

Nominated RD&E Priorities for Investment
(Relevant Funding Partner(s) are shown beside priority title)

Priority Titles	Funding Partners
Digital literacy for commercial fishers	QLD RAC; HDR
Management strategy evaluation for sustainability of Queensland rocky reef finfish	QLD RAC
Best Management Practise program for commercial and recreational fisheries	QLD RAC; National Priority 1; HDR
Environmental changes and effects on wild-caught species in Queensland	QLD RAC
Integrating recreational fishery data into harvest strategies for multi-sector fisheries in New South Wales	NSW RAC; Recfishing Research subprogram
Estimating the biomass of fish stocks using novel and efficient genetic techniques	NSW RAC
Marking of offshore fishing gear for navigational purposes	NSW RAC
SA RAC Post-graduate student funding	SA RAC
The latent opportunities in Victorian inshore professional wild-capture fisheries	VIC RAC; HDR
Understanding population structure and dynamics of Victoria's developing Octopus fishery	VIC RAC
Fish stocking – decision tools for native fish outside their range	VIC RAC
Viability of small commercial fisheries – Benchmarking Project for WA's Southern Fisheries	WA RAC
Viability of small commercial fisheries – Valuing the WA Southern Fisheries Contributions to Greater Southern Regional Communities	WA RAC; HDR;
Viability of small commercial fisheries –Market development opportunities	WA RAC
Establish a Pathway for a Reef Development Zone management process utilising Oil and Gas decommissioned infrastructure	WA RAC
People Development	WA RAC
Revisiting biological parameters and information used in the assessment of Commonwealth fisheries: a reality check and work plan for future proofing	COM RAC
Quantify reductions in bycatch and discards in the GABTS and the Commonwealth Trawl Sector of the SESSF	COM RAC
An updated understanding of Eastern School Whiting stock structure, biological parameters, and catch composition with Stout Whiting along the east coast of Australia	COM RAC; NSW RAC
Common harvest strategies and catch sharing for fisheries	COM RAC, HDR
Refine the Southern Rock Lobster industry cold chain	SRL IPA
From best practice guidelines to business-as-usual: what supports industry adoption?	HDR; National Priority 1; National Priority 2
Measuring, interpreting and monitoring productivity in commercial fisheries	HDR; National Priority 2
Pathways to reform in inshore fisheries	HDR

Priority	Digital literacy for commercial fishers
Need	<p>Fisheries management reform is changing the way commercial fishers operate. In order to assist fishers adapt to these new arrangements it is imperative they adopt a wide range of new digital technologies. The QLD RAC views this as a capacity building and people development challenge, with specific urgency due to the current Queensland Fisheries Management reform processes that are currently underway.</p> <p>Accompanying management reform, Fisheries Queensland is developing a range of new technologies such as a Commercial Fishery App. This App will transfer many existing and new online functions to smartphone and other mobile device platforms. Many of these functions will be required for day to day commercial fishing activities including confirming Vessel Monitoring System operation, reporting catch, trading quota units or other license entitlements. Fishers must understand and adopt these new technologies if they are going to transition smoothly to new management arrangements. The new technologies ensure that fishers can continue to operate efficiently and to maximize the advantages of new management arrangements.</p> <p>Project proposals for this objective should aim to deliver a Queensland case study to investigate optimal means by which large numbers of commercial fishers can adopt these new technologies. Additionally proposals that look at behaviours (drivers, impediments to uptake) and explicitly consider how this project could be relevant and applied in other non-Queensland cases are welcome</p>
Planned Outcomes	<ul style="list-style-type: none"> • Capacity building tools for large numbers of commercial fishers to rapidly adopt new technologies. • Queensland case study: On the ground adoption of new technologies by Queensland commercial fishers. • Proven methodology with national applicability
Funding Partners	QLD RAC; HDR

Priority	Management strategy evaluation for sustainability of Queensland rocky reef finfish
Need	<p>The Queensland Rocky Reef Fin Fish Fishery is predominantly a multi species commercial and recreational line fishery. Many of the species captured in the fishery are comprised of stocks that span the Queensland and New South Wales state border. The two main targets species – Snapper and Pearl Perch are considered overfished in Queensland.</p> <p>Fisheries Queensland through the Sustainable Fisheries Strategy has recently formed the Rocky Reef Fishery stakeholder working group to provide advice on a range of matters, including management options that would rebuild these and other rocky reef fishery stocks towards long term sustainability targets. The management options available to effectively constrain recreational catch harvests to sustainable limits are particularly challenging. The recreational sector (including charter) are responsible for two thirds of</p>

	<p>total Snapper harvest in Queensland.</p> <p>Research proposals against this objective should include quantitative evaluation and modelling of the effectiveness of spatial and / or temporal fishing controls, compared to other management options such as bag and size limit changes. The project should be a desktop modelling and evaluation exercise based around known best practice management and past experience in similar fisheries. Timing and alignment to the Dept. Agriculture and Fisheries strategic plan is paramount, as a critical component of this project will include forwarding all available results of this research to the Fisheries Queensland Rocky Reef Working Group June 2019 scheduled meeting. The Working Group will then consider the results of the project and advise on further consultation or evaluation as required.</p>
Planned Outcomes	Management options to adequately reduce fishing mortality across all sectors, with an emphasis on the recreational sector, resulting in improved sustainability of key rocky reef finfish species.
Funding Partners	QLD RAC

Priority	Best Management Practise program for commercial and recreational fisheries
Need	<p>Best Management Practices (BMP) have been developed for a number of terrestrial farming industries.</p> <p>BMP are driven by the grower and utilise the best available science and up-to-date recommended management practices underpinned by industry R&D, to improve productivity, profitability, biosecurity, environmental and natural resource stewardship.</p> <p>BMP identifies practices considered best practices now and those that may be considered best practices in the future. They also identify practices that are no longer considered BMP and should no longer be practiced. BMP programs are voluntary and have been shown to be an effective mechanism to achieve positive outcomes.</p> <p>BMP is considered as a suitable fisher driven approach to improve the practices of recreational and commercial fishers. BMP could build upon the current codes of conduct or environmental management systems that have been developed in some fisheries. It could also include specific training requirements (e.g. protected species identification or handling training).</p> <p>The proposal must include at least one Queensland case study, preferably in the inshore fisheries. The project must also include an evaluation component to assess how effective it has been as a model of behavioural change.</p>
Planned Outcomes	<ul style="list-style-type: none"> Establishment of an agreed BMP framework for key fisheries (starting with inshore, trawl and crab). This should include different practices under a framework of either: (A) innovative; (B) best practice; (C) common practice; (D) outdated practice. Or: above; at; or below best practice.

	<ul style="list-style-type: none"> • Understanding of the effectiveness of the BMP program as a model of behavioural change • Reduced impacts on non-target species and habitats • Improved public acceptability of fisheries
Funding Partners	QLD RAC; National Priority 1; HDR

Priority	Environmental changes and effects on wild-caught species in Queensland
Need	<p>The impacts of environmental change to a number of key wild-caught species in Queensland is relatively unknown. Changes in distributions of fish and ecosystem shifts are poorly defined, increasing the risk of misinformed fisheries assessments.</p> <p>Research is underway regarding Scallops and Coral Trout, but nothing definitive is available to document environmental change consequences to other individual key commercial, recreational and culturally significant species, especially in relation to physical, climatic and oceanographic changes.</p> <p>Proposals must provide evidence of any such species that is considered at-risk (see Welch 2010-565), demonstrate the impact environmental change has effected and address key species with the highest need. Furthermore, a proposal must clearly articulate how the proposed project would assess environmental change effects on stock distribution and/or catchability, relative to other drivers.</p>
Planned Outcomes	<ul style="list-style-type: none"> • Alternative catchability assumptions • Demonstrated assessment models • Increased economic performance of fisheries and their management • Improved understanding of environmental influences on fisheries
Funding Partners	QLD RAC

Priority	Integrating recreational fishery data into harvest strategies for multi-sector fisheries in New South Wales
Need	<p>Current assessment protocols do not adequately account for recreational fishing in determinations of stock status. A more comprehensive approach that considers the importance and value of recreational anglers' activity is required to enable a thorough assessment of NSW fisheries resources.</p> <p>Failure to account for recreational-based mortality increases the risk of over-exploitation for numerous key species, on which commercial and cultural sectors also depend. The perceived allocation of resources to commercial fishers under the new share linkage reforms, with no such allocation or recognition for the recreational sector, represents a risk to the integrity and equity of the process.</p> <p>This information should be considered not just in terms of a total catch but also any other relevant recreational fishing aspirations such as higher densities of fish in certain areas or larger fish</p>
Planned Outcomes	<ul style="list-style-type: none"> • Development of a framework that integrates recreational fishing information into harvest strategies for multi-sector fisheries. • Improvement of current assessments and determination of stock status for multi-sector fisheries through the identification of types of monitoring that will produce robust recreational fishing data
Funding Partners	NSW RAC; Recfishing Research subprogram

Priority	Estimating the biomass of fish stocks using novel genetic techniques
Need	<p>There is considerable uncertainty regarding the stock status of many key marine and estuarine species in NSW due to:</p> <ol style="list-style-type: none"> (1) reliance on commercial fishery data, the quality of which varies considerably between different fisheries, regions and through time; (2) established stock monitoring that currently relies on a variety of proxies of biomass and abundance that are costly to measure and only provide a relative assessment of stock status through time, subject to numerous sources of error. (3) the implementation of Recreational Fishing Havens and Marine Parks, which have reduced the spatial coverage of commercial fishery data; and (4) unaccounted-for recreational fishing mortality <p>Uncertainty regarding stock status places key stocks in NSW at risk of over-exploitation, potential stock collapse, and will likely result in precautionary TAC setting, reducing the productivity and profitability of fishing in the state. Thus increasing the risk of unsustainable harvest levels.</p>

	A proposal will be expected to develop a cost-effective ongoing method for independently estimating the biomass of economically-important marine and estuarine fish species using novel genetic techniques.
Planned Outcomes	<ul style="list-style-type: none"> • Increase in accuracy, and reduction in cost, of long-term methods for biomass estimation • High-quality information on stock status and an independent measure of abundance to compare with current fishery-dependent approaches. • Decreased risk of over-exploitation of NSW key marine and estuarine species
Funding Partners	NSW RAC

Priority	Marking of offshore fishing gear for navigational purposes
Need	Commercial fishers constantly report loss of fishing gear due to suspected interaction with large vessels and interactions with large marine mammals. Fishers estimate that the loss of gear (anywhere from 20-50 floats/gear is lost per year) and product per fisher is equating to estimated \$15,000 each. There is a need to find a solution that will prevent loss of fishing gear that meets AMSA and fisheries compliance regulations.
Planned Outcomes	Changes in gear technology, configuration and management regulations that allow fishing gear to be deployed in a way that prevent interactions with vessels and marine mammals.
Funding Partners	NSW RAC

Priority	South Australian Research Advisory Committee Post-graduate student funding
Need	<p>The South Australian Research Advisory Committee (SA RAC) is offering funding for up to 3 post-graduate student projects. This new initiative led by the SA RAC is to attract high performing post-graduate students to address a range of priority fisheries projects. In 2019, funding is available for the following projects:</p> <ul style="list-style-type: none"> • Population dynamics and assessment of Sea Urchin (<i>Heliocidaris erythrogramma</i>) in South Australian waters – understanding the species potential as an under-utilised species • Defining stock structure for Black Bream in southern Australia, and implications for management • Understanding the population biology of ‘Warrener’ (<i>Turbo undulata</i>: Mollusca) to assess its fishery potential <p>The student will gain direct applied research and industry experience by being co-supervised by a scientist from the South Australian Research and Development Institute (SARDI), while researching an industry relevant project and be registered at a South Australian university in order to undertake their post-graduate.</p>

	The funding available for each student will be \$25,000 per year, for up to 3 years, comprised of an annual \$15,000 top-up stipend for living expenses and \$10,000 for project operating expenses.
Planned Outcomes	<ul style="list-style-type: none"> • An increased fisheries science capacity in South Australia. • Increased knowledge of the stock structure and/or population biology of selected industry relevant species. • Close collaboration between scientists, fishery managers, commercial, recreational and Aboriginal Traditional fishers.
Funding Partners	SA RAC

Priority	The latent opportunities in Victorian inshore professional wild-capture fisheries
Need	<p>There has been a reduction in the availability of a variety of fresh local sustainably caught fish to Victorian consumers over the past two decades. For example, Bay and Inlet fisheries have historically provided seafood to the Victorian public. With 7 out of 9 Bay and Inlet net fisheries now closed or restricted to fishing, approximately 60% of the fish caught 20 years ago is no longer available to the Victorian public. There are a number of reasons for the reduction in fish catches, however these have not necessarily been for sustainability concerns, particularly in the case of Bay and Inlet fisheries. Instead, the Victorian consumer of fish has lost access due to competing interests.</p> <p>There is a clear demand from the Victorian (and Australian) public for access to locally-caught seafood, which raises the question, what latent opportunities exist in Victorian wild-capture fisheries to provide more seafood sustainably to the Victorian consumer, what are the barriers to sustainably increasing production, what is the viability of potential opportunities, and who would they attract?</p> <p>In collaboration with industry leaders to develop the project and identify case studies, the project would seek to:</p> <ul style="list-style-type: none"> • Synthesise historical data and reports on changes in fish production and species composition, and the reasons for change in production to identify economic and socio-political opportunities and barriers to increasing production as well as viability, particularly for underutilised species. An example of this may be small pelagic species such as Australia Anchovy and Australian Sardines in Victoria. • Identify opportunities and viability for commercial development and growth of emerging Victorian fisheries and critically examine barriers to increasing production. Examples may include octopus and Sea Urchin fisheries in Victoria. • Critically examine existing latent licences, the social, economic, environmental and political reasons for latency, barriers and risks to optimal use, as well as the opportunities and viability of innovation, sustainable use and management. A potential case-study fishery would

	<p>be the Victorian Ocean Access Fishery Licence (OAFL), which allows licence holders to fish using a variety of methods in Victorian ocean waters (not Bay and Inlet) to 3 nautical miles, has considerable latent effort, and barriers to transferability.</p> <p>With the following expected outputs:</p> <ul style="list-style-type: none"> • Identification of opportunities for sustainably growing Victorian wild-capture fisheries • Identification of the barriers and risks that need to be addressed to sustainably grow Victorian wild-capture fisheries • Determination of the investment required and viability of opportunities identified, including who would be most attracted to take up a new opportunity (e.g. existing operators from certain fisheries, or new entrants) • Development of a methodology to identify opportunities in inshore fisheries that is transferrable to other Australian jurisdictions
Planned Outcomes	<ul style="list-style-type: none"> • Reduction in latent effort • Re-establishment of sustainable fisheries in Victoria
Funding Partners	VIC RAC, HDR

Priority	Understanding population structure and dynamics of Victoria's developing Octopus fishery
Need	<p>In Victoria, <i>Octopus</i> spp. are predominantly a byproduct species caught across various fisheries. Pale Octopus is not differentiated from other octopus species in catch and effort reporting in Victoria, making it difficult to apply stock assessment methods or catch rate indicators. Maori Octopus (<i>Octopus maorum</i>) are likely caught in the Victorian Rock Lobster Fishery (VRLF); whereas Pale Octopus and Gloomy Octopus (<i>Octopus tetricus</i>) are caught within the Inshore Trawl Fishery, Ocean Access Fishery (OAF), Corner Inlet Fishery (CIF) and Port Phillip and Westernport Bay Fishery (PPWPBF).</p> <p>Targeting octopus using 'shelter traps' within the OAF off Lakes Entrance has significantly increased in 2016 and 2017. The average catch during this period was ten times greater compared with the average catch taken from 2006–2015.</p> <p>With the potential for a developing fishery, management is lacking fundamental information to assist in guiding and building a sustainable fishery. For example, there is no requirement to identify and report quantities of species caught. This makes any sort of assessment impossible. Presently, two license holders actively fish for octopus with a capacity to have many more within the OAF.</p> <p>Research proposals that address the above priority from a south-eastern stock perspective are welcome.</p>
Planned Outcomes	<p>To provide information for assessment and management. This includes:</p> <ul style="list-style-type: none"> • Species identification

	<ul style="list-style-type: none"> • Biological characteristics (Growth and Reproduction) • Development of appropriate biomass indicators and analysis for assessment
Funding Partners	VIC RAC

Priority	Fish stocking – decision tools for native fish outside their range
Need	<p>Fish stocking continues to play an important role in providing fishing opportunities to many Victorians. Opportunities exist to catch native species like Murray Cod and Golden Perch as well as introduced species like trout. The role of the Translocation Evaluation Panel is to provide advice to the Department of Environment, Land, Water and Planning on the management of risks associated with proposed translocations and to the Administration Officer on administrative assessments.</p> <p>Numerous factors are used to determine the level of risk associated with stocking waterways e.g. threats to existing flora and fauna. Stocking fish outside their natural distribution provides a greater level of uncertainty regarding the impact that the stocked fish has on their surroundings. Similarly, recent changes in environment and climate may have impacted species distribution when compared to historical information.</p> <p>There is a clear need to inform fish stocking programs of how to maintain native species diversity and ensure that any stocking program does not have a detrimental impact on the systems (i.e. cause an imbalance).</p> <p>Expected outputs from proposed research include:</p> <ul style="list-style-type: none"> • Determination of the current and potential distribution of key inland native fish species based on historical information. • Assessment of the potential impacts of native fish stocking outside their natural range for key native fish species • Development of protocols that minimise the risk to the environment and associated ecosystems when stocking fish outside their natural distribution.
Planned Outcomes	<ul style="list-style-type: none"> • Better informed management of native fish stocking programs • Increased ability to mitigate detrimental impacts that fish stocking programs have on the ecosystem
Funding Partners	VIC RAC

Priority	Viability of small commercial fisheries – Benchmarking Project for WA’s Southern Fisheries
Need	<p>The 2017 Discussion Paper (Dr Peter Rogers) – “The Case for Establishing Southern Seafood Producers Western Australia” put forward a range of recommendations to progress a strategic outlook on the prospect of future fisheries resource development on the south coast and market development opportunities. Recommendations of this report are in various stages of implementation.</p> <p>In an uncertain policy and regulatory environment it is critical to empower industry for future opportunity with information available in a cohesive format. Future industries depend on initial broad scale strategic study of industry that enables finer scale opportunities to be pursued at an industry sector and business level.</p> <p>An initial Benchmarking Project for WA’s Southern Fisheries, against other primary industry sectors, will provide the frameworks to monitor, measure and review progress with regard to critical KPI’s on the journey of delivering the bigger picture. The project should consider benchmarking of existing performance in key areas such as production and profitability. A framework to continue this exercise beyond the life of the project should also be considered. Industry see this the start of an innovation pipeline that can deliver a market-focussed, value adding production system that is essentially a Producer Driven Value Chain (see Chair Beef and Lamb NZ , James Parsons concept)</p>
Planned outcomes	<ul style="list-style-type: none"> • Identified potential areas of opportunity and roadmap to progress these opportunities • Development of metrics to underpin an understanding of the progress of these opportunities • Broad industry-wide understanding of future potential
Funding Partners	WA RAC

Priority	Viability of small commercial fisheries - Valuing the WA Southern Fisheries Contributions to Greater Southern Regional Communities
Need	<p>The 2017 Discussion Paper (Dr Peter Rogers) – “The Case for Establishing Southern Seafood Producers Western Australia” put forward a range of recommendations to progress a strategic outlook on the prospect of future fisheries resource development on the south coast and generally, market development opportunities. Recommendations of this report are in various stages of implementation.</p> <p>The report identified that a key component of the fisheries’ social licence to operate is derived from recognising the importance of the downstream domestic benefits through the market chain. Furthermore, the implementation of the Aquatic Resources Management Act 2016 in Western Australia will see reallocation of resources across fishing sectors, underpinned by a range of benefits including economic and social, that the aquatic resources provide to the states. Work is underway to progress transparent frameworks for re-allocation of fishery resources (see 2016-113: Lever opportunities under the Aquatic Resources Management Act WA: benefit sharing, re-allocation and co-management in practise) as well as derive improve social and economic metrics in some of the southern fisheries (see 2016-034: Golden fish: evaluating and optimising the biological, social and economic returns of small-scale fisheries).</p> <p>However, further work is need to complement these processes, deriving a greater understanding of the broad range of economic and social contributions these southern fisheries make to the Great Southern Region and to Western Australia broadly. This understanding can then support analyses of impacts of any development or changes in these fisheries.</p> <p>It is suggested a study of WA Southern Fisheries and their Economic and Social Contributions to the economic, social and cultural wellbeing of Great Southern Region and communities, from this diverse family businesses sector be undertaken.</p> <p>Methodologically, this study would draw on the Guidelines for estimating economic contributions of the seafood industry, developed for the National FRDC project 2017-210. It will utilise the estimates this national project will provide of economic contributions of these fisheries the Western Australian community.</p>

Planned outcomes	<ul style="list-style-type: none"> • Identified contributions of southern fisheries to regional communities in an array of areas (through economic flow on benefits, interactions with related sectors such as food tourism, contributions to regional economic growth, and through social contributions to community wellbeing) • Development of indicators to continue to track these contributions and to underpin potential impact studies in the event of changes to fisheries management and resource access, including increased opportunities for resource use and contribution to regional development and wellbeing
Funding Partners	WA RAC, HDR

Priority	Viability of small commercial fisheries - Market development opportunities
Need	<p>The viability of seafood sectors is supported by understanding and appreciation for the service the fishing industry provides to the community. Consumers need information regarding a food offering that has a competitive advantage based on provenance and the story that sits behind the product itself. There is also a need to not only tell the story of the product, but also that of the industry, “introducing” the families and fishers to the communities and consumers. In many cases these stories may differ, however they are likely to fit within an overarching narrative. Development of this overarching narrative and delivery platforms along the supply chain could underpin regional branding. This would work to increase returns ensure understanding and appreciation of the industry by the community.</p> <p>Effective engagement and communication is required to promote regional product knowledge, support food tourism programs and provide a platform for promotion of lesser known species and local hero seafood and producers.</p>
Planned outcomes	<ul style="list-style-type: none"> • Building the profile and activities of WA fishing and seafood centres • Opportunities and markets for development of opportunities • Improved awareness perception, support and recognition of fishing and aquaculture benefits
Funding Partners	WA RAC

Priority	Establish a Pathway for a Reef Development Zone management process utilising Oil and Gas decommissioned infrastructure
Need	<p>The impending decommissioning needs of the Oil and Gas industry are well known with estimated liabilities from decommissioning in Australia valued at US\$21bn over the next 50 years</p> <p>In an Australian first a purpose built reef was deployed in Exmouth in July 2018 utilising Oil and Gas infrastructure. The approval process for this project was long and arduous and does not allow for modification or ongoing refinement. The current process is not conducive to allowing a scaling of oil and gas decommissioning options in the future.</p> <p>In much the same way as <i>'aquaculture development zones'</i> in Western Australia have provided the aquaculture industry with the confidence to invest in aquaculture, a Reef Development Zone will provide the Oil and Gas industry with a clear option for decommissioning infrastructure, provide long term benefits to the fishing sector and allowing the pace of decommissioning to be substantially increased.</p> <p>As this project is to benefit not only the fishing industry but the Oil and Gas sector, applicants are encouraged to seek collaboration from both sectors</p> <p>While an immediate benefit is seen for Western Australia, the establishment of a set of guidelines and criteria for reef development zones will also provide benefit to other jurisdictions such as the Bass Strait and the Great Australian Bight.</p>
Planned outcomes	<ul style="list-style-type: none"> • Establish a pathway for a reef development zone management process with pre-approval for the deployment of augmented infrastructure that meet a pre-defined set of criteria for purpose built reef deployments utilising Oil and Gas decommissioned infrastructure • Identify pathways from this process to be accepted by the Commonwealth regulator to optimise benefits beyond WA • Greater ability to augment reef once deployed • Increased fishery productivity through habitat enhancement and protection and improvement activities for which all fishers may champion
Funding Partners	WA RAC

Priority	People Development
Need	The WA RAC has set aside an annual amount for a standard priority seeking applications for People Development from industry in WA.

	<p>Some of the more common types of people development applications that are likely to be considered include:</p> <ul style="list-style-type: none"> • Bursaries, scholarships awarded to enable study to be undertaken • Capacity building - process of developing and strengthening the skills, processes and resources needed to survive, adapt, and thrive • Knowledge exchange (e.g. holding workshops/conferences, visiting experts) • International exposure (e.g. attend conferences, study tours) • Educational opportunities for learning new skills • To provide stewardship into the future (e.g. youth development programs) • Succession planning within industry <p>In seeking RAC investment for capacity building activities the RAC encourages some level of financial contribution from applicant.</p>
Planned Outcomes	<ul style="list-style-type: none"> • Provide opportunities for knowledge transfer and R&D adoption • Enhance industry leadership within, and across, all sectors • Build industry capacity to drive change to achieve goals • Build workforce capability
Funding Partners	WA RAC

Priority	Revisiting biological parameters and information used in the assessment of Commonwealth fisheries: a reality check and work plan for future proofing
Need	<p>In recent years the focus of much research has been on modelling and predictive capacity, implementation of harvest strategies, and strategic use of ecosystem models such as Atlantis.</p> <p>However, this meant there has been very little attention to some of the basic biological parameters and information that underpin such approaches. Such parameters include growth rates, reproduction ogives, age and size at maturity and background natural mortality rates. For ecosystem models additional trophic (dietary) information is required for the operating model. The issue is that for many fisheries some of this information is over 25 years old and has not been revisited. There is evidence elsewhere (e.g. Europe and North America) that some life history and biological traits have changed due to climate change and other evolutionary drivers (e.g. fisheries induced evolution). Consequently, it is likely there have been changes in fundamental parameters for Australian stocks (particularly as both southeast and south western Australia are climate hotspots and even the tropical waters of Australia have warmed faster than the global average) and these are not currently being accounted for.</p> <p>At the same time there are a range of new methods such as eDNA, Close Kin Mark Recapture and retrospective analyses that may provide costs effective means of determining current parameters or at least the magnitude of change to consider in any uncertainty/sensitivity analyses.</p>

	The aim of this priority is to document the appropriateness of current biological information used across Commonwealth fisheries, consider implications and risks to the efficacy of assessments and other model based work of using parametrisations without updating, and develop a work plan to update this information where required.
Planned Outcomes	<ul style="list-style-type: none"> • A review and documentation of biological information used to support Commonwealth fisheries management. • An assessment of the implications and risks associated with using information that originates, in some cases, over 25 years ago. • Consider the efficacy of new methods and approaches that have been developed over the 5 years or so. • Develop a work plan that provides a cost effective means of updating this information for priority species and modelling frameworks. • Improved sustainability Commonwealth fisheries
Funding Partners	COM RAC

Priority	Quantify reductions in bycatch and discards in the GABTS and the Commonwealth Trawl Sector of the SESSF
Need	<p>Minimising incidental catch of bycatch and unmarketable commercial species has benefits for both industry, in terms of achieving optimal efficiency, and for improving the sustainability of the fishery. Improvements to fishing gear selectivity can reduce incidental catches and thus minimise the impact of fishing on these species. This has obvious environmental benefits, and reducing resource wastage may also aid in increasing the viability of the fishery into the future by reducing impacts on juvenile target species. Reducing the environmental impact of the fishery also improves public perception. By improving the selectivity of fishing gear and reducing incidental catches, operational costs may be reduced via a reduction in net drag and subsequent fuel savings. Reduced on deck sorting times may also result, improving crew efficiency.</p> <p>Previous work by Knuckey and Ashby (2009) and by Walker and colleagues (2010), has shown that fishing gear modifications can significantly reduce the amount of small fish captured by trawl operators (up to 60%). As a result of these projects there has been large scale adoption of various gear modification technologies by industry, and subsequent legislative changes in gear configuration requirements were implemented by early 2006.</p> <p>Changes to mesh size and orientation, and the use of hydro-acoustic gear monitoring equipment is currently being employed by some operators and is reportedly reducing the incidental catch of bycatch and unmarketable commercial species. Quantifying the reduction in incidental catch is a high priority as it may encourage uptake by Commonwealth fish trawl operators.</p> <p>The first stage of this project will involve testing and quantifying the effectiveness of modified otter board trawl gear already in use in the CTS and GABTF.</p>

	<p>As a follow-up to the first stage of this project, it is proposed that a review of existing gear technology and fishing practices, including whether they are transferable across fisheries/sectors, be carried out.</p> <p>Reductions in incidental take of bycatch and unmarketable commercial species can be achieved by a multitude of management actions (including a range of input controls). However, the preference is to allow industry (with support from AFMA) to explore and voluntarily adopt innovative solutions that can be successfully demonstrated while still allowing industry to operate without unacceptable losses to profitability. This project will significantly assist in achieving these objectives as it provides an opportunity to ground truth the effectiveness of technology already in use, and to develop and test new mitigation measures.</p> <p><i>References: Knuckey, I.A. and C.J.T. Ashby. (2009). Effects of Trawling Subprogram: Maximising yields and reducing discards in the South East Trawl Fishery through gear development and evaluation. FRDC Project 1998/204. Fisheries Victoria – Fisheries Research Branch 279 pp; Walker, T. I., Knuckey, I. A., and Newman, J. L. (2010). Promoting industry uptake of gear modifications to reduce bycatch in the South East Trawl Fishery. Final Report to Fisheries Research and Development Corporation Project No. 2001/006. June 2010. pp iv + 95. (Marine and Freshwater Fisheries Research Institute, Fisheries Victoria, Department of Primary Industries: Queenscliff, Victoria, Australia.)</i></p>
Planned Outcomes	<ul style="list-style-type: none"> • Quantitative assessment of existing gear modifications on the reduction of incidental catch of bycatch and unmarketable commercial species, and improvements to vessel efficiency. • Development of new gear technology and fishing practices to further reduce incidental catch and improve vessel efficiency. • Develop best practice guidelines for gear modifications to optimise the catch of target species and reduce incidental catch for board trawl operations in the SESSF. • Improved sustainability and economics for the fishery.
Funding Partners	COM RAC

Priority	An updated understanding of Eastern School Whiting stock structure, biological parameters, and catch composition with Stout Whiting along the east coast of Australia
Need	<p>Eastern School Whiting is a key economic species in the Commonwealth South East Trawl Sector (SET) of the Southern and Eastern Scalefish and Shark Fishery (SESSF) with a Commonwealth TAC of 986 t in 2017-18. A significant proportion of the commercial catch, in addition to the Commonwealth TAC, is taken in New South Wales waters north of Sydney.</p> <p>AFMA and NSW DPI are in the process of transitioning the NSW Southern Fish Trawl Fishery (SFTF) into the Commonwealth SET, which will include allocation of school whiting quota to existing State operators, as well as</p>

	<p>establishing catch triggers for State fishers operating north of the sector.</p> <p>Eastern School Whiting occur from southern Queensland to western Victoria. Early genetic studies suggested two stocks in this range, with the division between 'northern' and 'southern' stocks between Coffs Harbour and Forster (Dixon et al. (1987)). This study while informative at the time but was hampered by a low numbers of samples. Additionally it is know that genetic techniques to help identify stocks have moved on significantly.</p> <p>Stout Whiting, whose southern distribution overlaps with the northern distribution of Eastern School Whiting, makes up a significant amount of the NSW catch, however it can be reported as Eastern School Whiting in State logbooks.</p> <p>The stock assessment for School Whiting in recent years have been hampered by a lack of certainty as to stock structure and if there needs to be a single or multiple spatially structured assessments.</p> <p>Depending on the outputs of the stock structure and biological parameter work, new approaches to assessment may be required to incorporate varying types and sources of data.</p> <p><i>Reference: Dixon PI, Crozier RH Black M and Church A 1987. Stock identification and discrimination of commercially important whittings in Australian waters using genetic criteria. Final Report, Centre for Marine Science, University of New South Wales.</i></p>
Planned Outcomes	A robust stock assessment which informs the TAC setting for Eastern School Whiting through an improved understanding of Eastern School Whiting stock structure using modern genetic techniques.
Funding Partners	COM RAC; NSW RAC

Priority	Common Harvest strategies and Catch Sharing: Developing a national framework/guide using case studies and experience
Need	<p>Until recently most jurisdictions had different approaches to catch sharing and harvest strategies. While somewhat understandable due to each jurisdiction's different responsibilities and priorities, there have been some moves towards inter-jurisdictional management of shared fish stocks outside formal arrangements (Offshore Constitutional Settlements - OCS). These have focused on the commercial sector and sharing between different jurisdictions, with the exception of Southern Bluefin Tuna (SBT). Even here, with a single Australian commercial fishery, progress has been difficult in 'setting aside' part of the allocated total mortality to recognise the interests of recreational fishing. The longer term success or otherwise of the SBT approach is not yet known. Anecdotal information internationally suggests that similar issues to those described above are being faced and that there may be some useful lessons for Australia in particular fisheries or jurisdictions.</p>

	<p>All jurisdictions are now facing resource sharing challenges and, other than OCS, there is no formal framework to support their resolution nor are there practical examples of best practice or readily available information on what's worked and what hasn't. Further, the use of TAC/ITQ management across jurisdictions (e.g. QLD, NSW & Cwlth) has made more urgent the need to develop approaches on how to best implement common harvest strategies. Due to the complexity of this issue and the wide range of those with an interest it is proposed that a small 'proto-project' is developed to undertake the task of building a project proposal that is acceptable to as many Australian Fisheries Management Forum (AFMF) jurisdictions as possible.</p> <p>AFMF, as the senior national body with members responsible for catch sharing and harvest strategies, must be the principal client if the outputs and outcomes of this project have a strong prospect of being adopted. Given the future use of the outputs engaging with the newly formed Fisheries Managers Association and the Management Sub-committee of AFMF (both of whom rated resource sharing as a high priority) is essential. Collectively AFMF, Mgt S/C, FMA, SIA, ARFF and IRG could form a Steering Committee to guide any future project. Support via an independent chair and project officer may be necessary.</p>
Planned Outcomes	A framework and/or guide that will assist government and non-government fishery stakeholders to determine the best pathways to navigate the catch sharing/common harvest strategy issues they are facing.
Funding partners	COM RAC , HDR

Priority	Refine the Southern Rock Lobster industry cold chain
Need	<p>The Australian Southern Rock Lobster industry harvests a collective 2,986t of lobsters each year across South Australia, Victoria and Tasmania. Approximately 95% of the product is exported to predominantly Asian markets.</p> <p>The current method of packing and shipping lobsters is antiquated. It is expected that since the current process' inception, that advancements in logistics and packing technology have occurred. These might include packing materials, as well as cold chain products and packaging accompaniments (currently ice packs).</p> <p>Current research shows that temperature at start of shipment is crucial to the quality of the product at the end consumer. Quality is a direct determinant of price.</p> <p>The supply chain utilises air freight and freight forwarders. Upon delivery to the freight forwarder, a lobster processor loses control of the product and scheduling to a large extent.</p> <p>Each freight forwarder employs differing methods of packing and moving. Examples include the use of trolleys, aluminium cartons, time on tarmac and</p>

	<p>length of time the product is required prior to take-off.</p> <p>Temperatures vary across the seasons at both departure points and destinations.</p>
Planned outcomes	<p>There is an urgent need to research the current cold chain techniques and identify opportunities for improving the condition under which SRL arrive in our premium markets.</p> <p>Southern Rocklobster Limited (SRL) is expecting the following outcomes from this project:</p> <ul style="list-style-type: none"> • Recommendations or identify new opportunities for containment or heat control. • Analysis of consistencies with other primary industries and identification of potential collaborative infrastructure opportunities. • Analysis of supply chain weaknesses • Recommendations to improve the supply chain, including suggested regulatory or internal policy reforms.
Funding partners	SRL IPA

Priority	From best practice guidelines to business-as-usual: what supports industry adoption?
Need	<p>Meeting the minimum level of permissible practice required by regulations is no longer considered to be acceptable to an increasing array of stakeholders; including consumers, wholesalers, international standard bearers, and communities of interest. Currently within fisheries and aquaculture there is considerable external pressure to improve behaviour in the following areas: biosecurity prevention and response; labour hire and duty of care; animal welfare; discards and fish handling. In many of these cases, guidelines of 'best practice' have been developed to provide a benchmark of desired behaviour.</p> <p>Achieving behavioural change in fisheries and aquaculture is often based on harnessing individual motivations, economic or otherwise, to change or adopt 'best practice' behaviours. In many cases change has been slow to occur, with the result being poor economic performance, and in cases where the goal of changed behaviour is to improve social or environmental outcomes (e.g. reduced bycatch or improved animal handling practices), loss of social acceptability. The need this priority addresses is to determine what types of extension models and interventions are effective in supporting positive behavioural change of members of fisheries and aquaculture in a range of areas.</p> <p>A logical starting point to understanding the drivers of behavioural change and to designing extension models and interventions that leverage these drivers to effect change is to learn from the agri-food sector where there is a rich history of relevant research and innovation.</p> <p>To address the need this project will therefore:</p> <ol style="list-style-type: none"> 1. Select case studies of interventions aimed at developing and extending best practice from the following areas: biosecurity prevention and response;

	<p>labour hire and duty of care; animal welfare; discards and fish handling. These case studies should include a combination of historical cases and commencing; and reflect different types of interventions.</p> <ol style="list-style-type: none"> 2. Collate and synthesise available RD&E undertaken into interventions applied in other agri-food or primary industry sectors that have been used to support behavioural change in the four case study areas of behaviour. Specific research questions will be: <ol style="list-style-type: none"> a. Which models of behavioural change were applied? b. Are there attributes of the area of behaviour that affect levels of adoption or change? c. Are there characteristics of the individuals or groups whose behaviour is meant to change that affect levels of adoption? d. What attributes of different extension models and interventions enable/disable adoption by people in agri-food sectors? 3. Apply, test and refine the behavioural change models, attributes and characteristics identified from the synthesis to the selected fisheries and aquaculture case studies (preferably through field trials in at least one case study, otherwise using established techniques such as scenario analysis or equivalent) 4. Assess the effectiveness of selected case studies of historical and planned interventions to develop and extend best practice in fisheries and aquaculture 5. Identify principles of effective design of interventions and extension to increase adoption of best practice for different behavioural contexts relevant to fisheries and aquaculture <p>The project will deliver the following outputs:</p> <ul style="list-style-type: none"> • Models of behavioural change adjusted to account for fisheries and aquaculture contexts, and the types of behavioural changes required to meet best practice. • Principles of effective design of interventions and extension to increase adoption of best practice for different behavioural contexts relevant to fisheries and aquaculture • A final report containing the above as well as the analysis of case studies of best practice development and interventions to support adoption.
Planned outcomes	<ul style="list-style-type: none"> • Design of interventions to develop and extend best practice is informed by understanding of what drives behavioural change in different context in fisheries and aquaculture • High proportions of members of fisheries and aquaculture are able to adopt best practice in key areas of practice
Funding partners	HDR, NP1, NP2

Priority	Measuring, interpreting and monitoring productivity in commercial fisheries
Need	The development of indicators to measure and monitor the performance of fisheries against economic, social and cultural objectives continues to challenge fisheries managers. To date economic metrics have focused on various measures of profitability, while the use of productivity to measure and monitor

	<p>performance in fisheries is less common. Yet measurement of productivity and productivity change is important for understanding the economic condition of firms and industries, and the economic prosperity of regions, and for understanding how changes in efficiency and technical change drive economic performance. Tracking productivity over periods of policy implementation is also a valuable means to gain insights into the actual effects of management changes. Outside fisheries, productivity has proven a useful economic indicator and its potential in Australian fisheries needs to be assessed. This project will meet this need by asking: In what contexts do indicators of productivity and productivity change provide a useful addition to other measures of fisheries economic performance.</p> <p>To address this need this project will:</p> <ol style="list-style-type: none"> 1. Review the use of productivity analysis as a performance indicator and in management assessment in Australian fisheries and internationally. 2. Select and execute 2-3 contrasting case studies of commercial fisheries to demonstrate the use of productivity measurement and analysis as a performance indicator and to assess the effect of a management change. Useful contrasting case studies may include, for example, single species and multi-species fisheries. 3. Drawing on 1. & 2., and the wider literature on productivity, develop a simple decision tool allowing managers to determine whether productivity is a relevant and cost-effective economic performance indicator. <p>The project will deliver the following outputs:</p> <ul style="list-style-type: none"> • Report presenting case studies detail (data, methods, results and interpretation). • Compendium of examples (based on case studies and review) demonstrating the range of uses that can be made of productivity measurement and analysis in fisheries management, and how these measures can be used in conjunction with, or synthesised with, other indicators of economic performance. • Document including decision-tool and guidelines (method, data, reporting, interpretation) for managers on the use of productivity measurement. <p>Involvement from project inception by fisheries management agencies is necessary to ensure relevance and adoption. It is recommended that the project team includes either a member of the Australian Fisheries Management Forum's Fisheries Management Sub-Committee or a senior fisheries manager with links to this forum.</p>
Planned Outcomes	Improved economic performance monitoring and policy analysis through greater use of productivity metrics and analysis.
Funding Partners	HDR, NP2

Priority	Pathways to reform in inshore fisheries
Need	Many inshore fisheries in Australia are characterised by low profitability and high levels of latent capacity. They are often highly heterogeneous, and the fact that

they operate in a crowded and contested coastal space means access and allocation are ongoing concerns. Management's ability to deliver outcomes that align with fisheries objectives and community expectations often requires fisheries reform (such as harvest strategy implementation, adjustments to access/allocation arrangements and changes in the mix of management instruments). It also often requires structural adjustment. Attempts at reform in inshore fisheries have often foundered, delaying intended benefits and causing unnecessary economic and social costs. There is a need to design 'pathways to reform' in these fisheries that build on the evidence provided by past reform processes and on an expanded knowledge of the drivers of fisher behaviour that underpins the structural adjustment process.

Structural adjustment is often hampered by inflexibility of fishing capacity which, by impeding the entry and exit of vessels, can prevent autonomous adjustment processes and reduce the effectiveness of formal capacity reduction programs, therein undermining the potential benefits of reform. Research suggests that entry and exit decisions are influenced by individual's assessments of financial/economic returns which reflect their personal characteristics and circumstances, among other things. To date, however, there has been little work that focuses on the way in which entry and exit decisions are influenced by the nature of existing management arrangements in the fishery (including existing rights) or by the nature of the reform process itself (including the perceived legitimacy of reform and the governance of reform). Understanding how these factors influence individual's decisions, and hence either impede or support the process of structural reform in inshore fisheries, is needed to inform the design of effective pathways to reform that increase the likelihood of success.

This project will address both these needs. Specifically it will develop tools for managers and key industry stakeholders to design effective and contextually appropriate pathways to reform for inshore fisheries, that are based on improved knowledge of the structural adjustment process in these fisheries and anticipated impacts (environmental, social and economic).

Research tasks should include (but not be limited to):

1. Review and synthesis of case studies of past reform processes in inshore fisheries, and identification of the goals of reform and determinants of success/failure.
2. Analysis to build a deeper understanding of structural adjustment processes in inshore fisheries, including the relationship between:
 - a. management processes and instruments (including the use of anticipatory impact analysis)
 - b. the economic and social operating conditions of fishers
 - c. the process of reform, and
 - d. entry and exit decisions.
3. Development and testing of a tool based on 1. & 2. above that can be used by managers and key industry stakeholders to design effective and contextually appropriate pathways to reform of inshore fisheries.

Involvement from project inception by fisheries management agencies is necessary to ensure relevance and adoption. It is recommended that the project team includes senior fisheries manager with links to this forum. Similarly,

	<p>involvement of industry leaders either directly or through project steering roles is recommended.</p> <p>Project outputs to include:</p> <ul style="list-style-type: none"> • Report detailing methods, analysis, results and their interpretation for research tasks 1 & 2 above. • Tool that can be used by managers and key industry stakeholders to design effective and contextually appropriate pathways to reform of inshore fisheries.
Planned Outcomes	More effective fisheries reform and/or structural adjustment processes in inshore fisheries
Funding Partners	HDR