



Human Dimensions Research Subprogram 2017-2020

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Abbreviations

AFMF	Australian Fisheries Management Forum
FRDC	Fisheries Research and Development Corporation
HDR	Human Dimensions Research
IMAS	Institute of Marine and Antarctic Studies
IPA	Industry Partnership Agreement
RAC	Research Advisory Committee
R&D	Research and Development
RD&E	Research, Development and Extension
SC	Steering Committee
SIA	Seafood Industry Australia

Executive Summary

The [Human Dimensions Research Subprogram](#) was established in late 2016 by the Fisheries Research and Development Corporation (FRDC) to coordinate FRDC-funded research and development aimed at addressing priorities within the field of human dimensions research. The Subprogram built on the legacies of FRDC's previous investments in this area (projects 2008-306, 2010-2015, 2015-2016) and focused on the interface between the human and natural subsystems that together define fisheries and aquaculture systems. The Subprogram spanned the social, economic and cultural domains of fisheries and aquaculture and the way in which peoples' behaviours, and thereby overall outcomes, are influenced by the way in which processes, rules and institutions in these domains are organised. The FRDC recognises the strategic importance of integrating human dimensions into research and development in order to maximise the public value of its investment and to increase the likelihood of realising its *Research and Development Plan 2015-2020* national priorities, which were achieving sustainability, profitability and productivity of Australia's fisheries and aquaculture.

What was the purpose of this project?

This Subprogram management project was established to manage the Subprogram and ensure delivery of the Human Dimensions Research Subprogram (hereafter, the HDR Subprogram) from 2017 to 2020. The objectives were to:

1. Identify human dimensions RD&E priorities annually, through review and consultation with key fisheries and aquaculture stakeholders (RACs, IPAs, Subprograms, AFMF) and develop projects to address those priorities.
2. Promote coordination and co-investment in human dimensions RD&E across RACs, IPAs and Subprograms.
3. Ensure quality and relevance of human dimensions RD&E through review of applications and project reports.
4. Support the FRDC in the management of a portfolio of projects with significant human dimensions research components.
5. Facilitate extension and adoption of human dimensions RD&E outputs.
6. Build and support capability in human dimensions research to meet the needs of fisheries and aquaculture.

How was the HDR Subprogram run?

The HDR Subprogram management leaders were Dr Emily Ogier (Principle Investigator of this project) and Dr Sarah Jennings (Co-investigator), both of the Institute for Marine and Antarctic Studies (IMAS), University of Tasmania (UTAS). Project staff employed by IMAS included Dr Kirsten Abernethy, who was engaged in relation to social acceptability research management. The FRDC Program Managers were Jo-Anne Ruscoe, Drs Chris Izzo and Carolyn Stewardson. The Subprogram was steered by an expertise-based Steering Committee. Development of priorities for investment of FRDC funds in human dimensions research was guided by the [Human Dimensions Research Subprogram RD&E Plan 2017-2020](#) (hereafter, the *HDR Subprogram RD&E Plan*). Addressing these goals through priority development and research coordination was aimed to contribute towards achievement of *FRDC 2015-2020 R&D Plan* National priorities, as described in Table 1 (below).

Table 1. Goals of the HDR Subprogram RD&E Plan 2017-2020 and their link to FRDC R&D Plan 2015-20 National Priorities

Goals of the HDR Subprogram R&D Plan 2017-20	National Priority 1: <i>Supports sustainability and improves perceptions</i>	National Priority 2: <i>Increase productivity and profitability</i>
1. Delivering benefits: Invest in R&D which supports the generation and flow of social, cultural and economic benefits from fisheries and aquaculture through benefit sharing, resource allocation and other management activities and models.	Social and economic sustainability	
2. Changing behaviours: Invest in R&D which improves understanding of and ability to harness behaviour of fishers/farmers, institutions and organisations in areas of compliance, adaptation, adoption of new practices and technologies, and innovation.		Adoption and innovation for increased financial performance
3. Working with markets: Invest in R&D which improves understanding of seafood product and non-product markets (e.g. labour markets, other inputs, markets for fishing rights) and of market-based mechanisms, and how the dynamics of these markets can be harnessed to support fisheries and aquaculture prosperity and sustainability.	Design and implementation of market-based mechanisms for greater sustainability	Market dynamics and harnessing them for improved performance
4. Effective engagement for social acceptability: Invest in R&D to determine and share what strategies effectively engage to build levels of community for fisheries and aquaculture.	Social and economic sustainability	
5. Building HDR capability: Invest in people development to enhance capability through data platforms and standards, training, and tools to help identify HDR needs.	Indirectly through capability-building	

Did the HDR Subprogram meet its objectives?

Priority development, and coordinated investment in human dimensions R&D (Objectives 1 & 2)

Across the period of this Subprogram management project, the HDR Subprogram has:

- Led 16 RD&E priorities
- Collaborated in seven priorities with RACs, IPAs, other Subprograms or National Priority Programs

The priorities and funded projects supported by the HDR Subprogram have addressed all five of its RD&E Plan goals, to varying extents. Priority areas of strongest investment have been: Effective engagement for social acceptability (RD&E Plan Goal 4): and, Understanding, delivering and sharing benefits (RD&E Plan Goal 1). Priority areas of under investment have been: Working with Markets (RD&E Plan Goal 3) and Building HDR Capability (R&D Plan Goal 5).

During the course of the *HDR Subprogram RD&E Plan*, HDR Subprogram investment was also responsive to emerging priorities from the FRDC Board and from RACs, IPAs and other

Subprograms. These included mental health, measuring and increasing economic productivity, and rapid assessment of the impacts of COVID-19 on the Australian seafood industry.

Support the delivery of HDR which meets Australia's fisheries and aquaculture sectors' needs (Objectives 3 & 4)

The HDR Subprogram project team and Steering Committee reviewed more than 150 applications as well as progress reports and final reports for more than 30 FRDC-funded projects, including for eight projects with HDR components funded and active prior to the HDR Subprogram's inception in 2017.

RD&E impact has been delivered through projects in which HDR Subprogram invested and provided advice to FRDC management, as follows:

- 16 completed projects (10 led by the HDR Subprogram, six in which the HDR Subprogram was a co-investor)
- 15 active projects at the time of reporting (seven being led by the HDR Subprogram, eight in which the HDR Subprogram is a co-investor).

Facilitate extension and adoption of R&D and capacity building in human dimensions research (Objectives 5 and 6)

The HDR Subprogram was successful in targeting internal audiences through its extension and adoption activities, as was able to strengthen collaborative networks across FRDC structures and key stakeholder groups. Extension and adoption activities included stakeholder workshops, face to face and web-based presentations, and conference sessions to share, update and progress planning for RD&E concerning key issues and priorities.

Extension and adoption plan goals which not fully met were those concerning extension to external audiences. Undertaking these types of extension and adoption activities was limited by the need for dedicated communications expertise and services. A project to this end proposed for early 2020 was not initiated due to the outbreak of COVID-19.

Building capacity was addressed through a series of technical R&D workshops for FRDC stakeholders, presentations and talks to FRDC structures and industry representative organisations, and running the Fisheries Economics Masterclass for AFMA staff. Research networks for HDR providers have been strengthened through HDR Subprogram funding of the Social matters workshop (2017-152), maintaining a national database of HDR providers, and by supporting the establishment of the Australian chapter of the Marine Social Science Network: <https://www.marsocsci.net/marsocsci-australia/>. Overall, however, building capacity in human dimensions research was a RD&E goal area of the *HDR Subprogram RD&E Plan* in which there was under investment. A series of priorities were developed and advertised to address under-investment however they were not progressed due to the outbreak of the COVID-19 pandemic in early 2020.

What impact did the HDR Subprogram have on fisheries and aquaculture stakeholders?

Through the extension and communication of the outcomes of the HDR Subprogram's investment in RD&E (see Box 1) there have been positive impacts for Australia's fisheries and aquaculture, as follows:

- Delivering and sharing social and economic benefits is core business for sustainable management now, and tools are in place to support assessment, decision making and policy design

BOX 1. OUTCOMES OF HDR SUBPROGRAM RD&E INVESTMENT

- **Rapid assessment of how COVID-19 has disrupted Australia's seafood industry** (see report [here](#)), and how the industry can prepare for greater uncertainty and future shocks through planning and partnerships with relevant governments. As well as highlighting the diversity of impact and response across the industry, this internal Subprogram research helped shape HDR's advice to FRDC on National economic and social data needs, gaps and data strategy options.
- **Evidence of the economic contributions of fisheries and aquaculture industry activity** in 2017/18 at the national and relevant state level ([2017-210](#)). The project has also already begun to build capacity of management agency staff, industry representative organisations and researchers and economic analysts by generating a nationally consistent framework for supporting cost-effective contribution studies. In so doing, and through direct engagement with these key stakeholders, the project has also increased economic literacy in measures of economic contribution and the appreciation of the value of collecting economic data. Capacity to measure contributions to social as well as economic wellbeing has also been extended ([2017-092](#); [2018-095](#)).
- Introduction of **behavioural change approaches (e.g. behavioural economics) to address complex compliance challenges** in recreational fisheries contexts ([2019-011](#) and [2019-078](#)) and adoption of best practice ([2017-133](#), [2019-023](#)). Demonstrating this research approach will help build confidence in its use in addressing other areas where changing fisher behaviour is key to achieving desired management and policy outcomes.
- Mainstreaming the use of **focused economic analysis on key issues, for example price flexibility** ([2018-017](#)), which provides demonstration products of the types of impacts these economic analyses can have on decision-making. Project ([2019-026](#)) will produce similar outcomes on **economic productivity**.
- Identification of the **range and gaps in performance of ITQ/ITE systems and markets** across Australian fisheries ([2017-159](#)), and the need to test opportunities for net gains through adjustment or re-design of these systems for future application. This foundational work proved valuable in informing the FRDC's submission to the Senate Inquiry into the Australian fisheries quota system, and the design of ([2019-165](#)) and ([2020-029](#)).
- Acknowledgement of **effective community engagement as a key driver of community trust and acceptance** necessary to provide fisheries and aquaculture with the freedom to operate, and the availability of tools to support industry groups to do this work ([2017-012](#), [2017-131](#), [2017-158](#), [2017-242](#), [2018-201](#), [2019-042](#), [2019-074](#)).

- Behavioural insights can be harnessed to support compliance, innovation, adoption of best practice
- Australia's fisheries and aquaculture have evidence of their contribution to economic and social wellbeing at the national and state level
- Price and productivity improvements can be incorporated into fisheries management
- Preparedness for future uncertainty and global shocks is stronger because of learnings from impacts and responses to the COVID-19 pandemic and disruption.

What are the recommendations for future work?

1. Build on HDR Subprogram priority legacies which contribute to the new [FRDC R&D Plan 2020-25](#) (Figure 1)
2. Continue the Subprogram using a model which directly integrates HDR subprogram priority development with the *FRDC R&D Plan 2020-25*
3. Improve FRDC extension, adoption and (ultimately) impact and return on investment by integrating R&D insights on behaviours of people, markets and institutions into R&D planning and delivery
4. Increase FRDC's access to social and economic data and support its provision of information services by consolidating existing data and identifying data sharing opportunities.

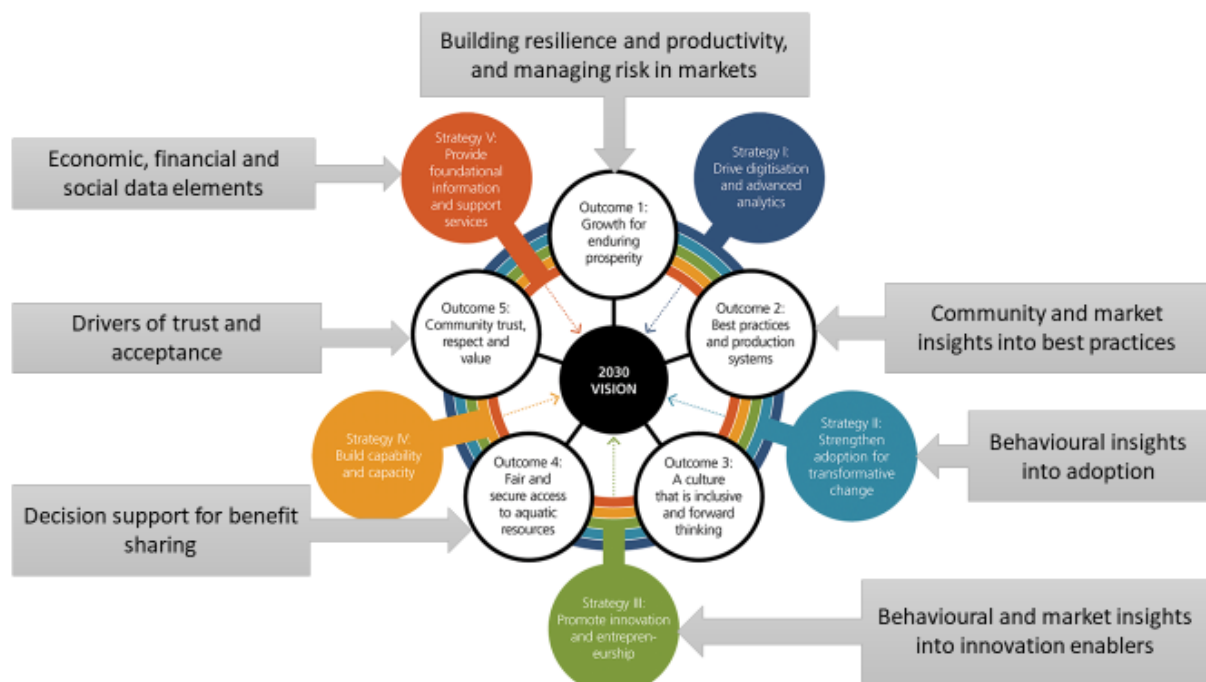


Figure 1. Legacies of the HDR Subprogram 2017-2020 impact for the FRDC R&D Plan 2020-25

Keywords: Human dimensions research, Economics, Social sciences, Fisheries, Aquaculture, Subprogram

1. Introduction

The operating environment within which Australian fisheries and aquaculture are positioned is complex, comprising economic, social and political institutions and organisations that are continuously being re-shaped by multiple external and internal drivers.

Addressing these specific drivers and the broader challenges associated with the operating environment requires understanding of the human, as well as the physical and biological, dimensions of the marine system. Human dimensions of Australia's fisheries and aquaculture refers to the social, economic and cultural factors that affect performance and outcomes. This includes the attitudes, processes and behaviours of individual people, companies, management agencies, communities, organisations, consumers and markets.

Human dimensions research is therefore the study or science of human systems. It can inform decisions about allocations or re-allocations, management reviews and reform packages, strategies to improve social licence based on understanding of social groups and markets and how these generate value. It can provide insights into changing performance and what causes market and policy success or failure, conflict between sectors, unintended consequences. It can inform the design of interventions and pathways to adoption by aligning these with behavioural insights. This requires the involvement of researchers from a broad range of disciplines including economics, sociology, human geography, political science, anthropology, management, history and law.

Achieving the level of coordinated investment in research and development (R&D) required to effectively deliver against this need to better understand the human dimensions of Australia's fisheries and aquaculture has been hampered by a range of factors, which have included:

- the complex nature of the operating environment and its associated multiple social, economic and cultural factors and dimensions;
- the challenge of effectively integrating human dimensions R&D with traditional biological fisheries and aquaculture science; and
- the lack of resources, particularly expertise capable of undertaking such research to ensure end user needs are met.

Globally, the need for leadership and investment to address this area of market failure has been recognised and addressed by a number of organisations. These include [NOAA Fisheries' Economics and Human Dimensions Research Program](#), ICES' [Strategic Intervention on the Human Dimension](#) and the [UK Fisheries Economist Network](#) (supported by Seafish).

Historically, the Fisheries Research and Development Corporation (FRDC) has invested in social science and economics research capacity and coordination (projects 2008-306, 2012-300, 2015-300). These investments recognised the need for human dimensions research and research capability to tackle known and emerging challenges facing Australian fisheries and aquaculture.

Under its *R&D Plan 2015-2020*, the FRDC recognised the strategic need for enabling direct capacity for investment in social and economic R&D to support the achievement of its R&D goals (Table 2). These included ensuring the sustainability of Australian's fisheries and

aquaculture sectors, in which sustainability was defined holistically to encompass social and economic dimensions.

The FRDC Board and Executive established the Human Dimensions Research Subprogram (hereafter, the HDR Subprogram) in 2016. The primary function of the HDR Subprogram was to coordinate FRDC-funded research and development aimed at addressing priorities within the field of human dimensions research, with a focus on social, economic and cultural factors and the people, markets, institutions and behaviours these affect.

A second function of the HDR Subprogram was to ensure quality and rigour of investment - funded both by industry contributions and by governments (public good funding) - in human Dimensions RD&E. Specifically, the Subprogram was tasked with ensuring that FRDC investment in human dimensions RD&E:

- is methodologically and technically robust,
- meets the stated needs of stakeholders and is credible to its intended audience,
- informs and improves outcomes for stakeholders, and
- maximises the return to FRDC stakeholders.

The HDR Subprogram project ([2016-128](#) – this project) was established in 2016 to enable management and operation of the HDR Subprogram. The Subprogram management project provided the leadership structure for the Subprogram (i.e. the project lead investigators were the Subprogram leaders), the financial resources for Subprogram operational activities (e.g. travel and Steering Committee meetings), and the accountability framework for Subprogram deliverables through project reporting requirements.

Table 2. National priorities outlined in the FRDC's RD&E Plan 2015-2020 and the deliverables relevant to the HDR Subprogram

National Priority 1: <i>The community has effective access to, and understanding of, RD&E that supports fishing and aquaculture sustainability and improves perceptions of Australian seafood.</i>	National Priority 2: <i>Deliver RD&E for fishing and aquaculture to increase productivity and profitability consistent with economic, social and environmental sustainability</i>
Increased knowledge about how community values align with the values of Australian fishing and aquaculture sectors, with the aim of improving community perceptions.	Social contribution is supported by the fishing and aquaculture sector so it can capture the non-monetary value of activities across sectors.
Community net benefit metrics.	
Expanded capacity to connect with seafood consumers and markets in Australia and abroad, and use of these channels to understand community perceptions to tell the Australian fishing and aquaculture story across the sectors.	

2. Objectives

Objectives of the HDR Subprogram project were to:

1. Identify human dimensions RD&E priorities annually, through review and consultation with key fisheries and aquaculture stakeholders (RACs, IPAs, Subprograms, AFMF) and develop projects to address those priorities.
2. Promote coordination and co-investment in human dimensions RD&E across RACs, IPAs and Subprograms.
3. Ensure quality and relevance of human dimensions RD&E through review of applications and project reports.
4. Support the FRDC in the management of a portfolio of projects with significant human dimensions research components.
5. Facilitate extension and adoption of human dimensions RD&E outputs.
6. Build and support capability in human dimensions research to meet the needs of fisheries and aquaculture.

A range of key performance indicators were used to monitor and assess the project's performance against its objectives (Table 3).

Table 3. HDR Subprogram Management Project key performance indicators and relevant objectives

Performance indicator	Relevant project objective
1. The Steering Committee meets a minimum of 3 times a year (at least once face-to-face each year)	1, 3
2. Reviews are provided in a timely manner to the FRDC of Expressions of Interest (Eols), revised Eols, full applications which include human dimensions research	3
3. The priority areas identified in the Subprogram's RD&E Plan are addressed through effective human dimensions research by 2020	1, 2
4. The funds available to the Subprogram for investment are fully utilised in accordance with the balanced portfolio agreed to by the Steering Committee and the FRDC	1, 2
5. The number of projects that identify a human dimensions research component increase during the life of the project	1,2 and 4
6. Human dimensions research projects receive advice and support from the Subprogram staff and Steering Committee as required	4
7. A midpoint review of the Subprogram's activities is conducted (end of 2018) to assess its effectiveness and identify any areas that the RACs, IPAs, national industry bodies and AFMF feel may require further review and development. Criteria for that review are developed in consultation with key FRDC stakeholders. Midpoint review determines the level of support by FRDC stakeholders for the activities of the Subprogram has not decreased, and recommendations from the review are incorporated into the program's ongoing work	1, 2, 3, 4, 5, 6
8. Human Dimensions Research e-newsletters are generated and circulated quarterly	5, 6
9. The National database of current and practicing human dimensions researchers (e.g. social scientists, resource economists) is updated and circulated on a regular basis to the RACs, IPAs, management and research agencies, the RPN, and industry associations	6
10. The Masterclass in Fisheries Economics is widely promoted and is delivered to FRDC stakeholders in response to demand	5, 6
11. The RACs, IPAs, national industry bodies and AFMF are aware of the major research findings and tools available to inform and address human dimensions RD&E priority areas	5
12. Effective pathways for strengthening integration of social and economic tools and frameworks with biological approaches in fisheries assessment and decision-support is identified	5, 6
13. The HDR co-invests a minimum of 20% of its allocated RD&E funds across the life of the subprogram	1, 2

3. Methods

3.1. Subprogram governance and management

Under the project agreement with the Institute for Marine and Antarctic Studies (IMAS), University of Tasmania, the terms of the HDR Subprogram were determined. This included:

- The role of the project Principal Investigator and Co-investigator as Subprogram leaders
- The FRDC policies guiding the role and function of the HDR Subprogram Steering Committee
- The role and function of FRDC Management in relation to the advice provided by the HDR Subprogram on RD&E investment
- The extension and adoption activities of the HDR Subprogram project

3.1.1. Steering Committee

The HDR Subprogram took its direction from its expertise based steering committee, appointed by the FRDC. In addition to its leadership and strategic roles, the committee advised the FRDC on allocation of Subprogram funds to projects consistent with stakeholder priorities and relevant RD&E plans; provided active oversight of progress of projects under its direct management; and provided technical advice to the FRDC on issues, applications and projects beyond those under its management.

The selection and appointment of Steering committee members by FRDC followed recommendations by the project lead based on the need to achieve a balance across institutional and non-institutional members; representation across industry, management and research; coverage of key areas of disciplinary expertise; and, jurisdictional diversity. Members were appointed by FRDC for the duration of the project.

Members of the Steering Committee were:

- Dr Nicki Mazur (ENVision Environmental Consulting)
- Dr Sean Pascoe (CSIRO and QUT)
- Dr Nyree Stenekes (ABARES)
- Bryan McDonald (Dept Primary Industries and Resources, NT)
- Alex Ogg (WAFIC)
- Dr Julian Morison (BDO EconSearch)

The Terms of Reference for the Steering Committee are outlined in Appendix 3. These terms reflected the following FRDC policies and procedures:

- *PP-06 Subprogram and coordination program establishment governance and management- signed 11 September 2013*
- *RAC Management Procedure*
- *Material personal interests for FRDC committee's policy (January 2016)*

- *Research, development and extension (RD&E) investment framework policy (2013)*

Importantly, the Terms of reference included notification of conflicts of interest by HDR Subprogram Steering Committee and project team prior to each session of priority development and application review. The HDR Subprogram terms included notification of not only material conflicts of interest – in accordance with FRDC policy – but also perceived conflicts of interest. This term was included to address the challenge of a small pool of human dimension R&D providers and the potential of perceived influence over priority development and application review processes of Steering Committee and project team members.

The Steering Committee met regularly throughout the project, with a mixture of face to face and online meeting format. The Committee also considered some matters out-of-session, as the need arose.

Table 4. HDR Subprogram Steering Committee meeting dates

Date	Format	Location
February 28-01 March 2017	Face to face	Melbourne
July 18 2017	Teleconference	
October 19 2017	Face to face	Melbourne
March 01 2018	Face to face	Melbourne
August 06 2018	Face to face	Melbourne
March 13-14 2019	Face to face	Melbourne
July 09 2019	Teleconference	
March 26 2020	Teleconference (planned as face to face, however altered due to COVID-19 outbreak)	
April 06 2020	Teleconference	

3.1.2. Evaluation activities

Evaluation of the HDR Subprogram occurred via two processes:

1. FRDC commissioned Forrest Hill to complete an external review FRDC structures in 2019. This review included the function and effectiveness of the HDR Subprogram, among other subprograms. The HDR Steering Committee wrote a response to the FRDC Board to the findings of the review, the *Review of FRDC's partnership models* (Forrest Hill Consulting 2019).
2. HDR Subprogram project staff and the Steering Committee completed a review in November 2019 of its R&D investment against its R&D Plan, and subsequently updated this review in early 2020 and at the end of the project to reflect completed projects (Appendix 4: Review of HDR Subprogram RD&E Plan 2017-2020).

3.2. Priority and project development (objective 1)

3.2.1. RD&E Plan development process

Potential RD&E priority areas were identified by the HDR Steering Committee and project team from late 2016 onwards on the basis of discussion with RACs, IPAs, other Subprograms, Seafood Industry Australia (SIA) and the Australian Fishing Management Forum (AFMF). HDR Subprogram management was proactive in seeking opportunities for discussions via presentations to RACs, participation at FRDC workshops, periodic 'phone discussions, and participation at other industry events.

The HDR Subprogram project team drafted the plan and oversaw the process of seeking and responding to feedback from the HDR Subprogram Steering Committee, FRDC management, RAC Chairs, IPA officers, the AFMF and SIA.

The HDR Subprogram project team then finalised its [HDR Subprogram Research, Development and Extension \(RD&E\) Plan](#) (see also Appendix 2: Human Dimensions Research Subprogram RD&E Plan) that provided a framework to identify and invest in key strategic research needs of stakeholders.

3.2.2. Priority development process

In developing priorities, the HDR Subprogram Steering Committee together with the project team applied multiple approaches, including bottom-up (i.e. developing priorities consistent with the HDR Subprogram RD&E Plan and consistent with feedback from Steering Committee professional networks) and top-down (i.e. responding to requests and directions from the FRDC Board and other FRDC structures). A list of potential priorities for discussion was tabled at each Steering Committee meeting. Priorities would be discussed, and feedback incorporated prior to finalising those priorities to include in the next FRDC Call for Applications.

3.3. Investment in HDR across FRDC structures (objective 2)

Partnering in R&D investment by the HDR Subprogram across FRDC structures occurred in a number of ways:

- HDR Subprogram would contact other FRDC structures and discuss an HDR-led potential priority and gauge interest in co-investment
- Other FRDC structures would contact the HDR Subproject team to gauge interest in co-investing in that RAC/IPA or Subprogram's priority
- Potential R&D priority areas identified and discussed at FRDC Stakeholder workshops or similar events with representative from FRDC structures would be developed collaboratively into a priority area, with the HDR Subprogram taking the lead or contributing as a co-investor
- HDR Subprogram would respond to draft priorities of other structures or Expression of Interest applications submitted to meet priorities of other FRDC structures and offer to co-invest in order to address a gap in the priority or project concerning inclusion of social or economic R&D components or budget for human dimension research capacity in the project team.

3.4. Quality assurance for investment in HDR (objective 3)

3.4.1. Application review

Review of applications for Expressions of Interest or Full Applications was a process overseen by the FRDC Program Manager (variously Jo-anne Ruscoe, Chris Izzo and Carolyn Stewardson) and managed by the HDR Subprogram project team.

Applications to be reviewed would be confirmed from a list of applications submitted for a call for applications by the FRDC. The applications would then be supplied to the HDR Subprogram project team, who would prepare and send out to the HDR Subprogram Steering Committee the set of applications and a spreadsheet for reviewing applications against FRDC R&D review criteria. These criteria were as follows, and assessment was by confirmation (YES) or disagreement (NO) plus further explanatory comment concerning reasons for this assessment and issues which could be addressed:

- Clearly specified needs and objectives
- Methods and expertise are appropriate
- Budget justified
- Suggested improvements (special conditions)
- Possible HRD Subprogram co-investment
- Supported / Supported with changes / Not supported
- Actions taken to address Conflicts of Interest

HDR Subprogram Steering Committee members would pre-populate the spreadsheet with their reviews prior to the HDR Subprogram Steering Committee meeting. The project team would prepare the consolidated reviews for discussion at the meeting. Meeting discussion would be recorded, and a draft final recommendation would be written during meeting proceedings. The draft recommendation would then be sent to the HDR Subprogram Steering Committee members for final review prior to being finalised and sent to FRDC Management.

Reviews of applications out-of-session did occur and, in most cases, the same process as above was followed, and short teleconferences were held to confirm the draft and final recommendation. In a small number of cases, recommendations were drafted and finalised with the HDR Subprogram Steering Committee via email only. This was on occasions where an application was addressing another FRDC structures' priority and the HDR Subprogram's input was required for technical review and recommendation only.

3.4.2. Milestone review and R&D project support

Progress reports and draft and final reports submitted for FRDC-funded projects in which the HDR Subprogram was either the lead or a co-investor would be sent to the HDR Subprogram project leader (Ogier) by the FRDC Program Manager. At this point a decision would be made collectively as to whether the report required HDR Subprogram project team review only, or HDR Subprogram project team plus HDR Subprogram Steering Committee member reviews.

Review comments would be sent to the FRDC Program Manager for consideration and actioning. The HDR Subprogram project team contributed to reviews of milestones for over 30 projects. In some cases, this included for projects not funded or co-funded by the HDR

Subprogram but because specific technical input was required (e.g. in survey design or recruitment, or in cost-effectiveness analysis).

Periodic contact with Principal Investigators of FRDC-funded projects led by the HDR Subprogram would take place to check whether any further support was needed from the HDR Subprogram project team. This support included reviewing project materials and providing feedback, helping make contacts with key stakeholders, participating in project meetings and workshops, participating in project advisory, technical or steering groups.

3.5. Support management of HDR across FRDC (objective 4)

The HDR Subprogram project team provided support to the FRDC in relation to management activities, research activities and decisions outside of the R&D goals areas of the *HDR Subprogram RD&E Plan*. These support activities were ad hoc at times (for example, see section 3.4.2 in relation to providing reviews on projects not led or co-invested in by the HDR Subprogram). In other cases, this support was provided on strategic matters such as FRDC participation in national initiatives and programs in areas aligned with HDR Subprogram priorities and expertise.

Additional R&D activities were undertaken by the HDR Subprogram project team as required by FRDC Management and the Board in response to emerging needs. These included R&D activities concerning mental health and measuring economic and social contributions to community wellbeing.

3.6. Extension and adoption activities (objective 5)

An Extension and Adoption Plan was developed by the HDR Subprogram project team and reviewed and revised based on input from the HDR Subprogram Steering Committee (see section 4.5 and Table 8). This Plan related to extension and communication of project activities, with responsibility for extension and adoption of individual research projects lying with the investigators of each project. Specific extension and adoption activities undertaken as part of the plan are listed in Table 8, section 4.5.

Extension and adoption activities of the Subprogram management project were reported as part of periodic progress reports and were reported to the HDR Subprogram Steering Committee as part of meeting papers.

3.7. Capability building in HDR (objective 6)

One of the needs the HDR Subprogram project addressed was the low capacity in human dimensions research across the FRDC community, inclusive of research providers, industry leaders, agency staff, members of FRDC structures, and the FRDC itself. The HDR Subprogram project team and Steering Committee undertook or attempted to undertake a number of initiatives to address this. These included:

- Development of priorities to build capacity of applicants in human dimensions R&D
- Technical workshops in key R&D areas, involving industry representatives, agency management staff as well as researchers
- Presentations to FRDC structures on how HDR is applicable to their priorities
- Advertisement and delivery of the Fisheries Economics Masterclass

4. Results

4.1. Priority and project development (objective 1)

4.1.1. HDR Subprogram RD&E priorities and projects

Across the period of this Subprogram management project, the HDR Subprogram has:

- Led 16 RD&E priorities
- Collaborated in seven priorities with RACs, IPAs, other Subprograms or National Priority Programs

RD&E impact has been delivered through projects in which HDR Subprogram invested and provided advice to FRDC management, as follows:

- 16 completed projects (10 led by the HDR Subprogram, six in which the HDR Subprogram was a co-investor)
- 15 active projects at the time of reporting (seven being led by the HDR Subprogram, eight in which the HDR Subprogram is a co-investor).

4.1.2. HDR Subprogram RD&E Plan outcomes

Under the *HDR Subprogram RD&E Plan 2017-2020* the HDR Subprogram has led investment in or co-invested in more than 30 projects with partner RACs, IPAs, Subprograms or National Priority Programs. A full review of RD&E plan outcomes was undertaken by the HDR Subprogram project team and the SC in 2020 (see full details in Appendix 4: Review of HDR Subprogram RD&E Plan 2016-2020).

The HDR Subprogram focused on investment in priorities which aimed to meet its RD&E goals and in doing so generate the following outcomes for Australian fisheries and aquaculture. The review found, in summary, that the HDR Subprogram had invested in projects mapping to all of its RD&E goal areas and with a range of FRDC structures (see Table 5).

Table 5. HDR Subprogram R&D project investment across HDR Subprogram RD&E Plan 2017-2020 goals

Goals of the HDR Subprogram RD&E Plan 2017-20	Number of projects* (completed and active)	
	<i>HDR Subprogram lead investment</i>	<i>HDR Subprogram co-investment</i>
1. Delivering benefits	4	6
2. Changing behaviours	2	2
3. Working with markets	3	
4. Effective engagement for social acceptability	6	5
5. Building HDR capability	2	1
<i>Total projects</i>	<i>17</i>	<i>14</i>

During the course of the *HDR Subprogram RD&E Plan 2017-2020*, HDR Subprogram investment was also responsive to emerging priorities from the FRDC Board and from RACs, IPAs and other Subprograms. These included:

- Building community trust and acceptance
- Mental health and wellbeing
- Economic and social contributions to community wellbeing
- Increasing productivity of commercial fisheries
- Impacts of COVID19 on the Australian seafood industry, and data to support assessment

Major outcomes of HDR Subprogram investment are listed in Box 1 (below). The review process found that there had been limited investment in *HDR Subprogram RD&E Plan 2017-2020* goal area 5, 'Increase capability in human dimensions research to deliver R&D impact'. Two priorities for people development in the area of HDR were included by the HDR Subprogram in the November 2019 call for applications. However, due to the COVID19 pandemic and subsequent impact on RD&E and people development activities, no projects addressing these priorities could be supported.

BOX 1. OUTCOMES OF HDR SUBPROGRAM R&D INVESTMENT

- **Rapid assessment of how COVID-19 has disrupted Australia's seafood industry** (see report [here](#)), and how the industry can prepare for greater uncertainty and future shocks through planning and partnerships with relevant governments. As well as highlighting the diversity of impact and response across the industry, this internal Subprogram research helped shape HDR's advice to FRDC on National economic and social data needs, gaps and data strategy options.
- **Evidence of the economic contributions of fisheries and aquaculture industry activity** in 2017/18 at the national and relevant state level ([2017-210](#)). The project has also already begun to build capacity of management agency staff, industry representative organisations and researchers and economic analysts by generating a nationally consistent framework for supporting cost-effective contribution studies. In so doing, and through direct engagement with these key stakeholders, the project has also increased economic literacy in measures of economic contribution and the appreciation of the value of collecting economic data. Capacity to measure contributions to social as well as economic wellbeing has also been extended ([2017-092](#); [2018-095](#)).
- Introduction of **behavioural change approaches (e.g. behavioural economics) to address complex compliance challenges** in recreational fisheries contexts ([2019-011](#) and [2019-078](#)) and adoption of best practice ([2017-133](#), [2019-023](#)). Demonstrating this research approach will help build confidence in its use in addressing other areas where changing fisher behaviour is key to achieving desired management and policy outcomes.
- Mainstreaming the use of **focused economic analysis on key issues, for example price flexibility** ([2018-017](#)), which provides demonstration products of the types of impacts these economic analyses can have on decision-making. Project ([2019-026](#)) will produce similar outcomes on **economic productivity**.
- Identification of the **range and gaps in performance of ITQ/ITE systems and markets** across Australian fisheries ([2017-159](#)), and the need to test opportunities for net gains through adjustment or re-design of these systems for future application. This foundational work proved valuable in informing the FRDC's submission to the Senate Inquiry into the Australian fisheries quota system, and the design of ([2019-165](#)) and ([2020-029](#)).
- Acknowledgement of **effective community engagement as a key driver of community trust and acceptance** necessary to provide fisheries and aquaculture with the freedom to operate, and the availability of tools to support industry groups to do this work ([2017-012](#), [2017-131](#), [2017-158](#), [2017-242](#), [2018-201](#), [2019-042](#), [2019-074](#)).

4.2. Investment in HDR across FRDC structures (objective 2)

Across the reporting period, the HDR Subprogram both led projects in which other FRDC structures co-invested (six projects) and co-investment in projects led by other FRDC structures (14 projects). The proportion of HDR Subprogram-linked projects involving co-investment was 69% (Table 6).

Table 6. RD&E projects led or supported by the HDR Subprogram which attracted co-investment across FRDC structures, 2016-2021

FRDC Structure(s)	Project No.	Project title
All RACs	2016-400	Sustainable Fishing Families: Developing industry human capital through health, wellbeing, safety and resilience
NSWRAC	2019-074	Engagement for Success: monitoring and evaluation to inform industry management strategies
VICRAC	2018-181	The End of an Era: Acknowledging the socio-cultural history and contribution of Australian small-scale fisheries
	2017-092	Valuing Victoria's Wild-catch fisheries and aquaculture industries
QLDRAC	2019-078	Fishing for change: A social marketing approach to reduce the recreational harvest of Snapper and Pearl Perch in Queensland.
	2017-012	Investigating social acceptance for the wild catch commercial fishing industry of Southeast Queensland
SA & WARAC	2019-011	Optimising Compliance Outcomes in Recreational Fisheries
SARAC	2017-014	Informing the structural reform of South Australia's Marine Scalefish Fishery
WARAC	2016-113	Lever opportunities under the Aquatic Resources Management Act WA: benefit sharing, re-allocation and co-management in practise
TASRAC	2017-013	Rebuilding Southern Rock Lobster stocks on the east coast of Tasmania: informing options for management
	2018-067	Socio-economic characterisation of a small-scale commercial fishery: opportunities to improve viability and profitability in the Tasmanian Scalefish Fishery
Recfishing Research Subprogram	2018-095	Recreational fishing and human wellbeing: insights from existing data and development of best practice approaches to future measurement
	2019-043	A Century of Angling History - Saving the historical records and memories of Australian Fishing Clubs
ACPF	2019-157	Economic Mapping of Australia's Wild-catch Prawn Supply Chain
NP1 & ACPF	2017-242	Our pledge: Australian seafood industry response to community values and expectations
NP1	2017-131	Media messages about sustainable seafood: how do media influencers affect consumer attitudes?
NP2	2019-026	Measuring, Interpreting and Monitoring Economic Productivity in Commercial Fisheries
	2018-017	Empirical Investigation of Demand Conditions and Dynamics in the South East Fishery
	2017-210	National fisheries and aquaculture industry social and economic contributions study: Phase 1
People Development	2018-174	Women in Seafood Australasia - Understanding, supporting and promoting effective participation by women within the Australian seafood industry

4.3. Quality assurance for investment in HDR (objective 3)

4.3.1. Application review

The HDR Subprogram project team and Steering Committee reviewed over 150 applications as part of sitting sessions, as well as additional applications out of session.

4.3.2. Milestone review and R&D project support

In addition, the HDR Subprogram project team provided reviews of project progress reports, milestone deliverables and draft and final reports for over 30 projects to FRDC Management in support of the projects the HDR Subprogram has invested in.

4.4. Support management of HDR across FRDC (objective 4)

The project team of the HDR Subprogram supported the FRDC in coordination and management of human dimensions research across a range of strategic initiatives, workshops and national projects, separate to HDR Subprogram investment (Table 7). These roles enabled the HDR Subprogram project team to develop RD&E priorities with these strategic insights.

On a more tactical level, the project team provided technical advice and support to FRDC Management staff, RAC Chairs, IPA Officers and other Subprogram leaders as required. An example of this support was the input as part of the drafting team for the FRDC's submission to the Senate Inquiry into ITQs for Australia's Fisheries Management.

Table 7. HDR Subprogram project team role in broader FRDC-linked R&D initiatives

FRDC-linked strategic initiative or committee	HDR Subprogram project team member
National Carp Control Program	EO – member of the Scientific Advisory Group
Joint RDCs AgriFutures Building Community Trust project	EO - manages this FRDC investment
Resource Allocation national workshop 2019	SJ – FRDC HDR Subprogram representative
IMOS	EO - Scientific Technical Advisory Committee
Non-Market Valuation - national research workshop	SJ – FRDC HDR Subprogram representative
IRG Data project (2018-016)	EO - Project Steering Committee
National Recreational Fishing Survey	SJ and EO - Technical Committee

4.5 Extension and adoption activities (objective 5)

The HDR Subprogram's extension and activities were described in the Extension and Adoption Plan developed by the project team and finalised with input from the Steering Committee (see Table 8 for the Plan). Most activities were completed, particularly those targeting internal audiences as the Subprogram's effectiveness was strongly linked to the strength of the collaborative networks it was able to build across FRDC structures and key stakeholder groups.

Additional extension and adoption activities were undertaken in response to needs arising and direction from the Steering Committee and the FRDC. These included stakeholder workshops and conference sessions to share, update and progress planning for RD&E

concerning: mental wellbeing of people in the Australian seafood community; social and economic contributions of commercial fisheries and aquaculture to community-level wellbeing; engagement with communities for building trust and acceptance; and, impacts of COVID-19 on the Australian seafood industry.

A further set of extension and adoption activities included working with project PIs to draft user-friendly plain language summaries of their work (see examples in Figure 2, below).

Extension and adoption plan goals which were not fully met were those concerning extension to external audiences. Undertaking these types of extension and adoption activities was limited by the need for dedicated communications expertise and services. A project to this end proposed for early 2020 was not initiated due to the outbreak of COVID-19. Details of extension and adoption-supporting activities completed by the project team and Steering Committee in accordance with the E&A Plan are described below (Table 8).

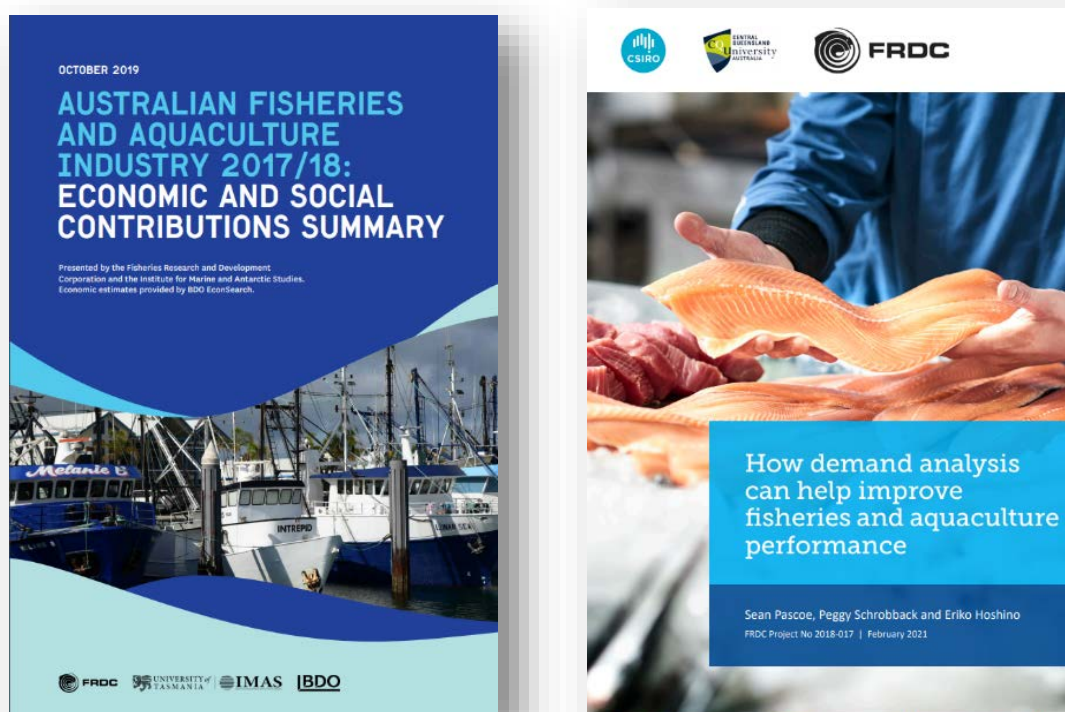


Figure 2. Examples of summary communication products for HDR Subprogram-led projects

Table 8. Planned and completed extension and adoption activities for the HDR Subprogram

Extension target	Method	Responsibility	Completion date	Completion status
Internal - HDR Steering Committee	Quarterly project updates to Steering Committee, which include updates on HDR managed projects as provided by project Principal Investigators (by email)	HDR Subprogram PriPI	Quarterly	Completed (provided to HDR Subprogram Steering Committee as part of meeting papers, and out-of-session as required)
	Steering Committee meetings and meeting papers (annual face-to-face plus teleconferences as needed)	PI	3 per year	Completed. Twice yearly face-to-face meetings, and 1-2 meetings by teleconference, annually
Internal - RACs, IPAs, RAC Managers, FRDC Program Managers, Subprogram leaders	Reviews of human dimensions research components of Expressions of Interest and full applications	PI & Consultant Economist, with input from Steering Committee	Prior to RAC and FRDC Board meetings	Completed within requested timeframe
	Reviews of human dimensions research components of milestone reports and draft final reports	PI & Consultant Economist, with input from Steering Committee	As required	Completed as required
	Draft Strategic RD&E Plan 2017-2020 circulated to internal audiences for feedback via email	PI & Consultant Economist, with input from Steering Committee	2017	Completed
Internal - RAC Managers, FRDC Program Managers	Quarterly updates with the FRDC Program Managers and RAC Managers (by telephone)	PI	Quarterly	Completed although frequency varied from annually to quarterly depending on the extent of collaboration and co-investment. Updates occurred informally, by 'phone or at workshops

Extension target	Method	Responsibility	Completion date	Completion status
Internal - RACs, IPAs	Twice-yearly discussions with RACs and IPAs (Chair/Exec Officer) (face-to-face, at RAC/IPA meetings, or by telephone as appropriate)	PI	Twice-yearly, including prior to RD&E priorities being finalized for upcoming calls for application	Undertaken annually at the Annual FRDC's National Lead, Collaborate, Partner workshops. HDR Subprogram project team members presented in person at least once, and in some cases twice, to RAC members at RAC meetings. Undertaken opportunistically at other occasions.
Internal - Subprogram leaders	Twice-yearly discussions with the Chairs/Coordinators of the IRG, National Priority 1, RecFishing Research Subprograms (face-to-face, at RAC meetings, or by telephone as appropriate)	PI	Twice-yearly	Undertaken at the Annual FRDC's National Lead, Collaborate, Partner workshop, and as issues have arisen.
Internal - RACs, RAC Managers, FRDC Program Managers, IPAs, Subprogram leaders	Participation in Annual RACs, IPAs and Subprograms planning workshops	PI & Consultant Economist	Annual	Completed
Internal - RACs, RAC Managers, FRDC Program Managers, IPAs, Subprogram leaders, peak industry bodies	National database of HDR practitioners updated and circulated annually via email	PI	August 2017, and annually thereafter	Completed. Updated periodically. Circulated to RACs, IPAs, FRDC Management and other Subprograms on request
	Criteria for, and results of, mid-point review of HDR circulated for feedback via email	PI & Consultant Economist, with input from SC	July 2018	Not completed. Instead, external review undertaken by Forrest Hill. HDR Subprogram SC and project team responded to the review findings. Internal review of performance against HDR Subprogram Strategic RD&E Plan undertaken using review template provided by FRDC Management.
Internal and external - all	Quarterly newsletter (circulated online)	PI	Quarterly	Completed but twice yearly (not quarterly) in the form of HDR Subprogram Email Updates on National Engagement and Contributions projects, which were emailed to all internal and external target audiences

Extension target	Method	Responsibility	Completion date	Completion status
	Finalised Strategic RD&E Plan 2017-2020 circulated	PI	2017	Completed August 2018
External – PIs of HDR projects and end users	Technical RD&E Workshops on HDR priority areas, to which PIs and end users invited	PI & Consultant Economist	1 workshop per priority area every 2 years	Completed. 5 National technical workshops hosted by the HDR Subprogram (see section 4.6)
External - AFMF, NSIA/SIA, NAC, WINSC, RPN	Updates presented to AFMF, NSIA/SIA, NAC, WINSC, RPN as opportunities arise (face-to-face, at meetings or by teleconference or email)	PI & Consultant Economist	As opportunities arise	PI presented updates in person to: SIA, WINSC/WISA, RPN, AFMF Subcommittees, Inshore Fisheries Subprogram committee meetings
External - all	HDR-managed project fliers (one page summaries at project start, mid-point, and end) circulated via email and social media platforms	PI	Depending on project progress	Completed for a selection of projects (for example, 2018-017; 2018-068). Completion for all projects required additional resources. HDR Subprogram communications priority was in development for early 2020 to meet the communications need to disseminate these. Project team and SC also requested that production of fliers be a requirement included in all project special conditions. Project extension was supported by FRDC Comms at a thematic level for projects addressing community acceptance through the development of an issues webpage on the FRDC website; http://www.frdc.com.au/issues/building-community-trust
	Presentations at industry conferences	PI & Consultant Economist	Seafood Directions 2017, 2019, and ABARES Outlook (March/April each year)	Completed PI presented at SD2017 and SD2019, as well as ABARES Outlook March 2021 PI presented at the MARE 2019 conference, People and the Sea, in Amsterdam
	Delivery of the Fisheries Economics Masterclass to members of the Australian seafood industry	Consultant Economist	As opportunities arise	AFMA Agency staff (June 2017) - completed Seafood Directions 2017 'taster' / introduction course – completed

Extension target	Method	Responsibility	Completion date	Completion status
				Discussions with NT DPI and NTSC to hold a class in Darwin did not proceed because of uncertainty of funding arrangements A selection of Masterclass presentations now available online (https://www.youtube.com/watch?v=s_EwVNtv5nM)
	Plain English articles (2 per year) in FISH on human dimensions research topics	PI & Consultant Economist	2 per year	Completed See series on Fisheries economics in 2017 issues http://frdc.com.au/media-publications/fish/FISH-Vol-27-3/WA-surveys-what-fishers-want http://www.frdc.com.au/Media-and-Publications/FISH/FISH-Vol-26-4/Fisher-wellbeing-in-focus http://frdc.com.au/media-publications/fish/FISH-Vol-27-3/Supported-by-society http://frdc.com.au/media-publications/fish/FISH-Vol-27-2/Fisher-conversation-helps-shape-industry-pledge https://www.frdc.com.au/media-publications/fish/FISH-Vol-29-2/Guide-to-better-marketing-for-the-seafood-sector
External – all, especially government agencies	Outputs from relevant FRDC Final reports presented by issue/tool (i.e. bioeconomic modelling tools, community engagement guides) on HDR webpage (as per AFMF request)	PI & Consultant Economist	July 2018	Commenced but not completed – HDR has worked with FRDC Communications staff to re-design webpages to make available links to relevant project outputs by theme (not by final report title). However, due to website design constraints this thematic approach has not been possible.
External - researchers	Refereed journal articles and conference presentations by PI (and others)	PI & Consultant Economist	End of project	Completed. (See Appendix 5: Publications linked to FRDC HDR Subprogram projects)

4.6 Capacity building in HDR (objective 6)

Capacity across the FRDC community - inclusive of research providers, industry leaders, agency staff, members of FRDC structures, and the FRDC itself – in understanding, using and undertaking human dimensions research was built through a number of Subprogram activities:

- Five national technical R&D workshops which the HDR Subprogram hosted on the following topics:
 1. Mental health R&D;
 2. Integrated Coastal Marine Management;
 3. Measuring social contributions to community wellbeing;
 4. Measuring economic contributions;
 5. Non-Market Valuation for Australia's fisheries and aquaculture management

Industry representatives and agency staff participated in these workshops, supported by HDR Subprogram funds to overcome barriers such as travel costs.

- Presentations to FRDC structures on what HDR is and how it could be applicable to their priorities by the project team
- Running the Fisheries Economics Masterclass for AFMA staff as well as a 'taster' in Fisheries Economics offered as a half-day conference workshop at Seafood Directions 2017

These initiatives have led to informal networks between HDR Subprogram project team members, R&D providers and industry and agency end users. And, in turn, have led to development of priorities as a follow up (for example, 2019-157 Economic Mapping of Australia's Wild-catch Prawn Supply Chain).

A range of tools and resources to support measuring human dimensions (for example, 2017-158; 2017-210; 2019-026; 2018-017) and incorporating them in assessment and decision making (for example, 2018-017; 2018-068; 2018-201) have been produced as a result of the Subprogram's investment. Extension to end users has been supported by FRDC Communications staff through articles in FISH and development of specific webpage content. However, further investment is required to develop clear 'value propositions' for these resources for members of industry and agency staff, and to create a central and easily accessed repository of these various project products which is organised to reflect the needs and interests of these potential end users. This was the focus of a communications, extension and adoption priority which the HDR Subprogram project team and Steering Committee developed at the end of 2019 as a legacy project for the HDR Subprogram. However, due to the COVID-19 pandemic outbreak and the subsequent hold on any R&D investment activity, this priority has not been progressed.

Research networks for HDR providers have been strengthened through HDR Subprogram funding of the Social matters workshop (2017-152) and by support for Dr Karen Alexander in coordinating and communicating the establishment of the Australian chapter of the Marine Social Science Network: <https://www.marsocsci.net/marsocsci-australia/> and email group: marsocsci-aus+unsubscribe@googlegroups.com. The HDR Subprogram project team and Steering Committee regularly update a database of Australian HDR R&D providers, inclusive of people working in research institutions as well as sole operators and consultants.

Provers listed also include those researchers engaged in HDR in similar sectors, such as agriculture or forestry. This database has been shared with RAC Chairs, IPA Executive Officers and FRDC staff as requested and required.

In recognition of the need for more investment in R&D in this area, the HDR Subprogram Steering Committee drafted two people development priorities which were included in the November 2019 Call for Applications. These took the form of an HDR Subprogram Graduate Research Student Bursary scheme and a Seafood Professional Bursary scheme and were designed to offer funding for applicants for operating or travel costs for research activities, conference or workshop participation in areas and topics addressing any of the *HDR Subprogram RD&E Plan* goals. However, while applications were received these were not able to proceed due to the outbreak of the COVID-19 pandemic in early 2020.

The overall impact of the HDR Subprogram project team and Steering Committee efforts in capacity building is demonstrated by the higher level of direct and substantive inclusion of HDR topics and methods in the key desired outcomes and enabling strategies of the *FRDC R&D Plan 2020-2015* (see Figure 1), compared with the levels of demand prior to the Subprogram's inception. Across the four-year reporting period for this project there were 16 HDR Subprogram R&D priorities included in calls, and 29 projects involving substantial HDR components funded.

4.7 Achievement against project key performance areas (KPIs)

In key performance areas (KPI), the HDR Subprogram project has been largely successful in achieving positive outcomes. Details of achievement against each KPI are provided in Table 9, below.

Table 9. Achievement against HDR Subprogram key performance areas (KPIs)

Performance indicator	Level of achievement
1. The Steering Committee meets a minimum of 3 times a year (at least once face-to-face each year)	Achieved (see Table 4 and section 3.1.1.)
2. Reviews are provided in a timely manner to the FRDC of Expressions of Interest, revised Expressions of Interest, full applications which include human dimensions research	Achieved (see section 4.3)
3. The priority areas identified in the Subprogram's RD&E Plan are addressed through effective human dimensions research by 2020	Achieved (see section 4.1.2, Table 5, Box 1 and Appendix 4: Review of HDR Subprogram RD&E Plan 2017-2020) Noting that investment in RD&E Goal 5 was lower than planned.
4. The funds available to the Subprogram for investment are fully utilised in accordance with the balanced portfolio agreed to by the Steering Committee and the FRDC	Achieved. Utilisation of funds has occurred across all the portfolio areas identified in the <i>HDR Subprogram RD&E Plan 2017-2020</i> .
5. The number of projects that identify a human dimensions research component increase during the life of the project	Achieved (see section 4.6). The HDR Subprogram Steering Committee determined that the overall impact of the HDR Subprogram project team and Steering Committee efforts in addressing market failure for R&D investment in HDR is better indicated by: <ul style="list-style-type: none"> the increased level of direct and substantive inclusion of HDR topics and methods in the key desired outcomes and enabling strategies of the <i>FRDC R&D Plan 2020-2015</i> (see Figure 1), compared with the levels of demand prior to the Subprogram's inception inclusion of 16 HDR Subprogram R&D priorities in calls for applications, and 29 projects involving substantial HDR components funded.
6. Human dimensions research projects receive advice and support from the Subprogram staff and Steering Committee as required	Achieved (see section 3.4.2)
7. A mid-point review of the Subprogram's activities is conducted (end of 2018) to assess its effectiveness and identify any areas that the RACs, IPAs, national industry bodies and AFMF feel may require further review and development. Criteria for that review are developed in consultation with key FRDC stakeholders. Mid-point review determines the level of support by FRDC stakeholders for the activities of the Subprogram has not decreased, and	Achieved (see section 3.1.2). The review findings and implications are also addressed in section 5 Discussion and Conclusions.

Performance indicator	Level of achievement
recommendations from the review are incorporated into the program's ongoing work	
8. Human Dimensions Research e-newsletters are generated and circulated quarterly	Partially achieved (see Table 8.) HDR Subprogram research updates were circulated via email twice yearly (on average)
9. The National database of current and practicing human dimensions researchers (e.g. social scientists, resource economists) is updated and circulated on a regular basis to the RACs, IPAs, management and research agencies, the RPN, and industry associations	Achieved (see section 4.6)
10. The Masterclass in Fisheries Economics is widely promoted and is delivered to FRDC stakeholders in response to demand	Partially achieved (see section 4.6 and Table 8) <ul style="list-style-type: none"> Delivered to AFMA staff in 2017 A half-day 'taster' offered as a conference workshop for Seafood Direction 2017 Units available on youtube: https://www.youtube.com/watch?v=1W69ntTkjpM https://www.youtube.com/watch?v=s_EwVNtv5nM
11. The RACs, IPAs, national industry bodies and AFMF are aware of the major research findings and tools available to inform and address human dimensions RD&E priority areas	Partially achieved (see section 4.6 and Table 8) Further investment is still required to consolidate HDR Subprogram R&D outputs into formats and platforms easily accessible and useable for FRDC stakeholders
12. Effective pathways for strengthening integration of social and economic tools and frameworks with biological approaches in fisheries assessment and decision-support is identified	Not achieved directly. The HDR Subprogram Steering Committee determined that this was addressed through inclusion of Goal 1 Delivering social and economic benefits in the <i>HDR Subprogram RD&E Plan</i> . Therefore, outcomes of HDR Subprogram investment in projects addressing this goal would contribute to meeting this KPI (see 4.1.2, Table 5, Box 1 and Appendix 4: Review of HDR Subprogram RD&E Plan 2017-2020).
13. The HDR co-invests a minimum of 20% of its allocated RD&E funds across the life of the subprogram	Achieved (see section 4.2) The level of co-investment by the HDR Subprogram (69% of all HDR Subprogram projects) exceeded the minimum level.

5. Discussion and Conclusion

The Human Dimensions Research (HDR) Subprogram provided the FRDC and stakeholders the opportunity to overcome market failure in human dimensions RD&E investment, and to maximise that investment in and the effectiveness of human dimensions RD&E for Australian fisheries and aquaculture. This is achieved through the Subprogram's capacity to:

- Provide leadership and coordination where required to draw on a range of expertise to tackle complex problems. Capacity to directly commission or call for RD&E enabled the Subprogram to meet needs for targeted, strategic RD&E. The capacity to co-ordinate complex multisectoral and multijurisdictional RD&E avoided unnecessary duplication, enabled economies of scale to be realised, and ensured comparability of results.
- Lever greater overall investment in human dimensions RD&E through co-investment arrangements. Co-investment with stakeholders enabled the Subprogram to be more cognizant of and responsive to their needs, for appropriate human dimensions expertise to be included in teams of research applicants and for human dimensions R&D to be more effectively integrated in traditional fisheries and aquaculture research projects.

The outcomes of investment in RD&E by the Human Dimensions Research Subprogram has been positive for Australia's fisheries and aquaculture, in combination with other supporting factors, in the following ways:

- Delivering and sharing social and economic benefits is core business for sustainable management now, and tools are in place to support assessment, decision making and policy design
- Levels of community trust and acceptance are stronger, and more positive impact is within reach through more effective engagement
- Behavioural insights can be harnessed to support compliance, innovation, adoption of best practice
- Australia's fisheries and aquaculture have evidence of their contribution to economic and social wellbeing at the national and state level
- Price and productivity improvements can be incorporated into fisheries management
- Preparedness for future uncertainty and global shocks is stronger because of learnings from impacts and responses to the COVID-19 pandemic and disruption

The project and period of the HDR Subprogram's operations being reported here were not without challenges which impeded achievement in certain areas. These areas of lesser levels of achievement included: integration of HDR Subprogram RD&E priority development and investment with other FRDC strategic directions and initiatives; capability building in HDR amongst industry leaders and agency staff; and extension and communication to FRDC's broader stakeholders to support adoption. These challenges and areas of under achievement were observed more broadly across FRDC Subprograms and other FRDC structures by Forrest Hill in their review of FRDC's partnership models in 2019. In responding to the review findings, the HDR Subprogram Steering Committee concluded that the HDR Subprogram functioned to meet the FRDC's needs in large, and that the technical/advisory function of the

HDR Subprogram Steering Committee should be retained rather than diluted across other arms of FRDC operations and advisory groups as a minimum.

The absence of an integrative mechanism or operational plan to direct, check and coordinate the alignment of Subprogram RD&E plans, priorities and project investment led to a degree of isolation of HDR Subprogram priority development process and project outputs. This in turn resulted in HDR RD&E investment being duplicated in other areas of FRDC investment in some cases. While at the same time, the more prescriptive nature of the HDR Subprogram RD&E Plan limited the Subprogram Steering Committee to some extent in responding to strategic and emerging RD&E needs.

Building further capability in HDR amongst professional stakeholders was limited by lack of expertise of the HDR Subprogram project team and Steering Committee in people development pathways and capability building interventions and models, as well as by uncertainty regarding FRDC's approach to investment in people development R&D directly. The Steering Committee and project team recognised this and commenced drafting priorities to call for expertise to design and deliver capability development RD&E in late 2019. The decision by the FRDC to re-active its people development program part way through the term of this project reflects this need for a more centralised and expert-informed approach to people development.

Noting the Subprogram's focus on extension and adoption of project activities, the HDR Subprogram Steering Committee strongly supported the options raised in the review to improve FRDC's pathways to impact through extension and adoption planning. HDR Subprogram performance in regard extension and adoption of the outputs of individual research projects was limited by lack of clarity of roles, expertise and capacity to actively plan for and undertake extension activities across RD&E projects, and an overall framework which identified the adoption and impact pathway into which each RD&E project feeds.

The FRDC already has improvements underway to address these structural challenges. These include changes to the FRDC investment framework and structures designed to direct RD&E investment across all structures in support of the key outcomes and enabling strategies of the *FRDC R&D Plan 2020-2015*, and the investment in dedicated roles with the FRDC to lead innovation and impact in people development and in extension and adoption.

These innovations, combined with the direct inclusion of human dimension of fisheries and aquaculture in the *FRDC R&D Plan 2020-2015*, highlight the centrality of human dimensions in the future of FRDC R&D for Australia's fisheries and aquaculture. This centrality is both in terms of key outcomes (for example, community trust, respect and value) and in terms of enabling strategies to achieve these outcomes (for example, foundational data, strengthening adoption). The HDR Subprogram has delivered a legacy through its completed and active RD&E projects (see Figure 3., below) to support this future.



Figure 3. Legacies of the HDR Subprogram 2017-2020 impact for the FRDC R&D Plan 2020-25

6. Implications

Impact for public management agencies of Australia's fisheries and aquaculture:

- Delivering and sharing social and economic benefits is core business for sustainable management of fisheries and aquaculture now, and tools are in place to support assessment, diagnosis of underperformance, and identify potential strategies and their effectiveness (2016-113; 2017-012; 2017-013; 2017-014; 2017-159; 2018-067)
- Measurement and evaluation of change in Australia's fisheries and aquaculture contribution to economic and social wellbeing at the national and state level can be undertaken using existing frameworks and methods (2017-092; 2017-210; 2018-095)
- Price responsiveness and productivity improvements can be incorporated into fisheries management (2018-017; 2019-026)
- Preparedness for future uncertainty and global shocks is stronger because of learnings from impacts and responses to the COVID-19 pandemic and disruption (2016-128)
- Non-Market Values for ESD components of Australia's fisheries and aquaculture - where available - are documented and accessible to decision makers (2018-068)

Impact for fisheries and aquaculture sector leaders:

- Levels of community trust and acceptance are stronger, and more positive impact is within reach through more effective engagement (2017-131; 2017-158; 2017-242; 2018-201; 2019-074)
- Australia's fisheries and aquaculture (commercial and recreational) have evidence of their contribution to economic and social wellbeing at the national and state level (2017-092; 2017-210; 2018-095)
- Levels of physical and mental wellbeing of seafood communities can be tracked and drivers are known (2016-400; 2018-095)
- Preparedness for future uncertainty and global shocks is stronger because of learnings from impacts and responses to the COVID-19 pandemic and disruption (2016-128)

Impact for FRDC and its structures, and for HDR providers:

- Human dimensions components of FRDC's R&D investment delivers a greater return due to quality assurance and technical support for priority development and project delivery
- Behavioural insights can be harnessed to support adoption of best practice (2017-133; 2019-023; 2019-078)
- The FRDC and its stakeholders are better positioned to navigate emerging changes in social, political and economic dynamics which emphasise a sectors capacity to generate and share a range of benefits in pursuit of broadly-defined sustainability goals

7. Recommendations

1. Build on HDR Subprogram priority legacies which contribute to the new *FRDC R&D Plan 2020-25*
2. Continue the Subprogram using a model which directly integrates HDR subprogram priority development with the *FRDC R&D Plan 2020-25*
3. Improve FRDC extension, adoption and (ultimately) impact and return on investment by integrating R&D insights on behaviours of people, markets and institutions into R&D planning and delivery
4. Increase FRDC's access to human dimensions data and support its provision of social and economic information services by consolidating existing data and identifying data sharing opportunities.

8. Project materials developed

Project output	Where it is available
HDR Subprogram RD&E Plan 2017-2020	Appendix 2 of this report
HDR Subprogram RD&E Plan review	Appendix 4 of this report
National database of HDR providers	Stored by PI on UTAS drive - available on request
<i>Mental Health in Fisheries and Aquaculture: Making a positive difference</i> National RD&E Workshop Report (November 2018)	Report provided to FRDC Management as part of 2016-128 milestone deliverables
MARE people and the Sea Conference 2019, conference report	Provided to FRDC Management as part of 2016-128 milestone deliverables
<i>COVID19 Impact: Economic and Social Data Inventory</i> (internal paper)	Provided to FRDC Management and stored in shared drive
<i>Impacts of COVID19 on the Australian Seafood Industry: January-June 2020</i> (report)	Report available on FRDC website here
ABARES Outlook March 2021 presentation, <i>Insights from the COVID-19 shock: Impacts and agility in seafood supply chain and markets</i>	Provided to FRDC Management and stored in shared drive Also available here: https://www.agriculture.gov.au/abares/outlook/program/2021-fisheries-aquaculture-lessons-pandemic
<i>Lessons from COVID-19: Data needs to support 'future-proofing'</i> (internal paper, 2021)	Provided to FRDC Management and stored in shared drive
Integrated Coastal Marine Management: National workshop series report	Included as part of the final report for FRDC 2017-214, available on the FRDC website here
Measuring social contributions workshop report	Included in the Final report for FRDC 2017-210, available on the FRDC website here
Measuring economic contributions workshop report	Included in the Final report for FRDC 2017-210, available on the FRDC website here

Appendix 1: Project staff

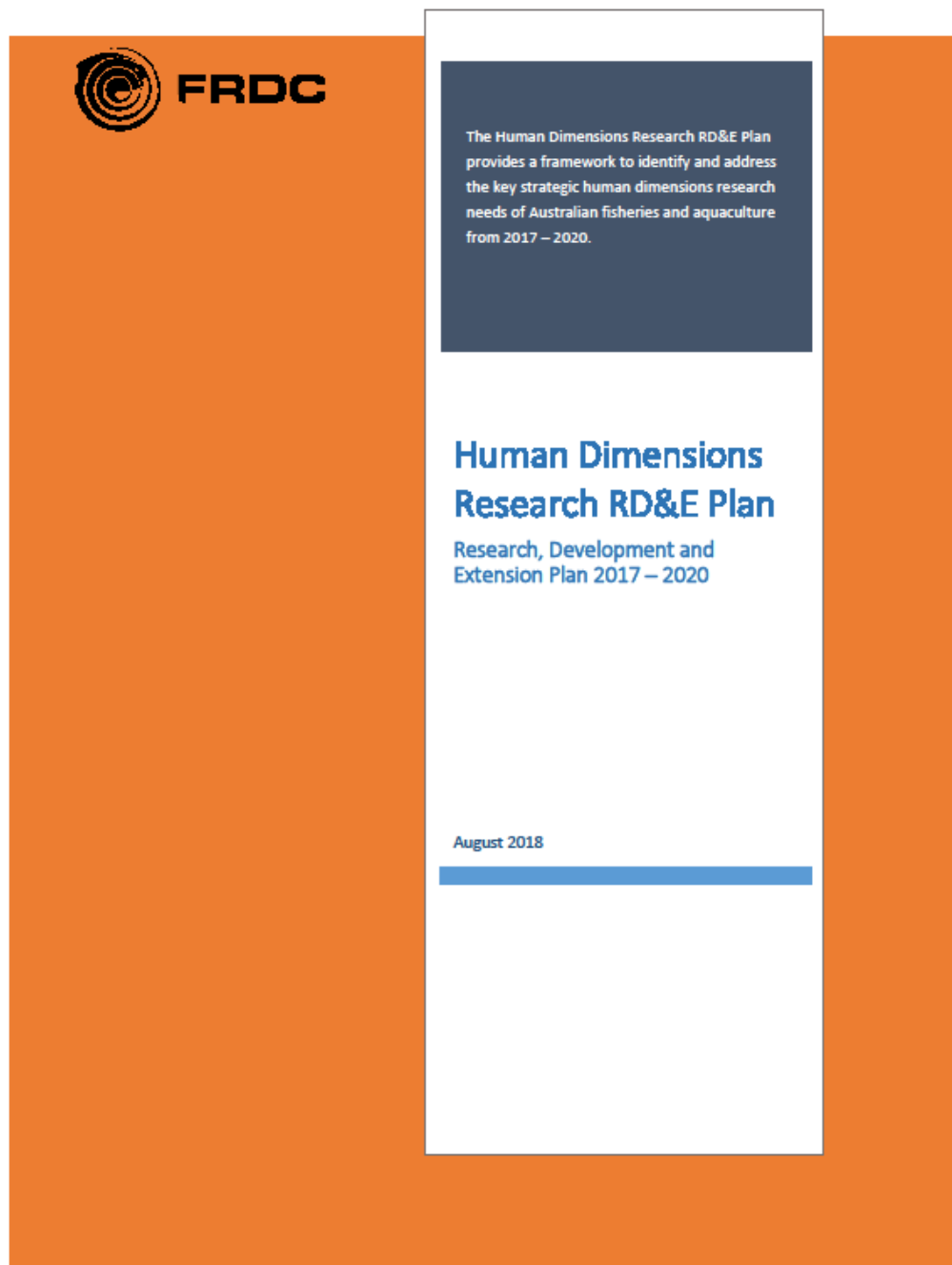
Emily Ogier

Sarah Jennings

Kirsten Abernethy

Appendix 2: Human Dimensions Research Subprogram RD&E Plan 2017-2020

Link: [https://www.frdc.com.au/-/media/fish-frdc/frdc-human-dimensions-research-rde-plan-2017-2020-\(00000002\).ashx?la=en](https://www.frdc.com.au/-/media/fish-frdc/frdc-human-dimensions-research-rde-plan-2017-2020-(00000002).ashx?la=en)



Appendix 3: HDR Subprogram Steering Committee Terms of Reference



Human Dimensions Research Subprogram

**Terms of Reference
2017- 2020**

Abbreviations

AFMF	Australian Fisheries Management Forum
FRDC	Fisheries Research and Development Corporation
HDR	Human Dimensions Research
IPA	Industry Partnership Agreement
NRM	Natural Resource Management
RAC	Research Advisory Committee
RD&E	Research, Development and Extension
SC	Steering Committee
ARC	Australian Research Council

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1.0 Introduction

The Human Dimensions Research (or, HDR) Subprogram has been supported by the FRDC for the period of 2017-2020 in recognition of the continuing need for, and increased use of, research into the human dimensions (social, economic, cultural) to improve fisheries and aquaculture sector outcomes. Specifically, the FRDC has recognised the need for an expert reference group to provide advice to FRDC Board and management, RACs, IPAs, other Subprograms, researchers, industry and managing agencies, and for coordination of and dedicated investment in human dimensions RD&E.

The HDR Subprogram is designed to:

- Maximise FRDC's research return on investment, for both the public and industry, by:
 - ensuring the uptake of previous human dimensions research work and minimising the risk of duplication;
 - brokering and incentivising research collaborations between social scientists, economists, researchers from biological disciplines, research providers, and industry associations;
- Increase the capacity of the fishing and aquaculture industries and management agencies to identify solutions to sectoral conflict, social acceptability issues and barriers to productivity and profitability; and
- Maintain and enhance capability for human dimensions research into Australian fisheries and aquaculture.

2.0 Subprogram Objectives

The objectives of the Subprogram are to:

1. Identify human dimensions RD&E priorities annually, through review and consultation with key fisheries and aquaculture stakeholders (RACs, IPAs, Subprograms, AFMF) and develop projects to address those priorities
2. Promote coordination and co-investment in human dimensions RD&E across RACs, IPAs and Subprograms
3. Ensure quality and relevance of human dimensions RD&E through review of applications and project reports
4. Support the FRDC in the management of a portfolio of projects with significant human dimensions research components
5. Facilitate extension and adoption of human dimensions R&D outputs
6. Build and support capability in human dimensions research to meet the needs of fisheries and aquaculture

3.0 Subprogram Terms of Reference

3.1 Governance

The Terms of Reference (ToR) for the HDR Subprogram will be reviewed and updated in light of the transition to a Subprogram. A face-to-face Steering Committee meeting will be held in early March 2017 at which time the draft revised ToR will be updated. Membership of the Steering Committee will be reviewed and then approved by the FRDC. The process for nominating members is included in the ToR.

Steering Committee membership is comprised of an FRDC representative plus nominated researchers (refer to Section 4.0). Membership is voluntary and for this reason funds are required to meet travel expenses for face-to-face meetings.

The Subprogram Leader will set the agendas, meeting dates, facilitate and chair the meetings, and generate the record of meetings. This will be undertaken in conjunction with FRDC to ensure that their needs and timelines are being met. Within reason, and subject to resourcing, the Subprogram Leader and/or Economic Coordinator, will attend relevant RAC, other Subprogram and IPA meetings where a contribution from the Subprogram is required when discussing human dimensions RD&E matters. The Subprogram Leader will undertake, or oversee, out of session activities.

3.2 RD&E planning and investment

The Steering Committee will commence drafting of the Subprogram's Strategic RD&E Plan, based on the RAC RD&E Plan template provided. Input and feedback will be sought from the FRDC, RAC Leaders, RAC and IPA Chairs and other Subprograms. The Plan will identify the Subprogram's RD&E priorities, as well as the balance of types of investment both broadly and specific to priority areas, including: directly commissioned, open call/competitive, and co-investment. The draft Plan will be circulated for comment and finalised by 31 August 2017. The Subprogram Leader will then work with the FRDC and the HDR Steering Committee to finalise the Plan.

The HDR Subprogram Steering Committee's role includes to provide advice in response to applications for projects or variations to existing projects to direct expenditure of the HDR Subprogram's allocated budget. This advice will be provided at scheduled meeting times (refer to sections 3.1, 4.0 and 4.1).

In the event that the HDR Subprogram is approached for recommendations that need to be made out-of-session, the Subprogram Leader will seek the advice of Steering Committee members via email and provide 5 working days for comment. The Subprogram Leader will seek the following advice of the Steering Committee using the following standard procedure:

1. Subprogram Leader to determine the level of risk of the project (High or Low), based on the criteria listed below
2. Subprogram Leader to email Steering Committee and seek response as follows:

- a. Where assessed risk is Low, that the majority of Steering Committee members support the assessed level of risk and the recommended decision outlined by the Subprogram Leader in the email.
 - i. If a majority of Steering Committee members do not support the assessed Low level of risk, then the level of risk is elevated to High and those procedures are followed.
 - ii. If a majority of members do support the assessed Low-level of risk then the decision recommended by the Subprogram Leader is passed on to the FRDC and through FishNet.
 - iii. If low or no responses are received from Steering Committee members then this will be assumed to be a default position of support from the non-responding members, and the decision recommended by the Subprogram Leader is passed on to the FRDC and through FishNet.
- b. Where the assessed risk is High, that the majority of Steering Committee members review the EoI/application and provide comments to the Subprogram Leader within the 5 days provided. The Subprogram Leader then collates all comments.
 - i. If a majority of Steering Committee members either support/do not support an application then the advice is conveyed to the FRDC program Manager and through FishNet.
 - ii. If a majority of members do not support a recommendation, then a teleconference session is arranged to discuss further within a further 5 days. If this does not result in a clear position, then the FRDC is advised.
 - iii. If low or no responses are received from Steering Committee members then this will be assumed to be a default position of support for a re-assessment of the application as Low risk from the non-responding members, and the decision recommended by the Subprogram Leader is passed on to the FRDC and through FishNet.

Low-risk applications/projects are those in which:

- The project or variation to a project fits clearly within the HDR Subprogram's Strategic RD&E Plan 2017-2020; and
- The investment decision involves funds of \$30,000 or less; and
- The proposed activity/variation itself is not assessed as presenting any unaddressed or unmanaged threats and risks to the HDR or to the FRDC.

High-risk applications/projects are those which do not meet the above conditions.

3.3 Facilitating development of proposals that meet priority areas

The Subprogram Leader and Economics Coordinator will work with research providers and stakeholders to support the development of fit-for-purpose and cost-effective EoIs and applications to meet priority areas. The Steering Committee will help to maintain and increase networks across the communities of practice and stakeholders.

3.4 Facilitating co-investment

The Subprogram Leader and Economics Coordinator will work with RACs, IPAs, the Research Providers' Network, the RAC Leaders, and other Subprograms to:

- identify and implement co-investment in RD&E priority areas;
- collaborate in providing support to the FRDC in managing these projects; and
- ensure the flow of benefits is proportionate to the level of investment.

Opportunities for co-investment with non FRDC stakeholders will also be explored, such as NRM groups, the ARC and philanthropic funds.

3.5 Capacity building

Initiatives to maintain and increase capacity in human dimensions research will be continued by the

Subprogram Leader and Economics Coordinator through coordination and oversight of the relevant Higher Degree Research projects being undertaken through Universities and other Higher Education institutions.

Initiatives to maintain and increase professional capacity in understanding human dimensions research will

be continued by the Economics Coordinator through:

- Coordination of delivery of the Masterclass in Fisheries Economics
- Consideration will also be given to development of professional training material in Marine Social Sciences

3.6 Supporting human dimensions RD&E broadly

The Subprogram Leader will undertake the following activities on an as-needs basis:

- a) Liaise with industry, government and researchers to identify and clarify issues and define research problems;
- b) Establish links between human dimensions researchers, members of industry and specific industry sectors and associations, and Leaders;
- c) Promote human dimensions research capability and activity, both FRDC-funded and external; and
- d) Provide expert advice to the FRDC, industry and management concerning human dimension research as required.

These activities may be undertaken by the Subprogram Leader, the Economic Coordinator or other

appropriate person at the discretion of the Subprogram Leader with input from the FRDC.

3.7 New research activities

The Subprogram Manager and Economics Coordinator will undertake selected research to address strategic or tactical needs identified in the Subprogram's RD&E Plan. These may include: meta analyses, gap analyses, review and synthesis work.

4.0 Steering Committee

The Steering Committee will be comprised of a maximum of seven members, including the HDR Subprogram Leader, the Economics Leader (refer to section 3, points 12-17 for a definition of this role) and a representative of FRDC.

- The remaining members of the Steering Committee will be selected on the basis of their combined experience across fisheries and aquaculture industries, management and research;
 - Due to the level of public management of fisheries and aquaculture, AFMF will have a member on the Committee, being responsible for disseminating information from the HDR Subprogram to members of AFMF.
- The Subprogram Leader is responsible for making recommendations in regard to potential Steering Committee members to the FRDC for review and approval. The final selection and appointment of the Steering Committee rests with the FRDC.
- The Steering Committee will meet a minimum of twice a year (at least one meeting of which will be face to face).
- Members of the Steering Committee will be appointed for a minimum period of one year and a maximum of three years.

4.1 Steering Committee Terms of Reference

The role of the HDR Steering Committee includes:

- developing a strategic 3-year RD&E plan (to align with the FRDCs RD&E plan), and annual mechanisms to enact those plans, taking into account other strategic plans and priorities developed by RACs, other Subprograms, coordination programs and IPAs; so as to encourage collaboration and co-funding of projects
- being responsive to the RD&E needs of stakeholders across all jurisdictions
- promoting the best scientific methods
- ensuring that Subprogram RD&E priorities are balanced across the programs of the FRDC RD&E plan and contain a mix of basic and applied RD&E
- maintaining a strategic direction and being responsive to changing circumstances
- setting RD&E priorities to maximise the opportunities of investment to meet identified priorities, avoid duplication and achieve the greatest potential return
- inviting RD&E applications to address identified priorities via the priority template
- providing investment advice on the HDR Subprogram allocated budget and expenditure against it
- promoting collaboration between researchers, fisheries managers, and industry, both within, and among, jurisdictions
- considering other RD&E funding opportunities

- communicating regularly with potential beneficiaries through existing networks and FRDC communication channels
- influencing the adoption of RD&E results
- assessing project stop/go points

5.0 Code of Conduct for Committee members

Please refer to the *Material personal interests for FRDC committee's policy (January 2016)*, which includes the FRDC committee member's code of conduct. In addition, the following HDR Steering Committee procedures supplement the aforementioned FRDC policy:

Members of the HDR Steering Committee are expected to adhere to the highest ethical standards and to ensure that these standards permeate the Subprogram. Committee members have the responsibility to ensure that the Subprogram's activities are achievable and contribute to positive and tangible outcomes for sustainable fisheries.

Steering Committee of the HDR Subprogram to undertake:

1. To act honestly, in good faith and in the best interests of the Subprogram.
2. To use care and diligence in fulfilling the duties required of them as members of the Subprogram.
3. Not to take improper advantage of their position in the Subprogram or attempt to improperly influence other members.
4. To make decisions in the best interest of the Subprogram, ahead of their own personal or professional/business interest, or in the interests of their employer. Please refer to "Conflict of Interest" (7.0 in this document)
5. The obligation to be independent in judgement and actions and take all reasonable steps to be satisfied as to the soundness of all decisions of the Subprogram.
6. Not to disclose confidential information received in the course of the Subprogram activities, or make public statements, unless otherwise authorised by the FRDC or the Subprogram Leader (this includes former Subprogram members).
7. To attend all meetings of the Subprogram unless there is a reasonable excuse for failure to attend a particular meeting or meetings. Where attendance is not possible, members will notify the Subprogram Leader in advance. With the exemption of AFMF and FRDC members, no substitutes or proxies will be accepted unless agreed to by the Subprogram Leader. A leave of absence may be requested of the Subprogram in advance if the member reasonably believes they will miss two consecutive meetings.
8. The continuing obligation to keep informed about the activities of industry research.
9. To treat all other Subprogram members with professionalism, courtesy and respect, and work cooperatively with fellow members towards agreed goals and to achieve consensus within the Subprogram through open, frank and friendly discussion.
10. All meeting discussions will be undertaken under 'Chatham House' rules.
11. If the final position is a **majority** decision - that will be the decision of the Subprogram; all members (including dissenting members) are then obligated to support the majority decision. A dissenting member may have his/her vote recorded in the minutes upon request.

12. The Steering Committee Chairperson will retain the right to vote and make a casting vote.
13. To disclose any conflict of interest with the activities or subject of discussions of the Subprogram on joining (see attached Register of Conflict of Interest), and as appropriate during the work of the Subprogram. If a situation or potential "conflict of Interest" should arise, the member concerned will discuss the matter with the Chairperson (or Subprogram Leader) and will withdraw if requested while the Committee discusses the potential conflict. If it is decided that a conflict does exist, then depending on the assessed significance, the member involved will be requested to take one of the following actions (in order of increasing significance)
 - a. Refrain from voting on a relevant matter during a Committee meeting;
 - b. Withdraw from discussion of relevant matter(s) during a meeting;
 - c. Take a leave of absence from the Subprogram for a period; or
 - d. Resign from the Subprogram.

6.0 Material personal interests

Please refer to the *Material personal interests for FRDC committee's policy (January 2016)*. In addition, this section aims to provide guidance as to what constitutes a "material personal interest"; and how to deal with it, as a supplement to the aforementioned FRDC policy.

A key issue in the way this policy has been structured is that the SC is constituted to give advice to the FRDC, and is not the funding decision maker. A SC member who considers that he/she may have a material personal interest in a matter to be discussed by the SC (i.e. a "conflicted member") will:

1. as soon as practicable after the committee member becomes aware of his/her interest in the matter give details of the nature and extent of that interest, and the relationship of the interest to the SC, either in a "standing notice" or at a meeting of the SC; and
2. subject to the views of the SC, may not participate in any discussion of, or decision on, that matter.

If the conflicted member is a Principal Investigator or a Co-Investigator on the application they will, before any discussion takes place on that matter, leave the meeting while that matter is discussed.

SC members may, through the HDR Subprogram Leader, ask a conflicted committee member specific questions about the matter. In querying a conflicted member, SC members will act to ensure that the conflicted member is not invited to advocate for the application. In answering questions from group members, conflicted members will act so as to ensure they are not influencing the group in making its decision, e.g., by advocating for the project. Note that this may involve re-calling a conflicted member to the meeting to be queried (with the conflicted member to leave the meeting again after he/she has been questioned).

The SC's meeting agenda will include a "standing notice" of material personal interests that will be used to review and update the register of material personal interests at the beginning of each meeting. All declarations of interests, and their consideration by the SC, will be recorded in the minutes. Note that where the meeting is being held via teleconference, leaving the meeting will require the member to leave the teleconference, and dial back as requested.

Guidance on what constitutes a “material personal interest”

The following are examples that provide a guide to the application of this policy, but in practice will depend on the particular circumstances. A SC member would usually be expected to declare a material personal interest if he/she is:

- an employee of an organisation whose application was being evaluated by the SC
- an employee of an organisation with an application that is in competition with an application being evaluated by the SC
- a shareholder of an organisation that holds a licence to fish in a fishery in which management changes (to either the organisation's benefit or detriment) could result from a successful application
- closely involved in the development of an application
- directly associated with a fishery's research, policy, and/or management, the operation of which could be affected by the SC's recommendation on an application
- a close personal friend of an applicant

Note that these tests extend to a member of the member's immediate family, or to any organisation with which the member is associated.

Appendix 4: Review of HDR Subprogram RD&E Plan 2017-2020

The HDR Subprogram project team and Steering Committee undertook a review of the Subprogram's investment and impact against its RD&E Plan goals. This review was submitted to the FRDC in late 2019 and revised in early 2020.


Table 10. HDR RD&E Plan 2017-2020 Outcomes: Environment

Priority	Performance	Traffic lights
None	While HDR Subprogram priorities are expected to have outcomes that have implications for the environment, the focus is on human interactions with the environment, hence priorities are listed against other Programs, particularly '2. Industry'.	

Table 11. HDR RD&E Plan 2017-2020 Outcomes: Industry

Priority	Performance	Traffic lights
<i>RD&E Goal 1. Ensuring social, cultural and economic benefits from fisheries and aquaculture</i> Priority areas: 1.2 Informing resource allocation	The HDR Subprogram has directed investment to RD&E that can inform and support FRDC's goal of progressing fisheries toward transparent, evidence-based decision-making to achieve optimal benefits for society from fisheries and aquaculture. Under the current plan, the focus has been on improving and harmonising resource allocation processes and policies, and on improving industry and management accessibility to decision support tools and the data and information needed to operationalise these. Outcomes have been complemented and enhanced through investment under 1.1 Understanding distributions of benefits (see Communities below) through its focus on identifying intended beneficiaries and monitoring how benefits are shared. Outcomes have been further supported through targeted capability building activities including a popular article in FISH	

Priority	Performance	Traffic lights
<p>1.3 Decision support and governance tools and models</p> <p>Outcomes:</p> <p>Sectors (commercial/aquaculture, recreational and Indigenous) can operate effectively in an increasingly complex and demanding socio-ecological environment by ensuring that decision-making at all levels is risk-based, transparent and evidence-based:</p> <ul style="list-style-type: none"> Decision makers are informed as to which multi-objective decision support tools and governance structures perform best in different 	<p>magazine (Vol.25 2 'One fish, two fish, my fish, your fish'); an emphasis on an economic way of thinking about resource allocation in the Economics masterclass, and the research focus of a top-up scholarship recipient (see 'Allocation of harvest between users in a fishery with habitat effect', Nichol, Jennings and Yamazaki, <i>Natural Resource Modelling</i>, 2018:31).</p> <p>1.2 Informing resource allocation</p> <p>The HDR Subprogram invested in the following:</p> <ul style="list-style-type: none"> 2018-068: <i>Non-market values to inform decision-making and reporting in fisheries and aquaculture – an audit and gap analysis</i> 2017-210 <i>National fisheries and aquaculture industry social and economic contributions study</i> (relevant in cases where management objectives allow consideration of flow-on effects) 2017-013: <i>Rebuilding Southern Rock Lobster stocks on the east coast of Tasmania: informing options for management</i> 2018-095 <i>Recreational fishing and human wellbeing: insights from existing data and development of best practice approaches to future measurement</i> <p>A further HDR priority (2019-065 <i>Pathways to reform in inshore fisheries: improving anticipated outcomes</i>) will improve managers ability to anticipate and respond to fisher's behaviour in response to changes in resource allocation. (The application was supported by the HDR Steering Committee but has not been approved by FRDC at this stage.)</p> <p>HDR Subprogram investment against this priority to date under the current RD&E plan has been deliberately measured, reflecting the challenge of securing support from management agencies in all jurisdictions for a harmonised approach to developing resource allocation principles. Support for this has only recently been forthcoming, and HDR will continue the collaboration, begun</p>	

Priority	Performance	Traffic lights
<p>decision contexts/points</p> <ul style="list-style-type: none"> Decision makers are informed as to which resource (re)allocation mechanisms and processes perform best across varying contexts Industry is informed about what information and capabilities are required to successfully participate in resource (re) allocation processes in the Blue (Ocean) economy 	<p>through its involvement in 2019-142: Resource Sharing in Australian Fisheries Workshop, through <i>2020 – 027: National Resource Sharing Guidelines</i>. Recommendations from 2018-068 on non-market valuation needs to support resource allocation and 2017-210 on economic data needs should also guide future investments.</p> <p>1.3 Decision support and governance tools and models</p> <p>The HDR Subprogram has made progress against this priority through i) investments in the trial of an integrated management tool for marine resources in the blue economy and in developing a decision support tool to help anticipate flows of benefits under alternate governance and management systems and ii) its advisory role on key FRDC project 2015 -013 Developing triple bottom line harvest strategies.</p> <p>The HDR Subprogram invested in the following:</p> <ul style="list-style-type: none"> 2017-214: Comparative evaluation of Integrated Coastal Marine Management in Australia – Workshop 2016-113: Lever opportunities under the Aquatic Resources Management Act WA: benefit sharing, re-allocation and co-management in practice (paused at the direction of FRDC) <p>A key challenge is lack of uptake of existing decision support and governance tools and models within the sector. The HDR Subprogram is tackling this through the priority <i>The human side: HDR Subprogram communication project</i> which will develop a product that lets FRDC and stakeholders engaged in RD&E planning characterise and match specific decision need/context to existing tools and models, and provides supporting resources to assist adoption. This priority is a central element of the Adoption program part of the HDR’s RD&E plan and is supported by the HDR Steering Committee.</p>	

Priority	Performance	Traffic lights
<p><i>RD&E Goal 2. Understanding behaviour of fishers/farmers, organisations and institutions</i></p> <p>Priority Areas:</p> <p>2.1 Effective compliance</p> <p>2.2 Adoption, adaptation and innovation</p> <p>Outcomes:</p> <p>Policies and practices are based on an understanding of drivers of key behaviours, ways that desirable behaviours can be incentivised and barriers removed to improve outcomes for industry and management, including:</p> <ul style="list-style-type: none"> Improved uptake of existing and future best-practice guidelines and 	<p>The HDR Subprogram has focused on effective compliance in recreational fisheries, on adoption and uptake in animal welfare practices and in community engagement for social acceptability. In each of these areas, the RD&E undertaken has resulted in the novel application of behavioural economics and psychology (e.g. social marketing) to these industry challenges. This paves the way for more targeted R&D in the 2020-2025 plan which has a major focus on innovation behaviour.</p> <p>2.1 Effective compliance:</p> <p>The HDR Subprogram co-invested in the following:</p> <ul style="list-style-type: none"> <u>2019-011</u>: <i>Optimising Compliance Outcomes in Recreational Fisheries</i> <u>2019-078</u>: <i>Fishing for change: A social marketing approach to reduce the recreational harvest of Snapper and Pearl Perch in Queensland.</i> <u>2017-013</u>: <i>Rebuilding Southern Rock Lobster stocks on the east coast of Tasmania: informing options for management</i> (this project included a discrete choice model to reveal recreational fisher preferences for alternative compliance measures) <p>These investments reflect the increasing interest in novel techniques to achieve behavioural change, in particular behavioural economics. At the same time there has been increasing levels of interest and investment in education campaigns for recreational fishers. Further needs include the application of these methods to assess the effectiveness of these investments in producing higher levels of compliance through controlled field trials of different campaign strategies.</p> <p>2.2 Improving adoption, adaptation and innovation:</p> <p>The HDR Subprogram lead through investment in projects looking at uptake and adoption of best practice in community engagement and animal welfare, as follows:</p>	

Priority	Performance	Traffic lights
<p>innovative practices through understanding drivers of adoption and innovation</p> <ul style="list-style-type: none"> Increased efficiency in producer behaviour through improved understanding of how institutions and fisher/farmer behaviours (both individually and cooperatively) influence profitability and productivity Effective and improved compliance systems which incentivises industry to comply and reduces perverse 	<ul style="list-style-type: none"> 2017-133: <i>The right conversations - Identifying optimal stakeholder engagement and evaluation practices for fisheries</i> 2019-023: <i>Identifying and mitigating obstacles to uptake and adoption of aquatic animal welfare practices by the Australian Fishing Industry</i> <p>A project application - 2019-065 <i>Pathways to reform in inshore fisheries: improving anticipated outcomes</i> - was submitted against the HDR priority concerned with reform and fisher livelihood adaptation and innovation. It was supported by the HDR Steering Committee but is not approved by FRDC at this stage.</p> <p>Challenges and gaps in addressing this priority area include the preference of RACs and IPAs for RD&E investment in enabling adoption of innovation in over RD&E investment in innovation technologies themselves. This may reflect the lack of any completed demonstration projects where applying behavioural change approaches could be seen to improve adoption.</p> <p>However, the HDR Subprogram's investment in applied behavioural change in a range of domains concerning fisheries and aquaculture will provide leverage for future R&D under the FRDC R&D Strategic Plan 2020-2025, which has a strong focus on innovation behaviour.</p>	
<p><i>RD&E Goal 3. Understanding markets</i></p>	<p>The HDR Subprogram has focused on seafood product markets and on the performance of ITQ systems, including the markets in which quota is exchanged. In the case of seafood product markets RD&E makes use of case studies (the SESSF and prawns) to provide value to industry and</p>	

Priority	Performance	Traffic lights
<p><i>and how they can work better</i></p> <p>Priority Areas:</p> <p>3.1 Seafood input & output markets</p> <p>3.2 Markets for fishing rights</p> <p>3.3 Opportunities for market-based mechanisms</p> <p>Outcomes:</p> <p>Decision are made that enable commercial fisheries and aquaculture sectors to participate in markets more effectively, and to allow managers, regulators and policymakers to design and implement market-based solutions based on sound principles and informed analysis. Specifically:</p> <ul style="list-style-type: none"> • Improved likelihood of higher economic returns through better understanding of 	<p>management through intelligence of market relationships, price dynamics and supply chains gleaned through best practice economic methods (see for example ‘Market Integration and Demand for Prawns’, Schrobback, Pascoe and Zhang, <i>Australia Marine Resource Economics</i>, 34:4). A comprehensive program of ITQ RD&E provides knowledge-based tools to ensure ITQ systems and markets operate to support fisheries objectives.</p> <p>3.1 Seafood input & output markets</p> <p>The HDR Subprogram has invested in the following:</p> <ul style="list-style-type: none"> • <i>2018-017: Empirical Investigation of Demand Conditions and Dynamics in the South East Fishery</i> • <i>2019-157: Economic Mapping of Australia's Wild-catch Prawn Supply Chain</i> <p>A focus on input markets has been lacking to this point, with lack of clarity of the range of nationally-relevant labour market issues being a challenge. HDR is still of the view that a targeted fore-sighting exercise is needed to properly scope an effective priority, accounting for likely ongoing post-Covid19 repercussions on national and international labour supply and demand.</p> <p>3.2 Markets for fishing rights</p> <p>The HDR Subprogram designed a comprehensive program of investments to scope and address issues to improve outcomes for ITQ-managed fisheries. The program consists of the following:</p> <ul style="list-style-type: none"> • <u>2017-159</u>: <i>Retrospective assessment of ITQs to inform research needs and to improve their future design and performance</i> • <i>2020-029: Responding to unintended consequences – evaluating changes to fisheries under ITQ systems</i> (Full application supported by HDR Steering Committee but not yet approved by FRDC) 	

Priority	Performance	Traffic lights
<p>consumer demand and market regulation</p> <ul style="list-style-type: none"> • More efficient quota market design, resulting in lower transaction costs and better allocation of quota • Improved understanding of blockages in supply chains • Improved ability to include consumer surplus in assessments of economic efficiency • Improved ability to address input market constraints • Improved understanding of costs and benefits of implementing new market-based mechanisms 	<ul style="list-style-type: none"> • <i>2019-065: Design aspects of well-functioning ITQ markets</i> (EOI supported by HDR Steering Committee but not yet approved by FRDC) <p>A further HDR priority was supported by the Steering Committee (<i>Rethinking ITQs – Design options for achieving better outcomes in new ITQ fisheries</i>) but has not yet been approved by FRDC.</p> <p>Recent widening acknowledgement of the need for improvement in many ITQ/ITE systems and markets allowed HDR to progress development of this program. This was evident in the findings of 2017-159, at the workshop attended by HDR management organised by Southern Rock Lobster as part of <i>2018-205 Informing strategies, policies and options supporting owner-operated fishing businesses in fisheries experiencing corporatisation</i> and in subsequent expressions of support from FRDC. Still, it has been challenging to ensure investment delivers outcomes that are general and pragmatic, and deliver solutions and support for driving change.</p> <p>With FRDC’s approval, HDR’s programmatic approach positions it to also address any emerging ITQ issues such post-Covid19 changes to quota markets and foreign investment, and the possibility of intersectoral trade in quota.</p> <p>3.3 Opportunities for market-based mechanisms</p> <p>The HDR Subprogram has not invested in this sub-priority during the current RD&E Plan 2017-2020 as suitable opportunity for co-investment with RACs, IPAs and other subprograms has not arisen.</p> <p>Where the potential for market-based/driven mechanisms (e.g. certification, offsets, bonds) to support best practice production systems (e.g. reducing impacts on non-target species, ecosystems and habitats) and for managing the trade-offs required for balanced growth emerges, HDR could synthesise and translate the findings of the broader environmental literatures and meet the need to adapt and test these innovations in fisheries and aquaculture settings.</p>	

Priority	Performance	Traffic lights
<p><i>Arising priority areas in response to targeted Industry needs</i></p>	<p>HDR Subprogram also invested in two further priorities in response to needs arising, as follows.</p> <ul style="list-style-type: none"> • During the period of the current HDR RD&E plan industry productivity emerged as a strong FRDC theme, reflected in the creation of National Priority 2: Improving productivity and profitability of inshore fisheries. The HDR Subprogram partnered with NP2 to invest in the following - <u>2019-026</u>: <i>Measuring, Interpreting and Monitoring Economic Productivity in Commercial Fisheries</i>. This is the first time the potential for mainstreaming the use of economic productivity measurement and analysis in Australian fisheries has been undertaken. The challenge of the industry's? lack of familiarity with key economic productivity concepts, terms and uses is being addressed by working in case study fisheries where results can be seen by managers and industry directly and through development of a guide to extend these to other fisheries. • Physical and mental wellbeing of commercial fishers also emerged as an evident priority area across FRDC industry stakeholders. The HDR co-invested in <u>2016-400</u>: <i>Sustainable Fishing Families: Developing industry human capital through health, wellbeing, safety and resilience</i>. Intended outcomes were the development and piloting of survey methods to track levels of wellbeing and of intervention programs to improve wellbeing outcomes for participants, both of which the project delivered. Capacity to improve mental wellbeing continues to be a priority for Industry and is being addressed through RD&E projects focused on models of mental health promotion and provision of access to support services by SIA and WISA in the 'People' and 'Adoption' programs (see below). 	

Table 12. HDR Subprogram RD&E Plan Outcomes: Communities

Priority	Performance	Traffic lights
<p><i>RD&E Goal 1. Ensuring social, cultural and economic benefits from fisheries and aquaculture</i></p> <p>Priority areas:</p> <p>1.1 Understanding distributions of benefits</p> <p>Outcomes:</p> <p>Sectors (commercial/aquaculture, recreational and Indigenous) can operate effectively in an increasingly complex and demanding socio-ecological environment by ensuring that decision-making at all levels is evidence-based, transparent and risk-based. Specifically,</p> <ul style="list-style-type: none"> Guidance as to what information is required to assess the expected distributional and other impacts on stakeholders 	<p>The HDR Subprogram has adopted a mixed investment strategy consisting studies that i) are jurisdictionally-based and case-specific that report on how benefits are shared ii) focus on identifying the range of benefits at different scales and their measurement iii) provide decision-support for reform to align management structures, instruments and processes with desired objectives, including distribution of benefits, and iv) to identify the consequences of ITQs on benefit distributions.</p> <p>1.1 Understanding distributions of benefits</p> <p>The HDR Subprogram co-invested in the following:</p> <ul style="list-style-type: none"> 2016-113: <i>Lever opportunities under the Aquatic Resources Management Act WA: benefit sharing, re-allocation and co-management in practice</i> (paused at the direction of FRDC) 2017-013: <i>Rebuilding Southern Rock Lobster stocks on the east coast of Tasmania: informing options for management</i> 2017-014: <i>Informing the structural reform of South Australia's Marine Scalefish Fishery</i> 2017-092: <i>Valuing Victoria's Wild-catch fisheries and aquaculture industries</i> 2018-067: <i>Socio-economic characterisation of a small-scale commercial fishery: opportunities to improve viability and profitability in the Tasmanian Scalefish Fishery</i> 2018-095: <i>Recreational fishing and human wellbeing: insights from existing data and development of best practice approaches to future measurement</i> <p>The HDR Subprogram led investments as follows:</p> <ul style="list-style-type: none"> 2017-210: <i>National fisheries and aquaculture industry social and economic contributions study</i> 	

Priority	Performance	Traffic lights
<p>which might arise from changes in fisheries and aquaculture policy and management frameworks</p> <ul style="list-style-type: none"> • Improved understanding of how the design of institutions and regulations effects the way in which benefits are shared across different stakeholder groups • Tools that enable transparency and pursue optimality to guide resource sharing decisions 	<ul style="list-style-type: none"> • 2017-159: <i>Retrospective assessment of ITQs to inform research needs and to improve their future design and performance</i> • 2018-068: <i>Non-market values to inform decision-making and reporting in fisheries and aquaculture – an audit and gap analysis</i> <p>The RD&E priorities the HDR Steering Committee identified in this area include the need to address the lack of clarity and disconnect between goals of fisheries management and more operational fisheries management objectives, which creates ambiguity in how benefits should be shared across different beneficiaries. This is also reflected in the AFMF Statement of Intent. This is particularly challenging in cases where statements of commitment to the interests of particular communities, such as Indigenous or the general public, are included in policy but not reflected in fisheries management, and result in management conundrums.</p> <p>An emerging commitment to achieving enduring and balanced ecological, social, economic and cultural growth of the seafood sector, for the benefit of society and communities, necessitates mainstreaming monitoring of how (net) benefits are shared and further understanding of how distribution of benefits are impacted by the choice of management instrument and other policy settings. The HDR Subprogram is well positioned to build on investments to date to develop and test tools and to embed data needed for distributional analysis in foundational social and economic data streams.</p>	
<p><i>RD&E Goal 4. Effective engagement to achieve socially supported fisheries and aquaculture</i></p> <p>Priority areas:</p>	<p>The final outcomes of HDR Subprogram investment in this goal area reflect heightened interest in and appetite for RD&E which addressed the social acceptability of fisheries and aquaculture. HDR Subprogram investment was focused in four key areas: understanding what drives socially supported fisheries and aquaculture, identifying key influencers, measuring the economic and social contributions of fisheries and aquaculture to community wellbeing, and tools to support community engagement for success. In pursuing these the Subprogram led several national</p>	

Priority	Performance	Traffic lights
<p>4.1 Determinants of socially-supported fisheries and aquaculture</p> <p>4.2 Knowing who has influence</p> <p>4.3 Social and economic contributions</p> <p>4.4 License to engage: Designing, Doing and Evaluating Engagement</p> <p>Outcomes:</p> <p>Fisheries and aquaculture are able to achieve a level of societal support, nationally and regionally, that gives the industry some future resilience. Specifically, the objectives are to enable Australian fisheries and aquaculture to develop engagement strategies which are:</p> <ul style="list-style-type: none"> • Better informed about the range of factors that determine their societal support, and the roles and levels of influence held by key people and groups (i.e. what is 	<p>projects, including some aimed at informing industry's understanding of the drivers of changes in community trust and acceptance and how to measure and track these. HDR also co-invested in several sector or state-specific projects designed to test and evaluate engagement strategies and contribute to the resources available to FRDC stakeholders for better engagement.</p> <p>4.1 Determinants of socially-supported fisheries and aquaculture</p> <p>The 2017-158 <i>Determinates of socially-supported wild-catch and aquaculture fisheries in Australia</i> project identified 16 determinants, based on a range of industry case studies across Australia. These findings have been paralleled and extended in a cross-sectoral/RDCs project in which HDR has led FRDC's engagement, the 2019-042 Community Trust in Rural Industries project.</p> <p>4.2 Knowing who has influence</p> <p>HDR co-invested with NP1 in 2017-131 <i>Media messages about sustainable seafood: how do media influencers affect consumer attitudes?</i> which is examining the reach and effectiveness of industry media and social media activity using the vehicle of celebratory chefs to promote sustainability messages. An additional project application was supported by the HDR Steering Committee – 2018-018: <i>Knowing who has influence: key influencers and networks for socially-supported fisheries and aquaculture</i> - but was not supported by the FRDC Board.</p> <p>4.3 Social and economic contributions</p> <p>HDR Subprogram's level of focus on and investment in contributions RD&E has been substantial, in response to FRDC Board direction to have national coordination of RD&E in contribution studies to ensure consistency and comparability, where possible. HDR led the following national project, with co-investment from NP2 - 2017-210 <i>National fisheries and aquaculture industry social and economic contributions study</i>. One of the outcomes of this project has been the availability of a methodology and framework for estimation of economic contributions of fishing and aquaculture</p>	

Priority	Performance	Traffic lights
<p>valued by whom, who to engage with, what about, and why);</p> <ul style="list-style-type: none"> Supported by relevant and meaningful information about the contributions to social and economic well-being their activities make; and Targeted and appropriate and, therefore, effective at meeting the purposes of engagement and can be demonstrated to be so. 	<p>industry sectors. Other outcomes include quantification of economic contributions to national and jurisdictional economic wellbeing.</p> <p>HDR has also co-invested in the following sector or state focused projects which have applied similar methods to estimate economic contributions (the Victorian study) or extended the national methodology to include economic contributions along the seafood supply chain (the Prawns project):</p> <ul style="list-style-type: none"> 2017-092 <i>Valuing Victoria's Wild-catch fisheries and aquaculture industries</i> <i>2019-157: Economic Mapping of Australia's Wild-catch Prawn Supply Chain</i> <p>In addition, HDR led the design of a priority to investigate the extent to which associations between recreational fishing and increased individual wellbeing are supported by empirical population-level data:</p> <ul style="list-style-type: none"> 2018-095 <i>Recreational fishing and human wellbeing: insights from existing data and development of best practice approaches to future measurement</i> <p>4.4 License to engage: Designing, Doing and Evaluating Engagement</p> <p>A range of applied projects were funded by the HDR Subprogram to apply and test the intelligence on drivers of social acceptability and community trust, and the evidence of contribution to community wellbeing, generated in the projects described above. These applied projects involved using this evidence base to pilot engagement strategies and assess their effectiveness in achieving desired outcomes, and included:</p> <ul style="list-style-type: none"> 2017-242 <i>Our pledge: Australian seafood industry response to community values and expectations</i> 	

Priority	Performance	Traffic lights
	<ul style="list-style-type: none"> • 2017-012 <i>Investigating social acceptance for the wild catch commercial fishing industry of Southeast Queensland</i> <p>A second group of projects led by HDR have focused on evaluation of engagement activities against intended industry outcomes to support the design of more effective engagement strategies. These include:</p> <ul style="list-style-type: none"> • <i>2018-201: Community Engagement Strategy Evaluation Framework</i> • 2019-074: <i>Engagement for Success: monitoring and evaluation to inform industry management strategies</i> (with NSWRAAC co-investment) <p>Challenges experienced in addressing these priorities included the preference of many FRDC stakeholders for single ‘one strategy fits all’ solutions to retaining SLO, which is not consistent with the evidence base these projects built of the highly complex and varied basis of community trust and acceptance. However, this body of RD&E has been able to highlight the importance of demonstrated industry responsiveness to community concerns as a major driver, and this is reflected in the types of engagement strategies piloted and evaluated.</p> <p>The national economic contributions project highlighted challenges arising from low data availability and quality to being able to continue to provide evidence of industry’s contributions in future studies. The recommendations of 2017-210 identify priorities for future RD&E investment to address economic data collection barriers and build data collection and national coordination capacity.</p> <p>Further research needs in relation to increasing levels of community trust include determining what strategies are most effective at demonstrating alignment with community values (see R&D Plan 2020-2025 Outcome 5: Community trust, respect and value). Industry practices particularly</p>	

Priority	Performance	Traffic lights
	sensitive to these trust risks and warranting further investment include live exports and animal welfare.	

Table 13. HDR Subprogram RD&E Plan Outcomes: People

Priority	Performance	Traffic lights
<p><i>RD&E Goal 5. Enhancing human dimensions RD&E</i></p> <p>Priority Areas:</p> <p>5.1 Social and economic data platforms and standards</p> <p>5.2 Designing and evaluating human dimensions RD&E</p> <p>5.3 Building capacity in human dimensions RD&E</p> <p>Outcomes:</p> <p>Operators and decision-makers within Australian fisheries and aquaculture are supported by data on human dimensions that is</p>	<p>The HDR Subprogram chose to focus on people development to enhance capacity in human dimensions RD&E over the course of the 2017-2020 RD&E plan, thus building on advances made through previous FRDC investments in earlier Social Sciences Research and Coordination Programs and <i>2008-306: Building economic capability to improve the management of marine resources in Australia</i>. This has been done through Subprogram investment in projects which inform ongoing data needs and priorities, build capacity through targeted workshops or the development of informative and supportive resources.</p> <p>5.1 Social and economic data platforms and standards</p> <p>The HDR Subprogram has invested in the following:</p> <ul style="list-style-type: none"> • <i>2017-210: National fisheries and aquaculture industry social and economic contributions study</i> • <i>2018-068: Non-market values to inform decision-making and reporting in fisheries and aquaculture – an audit and gap analysis</i> (includes advice on the use of benefit transfer data) <p><i>2017-210</i> was particularly instrumental in drawing attention to gaps in economic data and has co-developed with jurisdictional data custodians, managers and researchers, recommendations to the AFMA and FRDC for greater co-ordination in the collection and storage of economic data to improve data quality and accessibility. Progressing this with industry is a critical next step.</p>	

Priority	Performance	Traffic lights
<p>accessible, rigorous, cost-effective and relevant to identified needs, and by capacity in human dimensions research to gather and apply such data. Specifically:</p> <ul style="list-style-type: none"> • Improved data quality, coverage, accessibility and therefore utility of social and economic data collected to inform decision making • Improved return on Human Dimensions RD&E through accurate identification of research problems and therefore needs, and selection of fit-for-purpose RD&E methods • Improved ability to integrate social and economic data with traditional biological data to inform decision making 	<p>Covid-19 and the associated economic and social crises have further exposed the sector-wide lack of foundational economic and social data streams available for routine monitoring of activity and performance at all scales. This also limits the extent to which human dimensions research can effectively support evidence-based strategies for adaptation and recovery. The HDR Subprogram is working closely with FRDC and the RPN to develop an economic and social data inventory, including metadata, to enable reporting and analysis to support industry and management decision-making, and to highlight critical gaps where coordination and investment are needed.</p> <p>5.2 Designing and evaluating human dimensions RD&E</p> <p>The HDR Subprogram Steering Committee has supported a priority that will address the need for improved problem structuring and method development in the social and economic dimensions of research work being commissioned by FRDC. <i>The human side: HDR Subprogram communication project (see Arising priority below)</i> will develop informing and supporting resources, including ‘cheat sheets’ of key economic and social terms and concepts (e.g. cost-benefit, efficiency, social wellbeing), the types of research problems these are typically used to address, the types of decision support that these can provide and examples.</p> <p>HDR has continued to co-develop RD&E priorities with several RACs, IPAs and subprograms, contributing expert input to the articulation of human dimensions research needs and methods.</p> <p>5.3 Building capacity in human dimensions RD&E</p> <p>HDR Subprogram investment in focussed workshops has been a central strategy in meeting the need for capacity building in human dimensions RD&E across a wide range of topics/focal areas and FRDC stakeholders, including researchers, industry and managers. For example:</p> <ul style="list-style-type: none"> • 2017-152: Social Matters Workshop and a workshop on the social dimensions of wellbeing studies (held as part of 2017-210: National fisheries and aquaculture industry social and economic contributions study) involved researchers, with the former acting as a catalyst for 	

Priority	Performance	Traffic lights
<ul style="list-style-type: none"> Increased capability and capacity in human dimensions research 	<p>the establishment of the Australian Chapter of the Marine Social Science Network (https://www.marsocsci.net/marsocsci-australia/);</p> <ul style="list-style-type: none"> 2017-214: <i>Comparative evaluation of Integrated Coastal Marine Management in Australia – Workshop</i> engaged managers in the process of trialling a marine resource integrated management tool; Managers, jurisdictional data custodians and researchers came together at the Economic Data Workshop as part of <i>2017-210</i> participated in prioritising data needs, strengthening professional networks and raising awareness of the uses of economic data; and Industry leaders and members of the Inshore Fisheries Subprogram Steering Committee participated in a workshop run as part of <i>2018-201: Community Engagement Strategy Evaluation Framework</i> to identify the program logic for industry community engagement activities and goals, which was designed to strengthen capacity to design more effective strategies. <p>The HDR Subprogram has maintained a small program of investment in human dimensions research higher degree support, through its oversight of three students on FRDC top-up scholarships funded prior to the current HDR Subprogram RD&E Plan. The Steering Committee has also recommended the award of two bursaries for Enhancing research capacity in marine economics and social sciences: post graduate research student support, which are yet to be approved by FRDC.</p>	
<p><i>Arising priority area in response to targeted People Development need</i></p>	<p>HDR Subprogram also supported a capacity building priority for women in the seafood industry in response to needs arising through co-investment in 2018-174 <i>Women in Seafood Australasia - Understanding, supporting and promoting effective participation by women within the Australian seafood industry</i>. HDR's support was also due to the application of innovate social science methods</p>	

Priority	Performance	Traffic lights
	of obtaining a census of the population of women participating in the Australian seafood industry labour force.	

Table 14. HDR Subprogram RD&E Plan Outcomes: Adoption

Priority	Performance	Traffic lights
<p><i>RD&E Goal 2. Understanding behaviour of fishers/farmers, organisations and institutions</i></p> <p>Priority Areas: 2.2 Adoption, adaptation and innovation</p> <p>Outcomes: Increased rates of adoption and uptake of best practice guidelines through better understanding of drivers of key behaviours, ways that desirable behaviours can be incentivised and barriers removed. Specifically:</p>	<p>HDR Subprogram investment under the Adoption program was predominantly in adoption (applied behavioural change) research rather than adoption of HDR Subprogram funded project products themselves. The specific area of adoption RD&E the Subprogram focused on was adoption of best practice guidelines by FRDC stakeholders.</p> <p>As described earlier under the 'Industry' program, the HDR Subprogram investment included projects looking at how to overcome barriers to uptake and adoption of best practice in community engagement (2017-133) and animal welfare (2019-023). The findings of 2017-133 on barriers and enabling strategies have been applied in 2018-201.</p> <p>And, as also described earlier, challenges and gaps in achieving this Plan outcome included the lack of any completed demonstration projects in which behavioural change approaches were applied and effective in improving adoption. However, 2019-011: Optimising Compliance Outcomes in Recreational Fisheries and 2019-078: Fishing for change: A social marketing approach to reduce the recreational harvest of Snapper and Pearl Perch in Queensland are two investments supported by HDR Subprogram which will achieve this outcome.</p> <p>A further emerging need includes application of behavioural change approaches to address barriers to uptake of best practice decision support tools by fisheries and aquaculture managers. This need includes exploring managers' risk preferences, attitudes, organisational cultures, as well as lack of</p>	

Priority	Performance	Traffic lights
<ul style="list-style-type: none"> • Provide behavioural evidence needed to develop strategies to improve the uptake of existing and future best-practice guidelines (thereby improving the return on investments) • Provide behavioural evidence needed to develop strategies to improve innovative behaviours, including adoption of product and process improvements, and responding to changes in market conditions 	human and financial resources and technical knowledge as potential factors inhibiting uptake of these available tools.	
<p><i>RD&E Goal 4. Effective engagement to achieve socially supported fisheries and aquaculture</i></p> <p>Priority Areas: 4.4 License to engage: Designing, Doing and Evaluating Engagement</p> <p>Outcomes: Concerned fisheries and aquaculture operators,</p>	<p>As stated above, HDR Subprogram investment under the Adoption program focused on applied behavioural change R&D into the adoption of best practice guidelines for community engagement by FRDC stakeholders.</p> <p>The findings of 2017-133 on barriers to adoption of best practice community engagement included that due low levels of motivation of industry leaders to change current industry engagement practices, and despite a range of support tools being available to assist the seafood industry build their capacity to engage (internally, externally), there has been very little uptake of those resources. This low rate of use has been attributed to a lack of more effective extension actions and approaches, as well as the materials being somewhat inaccessible due to their use of scientific/technical language, dense formats, and/or other academic styles of presentation.</p>	

Priority	Performance	Traffic lights
<p>businesses, organisations and agencies are able to:</p> <ul style="list-style-type: none"> • Identify their engagement needs and goals • Identify key stakeholders and influencers; and • Develop, implement and evaluate engagement strategies, tools and practices 	<p>These findings have or will be applied in the following active HDR Subprogram-led projects, which are designed to increase levels of adoption of best practice community engagement:</p> <ul style="list-style-type: none"> • <i>2018-201: Community Engagement Strategy Evaluation Framework</i> • <u>2019-074: Engagement for Success: monitoring and evaluation to inform industry management strategies</u> (with NSW RAC co-investment) <p>These investments in R&D have been informed by two Stakeholder Workshops on Community Engagement run by the HDR Subprogram in 2018 and 2019 with industry representatives.</p> <p>Further R&D needs will include:</p> <ul style="list-style-type: none"> • synthesis of the best practice guidelines and tools, as well as findings of evaluations of case study community engagement activities, generated across multiple projects into useable packages for industry; and • people development and capacity building in community engagement skills. 	
<p><i>Arising priority area in response to targeted Adoption need</i></p>	<p>The FRDC's investment in RD&E addressing economic and social dimensions of fisheries and aquaculture has been considerable. However, the accessibility of the key insights and benefits of this investment to members of industry and management agencies remains limited in many cases. This reflects the lack of investment by HDR Subprogram in Adoption to increase impact of FRDC investment generally and is an acknowledged area of deficit.</p> <p>The need was identified by the HDR Subprogram and Steering Committee for further work to extend and facilitate the adoption of FRDC funded work that has already been done within the HDR sphere and illuminate the purpose of this investment. The HDR Subprogram has therefore identified an additional priority, <i>The human side: HDR Subprogram communication project</i>. A project application is being developed with Annabel Boyer (FRDC Extension Manager).</p> <p>Specific needs the project will address are as follows:</p>	

Priority	Performance	Traffic lights
	<ol style="list-style-type: none"> 1. To maintain and build capability within the FRDC decision-making sphere (RAC member, FRDC programs staff etc.), and elsewhere within fishing and aquaculture (fishery managers, policy staff, industry representatives and leaders), of knowledge and understanding required to adequately assess and frame the social and economic dimensions of research work being commissioned by FRDC (see needs under RD&E Goal areas 1.2 and 5.2). 2. To build awareness and appreciation of the work done through FRDC's HDR subprogram. 3. To make key HDR subprogram research accessible. 	

Green = Projects addressing the priority, program expenditure in line with FRDC expectations and balanced portfolio, outputs in line with the priority having impact.

Yellow = Projects in development or partially addressing priority areas. Further consideration of priorities and investment required

Red = Not addressed, investment too low

Appendix 5: Publications linked to FRDC HDR Subprogram projects

Table 15. Publications resulting from FRDC R&D investment in HDR

FRDC Project No.	Name	Project Lead	Reference
2013-204	Meeting sustainability expectations: Policy translation for Australia's fisheries management	Emily Ogier	Farmery, A. K., E. Ogier, C. Gardner and J. Jabour (2019). "Incorporating ecologically sustainable development policy goals within fisheries management: An assessment of integration and coherence in an Australian context." <u>Journal of Environmental Management</u> 249 : 109230.
2014-301	Social and economic evaluation of NSW wild-catch professional fisheries	Kate Barclay	Voyer, M., Barclay, K., McIlgorm, A., Mazur, N. 2017. Using a well-being approach to develop a framework for an integrated socio-economic evaluation of professional fishing, Fish and Fisheries, 00:1-16. https://doi.org/10.1111/faf.12229
2014-301	Social and economic evaluation of NSW wild-catch professional fisheries	Kate Barclay	Voyer, M., Barclay, K., McIlgorm, A., Mazur, N. 2017. Connections or conflict? A social and economic analysis of the interconnections between the professional fishing industry, recreational fishing and marine tourism in coastal communities in NSW, Australia, Marine Policy, 76: 114-121. http://dx.doi.org/10.1016/j.marpol.2016.11.029
2017-214	Comparative evaluation of Integrated Coastal Marine Management in Australia - Workshop	Rob Stephenson	Stephenson, R. L., A. J. Hobday, C. Cvitanovic, K. A. Alexander, G. A. Begg, R. H. Bustamante, P. K. Dunstan, S. Frusher, M. E. Fudge, E. A. Fulton, M. Haward, C. Macleod, J. McDonald, K. L. Nash, E. Ogier, G. Pecl, E. E. Plaganyi, I. van Putten, T. Smith and T. M. Ward (2019). "A practical framework for implementing and evaluating integrated management of marine activities." <u>Ocean and Coastal Management</u> 177 : 127-138. 10.1016/j.ocecoaman.2019.04.008
2016-400	Sustainable Fishing Families	Tanya King	King, T., S. Kilpatrick, K. Willis and C. Speldewinde (2015). "'A Different Kettle of Fish': Mental health strategies for Australian fishers, and farmers." <u>Marine Policy</u> 60 : 134-140.
2017-013	Rebuilding Southern Rock Lobster stocks on the east coast of Tasmania: informing options for management	Jeremy Lyle	Mackay, M., S. Yamazaki, J. M. Lyle, and E. Ogier. 2020. Determining management preferences in a multimethod consumptive recreational fishery. Ecology and Society 25(2):22. https://doi.org/10.5751/ES-11602-250222

FRDC Project No.	Name	Project Lead	Reference
2017-159	Retrospective assessment of ITQs to inform research needs and to improve their future design and performance	Sean Pascoe	Hoshino, E., I. van Putten, S. Pascoe and S. Vieira (2020). "Does quota ownership affect perceptions of fishery performance?" <i>Marine Policy</i> 120 : 104155. https://doi.org/10.1016/j.marpol.2020.104155
2018-017	Empirical Investigation of Demand Conditions and Dynamics in the South East Fishery	Sean Pascoe	Peggy Schrobback, Sean Pascoe, and Rui Zhang, "Market Integration and Demand for Prawns in Australia," <i>Marine Resource Economics</i> 34, no. 4 (October 2019): 311-329. https://doi.org/10.1086/706375
2015-013	Developing triple bottom line harvest strategies that include all environmental aspects for multi-sector fisheries	Natalie Dowling	Pascoe, S., T. Cannard, N. Dowling, C. Dichmont, S. Breen, T. Roberts, R. Pears and G. Leigh (2019). "Developing Harvest Strategies to Achieve Ecological, Economic and Social Sustainability in Multi-Sector Fisheries." <i>Sustainability</i> 11 : 644. DOI: 10.3390/su11030644
2017-131	Media messages about sustainable seafood: how do media influencers affect consumer attitudes?	Michelle Phillipov	Farmery, AK, van Putten, IE, Phillipov, M, McIlgorm, A. Are media messages to consume more under-utilized seafood species reliable?. <i>Fish Fish.</i> 2020; 21: 844– 855. https://doi.org/10.1111/faf.12467
2017-068	Non-Market Values to Inform Decision-Making and Reporting in Fisheries and Aquaculture: An Audit and Gap Analysis	Louisa Cogan	Cogan, Louisa, Sean Pascoe, and Gabriela Scheufele. "Availability of non-market values to inform decision-making in Australian fisheries and aquaculture: An audit and gap analysis." <i>Sustainability</i> 13.2 (2021): 920. https://doi.org/10.3390/su13020920