussions regarding the future management arrangements.

5. Meeting concluded: 2:30pm

6. Next meeting:

The Chair informed the Working Group that the agreed approach of having a single meeting each year to consider survey results will continue. September 2020 will be when the Working Group meets next unless the need arises for an earlier meeting.

Action List

Item	Actions from 16 December 2019	Responsibility	Target Date
1	Validate the dataset and information used to explore the correlation between Giant Australian Cuttlefish abundance and Yellowtail Kingfish biomass from the adjacent aquaculture site.	CCSA, SARDI, EPA	ASAP
2	Minute to Minister regarding management arrangements post 14 February 2020	PIRSA	31 January 2020