

Final Report

AFMA Project 2011/808

Empowering Torres Strait Islanders to Have Greater Engagement in the Research, Development and Extension (RD&E) Process



Chris Calogeras and Stan Lui

June 2013

Australian Fisheries Management Authority

Empowering Torres Strait Islanders to Have Greater Engagement in the Research, Development and Extension (RD&E) process

Chris Calogeras

C-AID Consultants

38 Lake Ridge Crt

Lake Macdonald

Qld 4563 Australia

Tel: +61 7 54477916

Email: info@c-aid.com.au

ISBN: 978-0-9871427-3-3

Copyright Australian Fisheries Management Authority (AFMA) and C-AID Consultants (2013)

This work is copyright. Except as permitted under the Copyright Act 1968 (Cth), no part of this publication may be reproduced by any process, electronic or otherwise, without the specific written permission of the copyright owners. Neither may information be stored electronically in any form whatsoever without such permission.

Disclaimer

The authors do not warrant that the information in this document is free from errors or omissions. The authors do not accept any form of liability, be it contractual, tortious, or otherwise, for the contents of this document or for any consequences arising from its use or any reliance placed upon it. The information, opinions and advice contained in this document may not relate, or be relevant, to a reader's particular circumstance. Opinions expressed by the authors are the individual opinions expressed by those persons and are not necessarily those of the publisher, research provider or the Australian Fisheries Management Authority (AFMA).

ACKNOWLEDGEMENTS

This input of the various individuals and organisations who contributed to this project is greatly valued and was critical to its completion.

The support of AFMA is acknowledged and greatly appreciated.

This project was funded by the Australian Government through AFMA Project No. 2011/808.

Glossary

Acronym	Description
ADAS	Australian Divers Accreditation System
AFMA	Australian Fisheries Management Authority
AIMS	Australian Institute of Marine Science
AUF	Australian Underwater Federation
CDEP	Community Education and Development Program
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DEEDI	Department of Employment, Economic Development and Innovation
DEWHA	Department of Sustainability, Environment, Water, Population and Communities
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EWGSE	Expert Working Group on Science Engagement
FRDC	Fisheries Research Development Corporations
FTE	Full time equivalents
IMAS	Institute for Marine and Antarctic Studies
IRG	FRDC Indigenous Reference Group
JCU	James Cook University
LMSU	Land and Sea Management Unit
NPF	Northern Prawn Fishery
NRM	Natural Resource Management
NT	Northern Territory
OH&S	Occupational Health and Safety
PBC	Prescribed Body Corporate
PIC	Prior Informed Consent
PZJA	Protected Zone Joint Authority
Qld	Queensland
Qld DAFF	Department of Agriculture, Fisheries and Forestry Queensland
RD&E	Research Development & Extension
RLS	Reef Life Survey
SLA	Service Level Agreements
SOP	Standard Operating Procedures
TFK	Traditional Fishing Knowledge
TFM	Traditional Fisheries Management
TRL	Tropical Rock Lobster
TSRA	Torres Strait Regional Authority
TSSAC	Torres Strait Scientific Advisory Committee
Uni Qld	University of Qld
UTas	University of Tasmania

CONTENTS

1	NON-TECHNICAL SUMMARY	6
1.1	OBJECTIVES	6
1.2	OUTCOMES	6
1.3	KEYWORDS	8
2	BACKGROUND	9
3	NEED	10
4	OBJECTIVES	11
5	METHODS	11
6	RESULTS AND DISCUSSION	12
6.1	ADVISING TORRES STRAIT PRESCRIBED BODY CORPORATE (PBC) REPRESENTATIVES	12
6.2	IDENTIFYING R&D OPPORTUNITIES FOR TORRES STRAIT ISLANDERS INVOLVEMENT	12
6.3	CONTACTING ORGANISATIONS THAT UNDERTAKE RD&E IN THE TORRES STRAIT REGION	13
6.4	RD&E UNDERTAKEN IN THE TORRES STRAIT REGION	15
6.5	AUDIT TO DETERMINE SKILLS AND QUALIFICATIONS REQUIRED BY RD&E PROVIDERS	17
6.6	GAP ANALYSIS BETWEEN RD&E PROVIDERS' POLICIES AND THOSE CURRENTLY AVAILABLE	17
6.7	AREAS TO BENEFIT TORRES STRAIT ISLANDERS AND MANAGEMENT FROM R&D OUTCOMES	19
6.8	ESTIMATE OF TORRES STRAIT ISLANDERS REQUIRED TO MEET RD&E FUTURE NEEDS	20
6.9	CASE STUDIES TO DEMONSTRATE MECHANISM FOR R&D ENGAGEMENT	21
6.10	BEST PRACTICE MODEL FOR SUPPORTING INDIGENOUS FEE FOR SERVICE AND EMPLOYMENT OPPORTUNITIES IN RD&E AND PATHWAY TO IMPLEMENTATION	28
6.11	BASIC BUSINESS PLAN AND IMPLEMENTATION PATHWAYS IN THE TORRES STRAIT	31
7	BENEFITS AND ADOPTION	35
8	FURTHER DEVELOPMENTS	35
9	OUTCOMES	36
10	CONCLUSION	37
11	BIBLIOGRAPHY AND REFERENCES	41
Appendix I:	Intellectual Property	43
Appendix II:	Staff	43
Attachment 1:	Sample Correspondence with RD&E Providers	44
Attachment 2:	RD&E Providers in the Torres Straits - Response to Questionnaires	46
Attachment 3:	Community Questionnaires	57
Attachment 4:	Summary of Examples Where Individual or Groups Collected Data Was Incorporated Into Formal R&D Outcomes	59
Attachment 5:	NT Ranger Engagement and RD&E Model	65
Attachment 6:	Process to Gain Minimum SCUBA Diver Qualifications	74

1 NON-TECHNICAL SUMMARY

AFMA Project 2011/808	Empowering Torres Strait Islanders to have greater engagement in the Research, Development and Extension (RD&E) process
------------------------------	--

PRINCIPAL INVESTIGATOR:

Chris Calogeras

ADDRESS:

C-AID Consultants

38 Lake Ridge Crt

Lake Macdonald Qld 4563

Australia

Tel: +61 7 54477916

Email: info@c-aid.com.au

CO-INVESTIGATOR:

Stan Lui Torres Strait Regional Authority (TSRA)

1.1 OBJECTIVES

- 1 Assess the costs and benefits of Torres Strait Islander engagement in fisheries research, development and extension (RD&E);
- 2 Identify future RD&E benefits and opportunities for Torres Strait Islanders;
- 3 Development of a best practice model for supporting indigenous fee for service and employment opportunities in RD&E in the Torres Strait; and
- 4 Draft a basic business plan and pathways to implement the best practice model in the Torres Strait.

1.2 OUTCOMES

At the time of this projects development, the idea of greater individual community members' involvement in research and development (R&D) seemed to have merit, as there appeared to be many potential opportunities to participate.

Today however, the situation is very different, as the Torres Strait Regional Authority (TSRA) Land and Sea Management Unit (LSMU) ranger program has significantly expanded and has filled much of this space. They are the dominant participants in marine and sea activities, including community engagement, research assistance, traditional knowledge recording,

turtle and dugong community based management plan implementation, and environmental and conservation surveys and monitoring.

Although there are many R&D activities still occurring in the Torres Strait, this research is now often being undertaken with the rangers' involvement, which means there are limited opportunities for possible self resourced local research assistants to gain employment in the specific projects identified and managed by the TSSAC which haven't already been taken up through the TSRA ranger program.

However, the project and information gathered can still provide a range of beneficial information and direction that could be used to empower Torres Strait Islanders and advise RD&E providers on how to achieve improved engagement in the RD&E process in the region.

Due to resourcing constraints, the ability to undertake some aspects of the project, particularly relating to community surveys identifying the skill sets, capacity and desires of Torres Strait Islanders, means that some of the project outputs and resultant findings (gap analysis etc) will need further refining in the future.

Notwithstanding this, the project outputs will still assist in addressing the identified need to enhance local participation in the RD&E process.

Key outcomes are;

- A means for Torres Strait Islanders and RD&E providers to identify opportunities for greater collaborative RD&E;
- Research providers will benefit from the project as it has shown that, if the aim is greater involvement of Torres Strait Islanders in the RD&E process, there is a need to identify opportunities to develop and adjust procedures and processes that will encourage involvement;
- Real involvement and engagement of the Torres Strait Islander community has the potential to enhance acceptance and adoption of findings which can lead to cost effective R&D and improved management arrangements in the region;
- Many of the R&D opportunities that were the basis for this project have now been taken up by the TSRA LSMU and therefore opportunities for those outside of this system appear limited.
- The TSRA LSMU does not have current capacity to undertake additional tasks focussing on fishing and seafood related R&D. This type of R&D generally falls outside of existing TSRA scope and currently funded LSMU roles/tasks. There would need to be arrangements made (legal and operational), and resourcing/funding opportunities identified, to build capacity and organisational structures, if the TSRA were to consider taking on such tasks as part of their day to day activities.
- A possible (untested) concept/model for fee for service, outside of the TSRA LSMU arrangement, has been identified but it would appear cost ineffective at this stage.

1.3 KEYWORDS

Aboriginal, Fishing, Seafood Industry, Indigenous, Research, Development & Extension (RD&E), Torres Strait Islander, Traditional Fishing Knowledge (TFK), Traditional Fisheries Management (TFM).

FINAL REPORT

Project No. 2011/808	Empowering Torres Strait Islanders to have greater engagement in the Research, Development and Extension (RD&E) process
-----------------------------	--

2 BACKGROUND

Stakeholders from most sectors of the fishing and seafood industry have expressed a desire for greater participation in the development, undertaking and reporting of RD&E that has an influence on the sector or resources that they interact with, or utilise.

This concept has a special interest for indigenous people, such as Torres Strait Islanders, as they have a long held tradition of involvement in the management and ongoing care of the fish and aquatic life in the waters adjacent to, and as part of, their traditional estates. Much of the current RD&E however is developed and undertaken from a 'western' perspective by major research and fisheries agencies, and may therefore have little real indigenous involvement.

A number of projects and workshops have identified the wishes of indigenous people for greater involvement in the RD&E process. Likewise, many RD&E providers have expressed a desire to increase indigenous people's participation and buy-in with projects being undertaken in or around indigenous people's estates. It would be anticipated that much of this RD&E would be focussed on data collection and monitoring.

This collaborative approach to the development and delivery of RD&E has however progressed little in the Torres Strait due to a number of real or perceived impediments. This project sought to assist by providing a pathway forward.

The project was developed as a follow up to a multi party workshop, 'Overcoming impediments of incorporating Torres Strait Islanders in research' held in the Torres Strait in February 2009.

Discussions have taken place with various staff at Australian Fisheries Management Authority (AFMA) and TSRA about the best means to progress this project.

A draft proposal was provided to the Torres Strait Scientific Advisory Committee (TSSAC) and this application has been developed in line with their recommendations.

The natural resource management and conservation landscape since 2009 has however changed, with a significantly expanded TSRA ranger program filling much of the R&D space. This means that there are limited opportunities (or economic benefit/return) for self-resourced local researchers to achieve the necessary qualifications and gain associated employment.

3 NEED

Torres Strait Islanders have expressed a desire for a greater hands-on role in a range of RD&E activities that take place in the region. A workshop was held in February 2009 to progress these aspirations with a view to identifying impediments to Torres Strait Islanders' participation in RD&E, and to instigate a process to address such impediments. To date there has been limited follow up on the proposed workshop actions.

This project aligns with the Strategic Research Plan for Torres Strait Fisheries and the Torres Strait Scientific Advisory Committee (TSSAC) operational plan priority areas, which seek to strengthen Torres Strait Islanders' engagement, and assist in improving data collection in all priority fisheries.

The TSSAC acknowledges there is a continuing need to improve Torres Strait islanders' involvement in RD&E and this could initially be addressed by focussing on overcoming a number of already acknowledged impediments to Torres Strait Islanders' engagement by RD&E providers. It should be noted that engagement is broader than just employment and fee for service roles on projects, and could include involvement in community workshops, paid observers and research assistant roles, and other opportunities (e.g. charter provision, translators, cultural advisors or data collection). The focus of this project however is only on involvement in field research and extension.

To achieve sustainable and agreed management outcomes, Torres Strait Islanders need to be in a position where they can better understand the processes involved in the research being undertaken, and receive appropriate communication (extension) regarding research objectives, methods, activities and results, along with acknowledgment of Traditional Knowledge (TK) and Traditional Fisheries Management (TFM).

Increased incorporation of TK and TFM in the RD&E process could lead to improved adoption and continuity. If there is greater involvement, communities and their members may feel they have an increased level of project ownership, and ultimately the management decisions being made.

There is immense potential to develop strong partnerships to assist TSRA, AFMA and the Protected Zone Joint Authority (PZJA) to meet its priorities and objectives, and to tap into the enormous opportunity such partnerships present to communities in overcoming aspects of disadvantage through capacity building, employment creation opportunities, cultural recognition and empowerment.

Although Torres Strait Islanders have control of, and/or interests in the region, there is generally little blending of western scientific and TK sets. Scientists could at times be considered as knowledge takers who don't seem to recognise or acknowledge Torres Strait Islanders' domains in the area. There is a need for clear protocols focussing on real

engagement, identifying opportunities for local people, and building pathways to greater trust and adoption of the outcomes of R&D.

4 OBJECTIVES

- 1 Assess the costs and benefits of Torres Strait Islander engagement in fisheries RD&E;
- 2 Identify future RD&E benefits and opportunities for Torres Strait Islanders;
- 3 Development of a best practice model for supporting indigenous fee for service and employment opportunities in RD&E in the Torres Strait; and
- 4 Draft a basic business plan and pathways to implement the best practice model in the Torres Strait.

5 METHODS

The project sought to build on the 'Overcoming impediments of incorporating Torres Strait Islanders in research' workshop held in February 2009. All aspects of the project were developed in conjunction with AFMA and the TSRA.

The *'Guide for Fisheries Researchers Working in Torres Strait'* was used as a model for engaging traditional owners. Mr Stan Lui's expertise and knowledge was an integral aspect of ensuring the research was conducted in culturally appropriate ways.

As appropriate, data was collected through a combination of email, phone and limited face-to-face contact.

The proposed methodology involved a number of steps, including;

- A. Advising relevant Torres Strait Prescribed Body Corporate (PBC) representatives (see Table 1) of the projects' intentions and methods, and if relevant/appropriate, obtaining written Prior Informed Consent (PIC) agreements with Mutually Agreed Terms for culturally correct community engagement.
- B. Undertaking analysis to determine current and envisaged RD&E opportunities for Torres Strait Islanders' involvement in relevant RD&E (only focussing on fieldwork and extensions roles) through existing RD&E providers. The scope of organisations surveyed was determined in conjunction with TSRA and AFMA (a full list of contacted organisations/persons is shown at Table 2)
- C. Undertaking an audit to determine skills and qualifications required by RD&E providers to effectively engage Torres Strait Islanders in RD&E opportunities
- D. Undertaking gap analysis between Occupational Health and Safety (OH&S) and other policies required by RD&E providers and those currently available for adoption in the Torres Strait (the scope of policies will be determined in conjunction with the TSRA)

- E. Identification of areas where Torres Strait Islanders could add to or benefit from research activities
- F. Estimating the numbers of Torres Strait Islanders who would be required to meet RD&E needs in the future (5 year time frame)
- G. Providing case studies to demonstrate mechanisms for R&D engagement with indigenous people, including extension protocols
- H. Seeking to identify potential benefits to Torres Strait Islanders (beyond employment opportunities) that would enhance trust, acceptance and adoption of R&D findings, leading to improved management arrangements and uptake in the region (this would seek to also identify means to determine if people are aware of research being undertaken and acceptance of relevant information)
- I. Determine a best practice model for supporting indigenous fee for service and employment opportunities in RD&E in the Torres Strait, and draft a basic business plan and pathway to implementation
- J. Preparation of a final report and a one page plain English summary suitable for distribution to relevant and interested parties, especially Torres Strait Islanders.

6 RESULTS AND DISCUSSION

This section assesses the project's results, the effectiveness of processes used, and the success of the methods employed.

6.1 Advising Torres Strait Prescribed Body Corporate (PBC) Representatives

The first stage of the project involved formally contacting relevant Torres Strait PBC representatives and informing them of the projects' intentions and methods, and if necessary, seeking written PIC for culturally correct community engagement.

The following PBCs were contacted by mail and/or email (Table 1). In the end, face-to-face meetings did not take place in these regions and as such, PICs were not required.

6.2 Identifying R&D Opportunities for Torres Strait Islanders Involvement

The next phase of the project involved identifying RD&E providers who had undertaken fishery related work in the Torres Strait region and then identifying past, present or future potential RD&E opportunities for Torres Strait Islanders to be involved in.

Although the total RD&E process is broad, going from project development stage through to extension of project outputs, this projects' focus was only on fieldwork and extensions roles.

Table 1: Torres Strait Prescribed Body Corporates Contacted Regarding the Project.

Prescribed Body Corporates
Badu Ar Mua Migi Lagani
Dauanalgalw (Torres Strait Islanders) Corporation
Erubam Le Traditional Land and Sea Owners (Torres Strait Islanders) Corporation
Garboi (Torres Strait Islanders) Corporation
Geberalgai (Torres Strait Islanders) Corporation
Goemulgaw (Torres Strait Islanders) Corporation
Kaurareg (Aboriginal) Corporation
Kulkalgai (Torres Strait Islanders) Corporation
Magani Lagaugai (Torres Strait Islanders) Corporation
Malu Ki'ai (Torres Strait Islanders) Corporation
Maluilgai (Torres Strait Islanders) Corporation
Masigalgai (Torres Strait Islanders) Corporation
Mer Gedkem Le (Torres Strait Islanders) Corporation
Mualgai (Torres Strait Islanders) Corporation
Mura Badulgai (Torres Strait Islanders) Corporation
Porumalgai (Torres Strait Islanders) Corporation
Saibai Mura Buway (Torres Strait Islanders) Corporation
Ugar Ged Kem Le Zeuber Er Kep (Torres Strait Islanders) Corporation
Wakeyama (Torres Strait Islanders) Corporation
Warraberalgai (Torres Strait Islanders) Corporation

6.3 Contacting organisations that undertake RD&E in the Torres Strait Region

The organisational contact list was developed through a process between AFMA and the TSRA initially. From this initial list, further potential contacts were identified and so on. This list was a moving feast during the life of the project, with a full list of contacted organisations/persons shown at Table 2. In the end, 10 organisations, represented by about 25 individuals, were contacted seeking their input to the project.

Each person was contacted individually, firstly by email and information was requested to assist in achieving the projects' objectives (see Attachment 1 for sample correspondence – exact details varied during the life of the project but content remained basically the same).

The correspondence provided background/rationale to the project, details on the investigators, and the process/methodology to be employed. In addition, there was a request for a range of specific information as shown below;

- organisation and key contact
- type of RD&E projects undertaken in the Torres Strait region
- duration or regularity of work (i.e. 2 weeks every year)
- skills/qualifications required (formal and informal)

- formal protocols or Standard Operating Procedures (SOP) in place regarding engagement of non-agency staff (i.e. need for ABN, insurance, induction training etc)
- examples of successful or unsuccessful engagement processes they had used or trialled
- suggestions for specific means to improve indigenous involvement in projects
- any other relevant information or documents.

Emails were sent out in early 2012, and as additional groups/individuals were identified further emails were sent, with a requested response time of early March 2012.

Table 2: Organisations and People Contacted as Part of the Project.

Organisation	Contact Person
AFMA	Sacha Taylor
AIMS ¹ Bio-resources Library	Libby Evans-Illidge
AIMS GBR Monitoring Program	Ray Berkelmans/Hugh Sweatman
CSIRO ²	James Butler
CSIRO	Jim Walker
CSIRO	Sarah Busilacchi
CSIRO	Darren Dennis
CSIRO	Roland Pitcher
CSIRO	Eva Plaganyi
CSIRO	Timothy Skewes
CSIRO	Ingrid Van Putten
CSIRO/Concordia University	Annie Lalancette
DEEDI ³ Fisheries Queensland	Helen Taylor
DEEDI Townsville	Jane Mellors
DERM Threatened Species	Col Limpus
ITEC Employment	Chris Davey
JCU ⁴	Helene Marsh
JCU Environmental Sciences	Mark Hamann
JCU/DSEWPac ⁵	Jillian Grayson
TSRA Economic Development	Suzanne Stratton
UniQld ⁶	Libby Liggins
UTas ⁷ Fisheries Aquaculture	Ben Chuwen

Initial responses were patchy and follow up emails were sent about one month later, and then again in about 6 months for those that hadn't responded. In addition, telephone contact was made if no response was received after that period. Further email contact was

¹ AIMS - Australian Institute of Marine Science

² CSIRO - Commonwealth Scientific and Industrial Research Organisation

³ DEEDI Department of Employment, Economic Development and Innovation - now DAFF Qld

⁴ JCU - James Cook University

⁵ DSEWPac - Department of Sustainability, Environment, Water, Population and Communities

⁶ Uni Qld - University of Qld

⁷ UTas - University of Tasmania

made about 10 months, and again 12 months, after first contact to follow up outstanding responses.

Overall, even though it took considerable effort, contact was eventually made and feedback provided by over 90% of those contacted. A full list of contacts and responses received to the questions is provided at Attachment 2.

6.4 RD&E Undertaken in the Torres Strait Region

Based on the information provided by the RD&E providers who responded to the questionnaire, RD&E opportunities that may be available in the region were identified. Not all projects may be suitable, but by developing an overall list, additional opportunities can be identified in the future. In addition, projects that were not identified during this survey can be added to the list over time to maintain a data bank of opportunities. Details of projects identified are shown at Attachment 2.

Following (see Table 3) is a brief summary based on the RD&E work undertaken in the Torres Strait region. It must be remembered that this is not a complete list of all fishery and seafood focused RD&E work undertaken in the region, but relates to work that was identified through this project, and was based on responses from those interviewed.

As can be seen from Table 3, RD&E work seems to have focussed around a number of species/areas; notably;

- Tropical Rock Lobster (TRL)
- Corals
- Seagrass/Algae
- Sea Cucumber
- Turtle
- Dugong.

Based on the interviews, it appears that there has been less RD&E focus on finfish and prawns.

It should be noted that the TSRA LSMU ranger program has now filled much of this space and are key contributors in work relating to mangroves, corals, seagrass, algae, turtle and dugong. Opportunities would only appear to exist in some commercial fishing related R&D, such as working with TRL, sea cucumber or key fish species.

Table 3: Summary of RD&E Undertaken in the Torres Strait Region as Identified through this Project.

Species/Focus	Type of Work	Opportunity
Corals	Maintaining instruments to monitor environmental conditions and establishing reef monitoring sites.	Ongoing and opportunity
Corals, Seagrass, Algae	Critical Marine Habitat - helicopter surveys mapping of corals, seagrass and algae	Completed but opportunity
Engagement and Participation	Workshop to increase Torres Strait Islanders' participation in R&D projects.	Completed but opportunity
Fish, invertebrates	Coral reef surveys - collections of wild coral reef fish and invertebrates for scientific research	Completed but opportunity
Mangroves	Workshop to improve involvement in R&D projects	Completed
Sea Cucumber, Trochus, Tropical Rock Lobster (TRL)	Hand collectable survey - marine surveys using SCUBA or Hookah (fishery species plus environmental data). Questionnaire surveys of TS islander fishers.	Ongoing and opportunity
Seagrass	Long term monitoring of seagrass in dugong sanctuary	Completed but opportunity
Seagrass	Sub tidal seagrass mapping and surveys Productivity and resilience of seagrass	Completed but opportunity
Seagrass	Intertidal monitoring of seagrass	Ongoing and opportunity
Sponge	Dive surveys and sampling to find 'broodstock'.	Completed but opportunity
TRL	Evaluating success of natural resource management considering biological, economic, <u>social</u> , and governance objectives in fisheries.	Completed but opportunity to take concept wider to all projects in region
TRL	Exploring better ways to integrate multiple perspectives in fisheries management as a means to improve the sustainability and social equity of management decisions.	PhD competed
TRL	Management strategy evaluation based on quota options - desktop assessment of different strategies.	Completed
TRL	Monitor indigenous component of TRL on freezing/processing barges to collect data	Completed but opportunity
TRL	Survey	Ongoing but opportunity
Turtle and Dugong	Dugong and Turtle database	PhD completed
Turtles	Turtle tagging and monitoring	Ongoing and opportunities
Various species	Subsistence catch records - assessment of biological data - catch/effort, creel surveys, interviews	PhD completed but opportunity

6.5 Audit to determine skills and qualifications required by RD&E providers

Those who responded were requested to provide details on the type of skills or qualifications (formal and informal) that would be required, or be useful, to support the RD&E work that they were undertaking (or had undertaken). Table 4 shows the identified skills that would be required.

Table 4: Possible Skill Requirements Identified through R&D Provider Interviews

Skill
Boat driving - with coxswains or Qld boating licence
Data collection <ul style="list-style-type: none"> – marine – biological – environmental – surveys – monitoring – interviews/questionnaires
Data entry - written and computer
Extension skills
Facilitation skills
First aid and advanced CPR and resuscitation training
Hookah (dive tickets)
Project management
Record keeping - written and computer
SCUBA (dive tickets)
SCUBA Tank maintenance
Snorkelling
Translators

6.6 Gap analysis between RD&E providers' policies and those currently available

A questionnaire was developed to be used throughout the islands on an opportunistic basis by TSRA staff, as part of ancillary activities, when conducting their business at communities. This questionnaire (see Attachment 3) sought information from local community people based on three scenarios;

- whether they had ever done any RD&E work for an organisation (paid or unpaid)
- whether they had formal skills or qualifications that could be useful to an organisation doing RD&E.
- whether they would like to do RD&E work for an organisation but don't have any formal qualifications or skills.

Unfortunately, TSRA staff did not undertake the surveys as their on-ground operational activities did not allow for any extra survey consultative time in the communities. As the

project budget didn't allow for travel to undertake this type of activity, the methodology always relied on 'piggy backing' onto other organisations (TSRA and AFMA) activities. This questionnaire would have provided some of the technical details relating to needs and could have been used to quantify gaps. It was therefore not possible to collect this data. However, the information in Table 5 provides anecdotal or 'best estimates' towards assessing the gap in requirements.

Completing the survey could be a relatively simple process that could be undertaken sometime in the future when one of these organisations can accommodate the work, or some other community based activity is being undertaken. The information would be extremely valuable as part of any future indigenous engagement protocol or capacity building process that is implemented to encourage the inclusion of the Torres Strait Islanders in the RD&E process.

As can be seen from Table 5, under the existing RD&E delivery format there is a significant gap between the formal requirements and the local capacity to comply. If the survey outlined in Attachment 3 was undertaken to determine the skills and capacity audit, it would prove valuable to add any questions that could provide further information to quantify the gap between existing RD&E provider requirements and local community capacity.

Table 5: Summary of Key RD&E Provider Protocols and Priorities Relevant to Torres Strait Islanders

Requirements	Estimate of Torres Strait Islanders Capacity	Potential Organisations
SCUBA Dive Certification	Limited	TSRA AIMS CSIRO QDAFF (DEEDI) EHP (DERM) JCU UniQld
Coxswains	Med/High	
SCUBA tank maintenance	Limited	
Workplace OH&S (dive, snorkelling, boat work etc)	Limited	
Subcontractor conditions (ABN, insurance, qualifications etc)	Limited	
First aid training - general	Med	
First aid training - advanced CPR/resuscitation	Limited	
Scientific permit	Limited	
Ethics permits	Limited	

Copies of SOP, policies and protocols provided by the major research providers, who took part in this project, had as a rule stringent health and safety requirements and protocols. In addition, there were a range of employment protocols and requirements for those wishing to work with most of the key RD&E providers. These are summarised in Table 5 with one or more of the organisations having these requirements as a prerequisite for employment, depending on the type of R&D being undertaken.

Although there are consistent themes in the protocols, each organisation does have their own individual prerequisites which could increase the complexity for Torres Strait Islanders to be in a position to be fully compliant with every organisations mandatory participation criterion.

A coordinated approach to dealing with this aspect of the RD&E process would benefit local community members although significant investment will be required to implement the information management system and the services of an experienced coordinator.

6.7 Areas to Benefit Torres Strait Islanders and Management from R&D Outcomes

To identify areas where benefits (includes financial, real engagement and acceptance, adoption and uptake of outcomes) could be achieved from the Torres Strait region based projects it is necessary to identify the areas that don't lead to optimal outcomes for Torres Strait Islanders from the existing process. These are discussed briefly below.

A constant position relayed by RD&E providers engaged in this project related to the need to engender greater involvement and engagement with Torres Strait Islanders in RD&E projects. This generally also equated to a feeling by providers that it was difficult and costly (time and dollars) to get engagement, yet there was a need to get the work completed as efficiently and quickly as possible, to minimise project costs, yet still building capacity.

An inclusive approach was utilised in a number of projects, but in most instances this didn't appear to be the case. This was for a number of reasons but generally related to;

- the relatively short time frame of project funding
- a desire by providers to limit field time to minimise project costs
- lack of confidence that local people could undertake the work as well, or systematically, as those employed by providers (within existing short project cycles)
- an inability to identify local people with the appropriate skill set
- inability of most local people to meet the required protocols/qualifications (e.g. diver training, insurances, ABN etc)
- lack of formal incentives to 'employ' local people as part of project approval processes
- local peoples' priorities not aligning with those of the researchers
- inadequate skill sets within the RD&E providers to adequately engage with the local community.

A perceived difficulty in deriving optimal engagement was often expressed. The best means to enhance engagement with Torres Strait Islanders is through a process of ongoing

consultation from project conception, through project application and delivery, and as part of an extension process to ensure Torres Strait Islanders are aware of the project outputs and outcomes. This comes with a cost, specifically in the project development phase, which in most instances must be borne by the potential provider without a guarantee of a return on investment. In addition, many projects funding provides little resourcing for ongoing project engagement once the 'research' starts.

Real engagement is without a doubt the area that Torres Strait Islanders could add to, or benefit from. Providers would also benefit from this.

6.8 Estimate of Torres Strait Islanders Required to Meet RD&E Future Needs

Based on the material obtained through this project it would appear that there are only limited opportunities for Torres Strait Islanders to be part of existing projects the way they are currently structured, and within the existing guidelines required by providers. Table 3 highlighted the potential projects underway, or completed, in the Torres Strait region (based on interviews). This showed that, under the existing paradigm, there may be a small number of ongoing roles on a full or part time basis available to Torres Strait Islanders if they had the appropriate capacity and qualifications, and the R&D provider protocols allowed the use of suitably qualified staff/contractors (

Table 6). It must be acknowledged that much of the R&D outside of specific projects identified and authorised by the TSSAC have already been taken up through the TSRA ranger program (i.e. environmental, conservation, management and associated surveys and monitoring).

It is not possible to quantify this number of potential 'jobs' exactly without a skills audit, but the reality is that only a very small number of roles could be realised by Torres Strait Islanders, as the existing conditions do not allow this to occur readily, and/or the capacity and/or skills are not in place.

However, if the scope of involvement in RD&E projects is expanded to include the use of Torres Strait Islanders as part of project development, delivery and extension, there are opportunities that would open up and would require a much lower level of provider driven qualifications or protocol compliance. Some level of upskilling and capacity building would be necessary for Torres Strait Islander participants so that they can adequately provide a link between community and agencies. In addition, non-indigenous persons involved in the project would need to improve their skills and capacity so they can operate better in the local environment.

To provide guidance on potential opportunities, some estimates of full time equivalents (FTE) roles have been made in

Table 6.

Table 6: Potential RD&E Roles That Could be Undertaken by Torres Strait Islanders

RD&E Project	Potential Torres Strait Islander roles/numbers (FTE equivalent ⁸)	Assumptions/Scenarios
Turtle and Dugong Research	<ul style="list-style-type: none"> – dinghy drivers - 2 FTE – animal catchers - 4 FTE – data collectors - 4 FTE 	Based on one active dinghy and one acting as safety vessel or for contingency use. May be possible cross task opportunities ⁸ .
Fishery Dependant Surveys	<ul style="list-style-type: none"> – fishers - 4 FTE – coxswains - 2 FTE – data collectors 4 FTE 	Based on 2 surveys, with one active dinghy and one acting as a safety vessel or for contingency use. May be possible cross task opportunities ⁸ .
Fishery Independent Surveys	<ul style="list-style-type: none"> – dinghy drivers - 2 FTE – safety lookout - 2 FTE – deck hands - 1 FTE – data collectors - 2 FTE 	Based on one active dinghy and one acting as safety vessel or for contingency use. May be possible cross task opportunities ⁸ .
Project Liaison Officers	<ul style="list-style-type: none"> – community liaison between researchers and community members before and after activities - 1 FTE 	Based on one person or a number of people engaged for specific periods/tasks. May be possible cross task opportunities ⁸ .

⁸ May be possible to cross task opportunities depending on individual skill sets (i.e. individual could be driver and safety officer, or catcher and data collector etc)

6.9 Case Studies to Demonstrate Mechanism for R&D Engagement

Originally, it was proposed to undertake three case studies to show possible models that may be beneficial in the circumstances in place in the Torres Strait region.

As part of preparing and identifying relevant case studies, a literature search was undertaken. The aim was to identify examples (from any sector in the Australian fishing and seafood industry) that highlighted parameters and expected outcomes similar to those leading to this project's development, i.e.;

- opportunities for non aligned individuals from indigenous communities to be engaged to participate in R&D projects
- where the R&D was adopted as part of best practice and used in the formal policy decision making process, or was recognised in research papers/reports
- where R&D partnership were in conjunction with major research providers
- was undertaken in Australia.

Finding even one example in the literature that met the above criteria proved almost impossible, let alone three examples. Around 30 general examples however were identified where individuals/groups collected data and these are summarised in Table 7 (with more detail provided at Attachment 4). In all instances, there was an organisational structure around the R&D participants, or close agency project management, to provide guidance and support, with only a handful having direct links to R&D providers.

A number of processes however were in place to provide collected data to recognised research providers such as CSIRO, AFMA and UTas. From a commercial fishing perspective, most data involved collecting length frequency and occasionally otoliths, with the analysis and results (generally undertaken by R&D providers) often incorporated into formal assessments, scientific papers and reports. From a recreational fishing perspective, most data collection relates to catch and effort, tag and recapture, boat ramp surveys, with some of this data incorporated into stock assessments, scientific papers and reports.

What these projects showed is that if programs are set up correctly and some training or capacity building is provided, valuable data can be collected to assist in preparing scientific advice to generate management and policy outcomes. All programs were voluntary - none were fee for service.

From these examples, four very interesting case studies were identified that involved SCUBA and free divers that may provide some guidance for activities in the Torres Strait region. These were the;

Reef Life Survey (RLS) uses trained volunteer recreational SCUBA divers to identify and record the presence and abundance of fish and invertebrates and "other large swimming animals". This is considered to provide high quality information at spatial and temporal scales beyond those possible by scientific dive teams. RLS consists of a network of trained,

committed recreational SCUBA divers, an Advisory Committee made up of managers and scientists with direct needs for the data collected, and recreational diver representatives. The project is supported by UTas, Institute for Marine and Antarctic Studies (IMAS), and the Department of Sustainability, Environment, Water, Population and Communities (DSEWPoC).

Identification of climate-driven species shifts and adaptation options for recreational fishers uses spearfishers to collect competition catch data by species and location. This is a collaborative project between CSIRO, JCU and the Australian Underwater Federation (AUF) to collect data on rocky reef fish to develop mechanisms to inform and guide other marine users, including commercial fishers.

Reef Watch uses volunteer divers to undertake fish identification and counts. As commercial fishing activity decreases, due to the imposition of marine parks, this program is being considered to become actively involved in monitoring the performance of parks in South Australia.

Red Map uses volunteer fishers and divers to record the distribution of uncommon Tasmanian marine species. Red map data is displayed on a website giving any interested Tasmanians the opportunity to see how ecosystems are changing.

Table 7: Summary of examples where individual or groups collected data that was incorporated into formal R&D outcomes

Project	Organisations	Source of Data	Type of Data
Anglers Catch Research Program/ Anglers Catch Data Base project	Anglers, NSW Fisheries	Recreational anglers during competitions	Catch, effort, length
Blue warehouse length frequencies	SETFIA, Fishwell consulting	CTF industry	Blue warehouse length frequency
CapReef (Qld)	Infotish Australia	Rec anglers	Catch and effort, tag and recapture, boat ramp surveys
Co-management of GAB species	GABIA	GABTF industry Fishwell	Quota species length frequency and otolith
Mapping - fishing operations in the GAB	GAB	GAB trawl fishermen	Mapping data – way points
Crystal Bowl (Qld)	Infotish Australia	ANSAQ members, Rec anglers	Catch and effort, tag and recapture, boat ramp surveys for Barramundi
Fisheries and Environment project	Fishwell Consulting	SESSF Fishers	Environmental observations and temperature loggers on fishing gear
Gamefish Tagging Program (NSW)	NSW Fisheries, Pepperell Research	Gamefishers	Tag and recapture
Great Australian Shark Watch	Australian Underwater Federation	Spearfishers, snorkelers and divers	Shark distribution
Identification of climate-driven species shifts and adaptation options for recreational fishers:	Southern Freedivers, Underwater Skindivers & Fishermen's Association	Spearfishers	Competition catch by species, location learning general lessons from a data rich case
Keen Angler Program	Qld Fisheries	Recreational fishers	Collection of frames of at least

Project	Organisations	Source of Data	Type of Data
			15 different fish species
King Ash Bay Barramundi Monitoring (NT)	King Ash Bay Fishing Club, Infofish Australia	Recreational fishers, Mabunji Sea Rangers	Catch and effort, tag and recapture, boat ramp surveys for Barramundi
Abalone data collection	Victorian Abalone Divers Association	Commercial abalone divers	Abalone length frequencies
Northern Prawn Fishery (NPF) observer program	AFMA, CSIRO, NPF crew member	NPF crew members	Data/photos on TEP species and 'at risk' bycatch species
Personal catch records	Nagambie Angling Club	Club members	Murray cod, catches, size
Personal catch records	Crater lakes angling clubs	Members	Trout and salmon, catches, size
Red Map	UTAS, IMAS and Tasmanian Community Fund	Fishers, volunteer divers	Distribution of uncommon Tasmanian marine species
Reef Life Survey	Reef Life Survey Advisory Committee, UTAS, IMAS, DEWHA	Trained volunteer recreational SCUBA divers.	Presence and abundance of fish/invertebrates and "other large swimming animals".
Reef watch	Reef watch, Museum of Victoria, VNPA, Conservation Council of South Australia	Volunteer divers.	Fish IDs and counts
Scientific line-transect aerial survey of southern bluefin tuna	SBT spotters, CSIRO	Commercial SBT spotters	Location and size of SBT schools
SUNTAG/AUSTAG	Infofish, ASNA, Qld Fisheries	Suntaggers and other recreational anglers	Tag and recapture, catch and effort
Vic rock lobster	Fisheries Victoria	Commercial Fishermen	Size, sex, tagging and tag returns, bycatch.
Victorian and Tasmanian giant crab	Fisheries Victoria, TAFI	Commercial Fishermen	Carapace width
Volunteer Angler Diary Program	Fisheries Victoria	Recreational anglers	Catch rate, length frequency
WA skeleton frame project	WA Department of Fisheries	Recreational fishers	Drop in fish frames – dewfish, snapper, baldchin groper, Australian Herring, Tailor, Garfish, Whiting

Torres Strait Region Case Study

A relevant case study was identified in the Torres Strait region that was completely adaptable to fish and fishing related RD&E - it relates to the Turtle and Dugong Management Initiative in the Torres Strait region. Following is a summary of the program.

In 2008/09 the TSRA received funding from the Australian Government's *Working on Country* initiative to develop a Turtle and Dugong Management Initiative in the Torres Strait region. The initiative was to address the growing scientific concerns regarding turtle and dugong populations throughout northern Australia and the increased public pressure through negative media reports of unsustainable traditional hunting practices of indigenous Australians.

The funding enabled the creation of part-time Community Turtle and Dugong Officers in seven Torres Strait communities. The T&D officers undertook community consultations in regards to a community based management project for turtles and dugongs. This resulted in the drafting of seven Torres Strait Community Based Turtle and Dugong Management Plans.

TSRA then negotiated further funding for the employment of 24 community Rangers across the eight island communities where the Turtle and Dugong and Management Plans had been completed. The Rangers were tasked with implementing the activities outlined in each of the management plans. This was the beginning of the Torres Strait Ranger Program.

TSRA received additional funding for the expansion of the program to all remaining Torres Strait communities from 2010-2013. This increased the Rangers to a total of 42 across 14 Torres Strait Island Communities.

The Queensland Government also contributes to the Torres Strait Ranger Program which also merged seagrass monitoring and invasive species control activities into their responsibilities.

Rangers are currently employed on Mabuiag, Badu, Boigu, Yam, Darnley, Murray, Moa (St Paul and Kubin Communities), Dauan, Saibai, Sue, Coconut, Yorke, and Stephen Islands.

In order for the Rangers to undertake the activities in a safe and legislated manner the Rangers are completing their Conservation and Land Management Certificates. The program includes the provision of employment, training and mentoring, in addition to administrative and day-to-day operational support for the Rangers.

The rangers have undergone a significant amount of training and capacity building including safe 4WD training, advanced 4WD and recovery techniques, first aid, chemical handling, chain saw operation, ATV operation, elements of shipboard safety, radio operations, outboard motor maintenance, certified snorkelling, coral reef biodiversity surveys, Indigenous Leadership courses, Sea Country ranger exchanges, and have attended several conferences.

One of the key roles of the community rangers is to implement priority activities under the Dugong and Turtle Management Plans. These priority activities include catch monitoring throughout the region, habitat and population monitoring, education and research activities and working with PNG Treaty villages of Papua New Guinea and Aboriginals and Torres Strait Islanders from the communities of the tip of Cape York. The activities are aimed at assisting Torres Strait Island communities in making informed decisions about managing dugongs and turtles within the Torres Strait region and raising awareness and involving all of the relevant stakeholders in the process.

The rangers have been engaged in a large number of projects on each island, ranging from feral animal trapping (pigs and dogs) to Mangrove Watch, Seagrass monitoring, invasive species management, turtle and dugong management activities, turtle tagging, beach clean-ups, land patrols and sea patrols.

In October 2012, the first of seven Land and Sea Ranger vessels was officially blessed and launched at a community event attended by approximately 200 community members and a range of elected dignitaries.

There are a number of similar stories from the Northern Territory in which Sea Ranger groups have built capacity to undertake a range of R&D and monitoring roles.

NT Ranger Program

The NT has taken this further and has a formal RD&E Marine Ranger Engagement Policy (Attachment 5). A large part of the policy relates to the formalised need, wherever possible, to involve Marine Rangers in any new fisheries research proposals. This is a powerful tool and has led to a far greater level of engagement and involvement of Aboriginal people/groups from the NT taking on major research and monitoring roles. Some ranger groups now take on a range of paid roles and functions such as;

- Compilation of indigenous knowledge related to resource management
- Identification and protection of sacred sites and sites of significance
- Coastal monitoring
- Fish kill reporting
- Bio-security
- Fisheries surveillance
- Natural Resource Management initiatives
- Fishery Research and monitoring activities
- Community education.

Some recent projects include;

- Juvenile mud crab research with four coastal ranger groups, commercial operators and NT Fisheries staff (Caring for our Country);
- Reef fish research with NT Fisheries staff and coastal ranger groups (FRDC Project - Optimising the management of tropical reef fish through the development of indigenous scientific capability)
- Shark and Stingray Indigenous fishing survey with Anindilyakwa Land Council and NT Fisheries staff.

International Case Studies

Although reported and published Australian case studies were limited, there are a number of international examples that have shown the benefit of involving local people in Natural Resource Management (NRM) R&D and monitoring⁹

An example that showed the cost/benefit advantage of an inclusive R&D process is outlined in *Increasing Conservation Management Action by Involving Local People in Natural Resource Monitoring* by Danielsen et al (2007). This paper tested whether investment in community participatory biodiversity monitoring made economic sense for obtaining data for management decisions by comparing the cost efficiency of participatory and conventional monitoring methods in Philippine parks (this is generally data collection based around a scientifically developed program). Drivers for this process were to address the alienation of the local populace from decisions, but also to evaluate the usefulness of community monitoring, with the focus on comparing the level of accuracy, as usually done by scientists, or on efficiency in terms of conservation impact. The project outcomes identified that

'from a government perspective, investment in monitoring that combines scientific with participatory methods is strikingly more effective than a similar level of investment in conventional scientific methods alone in generating management interventions. Participatory monitoring not only represents a cost-effective alternative when conventional monitoring is impossible, but it is also an unexpectedly powerful complementary approach, capable of generating a much higher level of management intervention, where conventional monitoring already takes place.'

Monitoring methods included Focus Group Discussion to identify abundance of finfish, Field Diary Reports relating to crocodile sightings and hunting, Fixed-Point Photography of specified areas and Line Transects assessing giant clam abundance. Although there are some limitation in assessing the outcomes from this work - it did show that it lead to formal or voluntary management responses and greater community support (156 in total).

Research on this approach (see Danielsen et al 2005) showed that locally based monitoring was consistently inexpensive relative to the costs of management and of professional monitoring, although the start-up costs can be high. It is unclear however if there is program sustainability over the longer term. Research also shows that properly designed schemes can be as reliable as those derived from professional monitoring and often lead to more prompt action.

Overall, it appears that the best outcomes for engagement for a local community in the R&D process takes place when there is ownership and empowerment. The case studies show that when the following attributes are incorporated, there is the greatest chance to have

⁹ see examples at <http://www.monitoringmatters.org/whatis.htm>

involvement of local people in the R&D process and enhance trust, acceptance and adoption of findings that drive management and uptake, i.e.;

- a community driven/lead process if possible (bottom up, not top down)
- a need is identified that is accepted by the community
- cultural awareness issues are addressed
- timelines meet, or address, community timelines and expectations
- a whole of project approach is adopted - from inception to extension
- a well designed program with a clearly articulated process and outcomes
- two way capacity building
- adequate support for participants (e.g. training, financial, administration, logistics)
- real desire from R&D providers, management and policy groups to engage in the process
- adequately trained, qualified and skilled people in the community
- commitment to find solutions to the complex problems that can occur when there is a transfer of roles from agencies to community or individuals.

6.10 Best Practice Model for Supporting Indigenous Fee for Service and Employment Opportunities in RD&E and Pathway to Implementation

Unfortunately, the reality of the opportunities for a comparably invisible individual on an island compared to a well coordinated and resourced group means that the real opportunities (cost v opportunity) for individuals to be able to take advantage of possible R&D field work based projects is extremely limited, and most likely may not be worth the effort.

Of course, if someone already has the appropriate qualifications, training, experience, insurance and available time, and providers are aware of them, they may generate some employment or fee for service opportunities. However, that would appear to be the exception and a coordinated approach seems most likely to gain traction.

As was outlined in Table 3 and Attachment 2, there may be some limited opportunities if researchers make the effort, and community members have capacity and the desire to be engaged in projects. If there is greater focus on the need to undertake real engagement and extension pre, during and post projects, opportunities in those roles will increase over time.

In light of the benefits offered by a coordinated approach, the Marine Ranger Engagement Policy model in place in the NT provides a sound starting point for developing a best practice model for supporting Torres Strait Islanders' opportunities in RD&E. A key aspect of the policy is that, wherever possible, Marine Rangers must be involved in any new fisheries' research proposals. Where researchers believe that participation by the Marine Rangers is not feasible, the reasons for that must be made clear and presented in writing to the Executive Director of the Department. This is used to assess the application and identify and address future barriers to rangers being able to undertake similar activities in the future. Further, proposals that intend on engaging Marine Rangers must show the benefits to both the Department and Marine Rangers (e.g. R&D outcomes, employment opportunities, utilising traditional knowledge as well as identifying the sorts of skill development and training opportunities for Marine Rangers and Fisheries staff). This is supported by Codes of Conduct for researchers and rangers that address behaviour, fairness, equity and discrimination as well as mandated cross-cultural training.

The NT Department supports the Marine Rangers through contractual Service Level Agreements (SLA), 'fee for service' arrangements and development of joint research projects. As well as the ranger groups having a range of SLA roles or fee for service activities, as part of their day to day activities, recent projects approved by the FRDC have placed greater emphasis on the role of Aboriginal people in the project delivery.

This has been enhanced by the involvement of the FRDC Indigenous Reference Group's (IRG) role as part of their Terms of Reference (see www.frdc.com.au), i.e.;

- ensure FRDC's RD&E investments are better aligned with indigenous Australians' strategic needs
- identifying, or developing, activities that will advance indigenous Australians' involvement in the fishing and seafood industry (broadly from capture, along the supply chains to R&D, policy development and compliance)
- assisting FRDC to provide advice and protocols to applicants, to add value to their RD&E proposals to better address indigenous needs and research objectives
- providing advice and making recommendations to FRDC with respect to research strategy priorities and advice on relevant research proposals.

The IRG seek to ensure that projects are 'good value for money' and provide an outcome in line with the objectives, but also that PIC has been obtained, adequate time is built into projects for real engagement, there are fees or employment opportunities in the projects or resulting from its outcomes, projects lead to positive indigenous outcomes, and indigenous and non indigenous capacity is built as a project legacy.

This two-pronged approach through the funding process (clear and applied guidelines for engagement and a review process with an indigenous focussed outcome) has meant that

new projects in the NT have real Aboriginal involvement at a number of levels, from the project development phase through to extension (during and after the project).

There are also relevant recommendations applied to R&D in the north developed in 2012 by the Expert Working Group on Science Engagement (EWGSE) for the Australia Tropical region. It was identified that there should be;

- a shift to indigenous stakeholders being involved from the outset in decision-making processes regarding the development of major science programs
- greater recognition of indigenous science and traditional knowledge in mainstream science projects
- investment to expand the capacity for indigenous-led science partnerships in the tropics
- programs focused on indigenous concerns in the tropics including the resources required to enable strong indigenous community-science partnerships
- a promotions and rewards system to shift focus to better recognise the importance of science engagement as a key academic endeavour – including the Australian government, CSIRO, Universities and State government research institutions.

A model that takes on board the process outlined in the Torres Strait Case Study, the NT Marine Ranger Policy, best practice from the research provider's review, review functions of the IRG, and addressing the EWGSE views, would provide a sound model for the Torres Strait region. That would be best served by the;

- development of an entity, or embedding the capacity into an exiting structure (e.g. TSRA as part of the Ranger Program), to coordinate opportunities for engagement in fish/fishery related RD&E processes
- development and stringent adoption of a formal policy by the TSSAC as part of the project application process, similar to that used in the NT, for all supported research projects in the Torres Strait; i.e. show cause why Torres Strait Islanders are not involved in the project and/or why capacity can't be built through the project
- undertaking of a formal skills audit and gap analysis to identify training and capacity gaps for local people and develop a capacity building program if the necessary skill sets are deficient for the expected R&D workload (possibly utilise and adapt the already developed survey - see Attachment 3)
- undertake formal skill analysis and skills matching for all proposed projects and advise project proposers of existing local capacity
- develop and empower a small independent indigenous lead group (similar to the FRDC IRG) to assist and/or guide potential project applicants to optimise Torres Strait

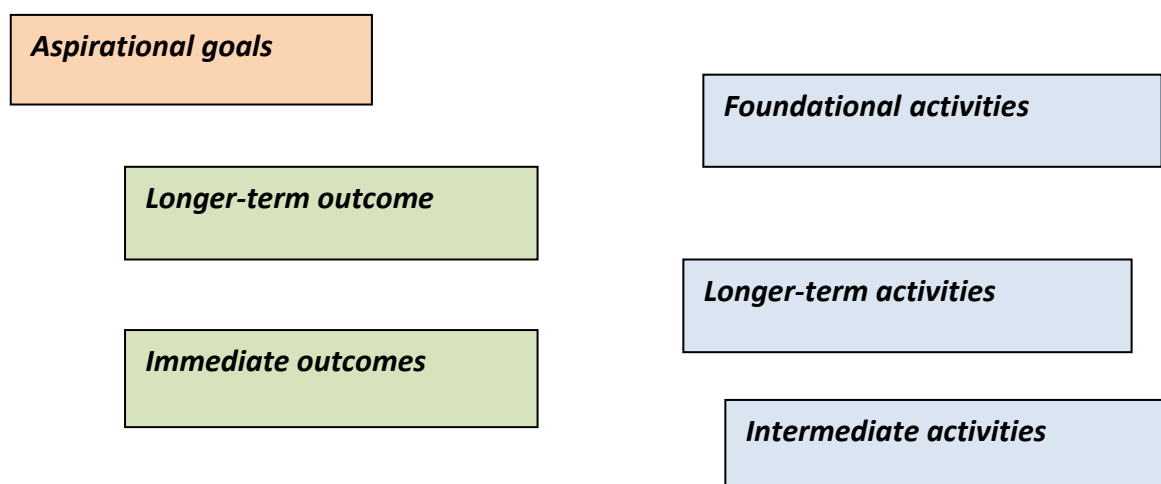
Islanders' capacity and engagement in projects, and to culturally upskill non indigenous researchers.

All of this will only work if there is a genuine desire from those undertaking and supporting and/or funding the R&D in the region to foster and support projects that have involvement and engagement of Torres Strait Islanders from the genesis and throughout the project's life. Further, there needs to be a commitment to build capacity and leave a legacy whilst working to address local needs. As suggested by the Expert Working Group on Science Engagement (EWGSE), the use of tools to encourage and reward as part of the funding process to ensure this takes place may provide an incentive for R&D providers to seek greater engagement.

The capacity of individuals and RD&E providers to realistically engage on one off projects is extremely limited unless there are prior and known contacts in place. The other limiter is that for many projects there are a range of very prescriptive requirements that must be complied with before any 'employment' can take place (i.e. ABN, insurance, relevant and up to date tickets and qualifications).

To take this concept of a best practice model further, there would be benefit in utilising a Program Logic approach to this, as was completed for the Turtle and Dugong Management Program, to clarify the aims and aspirations of such an approach. This should include clearly identifying the participants, aspirational goals of the program and the immediate and longer-term outcomes and activities as shown in Figure 1.

Figure 1: Example of a Program Logic Approach



6.11 Basic business plan and implementation pathways in the Torres Strait.

If a stand alone coordinated approach to increase Torres Strait Islander involvement in the RD&E process was to be considered, there would be a need to commit and expend significant resources to the program. In addition, it would be reasonable to expect that for this to be successful and cost effective the local 'coordinating entity' would most likely need

to be the principal R&D provider in most instances, and then (especially in the initial stages) subcontract out the work to various outside groups with the necessary expertise (i.e. outside groups develop the science based approach and possible assessment with the local group undertaking the monitoring and day to operational roles).

Any Torres Strait Indigenous marine and fisheries research partnership would need to provide organisations with a marine or fisheries R&D interest in the region, with suitably qualified Torres Strait Indigenous research assistants for the required period of the project activity in the Torres Strait.

This concept is still in its theoretical stage and has yet to be discussed with stakeholders or costed. The concept would require a private entity with staff and research assistants being traditional owners of the region. This would mean that any research project that utilises their services would have the benefits of a culturally appropriate approach to undertaking the operational research activities, with the knowledge and safety net that all community protocols have been followed.

Marine and fisheries R&D has been undertaken in Torres Strait for many years with good results thus far, with the majority of the work coordinated through major research agencies. However, there is a thought that there may be an opportunity for Torres Strait Islanders to become research assistants, to add value to the research by providing a very personal and tailored approach to the compulsory community engagement process that is required to be undertaken by all organisations before, during, and after R&D undertaking activities in the Torres Strait region.

The future of the concept/entity would be dependent on the establishment of a suitably qualified team of 10-12 marine research assistants, a co-ordinator or manager, and possibly one administration officer. For the purpose of this report, the focus is on the marine research assistants' roles.

No matter what governance or business structure the entity adopts, it would be required to be compliant with a range of legislation and protocols, including the;

- Workplace Health and Safety Act 2001
- Workplace Health and Safety Regulation 2011
- Workplace Health and Safety Regulation 2008
- First Aid Code of Practice 2004
- DERM Underwater Diving and Snorkelling Operations Manual 2012
- Codes of Practice, Policies and Regulations of the Hiring Organisation

The Indigenous Research Assistants (IRA) would need minimum qualifications of;

- Open Water Rescue SCUBA Diver, with 30 hours of recognised dive time
- First Aid Certificate with current CPR and Oxygen Resuscitation Certificate

- Be familiar with any codes of practice or policy as instructed by contracting or contracted research organisations.

A level of numeracy and literacy would be required to pass the written exams required to gain the above diver qualifications. Theory for all of the above courses can be done online using PADI eLearning, although this may not be appropriate for Torres Strait Islanders who may not have access to the internet, or will require the assistance of a hands-on mentor to provide one on one tutoring.

To gain the minimum SCUBA diver requirements potential IRA would need to comply with the process outlined below in Table 8 (Attachment 6 provides greater detail).

To be effective the entity would require a training facility (to keep staff qualified and provide staff succession), on-ground transport, a suitable vessel(s), accommodation, transport to training location for participants, and be able to provide meals and all SCUBA equipment. All participants would have to pass the AS2299 medical test prior to commencing training.

Table 8: Requirements to Gain Minimum SCUBA Diver Qualifications to Work as IRA

Qualifications	Requirements
Pass the AS2299 medical test (annually)	Pass the AS2299 Commercial Dive Medical, which consists of a comprehensive questionnaire as well as eyesight, hearing, lung function, blood pressure, urine tests, and chest x-ray. The whole procedure takes approx three hours.
PADI Recreational Open Water Diver	Visit PADI Dive Centre to complete training, including eLearning Review to confirm understanding of safety-related course material Successfully complete and master 5 confined water dives and 4 open water dives with PADI Instructor. Cost is \$120 plus the in-water practical of the certification and any travel and equipment.
PADI Recreational Open Water Advanced Diver	Need to be a certified entry-level diver and fit for diving. Successfully complete at least 5 Adventure Dives including deep adventure dive and underwater navigation adventure dive. Cost is \$120 plus the in-water practical of the certification and any travel and equipment.
PADI Recreational Open Water Rescue Diver	Need to be certified to beyond entry-level with proof of underwater navigation training and be fit for diving. Visit PADI Dive Centre to complete training, including eLearning Review to confirm understanding and review of safety-related course material. Complete online 5 'easy-to-learn' sections after introduction. Complete 10 rescue exercises in open water and 2 Rescue Diver Scenarios in open water.

	Cost is \$120 plus the in-water practical of the certification and any travel and equipment and separate Dive Centre fee for completing rescue training exercises and scenarios.
30 hours of recreational dive experience.	Need to have certifiable dive history including a 'dive buddy' and qualified instructor to sign off on the logbook.

As an example, the cost to send potential IRA to Cairns to complete the training required to reach the Recreational Rescue SCUBA Diver qualification (10 days) from a recognised SCUBA Dive Instruction School is approximately \$2,000 each, and would cost approximately \$20,000 in total training costs. For accommodation, meal allowance and travel expenses for 10 participants plus a mentor, would cost approximately \$33,000 in total.

The equipment required to adequately support the entity, from training to fee for service activities status, would consist of;

- dive compressor (\approx \$17,000)
- 14 (including spares) sets of SCUBA gear including, wetsuits, BCD, regulators, weight belt and weights, dive computer (\approx \$4,000 each) for a total of \approx \$56,000
- 14 (including spares) sets of masks and fins (\approx \$200 each) for a total of \approx \$2,800
- 20 (including spares) SCUBA tanks (\approx \$500 each) for a total of \approx \$10,000

The total cost for the very basic equipment as listed above is \$85,800.

The 30 hours of certifiable dive experience, that is required to be logged as a recreational SCUBA diver, would require a suitable platform (vessel) which would cost approximately \$6,000 per day including fuel, meals, tender and a master. The total cost for the vessel for the 24 days, which allows for compliance with the restrictive regulation relating to compliance with dive tables, and based on tank capacity and safe operations (see Attachment 6 for more details) to complete the necessary hours for 10 divers would be approximately \$144,000.

Table 9 below provides an itemised breakdown of cost for the delivery of training in Torres Strait and Cairns, including the requirement for 30 hours of diving experience.

If an individual who resided in the Torres Strait was interested in gaining the required qualifications on their own, the total cost could be reduced if accommodation was sourced from relatives or friends, although the time taken and cost to acquire 30 hours of verifiable experience would be increased due to the need to participate in diving expeditions. Based on the model, the estimated cost to meet this level of qualification could be in the vicinity of \$20--30,000 per person.

As an individual, an array of options can be sourced dependant on the participant's ability to think outside the box and proactively seek these opportunities. However, there is no

guarantee of R&D assistant roles being available, even if an individual has the appropriate skills.

Table 9: Approximate Costs for IRA SCUBA Diver Certification for 10 participants

Diver Certification in Torres Strait and Cairns	Total Cost
Basic Equipment	Supplied
Deep Sea Divers Course Fees	\$20,000
Accommodation	\$10,000
Meals	\$10,000
Airfares	\$15,000
Sub Total	\$55,000
30 Hours SCUBA Diving Experience over a 1 month period	
Basic Equipment	\$85,800
Vessel Hire (24 days)	\$144,000
Sub Total	\$229,800
TOTAL	\$284,000

7 BENEFITS AND ADOPTION

The potential benefits of the adoption of locally based monitoring of fish and marine resources utilising IRA are many, and would include;

- supporting the Torres Strait regional goal of - *'our natural and cultural environment is an asset that is protected, preserved and enjoyed through sustainable management'*
- providing relevant background, understanding and information for management actions by engaging at the forefront with the people and communities of the region in the design and delivery of research projects and services
- increasing the utilisation of adequately resourced locally available services, which over a period of time could become self sustaining
- the participation of local people in the management of their marine environments, whilst acknowledging that regional and remote training and employment needs differ to those of southern localities
- stimulating and encouraging broader discussion regarding possible links between TFK and TFM and scientific natural resource management amongst stakeholders through direct contact between researchers and Traditional Inhabitants

- building management skills and capacity of agency field staff, their agencies and communities at all levels to effectively coordinate regionally and nationally appropriate research programs and services
- providing stakeholders with direction and easy to understand overviews relating to the aims of R&D projects and programs and their links to sustainable resource management that lead to healthy, resilient and well-managed ecosystems, and communities who are well informed regarding the sustainable use, protection and management of natural and cultural resources in the Torres Strait region
- reinforce and improve livelihoods by strengthening community based resource management systems, and providing hands on opportunities to participate in the collection of data for the purpose of sustainable management
- allowing improved efficiencies and resource outcomes that come from well managed, regional based and local data collection.

8 FURTHER DEVELOPMENTS

It is the view of the authors that when the concept of having Torres Strait Islanders more involved in field research was first discussed, the TSRA LSMU ranger program was not fully operational. At that time, the LSMU had only seven Turtle and Dugong Officers spread over seven communities and they were dedicated solely to turtle and dugong activities. The idea of greater individual community members' involvement in R&D seemed to have merit, as there appeared to be many potential opportunities to participate.

Today however the situation is very different, as the LSMU ranger program has not only replaced the seven Turtle and Dugong Officers, but expanded to 42 rangers operating in all Torres Strait Communities. The LSMU are the dominant participants in marine and sea activities. This program is well resourced and has a very competent support mechanism through the employment of program and project managers, natural resource management officers, ranger supervisors, and administration and logistic staff. The Ranger Program has also implemented a future recruitment process through a Junior Ranger Program at the Torres Strait Tagai College, Thursday Island Campus.

Although there are many R&D activities currently occurring in the Torres Strait, with the advent of the Ranger Program, much of this work is now often being undertaken with their involvement, which means there are limited (if any opportunities) for possible self resourced local research assistants to gain employment.

If a coordinated approach is desired, the next step to progress this would be to undertake a skills audit through on-ground interviews and community surveys. This would require considerable resources given the expensive nature of doing work in the Torres Strait.

In addition, as part of the future funding process there would be merit in developing a register to document the RD&E skill sets required for each project that is being undertaken

in the region. This would provide the opportunity for the TSRA LSMU and/or Tagai College to identify gaps and then develop programs to build local capacity, based on quantitative data of potential ongoing employment needs in the Torres Strait and beyond.

A cost benefit analysis in respect to measuring the level of project outcome optimisation arising from conventional versus participatory research approaches may also be a valuable decision analysis tool as part of any future RD&E project assessments. Overseas research shows that participatory research may often provide greater adoption of research outputs and outcomes, whilst being less expensive.

9 OUTCOMES

Due to a changed situation in the Torres Strait region, especially through the expansion of the LSMU, some of the expected outcomes have not been fully achieved. This is because the major focus in the region has shifted from individual Torres Strait Islander engagement to an organisational approach. This obviously limits opportunities for individuals to benefit. Notwithstanding this, the project still delivered a range of outcomes as outlined below.

Through the project surveys and interviews, the scale and scope of fishing and seafood related RD&E and potential opportunities has been documented. By considering this information, Torres Strait Islanders and RD&E providers will be able to identify opportunities for greater collaborative RD&E in the future. The surveys showed that very few Torres Strait Islanders were involved in current field research and extension.

Research providers will be able to review the information in this report to assess their procedures and processes to see if they can be adjusted to encourage greater involvement of Torres Strait Islanders in the RD&E process.

A potential model and draft arrangement for supporting an indigenous fee for service, and employment opportunities in RD&E in the Torres Strait has been identified and put forward as a concept. However, as was identified as a potential threat during the project development phase, there would not appear to be a suitable cost effective best practice business model for individual employment in the RD&E process. This is mainly because the LSMU has now positioned itself very strongly in much of this space and takes a primary role in providing real involvement and engagement in the RD&E process (from project development to outcome delivery) in many of the marine focused projects taking place in the Torres Strait. Some gaps (opportunities) still occur in fishing and seafood related R&D that fall under projects overseen by the TSSAC.

This still has the potential to enhance acceptance and adoption of R&D findings, which can lead to improved management arrangements in the region. Overseas' research shows that greater environmental outcomes can be achieved through community participation and there is still an opportunity for this to increase in the Torres Strait.

Increased participation has already taken place in this RD&E space through the employment of an additional 35 rangers plus support staff by LSMU. Some of this capacity has moved to the marine and fisheries RD&E fields that were to be considered under this project's scope.

10 CONCLUSION

It is the view of the authors that when the concept of having Torres Strait Islanders more involved in field research was first discussed, the TSRA LSMU ranger program was not fully operational. This situation has now changed and the LSMU, (excluding a number of commercial fishing and seafood related projects), are now the dominant participants in marine and sea focussed R&D activities; including community engagement, research assistance, traditional knowledge recording, and turtle and dugong management plan implementation.

This LSMU program is well resourced and has a very competent support mechanism through the employment of program and project managers, natural resource management officers, ranger supervisors, and administration and logistic staff. The LSMU is positioned very strongly and takes a primary role in providing real involvement and engagement in the RD&E process, decreasing the need to identify greater individual involvement in R&D through potential opportunities.

The Ranger Program has also implemented a future recruitment process through a Junior Ranger Program at the Torres Strait Tagai College, Thursday Island Campus.

The surveys undertaken through this project, with RD&E providers, has shown that under the existing funding models and arrangements there are few (if any) real full time or meaningful part-time opportunities for individual involvement currently, or into the future. The costs and commitment for an individual (or for a new entity) to comply with the many protocols and formal requirements required to do fishery based RD&E, in conjunction with the major R&D agencies systems, would appear to be cost prohibitive, based on the amount of work possibly available.

The high costs of undertaking training, as outlined previously, and the LSMU Ranger program being fully operational, in reality do not support the creation of a Torres Strait Islander research assistants program. At this stage the Ranger Program does not provide a fee for service, but provides the service as a responsibility/role within job descriptions under specified funding arrangements. The LSMU Rangers marine team undertakes research activities in collaboration with research institutes and organisations, as well as commissioning their own activities. The research activities are done on the ground with the assistance of the Rangers. This provides manpower to the researchers, as well as capacity building and knowledge exchange opportunities directly to the rangers involved. As well, in the periphery, Rangers take that knowledge through their everyday activities and contact with their community members.

Many of the potential capacity building opportunities that were first being considered as part of this project's outcomes have now been picked up by the LSMU, such as; utilising local services and people in the project development and RD&E delivery, improving two way knowledge exchange, building management skills capacity, developing an employment pathway, and providing governance and support.

That is not to say that suitably qualified and experienced Torres Strait Islanders could not gain employment with R&D providers, just that the volume of work versus the cost may provide limited, or no, financial benefit to the individual. As an example, to qualify as a basic diver was estimated to cost around \$30,000, and regular employment for a number of years would be needed just to recoup the outlay. Once qualified, the availability of regular employment as a research assistant through the marine based research activities occurring in the Torres Strait (which are not in collaboration with the LSMU) may be in short supply.

An option that may be pursued by individuals is to contact local employment and training organisations and enlist their services to undertake a mapping process to clearly describe what would need to be done to participate in the R&D process. Following that, an appropriate training program could be developed to access training through training service providers as part of the Community Education and Development Program (CDEP).

If a number of individuals were to gain the correct qualifications then they could either approach the R&D providers directly, or seek assistance from the LSMU to be involved in projects as a research assistant so as to build skills and capacity. The TSRA would most likely be unable to provide any remuneration for involvement, but research agencies may have different policies which may enable them to provide some remuneration.

It must be remembered that the TSRA LSMU does not have current capacity to undertake additional tasks focussing on fishing and seafood related R&D, as this type of R&D generally falls outside of the existing scope and currently funded roles/tasks. Arrangements would need to be made and resourcing/funding opportunities identified to build capacity and organisational structures, if the TSRA were to consider taking on such tasks as part of their day to day activities.

If a coordinated approach outside the TSRA LSMU is desired, the next step would be to complete a skills audit through on-ground interviews and community surveys.

A potential model and draft business arrangements for supporting indigenous fee for service and employment opportunities in RD&E in the Torres Strait has been developed and put forward as a concept. As was shown in the case studies, successful training and meaningful participation for Torres Strait Islanders in research is currently provided through Government Funded projects that have a very well established governance process. This means that even if participants were to successfully complete training, a support governance system would still need to be implemented. This would be necessary to enable research assistants to be provided with a policy framework, to ensure they are compliant with all relevant legislation, and that they are provided with equipment that is maintained

to the level required by legislation to meet insurance and workplace safety standards. Research providers indicated that a one-stop shop for suitably qualified research assistants was the optimal model. All the costs associated with gaining the appropriate qualifications, meeting the required legislated standards and purchase of the equipment, as well as the annual equipment servicing requirements, would need to be passed on to the clients wishing to use these services. Again this may not be a realistic economic model based on the volume and regularity of available work.

Looking forward, a few concepts that could be considered to further enhance and empower Torres Strait Islanders in the RD&E process follow.

The current situation sees all marine and fisheries research project concepts going to the LSMU to gain support. Without this support, the projects very rarely get funds to proceed. This process should be formalised and embedded in the funding process in the region, similar to the NT model.

In addition, as part of the future funding process there would be merit in developing a register to document the RD&E skill sets required for each project undertaken in the region. This would provide quantitative data for the LSMU and/or Tagai College to identify gaps in available research needs so as to develop programs to build local capacity, based on potential ongoing employment needs in the Torres Strait and beyond.

A cost benefit analysis in respect to measuring the level of project outcome optimisation, arising from conventional versus participatory projects, may also be a valuable decision analysis tool as part of any future RD&E project assessments. Overseas' research shows that participatory research may provide greater adoption of research outputs and outcomes, whilst being less expensive, and allowing improved efficiencies and resource outcomes that come from well managed, regional based and local data collection.

11 BIBLIOGRAPHY AND REFERENCES

- Ah-kee, D. 2009. Chairs summary - Overcoming impediments of incorporating Torres Strait Islanders in research
- Busilacchi, S. 2008. The subsistence coral reef fish fishery in the S; monitoring protocols and assessment (PhD)
- Commonwealth Scientific and Industrial Research Organisation. 2011. Diving Procedures Manual Version 1.8. Endorsed by CMAR Executive Committee, May 2006
- Danielsen, F., Burgess, D., Balmford, A. 2005. Monitoring matters: examining the potential of locally-based approaches
- Danielsen, F., Jensen, A., Alviola, P., Balete, D., Mendoza, M., Tagtag, A., Custodio, C., Enghoff, M. 2005. Does monitoring matter? A quantitative assessment of management decisions from locally-based monitoring of protected areas
- Danielsen, F., Mendoza, M., Tagtag, A., Alviola, P., Balete, D., Jensen, A., Enghoff, M., Poulsen, M. 2007. Increasing Conservation Management Action by Involving Local People in Natural Resource Monitoring
- Dennis, D., Ye, Y., Lara-Lopez, A., Jones, A., Cheers, S. 2009, 2009 Commercial catch age composition and conversion ratio for the Torres Strait Tropical Rock Lobster Fishery. AFMA Project: RR2007/0835
- Department of Resources. 2010. Marine Ranger Engagement Policy
- Department of Resources. 2011. Indigenous Marine Ranger Engagement
- Expert Working Group on Science Engagement Into and For Australia's Tropical Region. 2012. Science Engagement and Tropical Australia - Building a prosperous and sustainable future for the north
- Jones, A., Barnett, B. Guidelines for ethical and effective communication for researchers working in Torres Strait
- Marsh, H., Grech, A., Hagihara, R. Aerial survey of Torres Strait to evaluate the efficacy of an enforced and possibly extended Dugong Sanctuary as one of the tools for managing the dugong fishery
- Murphy, N., Skewes, T., Dovers, E., Leatherbarrow, A. 2012. Assessing stock recovery using experimental fishing for sandfish on Warrior Reef, Torres Strait. Final Report AFMA Project 2011/803
- Torres Strait, Protected Zone Joint Authority. 2010. A guide to fisheries researchers working in the Torres Strait.
- Torres Strait Scientific Advisory Committee. 2010. 2010 Operational Plan For Torres Strait Fisheries

- William, A., Beggs, G., Little, R., Curry, L., Ballagh, A., Murchie, C. 2007 Evaluation Of The Eastern Torres Strait Reef Line Fishery
- Winkel, C. 2009. Food Safety and Export Documentation Training specific to the Seafood Industry in the Torres Straits.

Appendix I: Intellectual Property

No intellectual property was developed under this project and any knowledge gained through this project is available to the broader Australian fishing and seafood industry.

Appendix II: Staff

The following staff were involved with this project;

Chris Calogeras	C-AID Consultants	Principal Investigator
Stan Lui	TSRA	Co-investigator
Gail Calogeras	C-AID Consultants	General Manager

Attachment 1:

Sample Correspondence with RD&E Providers

AFMA Research Project 2011/808- Empowering Torres Strait Islanders to have greater engagement in the Research, Development and Extension (RD&E) within the Torres Strait commercial fisheries sector

I am contacting you to introduce myself and Stan Lui, co-investigators for the above project, which is seeking to identify processes that will allow greater participation and engagement of Torres Strait Islanders in the Research, Development and Extension (RD&E) process. Although participation and engagement can be very broad, this project's focus relates to involvement in field research and extension, however other identified opportunities will also be documented.

Through your involvement in RD&E in the Torres Strait, you would be aware that Torres Strait Islanders have a long held ambition to participate in RD&E associated with the fisheries and seafood sector. Torres Strait Islanders have a continuous tradition of involvement in the management and ongoing care of the fish and aquatic life in the waters adjacent to, and as part of, their traditional estates. Much of the current RD&E however is developed and undertaken from a 'western' perspective by major research and fisheries agencies, and for a number of reasons may have limited indigenous involvement.

A number of recent projects and workshops have again identified the desire of indigenous people for greater involvement in the RD&E process. Likewise many RD&E providers and researchers have expressed a desire to increase indigenous people's participation and buy in for projects being undertaken in or around indigenous people's estates. The Torres Strait Scientific Advisory Committee (TSSAC) acknowledges there is a need to improve Torres Strait islander involvement in RD&E, and based on their recommendations, this project is seeking to take the next step in enhancing that involvement.

The project involves a number of steps, including;

1. Liaising with research agencies to ascertain the type of RD&E work they do in the Torres Straits, what skills they need, and any impediments to greater use of local people in their projects
2. Identifying areas where Torres Strait Islanders could add to, or benefit from, research activities and what skills are available in communities
3. Develop a best practice model for supporting indigenous opportunities in RD&E in the Torres Strait.

Initially we are focusing on item 1 above, and are looking to obtain information from you that will help us to address the current issue relating to the small number of Torres Strait Islanders currently involved in the RD&E process.

To assist us could you please provide the following information (by email or you can call me on the number below if you want to discuss this in further detail)?

- organisation and key contact
- type of RD&E projects you undertake in the Torres Strait region
- duration or regularity of work (i.e. 2 weeks every year)
- skills/ qualifications you require (formal and informal)
- formal protocols or SOP's in place regarding engagement of non-agency staff (i.e. need for ABN, insurance, induction training etc)
- examples of successful or unsuccessful engagement processes you have used or trialled
- suggestions for specific means to improve indigenous involvement in your projects.

If you could provide the information by 1st March 2012 it will allow us to take the next step in the project. Please feel free to attach any relevant documents as well. This is a major issue for the local community and your assistance in this matter is greatly appreciated. Please contact me on 0401692601 or via calogeras@iinet.net.au, or Stan on 0488 442 678, to discuss any of the above matters.

Yours sincerely
Chris Calogeras
Project Principal

Attachment 2: RD&E Providers in the Torres Straits - Response to Questionnaires

Org	Key Contact	Field of Interest	RD&E Projects Undertaken	Regularity of Work	Skills or Qualifications Required	Formal Protocols or SOP's for Non-Agency Staff	Successful or Unsuccessful Engagement Processes	Means to Improve Indigenous Involvement
AIMS GBR Monitoring Program	Ray Berkelmans Hugh Sweatman	Coral Monitoring NERP 2.3 TS Coral Reef Biodiversity Surveys Biodiversity coral reef dive surveys	Maintaining instruments to monitor environmental conditions in TS, establishing reef monitoring sites.	Envisage that the reef sites will be monitored annually. Program will start small 6-12 sites and expand as the TSRA see fit	TSRA Rangers trained in SCUBA diving for the workplace Need to identify marine creatures Use underwater cameras Use computers.	The project specifically involves TSRA staff.	not applicable at this early stage	Too early
AIMS Bioresources Library	Libby Evans-Illidge	sponge farming Eatlas	Dive surveys and sampling to find 'broodstock'.	Ongoing	Dive tickets Coxswains Boat driving Tank maintenance Data collection	Divers abide by AIMS 'visitor' protocols. Need workplace OHS	Maintain relationships. Invest resources into staff. Find innovative ways to provide capacity through funding (lump sum payments for operating expenses allowing purchase of capital item by community). Develop calendars and milestone reporting processes to assist with project and qualifications timetables. Can save money on projects over time. Often Uncles more reliable than young bucks Problem with intra observer variability but can be addressed by induction and researcher and islanders working together. Have realistic expectations based on skill set – use observers or mentors as part of setting up and auditing Use 'workshops' to do skills fests so people can identify interest and skill sets	Need a structure to coordinate and make payments and provide evidence of work done, qualifications met and protocols being followed – auditable paper trail. Provide trouble shooting service to providers if needing assistance. Provide SOPs for all aspects in a culturally appropriate manner. Keys - Empowerment, Accountability, Ownership, Leadership Spend time to develop project and then get sign on and agreement (PIC) Provide a platform for personal development. Maintain ongoing on ground liaison – know who to talk to, when, how. Be careful of research or consultation 'fatigue' if you keep going to same people. Need to pay for services, knowledge. Work with Taiga to build up skills and liaison with sea rangers to upskill to anticipated needs
CSIRO	Ingrid Van Putten	TRL TAC setting	Management strategy evaluation project based on quota options; (Olympic,	Over two year's period – community meetings.	Diving qualifications to collect data. Meeting facilitation skills. Project extension skills	CSIRO diving protocols. Employment for sub contractor conditions (ABN,	Collecting data unless through a very structured program may not work. See opportunity to use local people to collect AFMA data with training and support.	Use local people to facilitate and ensure proper protocols adopted. Transfer findings from scientists to community – i.e. so your mum or friend would understand

			community, allocation or mixture) Desktop assessment of different strategies.			insurances, training etc)	Improved outcomes if local people engaged in project development, undertaking and implementation. Opportunities to collect social, economic data (demographics, behaviours) as well as monitoring programs – with support	Provide appropriate infrastructure and engagement support. People need business skill training to run own 'consulting' business. Small meetings seemed to work better
CSIRO	James Butler	Increase participation in R&D	Workshop to increase islander participation in R&D projects. Work with Tugai college on coxswain. Cert III in land management					
CSIRO	Jim Walker	Marine atmospheric and mangroves	Indigenous engagement				Workshop with Tim Skewes to improve Islander involvement in R&D projects. Tulagi college coxswain	CSIRO cadetship opportunities. Increase skill set and capacity from school upwards – use school system to ensure students graduate with a CERT III in land or sea management as part of normal schooling
CSIRO	Libby Evans-Illidge	TRL	Monitor indigenous component of TRL. Work on freezing processing barges to collect data	4-5 year contract (1990s) For up to 3 months at a time.	Data collection Extension Interpreting	Yes but manageable if you are creative	Does not work well if people just come in and do work and they are not seen again. Challenge for people to keep qualifications current – especially if living remote	Look to link with sea ranger model. Provide support to run business of consulting to assist in RD&E. Possibility for remote requalifying.
CSIRO	Sarah Busilacchi	Subsistence catch records	PhD project. @ Eastern Islands (Murray, Darnley and Yorke Is) Assessment of biological data - catch, effort. Creel surveys, interviews	2004-2006. Spent long periods on islands 7-21 days at a time for approximately one month for each island total	Data collections Commitment to work program	NA Paid cash, based on invoices provided.	Had people on each island as research assistants. Involvement of local people critical. Trained people to collect data, provide equipment etc. Major issues around ability to commit time to projects consistently. Issues with people having 'something come up' which meant they couldn't work and data not collected. So many other issues going on islands that work is not highest priority, especially mundane jobs like collecting data. Issues identified were absence directly after pay days. Success with well organised and	Long term and well organised and supported program (like rangers) most successful as there is training, support and structure in place to make sure about qualifications, safety, attendance, payment etc. Use a local person as this resolves issues around protocols, connections and language. Younger people were often less interested than older people. Local people can help source people for interviews and provide local contact - shows respect to community to use local. Invest in locality spend time area. Use local people/rangers to do the

							structured group and longer term projects – e.g. rangers. Very difficult with small one off projects	presentations and seek feedback and opinion (e.g. turtle/dugong workshop example).
CSIRO Concordia University	Annie Lalancette	TRL participatory research training	PhD research in social science. Specifically, better ways to integrate multiple perspectives in fisheries management as a means to improve the sustainability and social equity of management decisions.	Once per year for four years starting 11/08. First visit 2½ weeks. Second visit April to August 2009. Third June to August 2010. Final February to end of June 2011.	A local facilitator. A respected and trusted contact on ground to introduce researchers to community members and help researchers understand cultural protocols etc to guide before entering new communities. Facilitators could assist in identifying relevant participants for interviews, focus groups or workshops and facilitate such activities. Trusted translators with appropriate social skills to act as research assistants when interviewing elders.	NA	Methods culturally appropriate and easily understandable for participants. Spend time developing relationships and investing in trust building. No method can provide a shortcut to time requirements for mutual trust building and understanding between researchers and participants, especially in cases of cross-cultural communication. Using scenarios setting tools useful in engaging conversation. Example one used fishing scenarios drawn on cards during “preference interviews” asking fishermen to choose between two fishing scenarios which one they would prefer on barriers to fishing and trade-offs between time spent fishing and resulting catch. The ranking obtained from this exercise was not necessarily a useful quantitative result but conducting the exercise was certainly very useful in understanding underlying motivations for fishing behaviours and decision-making. Scenario two explored potential impacts of different quota options for management of the TRL. Stimulated thinking beyond immediate impacts and generated discussions which raised awareness among participants and revealed potential unintended consequences of proposed measures - relies on good facilitation skills. Worked closely with the local rangers and other local Islanders so that they could act as additional facilitators during the workshop. The greatest difficulty is that there are limited human resources. There is no one on the ground with the time or resources to pursue the process that was initiated during the workshop.	Many researchers are willing to share their skills and provide training but there is no structure to facilitate such endeavours. Two suggestions: 1) Key persons (e.g. Rangers) could receive basic training in facilitation and basic social science methods such as interviews and focus groups; 2) There should be a structure to encourage and assist researchers in providing some training and contributing to capacity-building. Having a local contact person in local communities that could act as both a facilitator and resource person would greatly improve Islander involvement in research. Need a process and commitment from researchers, islanders and regional support agencies to invest time in local capacity-building.

CSIRO Division of Marine and Atmospheric Research	Eva Plaganyi Darren Dennis Darren Johnson	TRL	TRL stock assessment surveys Funded by AFMA. Possible supplementary work, field monitoring (e.g. TRL, environmental)	Ongoing since 1989 Two weeks per year	Diving Snorkelling Data collection Monitoring Data entry	OH&S issues around diving and snorkelling. Difficult for locals to gain dive tickets to meet CSIRO protocols.	A range of successful projects examples; BADU contracted local monitoring at processing - very precise and quality data. Conversion ratio analysis for TAC Local depletion issues at Warragia MSE project Very few pear shaped. Noted concerns via SAC relating to lack of islander involvement in process in 2009. Needs a number of years (3) to transition to Islander driven project. Lack of interest in some of the more mundane monitoring tasks. Some tension between islanders and non islanders and between communities make it hard often to gain a consensus view - non islanders have limited traction and it often seems difficult to engage. CDEP could have addressed some employment issues. Lack of infrastructure on islands.	TSRA employ and CSIRO contract through the organisation. Need a more coordinated approach to data gathering using local knowledge and sound scientific protocols Researchers must be proactive in providing information to the SAC. Undertaken information workshop to gain local understanding/input Develop projects around islander concerns and needs - need bottom up not top down push driven by outside influences. Projects need longer timeframes to gain better engagement. Ideal process would; Identify RD&E issues through SAC process with two way feedback into priority setting process Ideas raised (bottom up approach) and vetted through the process . Have a formal working group. More open communication process to engender 2 way trust. Fly in fly out approach doesn't allow adequate time for relationship building - but budget driven. Need a formal feedback loop. Project outlines and outcomes should be developed so that there is an Exec Summary, Layman's one pager and also extended through local radio etc. Need to better explain what the research is about - gain community understanding and support. Long term contracts and project funding would allow the development of joint processes and capacity building to be incorporated into process
CSIRO Marine and Atmospheric	Timothy Skewes	Hand collectable R&D training	Fisheries sustainability. Sea cucumber,	Field work carried out for 1- 2 weeks on	Marine surveys using SCUBA or Hookah equipment.	Casual engagement of Islanders in	Have used casual employment contracts to engage Islanders for field surveys in past. Administrative	Suggestion that there be a centralised register of available expertise, with group or individual

Research		and survey	trochus and tropical rock lobster.	average once a year (but less than that in recent years).	Counts of fishery species plus environmental data (coverages of biota and substrate). Questionnaire surveys of islander fishers. Survey data analysed to determine stock and fishery habitat status. This information used to recommend management actions.	projects. Used to do annually for the TRL surveys 1990s. Employed Yam Islander for the sandfish survey in 2010 under a standard employment contract, with usual admin and engagement overheads. Interacted with Islanders in normal fishing activities (directed fishing activities, as in current Sandfish project). In this case, no formal engagement. Paid Islanders for catch data (size and weight) on straight "fee for service" basis though Island processors - required an ABN and Invoices for CSIRO to pay.	overheads and cost (non-wages costs) are very onerous. However, the level of engagement and interaction is enhanced with this type of arrangement (i.e. Islanders are "CSIRO staff" and benefit from this status). Did try and engage Islander field staff on a contract basis, but the lack of an ABN and Insurance made it virtually impossible. Difficult community perceptions and lack of ownership of projects.	coverage for Insurance and ABN requirements, that outside agencies can engage. We would like to have a system to engage Islander expertise on a contract basis, but this would require that the Islanders would have an ABN, Insurance and other up to date requirements before this could happen. Has proven to be a stumbling block in the past. Experimental fishing survey – allow the selling of product as part of scientific project.
DEEDI Fisheries Queensland	Helen Taylor	Sub tidal seagrass mapping and surveys	Productivity and resilience of seagrass at Mobiac.	2002 for 12 month	Record recovery experiments working with a team of scientists initially – rangers now assist			Liaise with TSRA to determine if the project is a priority – check with PBC chairs and provide feedback loop to TSRA and project proponent
DEEDI Fisheries Queensland	Helen Taylor	Critical marine habitat	Helicopter surveys annually. Mapping exercise of corals , seagrass and algae		Need expertise at least two people one to identify data and one to GPS	Limited to 3 seats in chopper – size important and ability to accurately record necessary data - expensive	Rangers have been out but didn't seem interested in the quite mundane work	

DEEDI Fisheries Queensland	Helen Taylor	Engaging with rangers	Long term monitoring of seagrass in dugong sanctuary		Training programs provided by DEEDI during project to collect data		Rangers will take over monitoring, collect data and send to DEEDI for analysis.	
DEEDI Townsville	Jane Mellors	Seagrass	Intertidal monitoring of seagrass	Ongoing monitoring	Project management		Look to engage with school to develop projects and programs that encourage commitment and interests. Do skills audit	Need to look to ensure projects are attacked from a different cultural perspective and develop ownership NOT just as an add on and build skill sets and capacity
DERM Threatened Species	Col Limpus	Turtle tagging	Aquatic threatened species . Standing data base – records kept statewide. Poorly represented in the TS even though protocols in place (key to identifying cause of death) Tagging for turtle research supplied by DERM and have state-wide SOP and entered onto shared database	Ongoing through various agencies and researcher No TS project in place Riane Is since 1975, Milnum Is, Branlle Cay, Campbell, Deliverance, Crab Is and Marpoon.	Trained to ensure protocols are followed and reporting is timely and accurate. Monitoring skills and accurate data recording. Reef transects to tag and measure Monitoring of nesting beaches, how many tracks by species by location.	R&M not a traditional activity so need permit from relevant authority. Collaborative projects with existing permit holder could take place. Concerns about an 'interaction'. Which could lead to all research having to cease.	Big hole in data is from TS on what is hunted by species – not just greens. Having success in western gulf related to pest management and survival of turtle - need 70% to survive to hatchling, seek to reduce predation (laid v lost bookkeeping process) and tagging. Limited activity by Rangers currently entering onto database. TSRA and JCU purchasing tags but not receiving much back data – use do to individuals now TSRA undertake the role Potential projects should; Identify species, size, photo of gonads (currently all females), crop to see what is feeding on, genetics sample, weight.	Understand the difference between R&M. M= collecting data and this is done by a formalised process (recipe) and with appropriate training is fine. R is more complex and includes project design, analysis and reporting – often need qualifications and expertise and ability to work with collaborators Plenty to do and opportunities but people want payment but is a shared responsibility Consider using kids to do tagging and collect lat and long information and provide the information back to the schools as a project?
ITEC Employment	Chris Davey	Training and capacity building	NA	NA	NA	.	CEA and ITEC wil combine in July 2013 as Remote Jobs in Community Programs (DEWER). \$245M over 5 years for community development. Aim is to support community develop and RJCP will provide training, logistics, equipment and support	Shift to solely job focused training outcomes to community benefit and support. Looking for bottom up approach from community – if community support then possible to get funding. Fishing is an option.
JCU	Helene Marsh Mark Hamann	Dugong	Aerial Dugong Surveys Sampling from harvested animals	Ongoing	Ability to accurately collect data Work long hours Pass medicals	Weight considerations when flying. Diving, boat safety and skippers. Permits for interaction with protected species Ethics permits for R&D	Conscious of weight restrictions/costs when flying so need skilled operators - can't be a training exercise. Different work expectation conditions - researchers work many hours to complete project whilst many locals have other commitments. Often due to cultural protocols some of the work required on dugongs (sampling) can't be completed People require 'cash' payments but this	One stop shop for skilled local people would be ideal. Provide opportunity for training for islanders during schooling and uni. Work through issues by developing a research partnership agreement. Find means to bridge the expectation gap on both sides. Need to improve skill sets and better meet work standards. Much research is boring and

							<p>is difficult when working through an agency - can try to use councils and reimburse but they are often cash poor. When looking to engage locals there were difficulties in passing medicals. Need to acknowledge the tensions between IK and western science - need to develop connections</p>	<p>repetitive - researchers need to do a better job in engaging to explain importance and purpose of R&D. Funders need to be more aware of the challenges and costs of undertaking work in remote locations. Researchers need to be able to precisely explain what the work entails and what for - get PIC. Researchers take part in cross-cultural training. Acknowledge that many people are cash poor in region and work must be paid for quickly (sometimes agencies take time to pay).</p>
JCU (Now SEWPAC)	Jillian Grayson	Dugong and Turtle database PhD Project	Trial of community-based catch-monitoring of dugong and marine turtle hunting	Ongoing for two years No longer conduct research in Torres Strait region	Developed conceptual framework to represent different functions of partners in an ecological monitoring program. The functions needed to develop and implement a community-based catch-monitoring project in Torres Strait region include design, data collection, data analysis and interpretation, data sharing and storage, assessment of the effectiveness of monitoring and integration of the results of catch-monitoring into management. In addition, the results of different monitoring projects need to be integrated to inform management. Fulfilling these functions requires	Two Torres Strait Islanders were employed to work on the project as catch-monitors. Employed by Hammond Island Council and the TRAWQ Community Council. Each council invoiced JCU to cover costs associated with employing staff.	<p>Followed the JCU ethics requirements and provided each participant with an information page, which they could keep detailing the aims and methods of the project as well as a PIC form detailing information such as their rights relating to their participation, how confidentiality would be guaranteed with respect to the information they provided, where the data would be stored and for how long, and what the outcomes of the research would be used for.</p> <p>To gain support for the project discussed proposed research questions, the research process, proposed outputs and anticipated outcomes with each of the groups involved, including how the research could benefit their communities. Developed a research agreement with the communities to ensure that conduct the research was in a culturally appropriate manner. Established Cultural Reference Group comprised of representatives from each of the parties to the Agreement to provide advice about cultural protocols, and scrutinise outputs to ensure did not inadvertently release culturally sensitive information or misrepresent the participating communities or Torres</p>	Formal training of Torres Strait Islanders in biology/ecology/natural resource management at the Tertiary level.

					assistance from experts such as scientists, database experts, communication experts, trainers and educators, rangers and hunters and other community members.		<p>Strait Islanders in general. Collaboratively developed catch-monitoring projects with hunters from the communities. Discussed different catch-monitoring tools to trial, including the advantages and disadvantages from a scientific perspective and from a cultural perspective and decided to trial a datasheet. Employed local male catch-monitors because hunting is a male activity, and it was important to provide employment and training to the communities involved in the project. The TSRA were very supportive in providing office space. The CRC TS Liaison officer, who worked for TSRA, was instrumental in facilitating engagement with community leaders and hunters. Community Councils were supportive of the project and encouraged hunters in their communities to participate. Having the Community Council provide leadership, support and focus on the project facilitates engagement. They also provided opportunities for providing feedback of results. Both AFMA and TSRA suggested I hold BBQs on Thursday Island to discuss the progress of the project with hunters and try to gain further support, but these events were very unsuccessful.</p>	
UTas Fisheries Aquaculture	Ben Chuwen (now Dan French)	Fisheries Monitoring - mackerel trout mobile phone reporting	Assessing fish monitoring using Islanders through the use of mobile phone technology	12-18 months	collect biological data record data send through without error on a regular basis.	UTas would undertake a risk assessment. Difficult to pay individual and to check they have all of the required insurance, licences, ABN etc and access to technology.	<p>Have had problems with continuity of employment and people losing interest in work. Need to build in time to develop relationships and waiting time - funders need to understand this.</p>	Need a structured group such as the rangers to facilitate work – provide scope and required skill sets and let organisation do the work. Not really possible to identify individuals, especially from remote regions. Would see benefits in using local skills to ensure project scope, uptake and extension in place. Need support logistics, funding, travel etc)
UniQld	Libby Liggins	Coral surveys	Worked in the Torres Strait Islands	10 days per year over two years.	Qualified skippers	Must comply with university	TSRA attempted to connect with Kailag Enterprises Ltd. in 2010, to employ their	Communication and the resourcing information is probably the most

			<p>in two capacities:</p> <p>1) collections of wild coral reef fish and invertebrates for scientific research (November 2010),</p> <p>2) delivering science education to primary and secondary school students (November 2010 and October 2011).</p> <p>During 2010 visit to the Torres Strait Islands I was affiliated with the University of Queensland; during my 2011 visit I was affiliated with the Australian Academy of Technological Sciences and Engineering, acting as one of their 'Young Science Ambassadors'.</p>			<p>guidelines.</p> <p>Require easy access to oxygen cylinders (in case of near drowning events) plus medical regulators to administer oxygen.</p> <p>Would undertake research using SCUBA but unable to locate cylinder filling facility or service, in the Torres Strait region.</p> <p>Precise diving protocols and procedures in place.</p> <p>Vessels need to be registered.</p> <p>Skippers of vessels 6m+ need coxswains and under 6m Qld recreational boating licence.</p> <p>All vessels have first aid kit and enough oxygen to last to medical help, should a snorkeler or diver be injured.</p> <p>For non-university staff using SCUBA, need to be very experienced Advanced Open Water Diver, preferably with ADAS Scientific Diver.</p>	<p>services (including accommodation, boat hire, skipper hire, and field assistance); however received no response from them.</p> <p>Tagai State College staff, (Andrew Denzin and Roy Pearce), proved invaluable.</p> <p>Visited Mabuig Island school with Andrew and Roy, to talk with students and staff about our research and science in general with assistance from TSRA and Tagia under regional community garden initiative.</p> <p>Under the Australian Academy of Technological Sciences and Engineering Young Science Ambassador Scheme, organised school visits and education activities for primary and secondary students of Horn and Thursday Island schools including classroom visits, outside science activities.</p>	<p>difficult thing about working in the Torres Strait Islands for us.</p> <p>Kailag Enterprises Ltd. now has a flyer advertising a contact person, this should be much easier for researchers.</p> <p>They also look to have extensive qualifications and capable of supporting research activities.</p> <p>Contacting schools across the Tagai Campuses is quite challenging – these contact details are not listed on the school website.</p>
--	--	--	---	--	--	---	--	---

						<p>Employees or volunteers read and sign Risk Assessments for prescribed work. Employees and volunteers require first aid and advanced CPR and resuscitation training (including oxygen administration) For payment to be made from a university account an ABN is necessary.</p>		
--	--	--	--	--	--	---	--	--

Attachment 3: Community Questionnaires

Torres Strait Islander RD&E Survey PROJECT 2011/808: Empowering Torres Strait Islanders to have greater engagement in the Research, Development and Extension (RD&E) process

Name: _____
Contact: _____
Address: _____

Scenario 1: Have you ever done any RD&E work for an organisation (paid or unpaid), if so please provide the following information.

Organisation and key person	When did this take place and for how long	What sort of work did you do and would you do it again	Was it paid or unpaid and under what 'contract'	What qualifications or skill did you need

Scenario 2: Do you have a formal skill or qualification that could be useful to an organisation that will be doing RD&E, if so please provide the following information.

What qualifications do you have – are they up to date	What skills do you have	What sort of work do you think you could do	Why haven't you done this type of work before	What would be the best way to let organisation find you

Scenario 3: Would you like to do RD&E work for an organisation but don't have any formal qualifications or skills, if so please provide the following information..

What type of work would you like to do	How much work do you want	Do you have the skills or qualifications to do the work	Would you do further training to get the skills	What would be the best way to help local people get RD&E work with organisations

Please return completed form to Chris Calogeras at calogeras@iinet.net.au or to 38 Lake Ridge Crt, Lake Macdonald 4563.

Attachment 4: Summary of Examples Where Individual, or Groups, Collected Data Was Incorporated Into Formal R&D Outcomes

Project name	Organisation	Data collector	What data	Reference	Who uses it - aims
Anglers Catch Research Program/ Anglers Catch Data Base project	Angling competitions, NSW Fisheries	Recreational anglers during competitions	Catch, effort, length	see http://www.dpi.nsw.gov.au/research/areas/systems-research/wild-fisheries/outputs/2008/995	Uses describe in attached reports. This report provides an assessment of the ARTMP since the inception of the program. This document includes: the first thorough documentation of all of the recreational fishing tournament-based monitoring datasets held by New South Wales Department of Primary Industries; the history of the collection of these data; and the resulting issues associated with the use of these data to meet scientific and managerial objectives.
Blue warehou length frequencies	SETFIA, Fishwell consulting	CTF industry	Blue warehou length frequency	None	CSIRO, AFMA. 11 vessels set up with measuring boards to sample length frequencies of blue warehou. 4000 lfs collected. Uncertain et if they will be included in 2012 stock assessment.
CapReef (Qld)	Infofish Australia	Rec anglers	Catch and effort, tag and recapture, boat ramp surveys	http://info-fish.net/capreef/	Not clear. CapReef is a community monitoring program that was established in 2005 following a series of changes to management of the Great Barrier Reef (GBR). It is a partnership program involving government, science and the community.
Co-management of GAB species	GABIA	GABTF industry Fishwell	Quota species length frequency and otolith	Briefly mentioned on page 213 of #13 report	CSIRO, AFMA, Fish ageing services. Industry members measure 1 bin of Bight Redfish or Deepwater Flathead per shot. This yields 15000-20000 samples per year which are entered into the AFMA database and used by CSIRO in stock assessments. They also send representative samples of other quota species to Melbourne Fish Market where Fishwell staff measure and take otoliths. Otoliths are ages by Fish Ageing Services. It works so well in this industry because it has a strong association, small number of operators, no grading and little discarding of quota species.
Commercial fishing operations in the GAB	Personal collections	GAB trawl fishermen	Mapping data – way points	http://www.frdc.com.au/documentlibrary/finalreports/2006-036-DLD.pdf	CSIRO data. Supporting sustainable fishery development in the GAB with interpreted multi-scale seabed maps based on fishing industry knowledge and scientific survey data. Opportunistic use of data collected during commercial fishing operations.
Crystal Bowl (Qld)	Infofish Australia	ANSAQ members, Rec anglers	Catch, effort, tag recapture, boat ramp surveys for Barramundi	http://info-fish.net/crystal-bowl/	Not clear. The “Crystal Bowl” is about developing the capacity to predict fish stocks into the future. This will provide fishers with information they can use in planning for their fishing future and managers can take a more proactive view in managing fish stocks.
Fisheries and Environment project	Fishwell Consulting	SESSF Fishers	Environmental observations & temperature	NA	Scientists. The industry data collection was more about feasibility study that data collection.

Project name	Organisation	Data collector	What data	Reference	Who uses it - aims
			loggers on fishing gear		
Gamefish Tagging Program (NSW)	NSW Fisheries, Pepperell Research	Gamefishers	Tag and recapture	NA	Over the history of the program, the grand total of fish tagged and recaptured, as at the end of June 2010, stood at 373,517 and 6,790 respectively, continuing the program's status as one of the largest of its kind in the world
Great Australian Shark Watch	Australian Underwater Federation	Spearfishers, snorkelers and divers	Shark distribution	http://www.auf-spearfishing.com.au/administration/documents/documents/43.pdf	Unclear. This community project "Great Australian Shark Count" (later Great Australian Shark Watch) achieved national co-ordination and partnerships and comprehensive educational activities for large-scale community monitoring of sharks in Australian waters. It was recognised as the largest community shark monitoring project in the world.
Identification of climate driven species shifts and adaptation options for recreational fishers: general lessons from a data rich case	Southern Freedivers, Underwater Skindivers & Fishermen's Association	Spearfishers	Competition catch by species, location	Media release will go out soon	CSIRO. Collaborative project between CSIRO, JCU and the Australian Underwater Federation, is working directly with spearfishing representative bodies, Southern Freedivers from Vic, and the Underwater Skindivers & Fishermen's Association from NSW. As well as observing change in rocky reef fish composition over at least the last 5 decades, the projects will consider adaptation options for recreational fishers and divers, and develop mechanisms to inform and guide other marine users, including commercial fishers.
Keen Angler Program	Queensland Primary Industries and Fisheries	Recreational fishers	Collection of frames of at least 15 fish species	http://www.daff.qld.gov.au/28_10450.htm	Qld Fisheries. The main aim of the Keen Angler Program is to collect samples (fish frames) of a range of species, particularly those difficult to obtain from other sources.
King Ash Bay Barramundi Monitoring (NT)	King Ash Bay Fishing Club monitored by Infofish Australia	Rec fishers, Mabunji Sea Rangers	Catch/effort, tag and recapture, ramp surveys for Barramundi	http://infofish.net/king-ash-bay/	Not clear. Monitoring of Barramundi in the McArthur River system in the Northern Territory commenced in 2009. The King Ash Bay Fishing Club initiated the project and it is being managed by Infofish Australia. Initially it was a 2 year project but has been extended to the end of 2012. Data on recreational catch is being collected through a creel survey which is providing information on catch and particularly Barramundi. Barramundi are also being tagged by local and visiting fishers to obtain information on growth and movement. In 2012 the tagging has been extended to include Golden Snapper and the Mabunji Sea Rangers at Borrooloola have joined in the tagging.

Project name	Organisation	Data collector	What data	Reference	Who uses it - aims
Length frequency collection	Victorian Abalone Divers Association	Commercial abalone divers	Abalone Length frequencies	http://www.vada.com.au/submissions/index.html	VADA/Fisheries Victoria. Industry collected length frequencies are major inputs into the stock assessment.
NPF Crew member observer program	AFMA/CSIRO/NPF Industry association	NPF crew members	Data/photos on TEP species and 'at risk' bycatch species	http://www.afma.gov.au/wp-content/uploads/2010/08/r2008_0826.pdf	CSIRO. Has not been used by management to date as not enough shots observed. "apparent inconsistency between the crew-member observer data and the other three data sets; the NPF prawn population monitoring surveys, AFMA scientific observer data and CSIRO scientific survey and scientific observer data." Page 147 of FRDC 2008/826
Personal catch records	Nagambie Angling Club	Club members	Murray cod, catches, size	NA	Fisheries Victoria. Report to be published shortly. No further information given.
Personal catch records	Crater lakes angling clubs	Members	Trout, salmon, catches, size	http://www.camperdownanglingclub.org.au/	Fisheries Victoria. Report to be published shortly
Rec fishing databases	Various	Various	Various	http://adl.brs.gov.au/brsShop/data/aus_catalogue_rec_fishery_data.pdf	Various. This catalogue contains descriptions of recreational fisheries databases compiled by government agencies, and presented in a standard format for use by policy, management and research staff. Only projects that included data collection during the last ten years are documented in the catalogue. The catalogue's main purpose is to assist managers and researchers to review recent recreational fisheries data collection for planning of future data collection and identification of information gaps in current monitoring systems.
Red map	UTAS, funded by IMAS and Tasmanian Community Fund	Fishers, divers	Distribution of uncommon Tasmanian marine species	http://www.redmap.org.au/ http://www.sciencedirect.com/science/article/pii/S0959378011001610 http://www.sciencedirect.com/science/article/pii/S0022098111000803	Used in 3 published papers. In time the Redmap data will provide a historical perspective of changes to species distributions in Tas. This will be very valuable information to help with planning for a sustainable marine environment. It may also highlight changes that require further information or targeted studies to be developed. Redmap data is displayed on the website so the information is used for a very important purpose - giving all interested Tasmanians the opportunity to see how our ecosystems are changing. Redmap invites the Tas community to spot, log and map marine species that are uncommon in Tas, or along particular parts of our coast. The information collected is mapped and displayed on the site, demonstrating, in time, how species distributions may be changing.

Project name	Organisation	Data collector	What data	Reference	Who uses it - aims
Reef Life Survey	Reef Life Survey Advisory Committee. Supported by UTAS, IMAS, DEWHA	Trained recreational SCUBA divers.	Presence and abundance of fish and invertebrates and "other large swimming animals".	http://reeflifesurvey.com/information/	Scientists. MPA stuff. Scientific Publication. EG – see attached papers. Reef Life Survey (RLS) aims to improve biodiversity conservation and the sustainable management of marine resources through the collection of high-quality biodiversity information at spatial and temporal scales beyond those possible by scientific dive teams (which have to work with increasingly limited resources). RLS consists of a network of trained, committed recreational SCUBA divers, and an Advisory Committee made of managers and scientists with direct needs for the data collected, and recreational diver representatives
Reef watch	Reef watch – with Museum of Victoria, VNPA, Conservation Council of South Australia (CCSA)	Volunteer divers.	Fish IDs and counts	http://www.reefwatchvic.asn.au/Home.htm	No one really. Except that Fisheries Victoria used observations from Reef watchers to justify total protection of blue groper in Victoria. From SA report "With the Marine Parks network of South Australia rolling out, there is potential for Reef Watch to become actively involved in monitoring the performance of the parks. DEH is very interested in exploring this avenue. Similarly, the EPA is exploring the option to develop report cards for various areas, and the Reef Watch data could substantially add to that process."
Scientific line-transect aerial survey of southern bluefin tuna	Commercial STB spotters CSIRO supply logbooks	Commercial STB spotters	Location and size of SBT schools		CSIRO. SBT guys pass on their aerial data to CSIRO, with CSIRO also undertaking independent aerial data collection
SUNTAG/AUSTAG	Managed by Infofish Australia/ASNA. Involves Qld Fisheries, ANSA Qld	Suntaggers and other recreational anglers	Tag and recapture, catch and effort	http://infofish.net/suntag/	Data from Suntag have been used in a range of community monitoring programs such as CapReef, Crystal Bowl, Stocktag and King Ash Bay. What has been learnt through Suntag is contained within the websites for those programs. There have been around 30 scientific papers that have been published using information from Suntag.
Vic rock lobster	DPI – Fisheries Victoria	Commercial Fishermen	Size, sex, tagging and tag returns, bycatch.		DPI – Fisheries Victoria. Vessels too small to take observers record length frequency, moult condition, bycatch, tagging and tag returns. Fixed site surveys – usually observers, but sometime fishermen do it. There is a report to be published in the next month or two that will document this for the rock lobster industry in Victoria.
Victorian and Tasmanian giant	DPI – Fisheries Victoria	Commercial Fishermen	Carapace width		DPI – Fisheries Victoria, TAFI. The attached report describes the setup for the Giant Crab fishery.

Project name	Organisation	Data collector	What data	Reference	Who uses it - aims
crab	TAFI				
Volunteer Angler Diary Program	Fisheries Victoria	Recreational anglers	Catch rate, length frequency	http://www.dpi.vic.gov.au/fisheries/science-and-research/angler-diary-program	Fisheries Victoria use it for stock assessments, size limits, environmental impact monitoring, monitoring artificial reefs
WA skeleton frame project	WA Department of Fisheries	Recreational fishers	Drop in fish frames – dhufish, snapper, baldchin groper, Herring, Tailor, Garfish, Whiting	http://www.fish.wa.gov.au/Fishing-and-Aquaculture/Recreational-Fishing-Research/Pages/default.aspx	WA Department of Fisheries. Scientists collect vital information from fish frames, to determine whether demersal and nearshore fish resources are in a healthy state or not. This is an ongoing monitoring project and each year you assist, you have a chance to win some fantastic prizes, as well as helping ensure there's fish for the future.
Monitoring of Natural resources	Various international indigenous groups	Indigenous communities and members	NRM data	See papers in http://www.monitoringmatters.org/whatis.htm	Showing the effectiveness of participatory and conventional scientific. See below Danielsen et al. 2007b. Increasing conservation management action by involving local people in natural resource monitoring. <i>Ambio</i> 36 :566–570. Danielsen et al. 2005a. Monitoring matters: examining the potential of locally-based approaches. <i>Biodiversity and Conservation</i> 14 :2507–2542 Danielsen et al. 2005b. Does monitoring matter? A quantitative assessment of management decisions from locally-based monitoring of protected areas. <i>Biodiversity and Conservation</i> 14 :2633–2652.

Attachment 5:

NT Ranger Engagement and RD&E Model

Marine Ranger Engagement Policy

Purpose

To establish a clear set of protocols and procedures to be followed by staff of the Northern Territory Fisheries Division when working with Indigenous Marine Rangers.

Background

Through the initiative of Aboriginal Traditional Owners of the NT, a number of community ranger programs have been established as a mechanism for Aboriginal people to actively participate in natural resource management. These programs have been further enhanced with the support of the respective Aboriginal Land Councils and include both land and sea management activities.

In 2002, the Northern Territory Government, through the Fisheries Division, established an Indigenous Community Marine Ranger Program (ICMRP) to support existing Indigenous ranger groups to engage in coastal surveillance activities including monitoring of fishing. This program allocates annual grants to a number of ranger groups in exchange for regular reports of activity along the coastline. Additionally, the Indigenous Development Unit (IDU) coordinates Fisheries Division and other government agencies in the provision of capacity building and training on aspects of fisheries research, management and compliance.

Whilst Fisheries Division provides annual grants under the ICMRP, rangers are not Northern Territory Government employees.

Consultation is regularly undertaken with the Anindilyakwa, Tiwi and Northern Land Councils about Marine Ranger activities. Due to the importance of the ICMRP and the need to assess its effectiveness the Fisheries Division has coordinated several Indigenous Marine Ranger Workshops to provide training and build the rangers' skills in fisheries management and monitoring activities.

Current fisheries related functions of the ranger groups include:

- Compilation of Indigenous knowledge related to resource management;
- Identification and protection of sacred sites and sites of significance;
- Coastal monitoring;
- Fish kill reporting;
- Bio-security;
- Fisheries surveillance;
- Natural Resource Management initiatives;
- Research activities; and,
- Community education.

There are a number of existing and developing Indigenous ranger groups based on or near the coast across the NT. Under the ICMRP, Fisheries Division works closely with eight ranger groups and others are supported wherever possible. To ensure rangers and Fisheries Division gain the maximum benefit of working together there is a requirement to establish clear and concise engagement protocols.

The Northern, Tiwi and Anindilyakwa Land Councils are the representative bodies for Aboriginal people in their areas under both the *Aboriginal Land Rights (Northern Territory) Act 1976* and the *Native Title Act 1993*. In recognition of the Land Councils as the representative body and employers of Indigenous rangers, any dealings between government and rangers must have

protocols of engagement. These protocols and/or procedures need to be protected and adhered to for the benefit of the rangers, Land Councils and government.

The Fisheries Division supports ranger groups through contractual grants (Service Level Agreements), 'fee for service' arrangements, training and development of joint research projects. It is vital that Fisheries Division follows a clear model of engagement which includes:

1. *Consultation with the relevant Land Council to discuss any new proposals;*
2. *The involvement wherever possible of Marine Rangers in any new fisheries research proposals;*
3. *Adherence to a Code of Conduct by NT Fisheries Staff working with Marine Rangers;*
4. *Adherence to a Code of Conduct by Marine Rangers undertaking work on behalf of Fisheries Division;*
5. *Cross cultural training and experience for staff working with Indigenous Australians.*

Legislative links

Northern Territory of Australia *Interpretation Act*
Section 23 (1) the *Land Rights Act*
Native Title Act
Workplace Health and Safety Act
Public Sector Employment Management Act
Marine Safety Act
Privacy Act
Northern Territory Public Sector Principles and Code of Conduct
Care and Protection of Children Act
Fisheries Act/Fisheries Regulations

Other Linkages

NLC Accountability and Governance Policy statements One to Five.
NAILSMA Guidelines and Protocols for the Conduct of Research
Safety At Sea Policy (DoR)
Isolated Field Work Policy (DoR)
Fisheries Marine Ranger Reporting Guidelines

Policy

1. *Consultation with the relevant Land Council to discuss any new proposals;*

In the event that a new proposal is being drafted, Marine Rangers must not be the first point of contact. Fisheries Division employees and/or stakeholder groups must first establish contact with the Fisheries Indigenous Development Unit for any new proposals that may involve Marine Rangers. Additionally, every effort will be made to go through the relevant Land Council(s), particularly for the purpose of obtaining 'Informed Consent' when working with Marine Rangers. During initial consultation with the Land Council(s), an agreed working process needs to be developed. Any changes to such a process must be negotiated and agreed to by both Fisheries Division and the Land Council(s). The Land Council(s) must be given appropriate time to consider and comment on any new working proposals prior to approaching Marine Rangers. This time will vary depending on project size but as a guide up to one month should be allocated for appropriate consultation.

Project proposals must include:

- Details of the participation required from Marine Rangers;
- Demonstrated benefits for Marine Rangers and the community; and,

- A commitment to respect and uphold Indigenous ‘Intellectual Property Rights’.

In the event a Marine Ranger group or Land Council initiates a new proposal, they will be directed to deal with the Fisheries Indigenous Development Unit to undertake all coordination on behalf of Fisheries Division.

2. The involvement wherever possible of Marine Rangers in any new fisheries research proposals;

If Fisheries Division staff intend on preparing any aquatic or coastal research applications to funding providers, they should make every effort to include Marine Rangers in their proposal. Where participation by the Marine Rangers is not feasible, the reasons for that must be made clear and presented in writing to the Executive Director. Reasons why rangers wouldn’t be included on proposals may relate to a lack of interest or that they don’t have the capability to fulfil the requirements of the research activity.

Research proposals that do intend on engaging Marine Rangers must show the benefits to both Fisheries Division and Marine Rangers. This may include leveraging other funds to support Marine Rangers, providing employment opportunities, utilising traditional knowledge as well as identifying the sorts of skill development and training opportunities for Marine Rangers and Fisheries staff.

3. Code of Conduct of Fisheries Division employees working with Marine Rangers;

Fisheries Division employees must adhere to the three Principles detailed in Part 2 of the *Public Sector Employment and Management Regulations*. This includes:

- Public Administration and Management;
- Human Resource Management; and,
- Conduct.

The Northern Territory Public Sector Code of Conduct includes; Personal and Professional Behaviour, Fairness and Equity and Discrimination.

(Northern Territory Public Sector Principles and Code of Conduct)

4. Code of Conduct of Marine Rangers undertaking work on behalf of Fisheries Division;

There is an expectation that Marine Rangers will adhere to the same Northern Territory Public Sector Principles and Code of Conduct whilst executing services for Fisheries Division either working with or on behalf of. Alternatively, where it exists, Marine Rangers must adhere to the relevant Land Council Code of Conduct and provide a copy of such to the Fisheries Division. The IDU will make these copies readily available to all staff within Fisheries Division.

5. Cross cultural training and experience of staff working with Indigenous Australians.

Fisheries Division staff that intend on working with Marine Rangers should have prior experience or have undertaken a cross-cultural training program. Where this is not the case, Fisheries Division staff will utilise the Indigenous Development Unit for support.



Indigenous Community Marine Ranger Program

Background

As the NT coastline spans some 10,000 kilometres, the challenges faced by government agencies in maintaining an effective and timely surveillance and deterrence capability are significant. It is therefore imperative to work with Aboriginal ranger groups to enhance government's coastal monitoring capability.

Currently there are already 16 established Marine/Sea Ranger groups distributed along most of the NT coastline. With respect to land adjoining NT coastal waters, approximately 71.5% of the mainland coastline and 92% of the island coastline has been declared Aboriginal land down to the low water mark [under the Commonwealth's *Aboriginal Land Rights (Northern Territory) Act 1976*]. The waters to the low water mark are also recognised as exclusively controlled access by Aboriginal people since the High Court's decision on Blue Mud Bay.

Given the existing distribution of these groups along the NT coastline; their intimate knowledge of remote coastal areas; level of relevant training; and the types of monitoring and surveillance activities already undertaken, Marine/Sea Rangers are ideally placed to assist government agencies monitor coastal waters.

In most cases the overseeing and funding of Aboriginal ranger activities is variously provided by the **Tiwi Land Council** ([insert link](#)), the **Northern Land Council** and the **Anindilyakwa Land Council**; much of which is funded through the Commonwealth Government's 'Caring For Our Country' program.



The NT Fisheries Division (Department of Resources) currently provides funding assistance to eight ranger groups under the auspices of the Indigenous Community Marine Ranger Program (ICMRP). The following Marine/Sea Ranger groups are being supported under the ICMRP:

- Tiwi Marine Rangers (Tiwi Islands);
- Li-Anthawirriyarra Sea Rangers (Borroloola);
- Thamarrurr Rangers (Port Keats);
- Djelk Sea Rangers (Maningrida);
- Mardbalk Sea Rangers (Warruwi);
- Yugul Mangi Land and Sea Rangers (Ngukurr);
- Anindilyakwa Sea Rangers (Groote Eylandt); and,
- Gumurr Marthakal Sea Rangers (Elcho Island).



Marine/Sea Rangers assist with local monitoring and surveillance of coastal waters, as well as providing a visual presence on the water. Increasingly, Marine/Sea Rangers play an important role in educating both Indigenous and non-Indigenous fishers.

The types of activities routinely undertaken by Marine Rangers, as well as the nature of information reported by these groups, are outlined below.

Surveillance

Reports are provided to Fisheries and other government agencies on the following:

- Any illegal activities either witnessed or suspected.
- Suspicious vessels, vehicles, aircraft or persons operating in local areas or in prohibited or closed areas.
- Any illegal Foreign Fishing Vessels in local waters and/or any shore landings of illegal persons.
- The presence of spotlights, small vessels or sounds of outboard motors operating in creeks at night.
- Nets, crab pots or other fishing equipment which are illegally set or unmarked.
- Catches of aquatic life in excess of bag limits.
- Fish or other aquatic life being sold or offered at cheap rates.

Reporting of sea management activities

- The presence of dead fish either floating or washed ashore.
- Details and/or samples of suspicious or unknown marine species (e.g. aquatic pests) located in unusual areas or in increasing numbers.
- Information on fishing patterns and the loss or return of aquatic species (e.g. fish, dugong, turtles etc.) in their patrol areas.
- Any dead, sick or injured dugong, crocodiles or turtles.
- Marine debris (e.g. **ghost nets** etc).

Education and other activities

- Information provided to the public on fisheries regulations and policies;
- Information and education sessions provided to schools or other community groups;
- Requirements for any additional education materials for distribution;
- Reports to relevant forums such as Aboriginal Coastal Consultative Committees or similar type committees.

From a Northern Territory Government perspective, Marine/Sea Ranger groups add value to the monitoring and protection of coastal habitats in remote areas through:

- Supporting the policing and deterrence of illegal activities through increased surveillance;
- Assisting government when dealing with marine issues involving Indigenous people;
- Provision of assistance in marine search and rescue activities;
- Promotion and leadership of marine safety in remote communities;
- Providing a more frequent and locally experienced presence when undertaking surveillance activities; and
- Linking into Indigenous networks of information sharing.

Training for marine/sea rangers

Since 2009 some 47 Marine/Sea Rangers have successfully completed a Certificate II Fisheries Compliance (Seafood Industry) course. This training has been developed and delivered by NT Fisheries, NT Water Police and Charles Darwin University.

Components of the current training provided to rangers include:

- Fisheries compliance;
- Report writing and evidence gathering for court room settings;
- Occupational Safety and Health at sea;
- Techniques for the monitoring of marine resources;
- Liaison techniques when dealing with fishermen; and

At present the Northern Territory Government is working with a training provider to develop and implement a Certificate III course in Fisheries Compliance for Marine/Sea Rangers. In addition, Fisheries Division and Water Police are working with Charles Darwin University to deliver a Certificate II specifically for Indigenous female rangers in 2011.

Government coordination

Crucial to the effectiveness of Marine/Sea Rangers is the coordination of activities with respect to coastal surveillance on behalf of government agencies. As such, a Marine Ranger Coordinator position has been created within the NT Fisheries Division to undertake this role, and to assist Ranger groups to maintain their operational readiness. The key activities undertaken by this position are listed below.

- Work with the Commonwealth and Territory governments agencies, land councils, local community organisations and Marine/Sea Ranger groups to develop, implement and evaluate service level agreements for coastal surveillance activities.
- Liaise with all relevant agencies and groups to establish protocols and lines of communication for the reporting of fishing activities.
- Assist Marine/Sea Ranger groups with the procurement of resources and equipment to undertake monitoring and surveillance operations.
- Assist Marine/Sea Ranger groups to maintain their operational readiness.
- Coordinate the training requirements for Marine/Sea Rangers.
- Maintain records with respect to coastal surveillance activities undertaken by Marine Ranger groups.



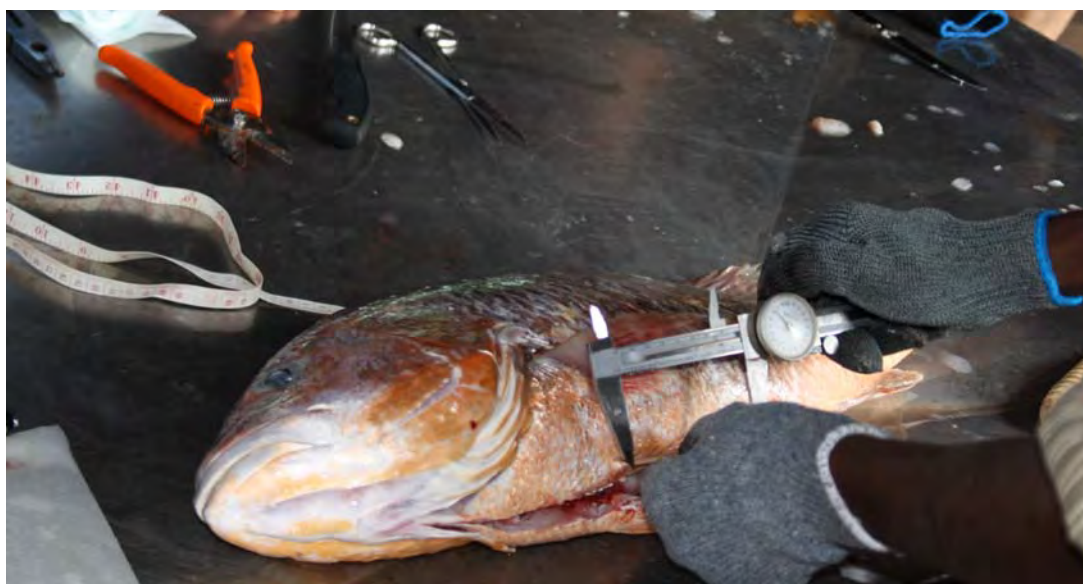
Achievements

Participation in research

Fisheries Division undertakes field work and 'joint' research activities with many of the Marine/Sea ranger groups across the NT. Some of the achievements to date include:

- Installation of the Blyth River marine sacred site buoyage system;
- Juvenile mud crab research with four coastal ranger groups;
- Juvenile and Mature snapper research with fisheries research and coastal ranger groups;
- **Shark and Stingray Indigenous fishing survey** with Anindilyakwa Sea Rangers of Groote Eylandt (attach link to Report);
- Ranger intelligence leading to four convictions for breaches to the *Fisheries Act* and *Sacred Sites Act*;
- Winner of the Northern Territory Seafood Industry training award 2009 and 2011;
- Winner of the 5th Australian Seafood Industry training award 2010; and,
- A number of seized vessels and vehicles have been "gifted" providing additional resources to rangers.

In recognition of the increasing engagement of Marine/Sea Rangers in fisheries related activities, Fisheries Division has recently developed its own **Marine/Sea Ranger engagement policy**. It is intended that this policy will provide clear guidelines for Fisheries staff that intend on working with Marine/Sea Rangers.



Attachment 6:

Process to Gain Minimum SCUBA Diver Qualifications

PROCESS TO GAIN MINIMUM SCUBA DIVER QUALIFICATIONS

SCUBA Diving is a physically demanding exercise which is strictly regulated through the use of dive tables. When diving, bottom time is governed by the cubic capacity of the dive tanks used. The tanks which would be purchased and are readily in use only allow for approximately 45 minutes of bottom time. This includes the staging events necessary to prevent CO² build up in the blood stream (stop for 3 minutes at a depth of 5 meters). The dive tables also set a total amount of dives an individual can complete in a period of 24 hours. All this information has been taken into consideration when preparing this document.

All participants would be required to pass the AS2299 Commercial Dive Medical. Currently a Doctor that resides on Thursday Island is qualified to complete the medicals. There is no charge on presentation of a valid Medicare card. The medical consists of a comprehensive questionnaire as well as eyesight, hearing, lung function, blood pressure, urine test and chest x-ray. The whole procedure takes approx three hours.

A level of numeracy and literacy would be required to pass the written exams in order to gain the rescue diver qualifications. Some of the subjects that taught are buoyancy, pressure and your body, pressure volume and density relationships, effects of increasing pressure, effects of decreasing pressure and effects of increase air density.

Theory for all of the above courses can be done online using the PADI eLearning although this may not be appropriate for Torres Strait Islanders who may not have access to the internet, or will require the assistance of a hands-on mentor to provide one on one tutoring.

PADI Open Water Diver

To gain the PADI Open Water Diver utilising eLearning will require a visit to the PADI Dive Centre or Resort to complete the training. Participants would need to take a short eLearning Quick Review to confirm their understanding of safety-related material from the course, and they must successfully complete five confined water dives and four open water training dives with the PADI Instructor.

They would have to master each of the required skills in confined water (swimming pool-like conditions) first before moving on and showing the instructor that they can comfortably repeat those skills in open water. As a PADI Open Water Diver, participants will be a certified entry-level diver able to rent dive gear, get air fills and dive anywhere in the world in better or similar conditions to those they have trained in. The course will cost \$120 plus the in-water practical of the certification.

PADI Advanced Open Water Diver

To gain the PADI Advanced Open Water Diver you need to be a certified entry-level diver and fit for diving. After completing the eLearning phase, participants must successfully complete at least five Adventure Dives. Two of these are mandatory; the Deep Adventure Dive and Underwater Navigation Adventure Dive. The other three dives can be chosen from a wide range of Adventure Dives and the decision as to which dives are chosen will be based on what is available at the dive location and what the PADI Instructor is able to offer. The course costs \$120 plus the in-water practical of the certification.

PADI Rescue Diver

The PADI Rescue Diver Course Online content is broken down into 5 easy-to-learn sections after an introduction. The course covers a wide range of topics including, The Psychology of Rescue, Recognizing Diver Stress, Accident Management, Assisting Responsive and Unresponsive Divers at the Surface and Underwater, Equipment Problems, Oxygen Delivery Systems, Missing Diver Procedures, Responding to Diver Emergencies and In-water Rescue Breathing.

Most certified PADI Rescue Divers say it is one of the most challenging - sometimes demanding - courses they've taken. Participants need to be certified to beyond entry-level with proof of underwater navigation training, such as PADI Adventure Diver with the Underwater Navigation Adventure Dive completed, and be fit for diving to be certified as a PADI Rescue Diver.

After completing the online portion of the PADI Rescue Diver Course participants require a visit to the PADI Dive Centre or Resort to complete the training. Participants would take a short eLearning Quick Review to confirm their understanding of safety-related material from the course. Then, they would complete the in-water training portion of the course.

The instructor would have participant's complete ten rescue exercises in open water, either with or without initial skills practice in confined water. Finally, participants will participate in two Rescue Diver Scenarios in open water. The PADI Dive Centre or Resort will charge a separate fee for completing rescue training exercises and scenarios. The course costs \$120 plus the in-water practical of the certification.