



**FRDC**

The Human Dimensions Research RD&E Plan provides a framework to identify and address the key strategic human dimensions research needs of Australian fisheries and aquaculture from 2017 – 2020.

# Human Dimensions Research RD&E Plan

Research, Development and  
Extension Plan 2017 – 2020

August 2018

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## FRDC'S HUMAN DIMENSIONS RESEARCH RD&E PLAN PURPOSE:

to deliver world-class research into the *human dimensions* of fisheries and aquaculture to support these sectors in achieving sustainability and prosperity.



### Goal 1 ENSURE SOCIAL, ECONOMIC AND CULTURAL BENEFITS

#### Priorities

- 1.1 Understanding distributions of benefits
- 1.2 Informing resource allocation
- 1.3 Decision support & governance tools & model



Image credit: Sam Nichols



### Goal 2 UNDERSTAND BEHAVIOUR OF FISHERS/FARMERS, ORGANISATIONS AND INSTITUTIONS

#### Priorities

- 2.1 Effective compliance
- 2.2 Adoption, adaptation and innovation



### Goal 3 UNDERSTAND MARKETS AND HOW THEY CAN WORK MORE EFFECTIVELY

#### Priorities

- 3.1 Seafood input & output markets
- 3.2 Markets for fishing rights
- 3.3 Opportunities for market-based mechanisms

### Goal 4 EFFECTIVE ENGAGEMENT TO ACHIEVE SOCIALLY-SUPPORTED FISHERIES & AQUACULTURE

#### Priorities

- 4.1 Determinants of socially-supported fisheries and aquaculture
- 4.2 Knowing who has influence
- 4.3 Understand social and economic contributions
- 4.4 License to engage: Designing, Doing and Evaluating Engagement



### Goal 5 ENHANCE HDR CAPABILITY

#### Priorities

- 5.1 Social and economic data platforms and standards
- 5.2 Designing and evaluating human dimensions RD&E
- 5.3 Building capacity in human dimensions RD&E

By *human dimensions* we mean the social, economic and cultural factors that affect Australia's fisheries and aquaculture. This includes the attitudes, processes and behaviours of individual people, companies, management agencies, communities, organisations, consumers, and markets. Human dimensions research is the "science of human systems".



Fisheries Research & Development Corporation

## 1. INTRODUCTION

The Human Dimensions Research Subprogram RD&E Plan provides a framework to identify the key strategic human dimensions research needs of Australian fisheries and aquaculture for a three and a half year period from 2017 – 2020.

By *human dimensions* we mean the social, economic and cultural factors that affect or are affected by Australia's fisheries and aquaculture. This includes the attitudes, processes and behaviours of individual people, companies, management agencies, communities, organisations, consumers, and markets. Human dimensions research is the "science of human systems".

The RD&E Plan aims to ensure that the research program meets both Subprogram and, where appropriate, national strategic RD&E goals and addresses the major challenges facing the Australian seafood industry, including the commercial, aquaculture, recreational and Indigenous sectors.

Where possible, this plan will link with other related strategies to enable efficiency and leverage opportunities e.g. other Research Advisory Committees (RACs), FRDC subprograms, FRDC coordination programs, FRDC sector based programs (i.e. Industry Partnership Agreements, IPAs).

The RD&E Plan reflects two main considerations – one, the broader FRDC RD&E investment context (section 2) and the way in which operating environment shapes human dimensions RD&E needs (section 3). An annual implementation plan will be developed that will detail the actions the HDR Subprogram will undertake to achieve its RD&E goals, address identified priority areas and thereby contribute to desired outcomes.

## 2. BROAD FRDC RD&E INVESTMENT CONTEXT

### 2.1 FRDC RD&E Investment Programs

The FRDC has five (5) RD&E investment programs that directly align with its governing legislation, the [Primary Industries Research and Development Act 1989](#) (PIRD Act). RD&E investments at the whole of organisation level are assessed to ensure the FRDC maintains a balanced portfolio across these programs that meets the short and long term needs of its stakeholders, including the Australian Government and the Australian community. The investment programs are:

**Environment** - This program relates to RD&E that supports natural resource sustainability in managing fishing and aquaculture activities in Commonwealth, state and territory waters.

**Industry** - This program relates to RD&E that assists the production and value of seafood. It could be in the form of business profitability, international competitiveness, opportunities for productivity increases, resource access, and experience or wellbeing benefits.

**Communities** - This program relates to RD&E that maintains the long-term sustainability of the commercial sector by understanding the interactions and co-dependence between fishing and aquaculture, and the wider community.

**People** - This program relates to RD&E that is needed to attract and advance people who will lead fishing and aquaculture towards a sustainable and profitable future.

**Adoption** - This program relates to how project outputs are delivered so they can be easily adopted and support stakeholder decision making and practices.

## 2.2 FRDC National Priorities

National priorities outlined in of the [FRDC's RD&E Plan 2015-2020](#) and the deliverables relevant to the HDR Subprogram are as follows:

### *National Priority 1:*

*The community has effective access to, and understanding of, RD&E that supports fishing and aquaculture sustainability and improves perceptions of Australian seafood.*

Relevant deliverables:

- Increased knowledge about how community values align with the values of Australian fishing and aquaculture sectors, with the aim of improving community perceptions.
- 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.

### *National Priority 2:*

*Deliver RD&E for fishing and aquaculture to increase productivity and profitability consistent with economic, social and environmental sustainability*

Relevant deliverables:

- Social contribution is supported by the fishing and aquaculture sector so it can capture the non-monetary value of activities across sectors.

### *National Priority 3:*

*Deliver RD&E sufficient for the significant commercialisation of at least two emerging aquaculture growth opportunities with demonstrated potential for profitable business operations.*



### 2.3 FRDC investment model

Under the [FRDC's RD&E Plan 2015 - 2020](#), the FRDC provides for a new investment model, a key component of which is the development of a multi-year RD&E Plan for each Industry Partnership Agreement (IPA), Research Advisory Committee (RAC) and Subprogram aligned with the FRDC's 5-year RD&E Plan.

## 3. OPERATING ENVIRONMENT AND HUMAN DIMENSIONS RESEARCH

### 3.1 Overview

The FRDC has historically invested in social science and economics research capacity and coordination (projects 2008-306, 2010-2015, 2015-2016). These investments recognised the need for human dimensions research and research capability to tackle known and emerging challenges facing Australian fisheries and aquaculture. 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. Recognising this, the HDR's RD&E Plan has been developed in response to the following drivers, which broadly correspond to the major drivers as identified in the FRDC's [RD&E Plan 2015-2020](#):

#### *Benefits (social, cultural and economic)*

Natural resource management in Australia increasingly requires that social, cultural and economic benefits are considered alongside biological and environmental performance in order to meet the multiple objectives held by various stakeholders with differing interests. Examples of benefits generated by fisheries and aquaculture activity include: economic returns for fishing and aquaculture operators; employment; recreational amenity; cultural benefits arising from resource access, harvesting and consumption.

In the case of fisheries and aquaculture management, this is embedded in the overarching Ecosystem-Based Management approach. It is also evident to varying degrees and with varying levels of clarity in the legislative and policy frameworks of individual fisheries, aquaculture sub-sectors and jurisdictions. The imperative for managers and industry to more clearly and visibly account for this 'triple bottom line' is reinforced by public debates across Australian communities which reflect a broad range of social, cultural and economic values and concerns including fairness and equity in the sharing of benefits (and costs).

For commercial, recreational and Indigenous sectors to operate effectively, decisions at all levels must be informed by appropriate decision-support methods and tools, governance structures and processes, and incorporate appropriately robust data and other types of information about benefits, costs and trade-offs. This will be particularly important for decisions, such as those effecting the allocation of rights between sectors. Such decisions can have profound and lasting consequences for the way in which the benefits generated from marine resources/ecosystems are shared among different groups in society.

#### *Behaviours (fishers/farmers, stakeholders, organisations and institutions)*

There is now widespread understanding that the task of marine management is largely about managing behaviours of people, businesses, organisations and institutions – not solely about managing the biotic and/or abiotic components of the environment. There has been growing

interest in exploring the key behaviours and behavioural drivers of individuals and groups associated with the production, processing and distribution of seafood, and of resource users (including recreational and Indigenous) and managers more generally. Recognition of the importance of institutions and organisations in shaping behaviours and outcomes is also important in assessing the effectiveness of management and governance systems.

For Australian fisheries and aquaculture, two of the areas of behaviour that are critical to ensuring preferred outcomes are: compliance; and adoption, adaptation and innovation. Non-compliance can undermine managements' efforts to achieve agreed objectives, and sometimes threatens sustainability and social support for activities. Observed low rates of adoption by fisheries and aquaculture operators of already developed standards of performance and guides to best practice, and low rates of innovation, can result in poor market performance and/or lost opportunities.

#### *Markets (design and behaviour)*

Markets are an important element of the complex environment within which fisheries and aquaculture are embedded. Markets are both economic institutions comprising buyers and sellers of a particular good or service, as well as social institutions that are constructed in culturally specific ways. Markets affecting Australian fisheries and aquaculture include input markets, such as labour and fuel, resource access and property rights markets (i.e. Individual Transferable Quotas sales and lease markets), as well as product (output) markets. Furthermore, market-based solutions are increasingly suggested as ways to address a range of issues including bycatch and discards.

The way in which markets operate is pivotal to achieving efficient outcomes and to determining how costs and benefits are distributed. However, markets do not hold the answer to resolving all issues associated with the management of common pool resources, such as fish stocks. Even in the case of wholly private goods (such as seafood) markets can fail to deliver efficient outcomes, such as when some buyers or sellers have influence over market outcomes or when there are externalities. And where markets do deliver efficient outcomes, these may not align with other goals (i.e. goals of Traditional Owners or equity concerns).

#### *Community acceptability*

When fisheries and aquaculture activities do not have sufficient levels of community-level acceptability or support, it can negatively affect the well-being of those operating in the sector; contribute to restricted resource access; and increase levels of conflict and dispute regarding management decisions and status assessments.

Australia's fisheries and aquaculture industries are increasingly attentive to levels of societal support and the presence of a 'social license to operate', in order to ensure their future sustainability and prosperity. Increasingly, engagement with various affected communities, stakeholders and influencers is intentionally undertaken to: build relationships and trust; understand concerns and needs arising from industry activity; and influence decisions. However, industry decision-making regarding the best engagement strategies to adopt is hampered by a number of major knowledge gaps, including: the identity of influencers and the relationships/networks that form the basis of their influence; the social and economic contributions fisheries and aquaculture make to individual and community well-being at a regional and national level; and, the effectiveness of available strategies at achieving industry engagement goals.

### **3.2 Human Dimensions Research**

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 socioecological system. This suggests the involvement of researchers from a broad range of disciplines including economics, sociology, human geography, political science, anthropology, management, history and law. Human dimensions RD&E for Australian fisheries and aquaculture must also:

- be methodologically and technically robust,
- meet the stated needs of stakeholders and is credible to its intended audience,
- inform and improves outcomes for stakeholders, and
- maximise the return to FRDC stakeholders.

Historically, achieving the level of coordinated investment required to effectively deliver against this need has been hampered by a range of factors, which have included:

- the complex nature of the operating environment and its associated human dimensions;
- the challenge of effectively integrating human dimensions RD&E 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.

The Human Dimensions Research (or, HDR) Subprogram presents the FRDC and stakeholders with the opportunity to overcome these factors and to maximise 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 enables the Subprogram to meet needs for targeted, strategic RD&E. The capacity to co-ordinate complex multisectoral and multijurisdictional RD&E avoids unnecessary duplication, enables economies of scale to be realised, and ensures comparability of results.
- Leverage greater overall investment in human dimensions RD&E through co-investment arrangements. Co-investment with stakeholders enables 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 RD&E to be more effectively integrated in traditional fisheries and aquaculture research projects.

### **3.3 Human Dimensions Research Subprogram objectives and performance indicators**

The HDR Subprogram's objectives 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

Performance indicators for the HDR Subprogram are:

- The priority areas identified in the HDR Subprogram's RD&E Plan are addressed through effective human dimensions research by 2020.
- 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
- The number of projects that identify a human dimensions research component increase during the life of the Subprogram project
- 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
- Effective pathways for strengthening integration of social and economic tools and frameworks with biological approaches in fisheries assessment and decision-support is identified
- The HDR co-invests a minimum of 20% of its allocated RD&E funds across the life of the subprogram.

#### 4. HDR SUBPROGRAM RD&E PLAN 2017-2020

##### 4.1 HDR Subprogram Strategic RD&E Goals

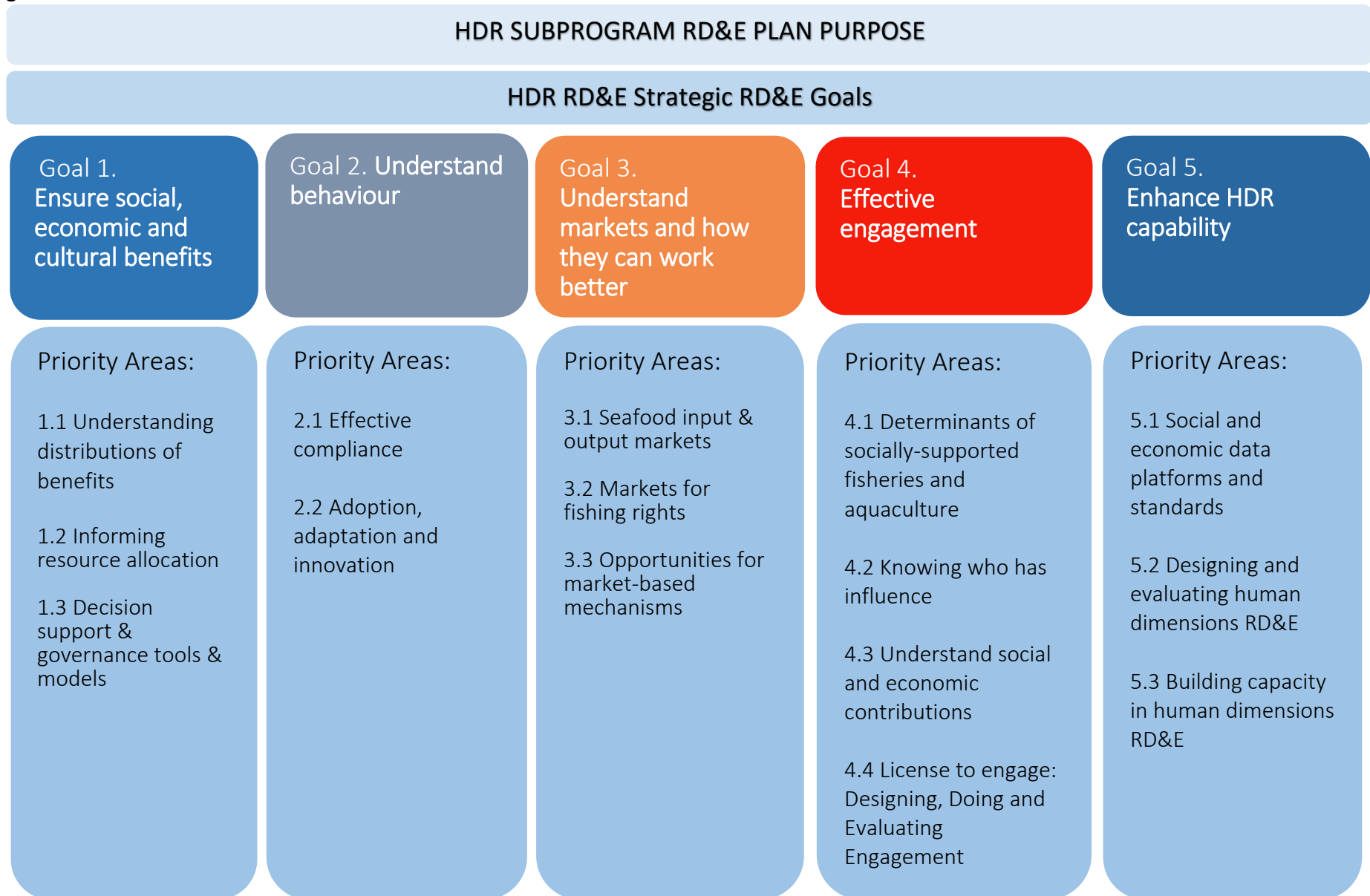
The overall goal of the HDR Subprogram is to deliver world-class research into the human dimensions of fisheries and aquaculture to support these sectors in achieving sustainability and prosperity. In so doing, the HDR Subprogram's RD&E Plan will support relevant aims of the [FRDC's RD&E Plan 2015-2020](#) plan and achievement of deliverables (refer to Section 2.2).

The HDR Subprogram's strategic RD&E goals, which reflect the human dimensions drivers identified above, are:

1. Ensuring social, cultural and economic benefits from fisheries and aquaculture
2. Understanding behaviour of fishers/farmers, institutions and organisations
3. Understanding how markets work and how they can work better
4. Effective engagement to achieve socially-supported fisheries and aquaculture
5. Enhancing human dimensions RD&E

The achievement of each of these goals will be through RD&E that aligns with the specific research priorities (Priority Areas) identified for each goal. The overall balance of RD&E investment across the five FRDC programs and the HDR Subprogram's five strategic goals is detailed in Figures 1 (below). No investment is planned in RD&E Program 1 Environment. Planned outcomes from addressing specific RD&E priorities (Priority Areas), and thereby achievement of strategic goals 1 – 5, are also listed in section 3.5 below.

Figure 1 Framework overview



## 4.2 HDR Subprogram Priority Areas - RD&E Programs

### RD&E Program 1. Environment

#### Priority Areas

#### Outcomes

#### No Priority Areas

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'.

## RD&E Program 2. Industry

### Priority Areas

*RD&E Goal 1. Ensuring social, cultural and economic benefits from fisheries and aquaculture*

Priority areas:

**1.2 Informing resource allocation**

**1.3 Decision support and governance tools and model**

### Outcomes

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:

- Decision makers are informed as to which multi-objective decision support tools and governance structures perform best in different decision contexts/points
- 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

*RD&E Goal 2. Understanding behaviour of fishers/farmers, organisations and institutions*

Priority Areas:

**2.1 Effective compliance**

**2.2 Adoption, adaptation and innovation**

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:

- Improved uptake of existing and future best-practice guidelines and innovative practices through understanding drivers of adoption and innovation
- 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

*RD&E Goal 3. Understanding markets and how they can work better*

Priority Areas:

**3.1 Seafood input & output markets**

**3.2 Markets for fishing rights**

**3.3 Opportunities for market-based mechanisms**

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:

- Improved likelihood of higher economic returns through better understanding of consumer demand and market regulation
- 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

## RD&E Program 3. Communities

### Priority Areas

*RD&E Goal 1. Ensuring social, cultural and economic benefits from fisheries and aquaculture*

Priority areas:

**1.1 Understanding distributions of benefits**

*RD&E Goal 4. Effective engagement to achieve socially supported fisheries and aquaculture*

Priority areas:

**4.1 Determinants of socially-supported fisheries and aquaculture**  
**4.2 Knowing who has influence**  
**4.3 Social and economic contributions**  
**4.4 License to engage: Designing, Doing and Evaluating Engagement**

### Outcomes

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,

- Guidance as to what information is required to assess the expected distributional and other impacts on stakeholders which might arise from changes in fisheries and aquaculture policy and management frameworks
- 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

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:

- 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 valued by whom, who to engage with, what about, and why);
- 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.

## RD&E Program 4. People

### Priority Areas

*RD&E Goal 5. Enhancing human dimensions RD&E*

Priority Areas:

**5.1 Social and economic data platforms and standards**

**5.2 Designing and evaluating human dimensions RD&E**

**5.3 Building capacity in human dimensions RD&E**

### Outcomes

Operators and decision-makers within Australian fisheries and aquaculture are supported by data on human dimensions that is accessible, rigorous, cost-effective and relevant to identified needs, and by capacity in human dimensions research to gather and apply such data. Specifically:

- 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
- Increased capability and capacity in human dimensions research



## RD&E Program 5. Adoption

### Priority Areas

*RD&E Goal 2. Understanding behaviour of fishers/farmers, organisations and institutions*

Priority Areas:

**2.2 Adoption, adaptation and innovation**

*RD&E Goal 4. Effective engagement to achieve socially supported fisheries and aquaculture*

Priority Areas:

**4.4 License to engage: Designing, Doing and Evaluating Engagement**

### 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:

- 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

Concerned fisheries and aquaculture operators, businesses, organisations and agencies are able to:

- Identify their engagement needs and goals
- Identify key stakeholders and influencers; and
- Develop, implement and evaluate engagement strategies, tools and practices

### 4.3 HDR Subprogram's RD&E investment

Through articulation of its Priority Areas, this Plan considers the balance of RD&E investment across the following domains:

- *Short and long term projects*

The Priority Areas identified under each RD&E Goal (see Appendix A) include both short term tactical projects to address critical knowledge or methodical gaps, as well as long term multi-stage projects which address entrenched challenges using multiple methods and will involve strategic collaborations.

- *Low and high risk projects*

Low risk projects are generally initiated and supported by the RACs and IPAs. Therefore part of the HDR Subprogram's role is to prioritise investment in "Blue sky" RD&E that undertakes transformational and innovative research, as well as in projects which pilot and demonstrate novel RD&E approaches.

In addition, the Priority Areas identified under each RD&E Goal specify a mixture of established (for example, benefit cost analysis) and emerging (for example, behavioural economics, non-market valuation) research approaches.

- *Strategic and adaptive research needs*

The Priority Areas are broad in scope, allowing the HDR Subprogram Plan to respond to adaptive regional needs as they arise. The Plan, including Priority Areas will be reviewed annually.

- *Regional variations and needs*

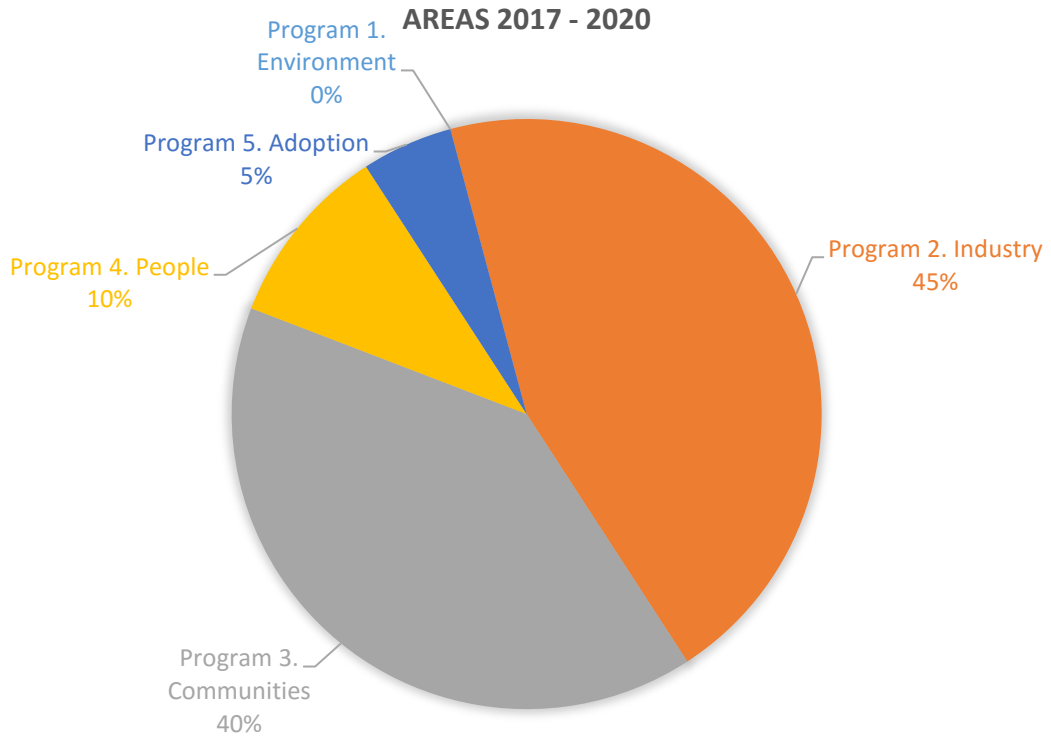
Co-investment opportunities will be sought to ensure investment in jurisdictional, and therefore regionally -focused projects. Projects which the HDR Subprogram leads will be national in focus, predominantly, however case studies which capture regional variations will be required.

- *National, jurisdictional and sector focused projects.*

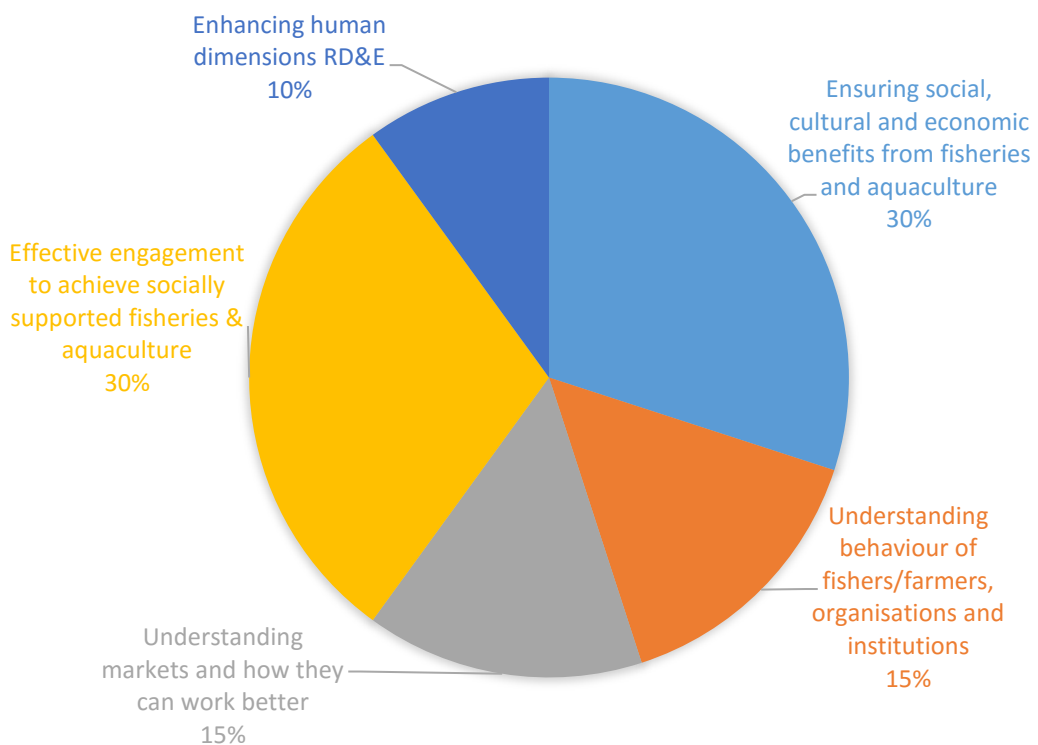
Co-investment opportunities will be sought to ensure investment in jurisdictional and sector-focused projects. Projects which the HDR Subprogram leads will be national in focus, predominantly.

#### 4.4 Forecast investment across strategic RD&E priorities

**FIGURE 1. ESTIMATED ALLOCATION OF FUNDING ACROSS FRDC PROGRAM AREAS 2017 - 2020**



**FIGURE 2. ESTIMATED ALLOCATION OF FUNDING ACROSS HDR SUBPROGRAM'S STRATEGIC RD&E GOALS 2017-2020**



## 5. HDR SUBPROGRAM RD&E PLAN DELIVERY

### 5.1 Investment collaboration

The HDR Subprogram will seek collaborative opportunities with external funding sources (other than the FRDC) as well as collaboration between the jurisdictional RACs, IPAs and FRDC subprograms. This collaboration occurs through the sharing of RD&E Plans as well as the results of priority planning processes. The annual planning workshop provides a forum for the sharing of these priorities to promote collaboration.

Collaboration provides the opportunity to share investment across common areas of interest and allows for efficiencies in the execution of RD&E. The FRDC has made funds available to incentivise collaboration.

### 5.2 Extension

Extension processes are embedded into all FRDC-funded RD&E. How results can be extended begins when a project is approved for funding, is considered in the design and proposal phase where priorities for end users are determined, and continues during the project's execution through to the final published report. This is often easier for short-term applied research but needs to be more considered for longer-term, blue-sky research.

The FRDC has adopted the National Strategy for Fishing and Aquaculture Research, Development and Extension (RD&E) which establishes the future direction to improve the focus, efficiency and effectiveness of RD&E to support Australia's fishing and aquaculture industry. They are:

- Principle 1: All stakeholders to value extension and adoption activities in the same way as research activities.
- Principle 2: Extension will be a key focus in research project development
- Principle 3: Project knowledge and outputs are actively managed
- Principle 4: Effectiveness and impact of project extension activities are evaluated
- Principle 5: Extension and adoption capacity is maximised and built upon.

It is best practice for project managers to have given some thought to how the project outputs will be used and adopted by end users while developing the application. It is a FRDC requirement that an Extension and Adoption Plan is developed and submitted for each project.

### 5.3 Evaluation of projects

The FRDC has adopted the Commonwealth input, output, outcome reporting framework policy. The Department of Finance and Deregulation has determined that the FRDC's planned outcome is *Increased economic, social and environmental benefits for Australian fishing and aquaculture, and the wider community, by investing in knowledge, innovation, and marketing*. The FRDC's performance is measured against its ability to deliver this outcome.

The success of the HDR Subprogram's planning, investment, management and adoption is measured by an evaluation framework that is based on adaptive management. The structure of the evaluation framework is as follows:

- A planning process that ensures investment is made against priorities where research can contribute to a significant improvement.
- An annual report evaluating the performance of individual projects against the targets in the RD&E Plan.

The FRDC has implemented the Rural RD&E Corporation Evaluation Framework methodology to achieve the total portfolio evaluation assessment. This is based on a rolling series of cost benefit analysis of project clusters (based on previous 5 years investment). The results of the project cluster assessments links to the agreed KPIs that are relevant to that cluster. This process ensures that the investment decisions are continually being adjusted to ensure optimal investment performance. In this ongoing evaluation, the FRDC will measure the performance of Subprogram investments after the life of its RD&E Plan.

During the life of the RD&E Plan, the HDR Subprogram will self-evaluate its performance against its identified Goals, Priority Areas and Outcomes as well as monitoring investment to ensure balance in investment across the FRDC's five programs. This is to be aligned with the prioritisation and RD&E Plan review processes undertaken in the September/October Steering Committee meeting.

#### **5.4 Review of the RD&E plan**

Annually, the HDR Subprogram will review its RD&E Plan. This will occur at the September /October Steering Committee meeting. It will be undertaken as part of revising the annual implementation plan. The Plan will be reviewed to:

- assess performance against the following:
  - the identified Goals and Priority Areas of the plan,
  - key performance indicators for the HDR Subprogram, and
  - the planned outcomes listed against each Priority Area
- identify gaps against the Priority Areas of the plan
- determine priority areas for investment against these gaps and other priority setting processes that may be undertaken

These annual priorities will be circulated to all FRDC subprograms and partnership agreements unless it is deemed that there are areas of sensitivity, IP protection or commercial advantage that require protection.

Each year, the FRDC will hold an annual workshop for all RACs, IPAs, Subprograms and National Initiatives to provide updates on priority areas for investment and any potential overlap and collaborative opportunities for the coming financial year.

The HDR Subprogram Steering Committee, at each meeting, will also undertake a situational scan to identify any tactical or immediate areas of RD&E need that require short term or immediate remediation.

## APPENDIX A – HDR SUBPROGRAM STRATEGIC RD&E GOALS AND PRIORITY AREA DESCRIPTIONS

RD&E GOAL	1. Ensuring social, cultural and economic benefits from our fisheries and aquaculture		
Scope	<p>The overall goal of RD&amp;E in this priority area is to enable sectors (commercial/aquaculture, recreational and Indigenous) to 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. In doing so, decisions are more likely to result in social, cultural and economic benefits being produced and distributed as intended.</p> <p>The scope of this priority area addresses three aspects of this goal, namely how concerns over the distributional aspects of decisions can be better incorporated in fisheries and aquaculture; what needs to happen to improve the way in which key resource allocation decisions are made; and which multi-objective decision support tools and governance structures perform best in different decision contexts/points?</p> <p>This priority area is the HDR’s response to RD&amp;E needs articulated by various RACs, the AFMF, and in the National Marine Science Plan to identified gaps in knowledge of the performance of alternative multi-objective decision-support tools, and the need to prepare the sector for emerging challenges in the Blue (ocean) economy. Some projects in this priority area will be HDR-led while others will involve HDR co-investment with interested RACs and other subprograms. Research in this priority area may sometimes intersect with other HDR priority research areas.</p>		
Priority Area	1.1 Understanding distributions of impacts	1.2 Informing resource allocations	1.3 Decision support and governance tools and models
Need	<p>Notions of fairness and equity are increasingly colouring public discourse about marine resource management and conservation. While these are complex, multidimensional concepts, both need to be informed by understanding the manner in which benefits are shared, and gains and losses are distributed, across different groups.</p> <p>These groups include, for example: culturally and linguistically diverse (CALD) fishers,</p>	<p>Increasing demands for goods and services derived from the marine domain will keep decisions related to resource access and allocation centre stage in coming years for both fisheries and aquaculture. This is evidenced by the continued priority afforded by subprograms, RACs and IPAs to issues related to intersectoral allocation and reallocation processes, particularly between recreational and commercial</p>	<p>The need for governments to manage natural resources to meet environmental, social and economic needs and aspirations is clear. What lags is understanding of decision-support tools and governance models that can best support integrated decision-making at different scales; and at different points in the adaptive management cycle, from problem</p>



	<p>Indigenous communities, new entrants and those leaving commercial fisheries/aquaculture sectors, non-fishing members of the relevant State or Territory.</p> <p>This research will provide guidance as to what information is required to assess the expected distributional impacts on stakeholders might arise from changes in fisheries and aquaculture policy and management frameworks. It will examine how distributional analysis can be incorporated into decision making, and what are the information needs.</p> <p>This research area also covers how the design of institutions and regulations effects the way in which benefits are shared across different stakeholder groups.</p>	<p>sectors. Similarly, there is growing recognition by fisheries and aquaculture of the need to prepare to participate effectively in complex multisectoral (e.g. other marine resource-used based sectors) marine spatial planning exercises that will be a feature of the Blue Economy.</p> <p>This research will provide evidence to support the design of transparent resource (re)allocation mechanisms and processes across varying contexts. Furthermore, it will identify information and capabilities required for fisheries and aquaculture to successfully participate in decision- making processes in the Blue (Ocean) economy.</p>	<p>formulation and objective setting to performance monitoring.</p> <p>This research will generate the evidence needed to identify preferred multi-objective decision support tools for various key decision contexts/points, and the preferred governance models that enable such tools to be incorporated. While a wide range of multi-objective decision support tools exist, both from the social sciences and economics field, little has been done to compare and contrast their performance.</p> <p>Similarly, while a range of governance models and approaches exist to enable structured and participatory decision-making that incorporates multiple objectives, limited comparison and evaluation has been undertaken to guide their refinement and adoption.</p>
Sectors	All	All	All, and Management in particular
HDR Subprogram role	Collaborate with interested RACs	Lead as well as Collaborate with interested RACs	Collaborate with interested RACs

<b>RD&amp;E GOAL</b>	<b>2. Understanding behaviour of fishers/farmers, organisations and institutions</b>	
Scope	<p>The overall goal of RD&amp;E in this priority area is to build policies and practices in fisheries and aquaculture to improve management and industry outcomes that are based on an understanding of drivers of key behaviours, ways that desirable behaviours can be incentivised and barriers removed. This priority research area intersects with other HDR priority research areas, particularly Market performance and potential. Research conducted under this priority area will also complement many of the research activities that fall within scope of FRDC's National Research Priority 2, Improving productivity and profitability of fisheries and aquaculture. Understanding complex human behaviours (both individualistic and cooperative) is central to meeting this priority and will require research based on traditional qualitative and quantitative empirical and analytical methods, but potentially also lab- and field-based experimental methods, institutional analysis and game theory.</p> <p>This priority area is the HDR's response to R&amp;D needs articulated by various RACs and the AFMF, and to support FRDC national priorities. It has also emerged in response to the observed and anecdotal poor conformance with important regulatory and voluntary initiatives. Some projects in this priority area will be HDR-led while others will involve HDR co-investment with interested RACs and other subprograms, as well as partnerships with other rural/agri-food sector RD&amp;E initiatives and other partnerships.</p>	
Priority Area	<b>2.1 Effective compliance</b>	<b>2.2 Adoption, adaptation and innovation</b>
Need	<p>Fisheries and aquaculture activities in Australia are subject to a wide range of rules and regulations set by various agencies at different levels and jurisdictions. Ensuring compliance with these is central to achieving the outcomes intended by management and governments and the Australian Fisheries Management Forum (AFMF) has identified "Development of risk based, effective and consistent compliance approaches" as a need.</p> <p>Research will focus on areas of non-compliance that pose the greatest risk to achieving objectives, particularly those that relate to biological, ecological and economic outcomes. Specific issues that will need to be addressed include what are the drivers of non-compliant behaviours and how can we use this knowledge to design effective monitoring and enforcement programs?</p>	<p>A key aspect of maximising the return to the community from fisheries resources is ensuring that fisheries and aquaculture operate profitably, minimising wasteful and inefficient behaviours and maximising opportunities for increasing productivity.</p> <p>Considerable resources have been invested in developing a range of best-practice recommendations, tools, guidelines and resources for fisheries and aquaculture concerning environmental performance; fish handling and stewardship behaviours; biosecurity; work health and safety; community engagement, operating small business, and food safety. While the desired practices, standards and outcomes have been identified, limited work has been undertaken to understand the drivers of successful adoption of recommended practices for fisheries and aquaculture, or of 'beyond compliance' behaviours. For example,</p>

	<p>To what extent does the ‘socialisation’ of the cost of non-compliance contribute to non-compliance? How effective are behavioural ‘nudges’ in promoting compliance and what is their relationship with traditional deterrence approaches?</p> <p>This research will provide the evidence needed to design and implement compliance systems in fisheries and aquaculture that appropriately balance cost, effectiveness and risk.</p>	<p>safe work practices are identified for all fishing boats by regulatory requirement. However evidence of limited adoption indicates a gap in understanding the barriers to adoption of these practices. Those barriers can relate to workplace culture, or the characteristics of the recommended practices themselves.</p> <p>Similarly, adaptation behaviours across fisheries and aquaculture in response to climate and other drivers of environmental change range from behaviours adopted autonomously by individual operators or recreational fishers to formal strategies supported by government or corporate policies.</p> <p>This research will draw on the substantial body of research on drivers/barriers of adoption of sustainable land management practices in the context of agriculture, which may hold many insights for fisheries and aquaculture. It will also draw on insights into the extent to which cooperative, pre-competitive behaviours can improve productivity and profitability through improved rates of adoption, adaptation and innovation.</p> <p>It will provide the evidence needed to develop strategies to improve the uptake of existing and future best-practice guidelines (thereby improving the return on investments). It will also enable better coordination between adaptation at different levels and across different stakeholder groups.</p>
Sectors	All, and Management in particular	All
HDR Subprogram role	Collaborate	Lead as well as Collaborate with interested RACs and IPAs

<b>RD&amp;E GOAL</b>	<b>3. Understanding markets and how they can work more effectively</b>		
Scope	<p>The scope of this priority area includes issues related to input, output and fishing rights markets. It also includes issues related to the use of markets and/or market-based instruments to manage a variety of interactions between the fisheries and aquaculture sectors and other activities and/or values in society. The overall goal of RD&amp;E in this priority area is to enable Australian fisheries and aquaculture to make decisions that let these sectors 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.</p> <p>The HDR identified a notable gap in past research in this area, and this has provided the impetus for this draft priority. Research in this area will be largely HDR-led, although opportunities for co-investment will arise where case studies provide immediate benefit to particular fisheries, sectors and/or jurisdictions. For example, knowledge of price flexibility/responsiveness in a particular fishery can inform the bioeconomics that sits behind the TAC-setting process.</p> <p>Given the central role of markets in Australia’s mixed economy it is unsurprising that this priority research area intersects with other HDR priority research areas, namely <i>Ensuring social, cultural and economic benefits</i> and <i>Understanding behavior</i>. Research conducted under this priority area will also complement the market access and strategic market intelligence activities that fall within scope of FRDC’s National Research Priority 2, <i>Improving productivity and profitability of fisheries and aquaculture</i>.</p>		
Priority Area	<b>3.1 Seafood input and output markets</b>	<b>3.2 Markets for fishing rights</b>	<b>3.3 Opportunities for new market-based measures</b>
Need	<p>The Australian seafood sector encompasses a broad array of markets in which both inputs and outputs are purchased and sold. There has been little work to date on either the economic or social characteristics, or on the performance, of the markets that underpin the seafood sector in Australia. For example, our knowledge of the following market characteristics and dynamics is very limited:</p> <ul style="list-style-type: none"> <li>responsiveness of buyers’ demand to factors such as price, availability of</li> </ul>	<p>The implementation of tradeable quota rights in Australian fisheries has brought about many demonstrable gains. At the same time however, trading systems have not always operated as envisaged and there have been unanticipated social and economic consequences associated with the move to tradeable fishing rights. For example, high transactions costs and the de-coupling of the ownership of quota from fishing practice may undermine the performance of ITQ systems.</p>	<p>The use of market-based measures, such as financial incentives (e.g. charges, bonds), tradeable quotas, or offsets, is one approach to managing interactions, allocating resources and to mitigating the impacts of activities in the marine environment. Such measures generally work by aligning the incentives people face with the objectives of management, changing their behaviour as a consequence. To date there has been only limited work identifying the</p>

	<p>substitute products and disease; or of price to changes in supply;</p> <ul style="list-style-type: none"> <li>• extent and speed with which price changes on the dock are transmitted to the retail level;</li> <li>• extent to which current employment contracts in the fishing sector resolve principle-agent tensions and/or provide incentives for undesirable behaviours such as discarding.</li> </ul> <p>This research will help the seafood sector perform better in these markets, and provide regulators and policy-makers with evidence of market failure.</p> <p>Studies aimed at securing market access and market development are not included in this priority area which will be addressed under NP2.</p>	<p>It is timely that we take stock of such issues as they have arisen in the implementation of tradeable fishing quota rights in Australia and that we learn from experience elsewhere.</p> <p>Synthesising and analysing this evidence will help identify reforms that can improve the performance of existing markets and inform the design of new tradeable rights markets, for example inter-sectoral trade of fishing rights.</p>	<p>circumstances under which such measures can be effectively and efficiently applied in Australian fisheries and aquaculture. Yet the potential for using such mechanisms is broad, for example bycatch and habitat quotas, recreational tags, individual user pays systems for the recovery of some management costs.</p> <p>This research will help build the body of evidence needed to ensure that the sector maximises the opportunities presented by market-based management measures.</p>
Sectors	Commercial fisheries and aquaculture	All	All, and Recreational and Management in particular
HDR Subprogram role	Lead and collaborate with interested RACs and IPAs	Lead	Collaborate with interested RACs and IPAs

RD&E GOAL	4. Effective engagement to achieve socially-supported fisheries and aquaculture
Scope	<p>More and more commonly, engagement with various communities of interest and stakeholders is intentionally undertaken by Australian fisheries and aquaculture to:</p> <ul style="list-style-type: none"> <li>• build relationships and trust;</li> <li>• understand concerns and needs arising from industry activity; and</li> <li>• influence decisions.</li> </ul> <p>This engagement takes place with those <u>affected by</u> industry activity, and with those <u>who affect</u> industry activity (i.e. decision-makers and ‘influencers’).</p> <p>The scope of this priority area includes engagement strategies and activities undertaken by all sectors of Australian fisheries and aquaculture to understand and address current levels of societal support amongst sections of the Australian community as well as those with direct influence on decisions affecting fisheries and aquaculture. The scope of this priority area does <u>not</u> specifically include communication strategies per se. Communication strategies are included only as one of a suite of useful tools to include in a broader engagement strategy.</p> <p>The goal of this priority area is to enable fisheries and aquaculture 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"> <li>• 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 valued by whom, who to engage with, what about, and why);</li> <li>• supported by relevant and meaningful information about the contributions to social well-being their activities make; and</li> <li>• targeted and appropriate and, therefore, effective at meeting the purposes of engagement and can be demonstrated to be so.</li> </ul> <p>The term ‘socially-supported’ fisheries and aquaculture is used as an umbrella term and encompasses both ‘social license to operate’ and the ‘social acceptability’ of fisheries and aquaculture more generally. Terminology aside, this priority will pursue the following relevant questions: Who is affected? Who has a wider interest? Who has influence? Who decides?</p> <p>The HDR will pursue a mixed strategy of investing in some research, some development and some extension. It will pursue a two-tiered approach in terms of scale:</p> <ul style="list-style-type: none"> <li>• National-level: <ul style="list-style-type: none"> <li>○ HDR led- research projects, which provide underpinning information about the nature of the challenges associated with social acceptability and social licence, and which also generate information and resources relevant at the sector level</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>○ HDR-led extension project, which is to determine appropriate and effective communication platforms as a basis for sharing resources, tools, findings and to maintain consistency (to be developed in partnership with representative groups and peak bodies)</li> <li>● Sector/regional-level: <ul style="list-style-type: none"> <li>○ HDR supported-RD&amp;E projects, led by RACs and fisheries and aquaculture groups, which also generate case studies for national-level projects</li> </ul> </li> </ul>			
<b>Priority Area</b>	<b>4.1 Determinants of socially supported fisheries and aquaculture</b>	<b>4.2 Knowing whose voice matters: key influencers and networks for socially-supported fisheries and aquaculture</b>	<b>4.3 Social and economic contributions of fisheries and aquaculture</b>	<b>4.4 License to Engage: Designing, Doing and Evaluating Engagement</b>
	<p>The need this priority area addresses is that of knowing the extent to which fisheries and aquaculture are supported, by who, on the basis of what, and how might this be changing? By undertaking a range of historical case studies across Australian fisheries and aquaculture, factors that explain differences in societal support will be identified and compared. Factors include:</p> <ul style="list-style-type: none"> <li>● Socio-economic and demographic characteristics and changes in the broader communities of interest</li> <li>● Type of seafood product and nature of interface with consumers and supply chain</li> <li>● Industry awareness and behaviours</li> <li>● Seafood business structures, behaviours</li> </ul> <p>Factors that relate to product communication along the supply chain, such as communicating what the quality, safety, ethics, and sustainability of seafood is with</p>	<p>The focus of this priority area includes a comparative analysis of a range of case study fisheries and aquaculture sectors /products to identify: who currently has influence and what is it they have influence over (e.g. market access, consumers, local community support, political decisions, science communication); how they gain and use that influence; and, what opportunities are available to more effectively engage with influencers, build networks, and communicate messages. A key influencer is defined as someone with authority and</p>	<p>Guidance on how to measure and evaluate the contributions made by fisheries and aquaculture to human well-being at various scales (geographic, temporal, sector, production through to consumption) to meet identified purposes.</p> <p>The Australian Fisheries Management Forum has noted the need for “promotion of socio-economic benefits arising from well managed fisheries and aquaculture and their recognition in broader planning and</p>	<p>The focus of this priority area is on development and adoption of fit-for-purpose engagement strategies, tools and practices. RD&amp;E to address the need to ensure improved outcomes of engagement will involve:</p> <ul style="list-style-type: none"> <li>● Reviewing existing knowledge, resources and requirements for evaluating engagement strategies and practices</li> <li>● Developing, undertaking and evaluating engagement strategies, tools and practices using Action-oriented research (research by doing) in collaboration with</li> </ul>

	<p>wholesalers, consumers and other communities of interest are addressed under the NP1 subprogram.</p> <p>Planned outcomes include: enabling fisheries and aquaculture sectors, operators and agencies to review the status of their societal support – e.g. to find out who are their ‘publics’/‘communities’, what are the issues or industry practices they are concerned with, who do they need support from, how can changing consumer and wider community sentiment about fisheries and aquaculture be monitored or tracked, what are the issues which influence the support.</p> <p>This analysis will help operators and agencies establish any benefits arising from increasing societal support, and what is potentially at stake if loss of support is not addressed. It will identify which parts of fisheries and aquaculture are more at risk of reduced levels of societal support, and of greater losses should support be lost.</p>	standing who has the ability to influence behaviour of others and, in this case, influence outcomes for fisheries and aquaculture.	environmental assessment processes.”	<p>interested RACs, IPAs and subprograms</p> <ul style="list-style-type: none"> <li>• Coordinating and sharing engagement tools, resources and best practices</li> </ul>
Sectors	Commercial fisheries and aquaculture	Commercial fisheries and aquaculture	Commercial fisheries and aquaculture Recreational fisheries	Commercial fisheries and aquaculture
HDR Subprogram role	Lead	Lead	Lead and collaborate with interested RACs and IPAs	Lead and collaborate with interested RACs and IPAs

RD&E GOAL	5. Enhancing human dimensions RD&E capability		
Scope	<p>Ensuring coordinated and sufficient investment in targeted and effective human dimensions RD&amp;E is challenging due to a range of factors, including:</p> <ul style="list-style-type: none"> <li>• the complex nature of the challenges and human dimensions RD&amp;E priority areas now being identified;</li> <li>• the need to effectively integrate such RD&amp;E with traditional, biological fisheries and aquaculture science; and</li> <li>• the need for specific expertise in undertaking such research to ensure end user needs are met, and the limited availability of such expertise.</li> </ul> <p>To address these challenges the HDR has identified the need to invest in:</p> <ul style="list-style-type: none"> <li>• the establishment of social and economic data platforms and standards to increase the availability, coverage, accessibility and comparability of data about the human dimensions of Australian fisheries and aquaculture;</li> <li>• initiatives to assist FRDC stakeholders in recognising, designing and evaluating human dimensions RD&amp;E in the needs and priority areas they identify; and in</li> <li>• existing and future capacity of human dimensions researchers, industry operators and representatives, and managers, as well as HDR subprogram staff and committee members.</li> </ul> <p>The goal of this priority area is to ensure that operators and decision-makers within Australian fisheries and aquaculture are supported by data on human dimensions that is accessible, rigorous, cost-effective and relevant to identified needs, and by capacity in human dimensions research to gather and apply such data.</p>		
Priority Area	<b>5.1 Social and economic data platforms and standards</b>	<b>5.2 Designing and evaluating human dimensions RD&amp;E</b>	<b>5.3 Building capacity in human dimensions RD&amp;E</b>
	<p>There is a need to invest in the development of social and economic data platforms to enable targeted human dimensions RD&amp;E to meet stated priorities, as well as to increase integration of human dimensions into decision-making by fisheries and aquaculture operators and managers. One of the factors limiting human dimensions RD&amp;E is the lack of time series data across multiple fisheries and aquaculture sectors</p>	<p>The Australian Fisheries Managers Forum (AFMF) has identified the need for guidance in how to identify the components of RD&amp;E that require human dimensions research, and the appropriate analytical methods to apply to address those components</p> <p>The need is for collation, synthesis and updating of existing guidance from</p>	<p>There is a need for the HDR Subprogram to continue to support and broker new opportunities to improve capacity in human dimensions RD&amp;E amongst industry operators and organisations, managers as well as researchers.</p> <p>Existing mechanisms include:</p>

	<p>and industries on important social, cultural and economic variables, including:</p> <ul style="list-style-type: none"> <li>• Fishing cost data</li> <li>• Employment data</li> <li>• Quota unit sales prices</li> </ul> <p>A further need is for standards and protocols to ensure rigor and reliability, comparability, as well as cost-effectiveness, of human dimensions RD&amp;E. Examples include:</p> <ul style="list-style-type: none"> <li>• Selection of appropriate candidates for benefit transfer from existing non-market valuation work and develop protocols for any future work</li> <li>• Guidelines for ethical human dimensions RD&amp;E, including research involving Indigenous communities</li> <li>• Guidelines for social and economic contributions studies</li> </ul>	<p>previous such work in fisheries and aquaculture, both nationally and internationally, as well as from the larger body of similar work in natural resource management.</p>	<ul style="list-style-type: none"> <li>• Promote and support the coordination of the Fisheries Economics masterclass</li> <li>• Promote and support the Australian Fisheries Economics Network activities</li> <li>• Maintain and expand the data base of marine resource human dimensions researchers working in fisheries and aquaculture and related area</li> </ul> <p>New opportunities include:</p> <ul style="list-style-type: none"> <li>• Providing PhD top up scholarships to projects that address HDR RD&amp;E priorities</li> <li>• Establish networks with international fisheries and aquaculture initiatives addressing human dimensions RD&amp;E for fisheries and aquaculture</li> <li>• Establish informal networks with social science research and training associations</li> <li>• Promote and disseminate information about capacity building opportunities to researchers</li> </ul>
Sectors	All	All	All
HDR Subprogram role	Lead as well as collaborate with interested Subprograms, RACs and IPAs	Lead	Lead