Evolution of the FRDC to 30 June 2024

A "corporate memory" of the activities of the Fisheries Research and Development Corporation since its establishment in 1991, for reference by directors and other interested people.

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Evolution of the FRDC
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The FRDC acknowledges the invaluable creative input of Peter Dundas-Smith AM and John Wilson in the preparation of this document.

The structure of this document is chronological. In the case of themes that have evolved over the years, to avoid repetitive listing the description of the inaugural activity is followed by one or more paragraphs summarising subsequent developments. Such paragraphs are enclosed by square brackets and are coloured indigo. This does not apply in cases where subsequent developments are of significant note.

Contents

Evolution of key corporate terminologies

Listed in this table are some key corporate terminologies that have evolved during the timespan of this document, including some that, although not in current use, have been important. The entries are in chronological order of first occurrence.

Term	Page number (first reference)
FIRTA ⟶ FIRDC ⟶ FRDC Fishing Industry Research Trust Account ⟶ Fishing Industry Research and Development Council ⟶ Fisheries Research and Development Corporation. *Nature of the entities*: FIRDC was one of the 18 rural industry research and development councils established in 1985; the FRDC was incorporated in 1991.	10
DPIE ⟶ AFFA⟶ DAFF ⟶DOA⟶DAWR⟶ DA⟶ DAWE⟶DAFF Department of Primary Industries and Energy ⟶ Agriculture, Fisheries and Forestry – Australia ⟶ Department of Agriculture, Fisheries and Forestry ⟶ Department of Agriculture⟶ Department of Agriculture and Water Resources⟶ Department of Agriculture⟶ Department of Agriculture, Water and Environment *Role of the entity*: Australian Government's department responsible for agriculture	8
PIERD Act ⟶ PIRD Act *Primary Industries and Energy Research and Development Act 1989.* In 2013 the Act was updated and energy was removed from the title to become the *Primary Industries Research and Development Act 1989.* *Role of the legislation*: regulate activities of rural R&D corporations.	8

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AFIC ⟶ NFIC ⟶ ASIC ⟶ NAC+CFA (see note) ⟶ NSIA ⟶ SIA

Australian Fishing Industry Council ⟶ National Fishing Industry Council ⟶ Australian Seafood Industry Council ⟶ (see note) ⟶ National Seafood Industry Alliance ⟶ Seafood Industry Australia

Role of the entity: to act as the voice of the Australian seafood industry. It provides members, consumers, governments and other stakeholders with confident and united representation.

From NFIC onwards it was a representative organisation to which the FRDC is required to report in accordance with the PIRD Act. When ASIC ceased trading in 2006–07, its place as a representative organisation was taken by the Commonwealth Fisheries Association (albeit the state and NT wild-catch sectors were then not represented) and the National Aquaculture Council (NAC). In 2011 the National Seafood Industry Alliance Inc (whose membership includes state and NT wild-catch sectors) was declared a representative organisation. Seafood Industry Australia was launched in June 2017, and in 2018 was declared a representative organisation while at the same time NSIA was revoked as a representative organisation. NAC obtained the formal *Notice of Cancellation* from the Department of Justice Tasmania on 24 August 2021. Subsequently NAC wound up,

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ABARE + BRS ⟶ ABARES

Australian Bureau of Agricultural and Resource Economics + Bureau of Rural Sciences ⟶ Australian Bureau of Agricultural and Resource Economics and Sciences.

Role of the entity: an Australian Government research bureau providing research, analysis and advice for government and private sector decision-makers on issues affecting Australia's agriculture, fisheries and forestry industries.

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NSC and AUSEAS and SeaQual ⟶ SSA

National Seafood Centre + Australian Seafood Extension and Advisory Service + Seafood Quality ⟶ Seafood Services Australia Ltd.

Role of the entities: respectively, improve value-adding of seafood; help the commercial sector to take up leading-edge post-harvest technology; provide quality management and food safety guidelines for seafood processing; and enhance the profitability, international competitiveness, sustainability and resilience of the Australian seafood industry. SSA deregistered in 2013.

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IC ⟶ PC

Industry Commission ⟶ Productivity Commission.

Role of the entity: advise on economic, social and environmental issues affecting the welfare of Australians.

NFITC ⟶ ASIEN ⟶ STA ⟶ AISC ⟶ ASA National Fishing Industry Training Council ⟶ Australian Seafood Industry Education Network ⟶ Seafood Training Australia ⟶ Agri-Food Industry Skills Council ⟶ AgriFood Skills Australia ⟶ Skills Impact. *Role of the entities*: industry training for the commercial sector.	17
CAC Act ⟶ PGPA Act *Commonwealth Authorities and Companies Act 1997* ⟶ *Public Governance, Performance and Accountability Act 2013*. *Role of the legislation*: the CAC Act enacted accountability arrangements for statutory authorities; the PGPA Act established a single system of governance and a performance framework across all Australian Government entities.	21
Standing Council on Primary Industries (SCoPI) Primary Industries Ministerial Council (PIMC), and the Natural Resource Management Ministerial Council (NRMMC) ⟶ Agriculture Ministers' Forum (AGMIN) Primary Industry Standing Committee (PISC) ⟶ Agriculture Senior Officials Committee (AGSOC) AGSOC is supported by the Research and Innovation Committee	40
FRAB ⟶ RAC *Role of entities: To advise the FRDC of RD&E priorities for their respective jurisdictions*	12
Aquaculture CRC, Aquafin CRC, Seafood CRC (*not contiguous*) Cooperative Research Centre for Aquaculture, Cooperative Research Centre for Sustainable Aquaculture of Finfish, Australian Seafood Cooperative Research Centre. *Role of the entities*: respectively, develop emerging aquaculture species; add significant value to the FRDC's subprograms for Southern Bluefin Tuna and Atlantic Salmon; and drive a national approach to closing major gaps in the seafood industry value chain.	13 25 11

Pre-1991: Fisheries research before the FRDC's establishment

1984-85, following a study of rural research, the Rural Industries Research Act established 18 research and development councils under the auspices of the Commonwealth Department of Agriculture, including the Fishing Industry Research and Development Council (FIRDC) – the predecessor organisation to the FRDC. Australian Fisheries Services, an element within the federal Department of Primary Industries and Energy (DPIE), managed the Fishing Industry Research Trust Account. Similar trust accounts were managed within the department for other industries.

[The FRDC inherited, and has stored, all the reports on research undertaken by its predecessors since 1971.]

The councils were intended to provide greater transparency about funding of rural R&D and at the same time give the respective industries more say about how such funds were invested. Bernard Bowen was appointed as the first chair of FIRDC. He was assisted by an executive officer, Michael Walker. Both were based in Perth.

Alan Newton, a senior officer within DPIE, played a leading role in setting up the councils. Subsequently, in 1989, Alan produced the *Research Innovation and Competitiveness Statement*, which initiated an evolution in the way in which rural research was funded. It was substantiated in the enactment of the *Primary Industries and Energy Research and Development Act 1989* (PIERD Act), developed by the Minister for Primary Industries and Energy, The Hon. John Kerin.

As a result, most councils soon afterwards evolved into new corporations under the PIERD Act. Fisheries, however, did not.

[In 2013 the Sugar RDC became an Industry Owned Corporation leaving only the Cotton RDC, FRDC, Grains RDC, Grape and Wine RDC[1], and Rural Industries RDC[2] as statutory corporations.].

The move towards formation of the FRDC was flagged in the Commonwealth Government Policy Statement of December 1989, *New Directions for Commonwealth Fisheries Management in the 1990s*. The statement established the framework for the FRDC and the Fisheries Resources Research Fund, and stipulated that the Commonwealth's funding was to be expended on "research which is directly management related and specific to a fishery be funded by those entitled to operate in that fishery, in proportion to the benefits received".

In late 1989, Alan Newton formed a committee within Australian Fisheries Services to develop new directions for Commonwealth fisheries management. The main item was the establishment of the Australian Fisheries Management Authority. However, it did examine the case for fisheries to establish an R&D corporation. In implementing the recommendations, Alan and his committee liaised with the Australian Fishing Industry Council[3], state industry councils and state governments.

Notwithstanding qualified support for setting up a fisheries RDC, the slow pace at which this happened reflected the states not wanting to lose control of the R&D agenda, which was mostly related to fisheries management, and industry not wanting to increase its contribution to fisheries management research. Hence, when the FRDC came to be established under the PIERD Act and related regulations[4], the regulations specified how industry contributions were to be made to the FRDC but excluded provision for the compulsory R&D levy that was applied to other R&D corporations.

[1] Effective 22 March 2013legislation was passed to create the Australian Grape and Wine Authority (merging the existing Wine Australia Corporation and the Grape and Wine Research and Development Corporation…On 07 November 2017 legislation was passed renaming the Authority Wine Australia.
[2]On 29 Aug 2017 RIRDC announced it had re-branding as AgriFutures Australia.
[3] The executive officer of AFIC was Brian Jeffriess.
[4] The Fisheries Research and Development Corporation Regulations 29 April 1991. They were amended on 31 January 1992, changing the definition of the fishing industry and adding the formula for industry sector contribution to AFMA.

Another major difference concerned the contribution that the Australian Government made to the revenue base of the FRDC. For most[5] other R&D corporations, the Australian Government matched industry contributions up to 0.5% of the industry's average gross value of production over three years (AGVP). However, for the FRDC the Australian Government provided unmatched funds equivalent to 0.5% of the AGVP in recognition of the federal and state governments' stewardship of the publicly owned natural resources on which the seafood industry depends. In addition, the Australian Government matched industry contributions, albeit up to a lesser amount — 0.25% of the industry's AGVP — in recognition of industry benefits deriving from the seafood industry's use of the natural resource.

For other industries, DPIE also provided infrastructural support for marketing and export, but no such support was afforded the seafood industry until 2013 when the objects of the rural R&D corporations were changed through an amended PIRD Act. [See **2013–14 New roles for the FRDC**]

1991–94: Formative years

On 02 July 1991 the Minister for Primary Industries and Energy, The Hon. Simon Crean, established the FRDC under the provisions of the PIERD Act (1989). Later in 1991 the Minister appointed Henry Bosch to head a selection committee to select a chair and board for the FRDC. The committee commissioned TASA International, an executive search company, to assist with this process. As a result, Bill Widerberg was appointed on 16 March 1992 as chair of the board. Other directors appointed at the same time were Dale Bryan, Dr Brian Hickman, Dr Burke Hill, George Kailis, Dr Robert Kearney and Ted Loveday. Bruce O'Meagher was appointed as Government Director.

Soon after the FRDC's establishment, Minister Crean declared the National Fishing Industry Council — later called the Australian Seafood Industry Council (ASIC)[6] — a representative organisation. The FRDC is required to have due regard for the priorities of its Representative Organisations and to formally report to them annually. Representative Organisations play an important role in influencing the FRDC's research priorities; and also in determining the membership of the Selection Committee that selects the FRDC's board.

[Over time the following organisations were also declared Representative Organisations for the FRDC: the Australian Recreational and Sport Fishing Confederation (Recfish Australia) [1995-96], the National Aquaculture Council (NAC) [2006-07], the Commonwealth Fisheries Association (CFA) [2006-07], and the National Seafood Industry Alliance (NSIA)[Sep 2011]. In 2015 the Australian Government provided the National Seafood Industry Alliance a grant to develop a national seafood peak body. As a result of this Seafood Industry Australia (SIA) was formally incorporated 12 May 2017 and was declared a Representative Organisation by the Minister in September 2017].[7] (NSIA was revoked as a Representative Organisation in favour of SIA at the same time.)
From 2015-16 the FRDC also treated its Indigenous Reference Group[8] (IRG) as if it were a Representative Organisations and similarly the Australian Recreational Fishing Foundation (ARFF) from 2018-19. The Australian seafood industry, broadly defined, has a history of disunity that the FRDC has done its utmost to combat.
For details of ASIC's demise see **2006–07: Seafood Cooperative Research Centre established**.]

From the Corporation's inception until they were amended in 2013, the FRDC's activities pursued, and were aligned with, the following objects specified in section 3 of the PIERD Act:

"The objects of this Act are to:

a. make provision for the funding and administration of research and development relating to primary industries with a view to:

[5] The two other exceptions were the Land & Water Resources RDC and the Rural Industries RDC.

[6] Previously the organisation's title had been the Australian Fishing Industry Council.

[7] See Appendix B: FRDC's Representative Organisations. Note that some have been revoked over time.

[8] FRDC formed its Indigenous Reference Group (IRG) in 2011 after conducting the first National Recreational and Indigenous Survey and in response to Minister Truss' encouragement to ensure its programs were responsive to the needs of Aboriginal and Torres Strait peoples.

(i) increasing the economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries; and
(ii) achieving the sustainable use and sustainable management of natural resources; and
(iii) making more effective use of the resources and skills of the community in general and the scientific community in particular; and

b. improving accountability for expenditure upon research and development activities in relation to primary industries."

The FRDC established an interim office in the Kurrajong Hotel, Canberra, staffed by seven people on secondment from DPIE. Subsequently, permanent accommodation was obtained on the ground floor of Deakin House, 50 Geils Court, Deakin West. Peter Dundas-Smith was appointed as the inaugural Executive Director, and five other staff were recruited to replace the seven seconded from DPIE. Of these inaugural staff members Annette Lyons and John Wilson remained until 2019 and 2020 respectively.

[In 1997, the FRDC moved to the ground floor of 25 Geils Court, where it remains; subsequently the building was named Fisheries Research House. In 2016 the FRDC opened an office in Adelaide. See **2015-16: Major reform of advisory committees** and **2021-22: Agricultural Innovation Australia Ltd**]

Early on, the chair and the manager of the secretariat met with state government and industry representatives to explain the role of the FRDC and to seek agreement on operational arrangements. A common stumbling block was the expectation that (unlike with FIRTA) industry funds raised by jurisdictions be unconditionally forwarded to the FRDC and subsequently accessed through a competitive R&D funding round. Such discussions were appeased by two measures. First, in May 1992 Minister Crean issued a direction under section 143(1) of the PIERD Act that the FRDC was to ensure that spending of industry contributions was to be of direct relevance, within a five-year period, to the fishery, region or state/territory in which funds were collected, based on advice from management agencies and industry sectors.[9] Second, the FRDC agreed to establish a trust fund within each state and Commonwealth (CSIRO-administered) jurisdiction and to pay into that trust fund the first year's Australian Government contribution of $6.5 million in proportion to the AGVP of each jurisdiction. The FRDC guaranteed that it would support such funds being invested in R&D without competitive processes. In doing so the FRDC achieved expenditure of the Australian Government contributions in the inaugural year, 1991, in which there were no R&D project applications to fund.

[Those Trust Funds remained in operation until the early 2000s and provided an incentive for state and territory governments to positively engage with the FRDC (and for the FRDC to actively engage with the state and territory governments).]

FRDC's enabling regulations specified how industry contributions were to be made to the FRDC but excluded provision for the compulsory R&D levy that was applied to other R&D corporations[10]; albeit the legislation did provide 0.5% Average Gross Value of Production (AGVP) to the FRDC from the Commonwealth Government in recognition of the public good component of the fishing industry. The FRDC received voluntary funding contributions from state and territory governments, which in turn collected funding from fisheries industries through levies or fees. The Commonwealth provided matching funding for state and territory contributions, up to a cap based on the AGVP of fisheries in each jurisdiction. FRDC's reliance on voluntary contributions from the various jurisdictions proved to be a key strength in shaping the FRDC's culture of:

- stakeholder focus so as to have impact through collaboration
- an ongoing need to "join the dots"
- not "reinventing the wheel", and avoiding making the mistakes of the past.

[Only the Australian Prawn Farmers Association (APFA) has put in place a compulsory R&D levy for the FRDC.]

[9] This is a summary of the original ministerial direction. The full text of the amended direction of 1995 is on page 11.

[10] There ended up being 15 RDCs

FRDC is obliged under its enabling legislation, in consultation with all its stakeholders, to develop, implement, and report against five-year research and development plans, and Annual Operational Plans.

[To date, FRDC has developed 7 research and development plans[11] driven by its stakeholders' priorities, including the Commonwealth Government science and research priorities and rural research and development priorities. FRDC's 1993-98 R&D Plan involved a single open competitive call for applications. FRDC's 1996-2001 and its 2000-05 RD& Plans involved the annual competitive call plus a dedicated allocation for subprograms. FRDC's 2005-10 and 2010-15 R&D Plans added allocations for IPAs and a small-project investment vehicle called the Tactical Research Fund. The return on investment during the 2010-15 R&D Plan was wound back from 1:4 to 1:2 to free up funds for more public good investment. It also moved from one annual competitive call to three open calls; and allocated funds for national investments (against the national priorities) and an investment incentive fund – winding the return on investment back from 1:2 to 1:1.84. It also provided IPAs with budgets against which they could invest (with carryovers). During the life of the 2020-25 R&D Plan the need to further reallocate funds to public good investment meant that from 2020-21 the IPAs were guaranteed a return of 1:0.88.]

Other significant inaugural activities were as follows:

- The first 5-year R&D plan came into effect. With a sole focus on the commercial sector, it identified four areas for its R&D investment: natural fish resources, aquaculture, harvesting and marketing.

  [A table showing the evolution of the R&D program structure is at **Appendix A: Evolution of the FRDC's programs in successive R&D plans.**]

- Tenders were requested through the Department of Finance for a project management system — a process subsequently disbanded in favour of developing an in-house system based on Microsoft® Excel® software.

  [The system subsequently migrated to Microsoft® Access® then .NET/SQL. In 2013 the FRDC moved to "out-of-the box" system solutions, including Microsoft® SharePoint® and Microsoft® Customer Relationship Management. Other agencies[12] purchased versions of the project management systems from the FRDC and used them to varying degrees.]

- The FRDC entered data into its project management system for 510 completed projects, worth $54 million, that had been funded by its predecessors since 1971. The majority of final reports from 1971 to 1991 were also obtained and placed in the final report database.

- The FRDC adopted 51 current R&D projects from FIRDC and invested in 42 new projects.

- One such project was the commissioning of a national seafood consumption study aimed at providing a basis for the FRDC's investment in marketing, which found that Australians consumed 13.5 kilograms of seafood per year.

  [The FRDC subsequently funded three smaller, city-based studies – in 1998 (Sydney), 1999 (Perth) and 2004 (Melbourne) – to update the original findings. These studies found that Australians consumed 15 kilograms of seafood per year. Later studies funded by the Seafood CRC (among those outlined at **2014–15: Seafood CRC leaves its mark**) focused on consumer attitudes and behaviours towards seafood purchasing and eating, and the influences of change. A major aim of the studies was to identify how the industry, through marketing, could influence seafood consumption.]

- Another project — funded by the FRDC in partnership with the Australian Tuna Boat Owners Association (later called the Australian Southern Bluefin Tuna Industry Association), SA R&D Institute (SARDI), and the Overseas Cooperative Foundation of Japan — was a trial of catching wild Southern Bluefin Tuna and growing them to market size. An ex-post analysis of this project revealed a benefit–cost ratio of 41:1.

[11] Refer Appendix A: Evolution of FRDC's programs in successive R&D plans

[12] AFMA, Australian Pork Limited, Condamine Alliance (a Queensland natural resources management group), CRC Reef, Forest and Woods Products R&D Corporation, NZ Ministry for Primary Industries, Seafood CRC, Sugar R&D Corporation, and Tasmanian Aquaculture and Fisheries Institute.

- The Australian Bureau of Agricultural and Resource Economics (ABARE) was commissioned to develop a priority-setting process. As a consequence, the FRDC, in consultation with state and Commonwealth jurisdictions, established Fisheries Research Advisory Bodies (FRABs) or made existing bodies relevant to the FRDC.[13] Their role was to ensure that R&D was directed to the needs of industry and other end-users.

  [In 2016 the title FRABs changed to Research Advisory Committees (RACs). See **2015-16: Major reform of advisory committees**]

- The FRDC developed its corporate image with the help of one of its Directors, Dale Bryan. Dale was the Executive Officer of the Tasmanian Fishing Industry Council (TFIC) and was experienced in industry communication. He, together with Mal Mahoney who wrote the content for TFIC's magazine and Dale's wife Daphne "Duckie" who assisted with its production, developed the FRDC's "spiral" logo device based on a similar logo they found online. Alan Pritchard of National Advertising and Graphic Design Studios in Fyshwick was then commissioned by the FRDC to refine the device, first by reducing the number of "spirals" from five to four to represent the FRDC's four R & D programs, and then to apply it to FRDC's communication media. Alan continued for a number of years to support FRDC with the production of its R & D Plans, Annual Reports and other publications.

- Following the development of its corporate image the FRDC commissioned Dale and Mal to produce R&D News, quickly achieving record circulation figures for a fishing industry periodical by being inserted in magazines produced by other industry organisations.

  [A subsequent change in focus following a stakeholder survey and re-branding as *FISH* is described at **2004-05: Hand-over at the helm**]

- The FRDC collaborated with other RDCs in contributing to the maintenance of the " Australian rural research in progress" (ARRIP) database and the Australian Bibliography of Agriculture (ABOA), both of which were established by the state governments to inform end-users and research providers of current and completed R&D.

  [The initiatives subsequently developed into Australian Agriculture and Natural Resources On-line (AANRO — www.anro.net), an integrated knowledge access tool for agriculture and natural resources management. Later, the states withdrew support for AANRO because of its resource needs; consequently, so too did the RDCs. This issue was not subsequently revisited by the FRDC until 2025 when the Research Link Australia platform (https://researchlink.ardc.edu.au) made all FRDC publicly available research accessible. Research Link Australia was established in 2024 and is part of the Australian Research Data Commons (ARDC).] It helps researchers and publicly funded research organisations find industry partners for translating their research discovery into the development of real-world products, or vice versa, to help industry to find research collaborators to enhance their R&D capabilities.]

- The FRDC also collaborated with other RDCs on a wide range of functions, including benefit–cost analyses (See **2008–09: People development ramped up**), communications, common project agreements, comparable approaches to risk management, and cost efficiencies.

  [Such collaboration continues. Reviews relating to RDCs have also recommended that the RDCs combine their back-office functions.]

- The first major activity in which the FRDC collaborated with other RDCs was the Australian Rural Leadership Program (ARLP) that was initiated by the Rural Industries Research and Development Corporation. A key driver of this initiative was the then RIRDC Managing Director, Keith Hyde. The Australian Rural Leadership Foundation (ARLF) was established as the governing body to manage the ARLP. The ARLF's inaugural Chief

[13] In 1995 Minister Beddall consequently amended the ministerial direction of 1992 to recognise the role played by FRABs in prioritising fisheries R&D.

Executive was LTCOL (retd) Mike Beckingham. The first FRDC-sponsored fishing industry participant in the ARLP Program, Peter Petersen, undertook the program.

[The FRDC has subsequently funded either one or two participants per year. In 2022 the ARLF celebrated 30 years of leadership investment and development in rural, regional, and remote communities; holding a gala dinner 26 October 2022 at which its then patron, the Governor General His Excellency General the Honourable David John Hurley AC DSC (Retd), was the guest of honour. In 2022 the ARLF also produced a report on its impacts over the previous thirty years, noting that it had run 154 programs and generated over 2,600 alumni.]

- In its second year, the FRDC commissioned the National Fishing Industry Marketing Strategy, later called the Fishing Industry National Study (commonly referred to as FINS), aimed at identifying sustainable development and profitability challenges for the industry. It involved an unprecedented degree of consultation with industry and others, both in Australia and New Zealand.

  [The study's report identified a number of strategic planks that were subsequently implemented through Seafood Services Australia Ltd, the Seafood CRC and other FRDC investments. Planks that were not implemented were a well-funded national peak body and a seafood promotion body. However, in 2013 the FRDC's enabling legislation was changed to give the Corporation the power, among other things, to undertake marketing activities. See **2013–14: New roles for the FRDC**. Further in 2017 a new peak body, Seafood Industry Australia, was established with a significantly more robust funding base than any of its predecessors.]

- A National Seafood Centre was established to improve value-adding of seafood. Innovation achieved by the Centre included packaging technology for export of live kuruma prawns, a machine to remove skin from small fish, and packaged UHT soup from processing waste. Later, the Australian Seafood Extension and Advisory Service was co-located to help the commercial sector to take up leading-edge post-harvest technology. Both initiatives were in partnership with the Department of Primary Industry, Queensland, and they were accommodated in the Department's Centre for Food Technology. The FRDC's contribution was to fund a Commercial Manager[14] to run the centre, 34 small industry-driven projects and other value-adding activities.

  [These initiatives later formed the basis for Seafood Services Australia, which commenced in unincorporated form in 1999 and as a not-for-profit industry development company in 2001. It wound up in 2013. See **2013–14: New roles for the FRDC**]

- The FRDC established managed subprograms so that when the scope of a particular R&D objective extended beyond that which could be achieved through a single project undertaken by a single researcher, strategic directions were developed and maintained, R&D was not duplicated, scientific methods were standardised, and results were extended. Originally there were three subprograms: Replacement of Fishmeal in Aquaculture Feeds, Abalone Aquaculture, and Effects of Trawling.[15]

- The Cooperative Research Centre for Aquaculture was established. The FRDC did not become a participant in this CRC but co-invested in related projects under an informal arrangement.

  [Since its establishment, the FRDC used co-operative research centres as investment vehicles to create strategic partnerships and leverage additional funds both from industry and government. In the early 1990s the FRDC co-invested in Cooperative Research Centre for Aquaculture projects under an informal arrangement. In 2001, the FRDC became a formal participant in the CRC for the Sustainable Aquaculture of Finfish. In 2007 FRDC became a participant in the Seafood CRC that wound up in 2015. See **2006–07: Seafood Cooperative Research Centre established.** Throughout the life of the Seafood CRC there was a strong collaborative relationship with the FRDC. The FRDC continues to drive some of the major CRC legacy activities.

The seafood industry's determined AGVP was as follows:

- 1991–92: $1.38b ($1.13b wild-catch, $0.25b aquaculture)
- 1992–93: $1.49b ($1.24b wild-catch, $0.25b aquaculture)
- 1993–94: $1.68b ($1.42b wild-catch, $0.26b aquaculture).

[14] The inaugural Commercial Manager, John McVeigh, later became the Queensland Minister for Agriculture, Fisheries and Forestry before moving into federal parliament from which he resigned in 2020. His successor as Commercial Manager, Deon Mahoney, later became the FRDC Programs Manager.

[15] Respectively under the leadership of Dr Geoff Allan, Dr Patrick Hone and Dr Ian Poiner.

1994–95: Building researcher capacity

From the FRDC's initial experience, it became evident that there was a need to improve the experimental design of fisheries research. In partnership with the University of Sydney, the FRDC established and funded, until 2001, the Quantitative Fisheries Training Unit. Under Professor Tony Underwood fisheries scientists were trained in modelling and analysis of the population dynamics of fisheries. The FRDC also subsidised the salary of a population dynamicist in each state and Commonwealth (CSIRO-administered) jurisdiction to increase the expertise urgently needed for fisheries management. After three years of FRDC support these experts[16] were paid by their agencies. They made significant contributions to fisheries science.

Other significant activities in 1994–95 were as follows:

- New board appointments were Dr Russell Reichelt as Chair, new directors Dr Diana Day, Peter Shelley and Richard A. Stevens, and re-appointed directors Dr Burke Hill, George Kailis and Ted Loveday. Dr Alison Turner was appointed Government Director.17

- At the request of the Australian Prawn Promotion Association, the Australian Government enacted the *Prawn Export Promotion Act 1995*. Under this Act, funding in the order of $700,000 per year was collected through a compulsory marketing levy on wild-catch prawn fishers. The initiative, the first of its kind for the seafood industry but similar to those of other primary industries, brought a number of benefits to the sector, including the capacity to successfully negotiate reductions in import tariffs.

  [In 2001 the Act was repealed by the federal minister following a representation to a Queensland based MP with interests in the seafood industry by a minority of Queensland prawn exporters who regarded the initiative as a threat to their businesses.]

- The FRDC instigated scholarships with the Australian Maritime College (AMC), Launceston, to provide short courses in fisheries management training to government fisheries staff and management advisory committees members. At the time the AMC was providing a tertiary level course in fisheries management.

  [The FRDC funded scholarships for a further eight years. The AMC later ceased its fisheries management courses. In 2023 and 2024 the FRDC, in partnership with the University of Wollongong, funded a five-day fisheries management program.

- The first comprehensive atlas of Australia's commercial fish and fisheries, *Australian Fisheries Resources*, funded with the Bureau of Resource Science, was launched.

- The *Australian Seafood Catering Manual* — a tool of trade for seafood suppliers, researchers, trainers, consultants and promoters published in conjunction with DPI Queensland — won a national award for marketing excellence. In *The Australian Financial Review*, food writer Stephen Downes judged it to be "the best publication of any sort I've seen on Australian food."

  [In 2000 the manual was re-designed and published as the Australian Seafood Users Manual, which continued to be sold through outlets such as the Seafood Services Australia bookshop.]

- The Industry Commission Report No 44 of 15 May 1994, *Research and Development*, concluded that research and development corporations "have made significant changes in improving the interactions between the R&D process and industry, and in making R&D more responsive to industry needs".

- The FRDC's transition to an ecosystem focus was reflected in funding of a significant project, "A review and synthesis of Australian fisheries habitat research" through the Australian Institute of Marine Science.[18]

[16] They included Dr Cathy Dichmont, Dr Rick McGarvey, Dr Malcolm Haddon and Dr James Scandol.

[17] Succeeded in 1997 by Mary Harwood.

[18] Led by Mike Cappo.

Ministerial direction of 11 May 1995

by the Minister for Resources, the Hon. David Beddall, MP

Pursuant to my powers under sub-section 143(1) of the *Primary Industries and Energy Research and Development Act 1989*, and replacing the Ministerial direction given to FRDC on 21 May 1992, I hereby direct that:

a. FRDC is to ensure that industry funds raised from a particular fishery, industry sector or State/Territory are spent within a five-year period starting from the year of receipt on research and development projects that are of direct relevance to:
    (i) that fishery; or
    (ii) industry sector; or
    (iii) the State/Territory in which the funds were collected;
b. in determining the projects on which funds are to be spent under (a), FRDC is to have regard to the advice of the relevant management agency and industry sectors acting in collaboration through the relevant FRAB; and
c. FRDC is to recognise the Australian Fisheries Management Authority, operating in consultation with its Management Advisory Committees, as the FRAB relevant to Commonwealth-managed fisheries, including Joint Authority fisheries managed under Commonwealth law.

[As a consequence of amendments to the PIERD Act (renamed the PIRD Act) in 2013, the FRDC entered into a 2015–19 Funding Agreement with the Commonwealth of Australia represented by the Department of Agriculture and Water Resources as a new basis for receiving Australian Government funding. In a letter of 28 May 2015, Senator the Hon. Richard Colbeck, Parliamentary Secretary to the Minister for Agriculture, referred to his signing of the Funding Agreement and set out a written direction to the FRDC, for the purposes of s143(1) of the PIRD Act, to the effect that in entering into the Funding Agreement the Ministerial direction issued in 1995 was no longer to apply, effective from 1 July 2015. See **2019–20: Government reviews the FRDC's performance**]

The seafood industry's determined AGVP was $1.81b, of which wild-catch was $1.42b and aquaculture $0.39b.

1995–96: A wider scope

Investing for tomorrow's catch: the FRDC's research and development plan, 1996 to 2001 (its second plan), specifying the FRDC's strategic R&D priorities for the next five years, came into effect. It recognised recreational fishing, and cultural fishing by Indigenous people, as principal sectors of the fishing industry. This significant change widened the scope of the FRDC beyond its previous focus on the commercial sector. Subsequentially, the Minister for Resources and Energy declared the Australian Recreational and Sport Fishing Confederation (Recfish Australia) as the second representative organisation of the FRDC.

The R&D plan re-structured the FRDC's programs into Resources Sustainability, Ecosystems Protection and Industry Development to reflect Government and industry priorities, and specified indicators against which the FRDC could measure its performance.

[A table showing the evolution of the R&D program structure is at **Appendix A: Evolution of the FRDC's programs in successive R&D plans.**]

The industry

The three principal sectors of the fishing industry are commercial, recreational, and Indigenous cultural.

The commercial sector, which is also commonly referred to as the "seafood industry", comprises the wild-catch sector and the aquaculture sector. For practical reasons the "seafood industry" also includes other commercial non-food producing sectors such as pearling.

[The scope of the FRDC description of the industry's sectors has evolved over time. The original term used to describe the industry has changed from the "fishing industry" to "Australian fishing and aquaculture", acknowledging that the FRDC invests heavily in public good research for which there may be little or no commercial outcome and:

- that many FRDC stakeholders are not commercial (eg recreational and Indigenous)
- the increasing importance of aquaculture.]

A formal definition of the fishing industry is included in the Fisheries Research and Development Corporation Regulations, Amendment 1992:
Includes any industry or activity carried on in or from Australia concerned with: taking, culturing, processing, preserving, storing, transporting, marketing, or selling fish or fish products.

Other significant activities in 1995–96 were as follows:

- The first national Fisheries Research Advisory Body (FRAB[19]) workshop was held to implement best practice in R&D planning and evaluation processes.

- A "whole of chain" emphasis in quality management and product quality was initiated through SeaQual, a joint initiative of the Australian Seafood Industry Council, DPIE and the FRDC managed by Jayne Gallagher. Early outputs of this initiative were *The seafood industry's strategic plan for achieving seafood excellence* and food safety guidelines for seafood processing, described by the Australia New Zealand Food Authority as "a model for others".

  [The SeaQual project was incorporated into Seafood Services Australia in 1999.]

- A book, *Marketing Names for Fish and Seafood in Australia*, was published with the aim of protecting consumers when purchasing seafood — part of longstanding efforts to use standardised names for more than 4500 marine species either harvested or available in Australia. This was the first of a number of publications and posters resulting from the activities of the National Fish Names Committee, which by then was managed by the FRDC after being managed by DPIE for some 15 years.

[19] FRABs were later renamed RACs. See **2015–16: Major reforms of advisory committees**]

[In 1999 the FRDC and CSIRO Marine Research, through the Fish Names Committee, which by then was managed by Seafood Services Australia (SSA), published a reference publication, the *Australian Seafood Handbook*. An identification guide to domestic seafood species, it proved to be one of the most popular and widely used publications. Subsequently a guide to imported species was published. In 2007 the National Fish Names Committee, led by Roy Palmer, achieved its goal when standardised Australian fish names were codified as Australian Standard® AS SSA 5300 – 2007: *Australian Fish Names Standard*. In 2013, management of the Fish Names Committee reverted to the FRDC following the wind-up of SSA.[20]]

- The Australian Government restructured industry training advisory bodies disestablishing the National Fishing Industry Training Council. The FRDC, in conjunction with the SA Skills Centre (Bob Miller), then established the Australian Seafood Industry Education Network (ASIEN).

  [ASIEN later relocated to Canberra, was staffed by Ross Ord under the management of ASIC, and was renamed Seafood Training Australia (STA). Subsequently the Australian Government, under another restructuring of industry training, recognised STA as an industry training advisory body and provided funding for it. The FRDC's involvement with STA was then reduced. STA was disestablished in 2004 when the Government rationalised industry training and seafood came under the Agri-Food Industry Skills Council, later AgriFood Skills Australia. In 2015 the Australian Government introduced a contestable funding model, and oversight of the Seafood Industry Training Package was transferred to *Skills Impact* in January 2016. *Skills Impact* is one of six national Skills Service Organisations, funded by the Australian Government. The two members of Skills Impact are ForestWorks Ltd and the National Farmers Federation. Skills Service Organisations' core function is to support the operation of Industry Reference Committees. These committees develop industry competency skills standards and vocational qualifications for use by industry and the VET sector. The *Aquaculture and Wild Catch Industry Reference Committee* (IRC) has responsibility for overseeing the development of industry units of competency, skill sets, and qualifications relative to the following sectors: Aquaculture, Wild Catch, Seafood, Fishing]

The seafood industry's determined AGVP was $1.70b, of which wild-catch was $1.31b and aquaculture $0.39b.

[20] The chair of the committee is currently Gus Danoun, and project manager is Meaghan Dodd of Intuitive Solutions. Alan Snow retired as project manager in June 2021 after being involved in the process since 2000.

1996–97: Continuous improvement starts to pay off

Several years of systematic improvement in the FRDC's R&D project management processes began to deliver results. Researchers were becoming more aware of FRDC funding processes and were responding positively to them, leading in turn to higher approval rates for projects and a record level of expenditure projected for the coming three to four years — within a continuing overhead cost constraint of no more than 8% of total FRDC expenditure, as determined by the board in framing its first budget. An increasing role was being played by the FRABs in setting priorities and communicating those priorities to the FRDC, other funding agencies and researchers.

Other significant activities in 1996–97 were as follows:

- The week-long, FRDC-sponsored Second World Fisheries Congress, attended by more than 1200 participants from 62 nations, put a spotlight on the state of science and management across national and international fisheries. It provided an excellent opportunity to hear first-hand the challenges facing fisheries in Australia and overseas.

- A post-harvest symposium, 'Making the Most of the Catch', hosted in Brisbane by the Centre for Food Technology of the Department of Primary Industry, Queensland, was sponsored by the FRDC's National Seafood Centre.

- A two-day fisheries economic statistics workshop was held to identify economic statistics essential to sustainable development of the fishing industry. Subsequently a steering committee developed an implementation plan to improve fisheries economic statistics. The committee produced a "barbecue companion" booklet detailing the value of the seafood industry and in 2002 published a comprehensive book, *Valuing fisheries — an economic framework*, edited by Professor Tor Hundloe.
  [See **2022–23: Valuing fishing and aquaculture sectors**]

- The FRDC was involved in the Inquiry into Management of Commonwealth Fisheries conducted by the House of Representatives Standing Committee on Primary Industries, Resources and Rural and Regional Affairs.

- The FRDC set up a website to provide corporate information, including online access to the R&D Plan, *R&D News* and annual reports, and to enable electronic lodgement of funding applications.

The seafood industry's determined AGVP was $1.78b, of which wild-catch was $1.34b and aquaculture $0.44b.

1997–98: Major gains in bycatch reduction

The Effects-of-Trawling Subprogram started to have a major impact on trawl fisheries around Australia. Uptake of bycatch reduction devices increased in the Northern Prawn Fishery, Torres Strait, Queensland East Coast Trawl and the prawn trawl fisheries of NSW and SA. Adoption of turtle exclusion devices increased, allowing confidence in setting targets for 100% adoption in northern prawn trawling fisheries by 2001. The SA prawn fishery became the first such fishery in Australia — if not the world — to have all operators voluntarily installing bycatch reduction devices. These initiatives were assisted by publication of a guide to bycatch reduction in Australian prawn trawl fisheries and the award of a $10,000 travel grant to a prawn fisher for leadership in innovation and adoption of bycatch reduction.[21]

To encourage bycatch reduction, the FRDC and OceanWatch Australia Ltd published *Bycatch solutions*, a handbook for fishers in non-trawl fisheries.

Other significant activities in 1997–98 were as follows:

- Board appointments were new directors Simon Bennison, Dr Jim Penn, Bill Sawynok and Sandy Wood-Meredith, and re-appointed directors Dr Russell Reichelt (Chair), Dr Diana Day and Richard A. Stevens. Mary Harwood continued as Government Director.[22]

- The Australian Government, through a once-off regulation, reduced its contribution from the 0.5% component of the AGVP for the coming financial year by $3.6 million. Minister for Resources and Energy, the Hon. Warwick Parer, at a meeting of the Ministerial Council for Forestry, Fisheries and Aquaculture, encouraged his state counterparts to maximise the Australian Government's matching contributions to the FRDC by ensuring that state industry contributions were at least 0.25% of the AGVP.

- The FRDC's quality management program was certified to international standard AS/NZS ISO 9002:1994 (later upgraded to AS/NZS ISO 9001:2008). This was tangible evidence of the FRDC's work ethic of continual improvement, giving further confirmation to stakeholders that their financial contributions to the FRDC were sound, beneficial R&D investments.

  [In 2013-14, with the demise of Seafood Services Australia, FRDC became a Standards Development Organisation (SDO) with responsibility for the Australian Fish Names Standard. This was seen as a response to misleading fish labelling and with a view to enhancing marketability and enabling consumers to make more informed choices when purchasing seafood. Standard labelling delivers improved food safety, traceability and species identification as well as superior management of seafood-related public health incidents. See **2013–14: New roles for the FRDC**. In 2020 FRDC added the Australian Aquatic Plant Names Standard to its responsibilities as a SDO.
  FRDC maintained its Quality certification for some 25 years, moving from a paper-based system to an electronic system. In February 2022, while maintaining its quality management program, the FRDC discontinued certification because it felt that formal certification was no longer adding value to its business processes].

- The FRDC was seeking to influence the development, at appropriate levels and sectors within the fishing industry, of R&D plans that incorporate R&D priorities. To assist this process the FRDC started to commission reviews of wide-ranging crucial topics such as seagrass, fisheries habitat and wild-caught abalone to identify R&D priorities.

  [In more recent years R&D plans, largely funded by the FRDC, were developed for all major industry sectors and jurisdictions. However, following a review of FRDC's structures and processes by Forest Hill Consulting in 2019 which was critical of the large number of extant R&D plans, FRDC removed the need for jurisdictional (RAC) R&D plans in favour of lists of rolling R&D priorities.]. [See **2015–16: Major reforms of advisory committees**]

[21] The inaugural winner was John Olsen.

[22] Succeeded in 1999 by Dr Derek Staples.

- Complementing these FRDC reviews, the Australia–New Zealand Standing Committee on Fisheries and Aquaculture, in collaboration with the FRDC, commenced an analysis of current and completed fisheries R&D. The aim was to form a picture of Australia's investment in fisheries R&D to help to identify key areas for investment.

- Outputs from some of the inaugural investments began to appear in the form of publications. Titles included *Seafood by season: a state-by-state pictorial guide to the availability of Australian seafood*; *Marketing into Asia: an analysis of Asian markets for seafood products*; *South East Fishery quota species – an identification guide*; *Fish Futures: individual transferable quotas in fisheries*; *The new rural industries: a handbook for investors in new fields of agriculture and aquaculture*; and a *Quality Chooser* developed under the SeaQual project.

- The portfolio of managed subprograms was extended by 1998 to include Southern Bluefin Tuna aquaculture, Atlantic Salmon aquaculture, Rock Lobster post-harvest and, controversially, Rock Lobster enhancement and aquaculture.[23] This latter subprogram originally concerned aquaculture, albeit including re-stocking of the wild fishery. It was strongly opposed by many Rock Lobster fishers, particularly in WA, who saw it as a threat to their sector. Consequently, it was renamed the "Rock lobster enhancement and aquaculture subprogram" to allay those concerns.
  [See **2023–24: Breakthrough on Rock Lobster aquaculture**]

- A major, multi-agency project commenced on the Huon River estuary to investigate the effects of sea cages on the aquatic environment and environmental factors (such as land- based run-off) on aquaculture production.

- The FRDC invested significant funds in live finfish export that involved a committee that worked with airlines.

- Two industry statutory organisations, the Australian Meat and Livestock Corporation (a marketing body) and the Meat Research Corporation (a statutory RDC) merged to form Meat and Livestock Australia, a company limited by guarantee.

  [This Industry Owned Company (IOC) led the evolutionary direction of the other PIERD Act RDCs such that there are now ten IOCs and five Commonwealth statutory bodies.]

The seafood industry's determined AGVP was $1.88b, of which wild-catch was $1.38b and aquaculture $0.50b.

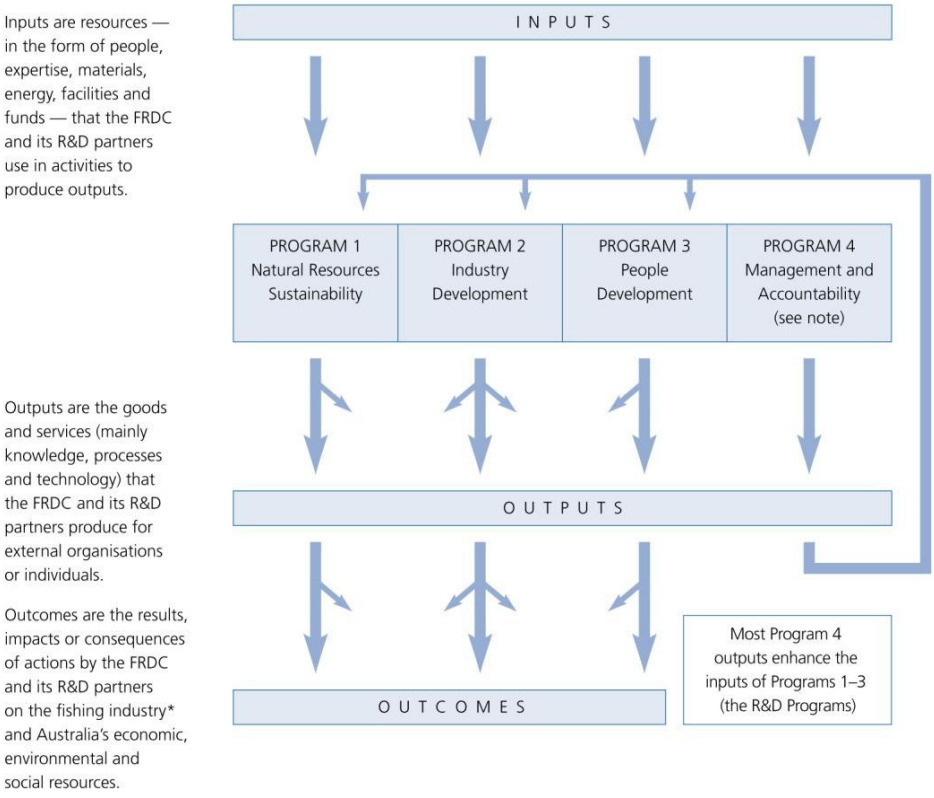
[23] Subprogram leaders were, respectively, Steven Clarke, Dr Stephen Battaglene, Dr Bruce Phillips and Dr Robert van Barneveld.

1998–99: New accountability measures

In January 1999, the Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry, Senator Judith Troeth, informed the FRDC of sweeping new accountability arrangements for statutory authorities. Under the new *Commonwealth Authorities and Companies Act 1997* (CAC Act), which mirrored the *Corporations Act 1989*, the directors of the Corporation were to include a report of operations in their annual reporting. Soon afterwards, the department, by then known as Agriculture, Fisheries and Forestry – Australia (AFFA) conducted a Report of Operations workshop to help R&D corporations to identify key requirements and processes in the new accountability arrangements. Other significant changes to accountability arrangements resulted from the Australian Government's moves to an accrual-based "outcomes and outputs" budget framework, to be used first in the 1999– 2000 financial year. Accordingly, the FRDC developed a new strategic structure to focus on outcomes and encouraged outcomes-based priority setting through its Representative Organisations, the FRABs and other entities. Figure 1 shows the essential elements in relation to the program structure at the time.

[The Public Governance, Performance and Accountability Act 2013 (PGPA Act) replaced both the CAC Act 1997 and the Financial Management and Accountability Act 1997. See **2014-15: Seafood CRC leaves its mark**]

Figure 1: The program structure as it was in 1998–99 and its focus on outcomes



Other significant activities in 1998–99 were as follows:

- *World Aquaculture '99*, hosted by the World Aquaculture Society and the NSW Department of Primary Industries, was sponsored by the FRDC.

  [This conference was, in part, a stimulus to the inaugural *Australasian Aquaculture* conference in 2004.]

- Public awareness of the health benefits of eating seafood was increased with the launch of *Seafood the Good Food*. The CSIRO Marine Research study on which it was based showed that most Australian seafood contains 10 to 100 times higher levels of certain omega-3 fatty acids than other protein sources such as beef, chicken and lamb, and lower levels of cholesterol".

[The high demand for this publication necessitated a second large printing run of an updated edition. In 2001, furthering the theme and culminating a long, rigorous study by Griffith University[24], a guide for seafood marketers outlining the health benefits of eating seafood — *What's so healthy about seafood?*[25] — was published. A second edition was published in 2004 and two subsequent projects provided updates to the original work.]

- *Antarctica to the tropics: a snapshot of the Australian fishing industry* was published by the FRDC to provide easily accessible insights into the industry and its challenges.

  [Two subsequent editions of the book were published. The need for this form of publication was overtaken by the availability of similar information on the FRDC website.]

In this year, the R&D and promotion arms of the meat and livestock industry amalgamated as Meat and Livestock Australia Limited (MLA). This was to be the first instance of a primary industry R&D corporation evolving to become independent of the PIERD Act; others followed. Levy arrangements for both R&D and promotion remained under a deed of agreement between MLA and AFFA.

The seafood industry's determined AGVP was $2.11b, of which wild-catch was $1.50b and aquaculture $0.61b.

1999–2000: Measurement of ESD performance

Following an inaugural national workshop to engage all stakeholders in developing a national fisheries ESD framework, the FRDC — in conjunction with the Australia-New Zealand Standing Committee for Fisheries and Aquaculture and with representatives of the fishing industry — established a suite of projects to speed the development of ESD criteria and indicators. They were expected to allow reliable measurement, over time, of the ESD performance of all Australian fisheries, and to be important in helping commercial operators to meet the requirements of the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 1999*.

[Subsequently the FRDC formed an ESD Reporting and Assessment Subprogram.[26] The Subprogram's ESD and risk assessment processes have now been adopted by FAO as their model for fisheries assessment worldwide.
During the past decade or so, the nature of natural resource management has undergone profound change. As the need for managing on an ecosystem scale has increased, fisheries managers have moved away from simply a focus on the biology and behaviour of particular species towards interactions among different species and between fish and their habitats.
The release of Australia's Oceans Policy, introduction of regional marine plans, enactment of the Commonwealth's Environmental Protection and Biodiversity Conservation Act and changes in state fisheries legislation have also prompted change in the way Australia's fisheries are managed. In the interests of environmental sustainability, efforts have been increasing in government and industry to achieve more inclusive approaches. This "ecosystem approach" to fisheries management has led to other entities having legitimate roles in managing the harvesting of fish and the associated human impacts on their habitats. To obtain the best economic, environmental and social outcomes from fisheries, managers must now interact well with commercial, recreational and Indigenous fishers and with other people in the community who have an interest in fisheries.]

Other significant activities in 1999 - 2000 were as follows:

- Dr Garth Newman reviewed the FRAB system and reported that the system "has materially improved the strategic directions of fisheries research [and] the focus of research funding". He noted the change from a fisheries biology and assessment perspective to one meeting the wider information needs of resource managers and industry, and the involvement of stakeholders in research planning. The FRDC implemented the changes recommended by the review.

[24] The principals of the study were Dr Shawn Somerset and Martin Bowerman.
[25] Many reviewers contributed to the book, among them Professor Mark Wahlqvist and Dr Naiyana Tikky Wattanapenpaiboon, who subsequently exhaustively examined the material and brought it up to date.
[26] Led by Dr Rick Fletcher.

[In 2014 the FRDC commissioned Greg d'Arville to undertake a second review of the FRAB system, which provided wide-ranging recommendations focusing on the structure of the FRAB system with a view to making it more effective and cost-efficient. A further review was undertaken by Forest Hill Consulting in 2019. See **2015-16: Major reform of advisory committees**]

- The Western Rock Lobster fishery received Marine Stewardship Council (MSC) certification as a sustainable, well-managed fishery — the first such certification in the world, resulting from a $5 million FRDC investment over several years.

  [Since then other Australian fisheries have received MSC certification. In 2013 the WA Government endorsed the MSC certification process and provided $14.5m of funding for its fisheries to undertake preliminary certification. Over time there has been a national increase in the uptake of environmental management systems and third party certification schemes.]

- The FRDC established the South East Fishery Industry Development Subprogram[27] to change a narrow focus on R&D to underpin stock assessment to one that reflected whole-of-chain processes in the fishery, which at the time supplied 60% of fish for the domestic market.

- A memorandum of understanding was signed with the Australian Tuna Boat Owners Association — the first of a number of memoranda with industry entities providing for the sector developing and maintaining a strategic plan, facilitating communication among members and contributing at least 0.25% AGVP revenue to the FRDC for a period of up to five years, in return the FRDC agreed to support development and management of research and development that addressed the industry sector's priorities.

  [The following year a similar memorandum was signed with the Tasmanian Salmonid Growers Association and in 2001–02 the FRDC continued to develop strategic alliances with industry through signing a memorandum with the Northern Prawn Fishery and Australian Prawn Farmers Association. From 2005 these arrangements were superseded by Industry Partnership Agreements. See **2005-06: Chefs and consumers engaged** and **Appendix D: Status of Industry Partnership Agreements**]
  The FRDC currently has 12 Industry Partnership Agreements (IPAs) covering a significant proportion of the Australian seafood industry by value[28]. The FRDC's targeted investment through these IPAs mirrors the development of new aquaculture species in Australia (eg tuna, salmon, prawns, abalone, rock lobster, pacific oysters, and barramundi). When the IPAs were first instigated the FRDC was guaranteeing a 4:1 return on contributions, however, due to FRDC's need to invest in public good research this return ratio was wound back to 1:0.88. Since 2001 voluntary industry contributions have exceeded that which can be matched by the Commonwealth Government.]

- At the *Aquaculture Beyond 2000* conference sponsored by AFFA and FRDC, participants resolved, after recognising that more than 90% of aquaculture value was derived from five species, that public investment in aquaculture R&D should focus on species that have a high potential for commercialisation. The Australian Government announced it would support an Aquaculture Action Agenda to facilitate aquaculture development.

- As a result of this Agenda, the National Aquaculture Council was formed with Australian Government seed funding **[See Appendix B: FRDC's Representative Organisations]**. Further, the conference resolution was embraced by the FRDC as its future aquaculture investment strategy. The potential to use inland saline water for aquaculture was identified in a national R&D plan funded by the FRDC.

  [Inland saline aquaculture R&D was conducted in NSW, SA, Vic, Qld and WA; however, it wasn't managed on a national basis. FRDC funded NSW DPI to establish demonstration facilities at key locations, study economic feasibility and facilitate investment. In 2007, the NSW component was included in the portfolio of the Seafood CRC with industry partners aiming to commercialise the R&D. The project failed to progress as water availability could not be guaranteed following the millennium drought.

  In 2022, FRDC, in response to renewed interest in inland saline aquaculture, funded NSW DPI to collate available information and identify opportunities. The review also examined why commercial scale aquaculture didn't develop in Australia while major industries have developed elsewhere, including in India (with investment from the Australian Centre for International Agricultural

[27] Led by Dr Ian Knuckey.
[28] Refer Appendix C: Status of Industry Partnership Agreements

Research), Israel and the middle-east, and the USA. Water security, environmental regulations, and difficulties with scalability were the main reasons identified.] [See **2020-21: Covid-19 impacts and responses.**]

- Following a comprehensive review of people development within the industry the FRDC, in conjunction with ASIC, sponsored the inaugural *Seafood Directions* conference in 1999 to encourage the seafood industry to become more strategic and proactive in shaping its future.

  [The FRDC has continued to sponsor the conference (usually biennially), initially alternating with sponsoring *Australasian Aquaculture* conferences. The latter conference ceased in 2014. From 2001 the FRDC also sponsored the biennial recreational fishing conferences. *Seafood Directions* conferences have included an important acknowledgement of exceptional contributions by industry people: the National Seafood Industry Awards. The awards recognise and celebrate the positive contributions of individuals, partnerships, businesses and organisations towards a sustainable and profitable Australian seafood industry. From 2013, the awards categories included inductees to the "Hall of Fame".]

- Based on improved understanding of the importance of sea mounts to the deep-sea environment, industry and fisheries managers agreed to protect a proportion of the Tasmanian sea mounts as a marine protected area.

  [This project was the start of the significant role that FRDC-funded research played in the development of marine protected areas. For a further example see **2005-06: Hand-over at the helm**]

- The FRDC collaborated with the National Land and Water Resources Audit; Australian Geological Survey Organisation; CSIRO; Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management; the University of Queensland; Environment Australia; and state and territory agencies to audit the health status of 970 of Australia's estuaries. The audit concluded that there was more to be gained initially in investing in the protection of healthy estuaries rather than the restoration of damaged estuaries.

  [Much momentum was lost in this project when the Coastal CRC was disestablished. See **2003-04: Where river meets sea**]

- The Institute of Public Administration Australia awarded the FRDC a High Commendation in its 1998–99 Annual Report Awards, commenting that a particularly strong point was the coverage of corporate governance.

  [This was to be the first of a series of national reporting awards by the Institute and the Australasian Reporting Awards, including an ARA gold award.]

The seafood industry's determined AGVP was $2.34b, of which wild-catch was $1.66b and aquaculture $0.68b.

2000–01: Industry response to ESD

An Environmental Management Systems (EMS) initiative between the FRDC and industry placed an EMS facilitator in each state to help the industry to implement environmental management systems and address the national fisheries ESD framework. A decision support methodology[29] provided a template for sector-specific EMS documentation. The aim of the initiative was to help commercial fishers and farmers to manage their operations sustainably principally through improving environmental outcomes but with consideration of economic and social factors.

[Based on FRDC's initial funding, many fisheries and farmers subsequently put in place EMSs supported by Seafood Services Australia and/or OceanWatch Australia; many large sectors moved from EMSs to third-party accredited standards.]

Other significant activities in 2000–01 were as follows:

- Board appointments were new directors Ian Cartwright and David Newton, and re- appointed directors Dr Russell Reichelt (Chair), Simon Bennison, Dr Diana Day, Bill Sawynok and Sandy Wood-Meredith. Dr Derek Staples continued as Government Director.[30] In appointing the new FRDC board, the Parliamentary Secretary varied the term of the appointments in order to have directors appointed before the start of the annual evaluation of FRDC R&D applications, thus giving new appointees adequate time for familiarisation.

- *Investing for tomorrow's fish: the FRDC's research and development plan, 2000 to 2005*, the FRDC's third five-year R&D plan, came into effect. It contained the most comprehensive available description of the Australian fishing industry and its future challenges, based on the changes in the FRDC's business environment envisaged for the following 20 years. The plan modified the previous program structure with the three R&D programs becoming Natural Resources Sustainability, Industry Development and Human Capital Development.

  [A table showing the evolution of the R&D program structure is at **Appendix A: Evolution of the FRDC's programs in successive R&D plans.**]

- The Women's Industry Network Seafood Community (WINSC) was initiated to empower women to take a greater role in seafood industry development.

  [In October 2018 WINSC changed its name to Women in Seafood Australasia (WISA)(https://womeninseafood.org.au/)]

- The first National Recreational and Indigenous Fishing Survey was published. (See FRDC projects 1998-169 and 199-158).

  [See **2022-23: Valuing fishing and aquaculture**]

- The Cooperative Research Centre for Sustainable Aquaculture of Finfish (Aquafin CRC) was established, with the FRDC a major participant, to add significant value to the FRDC's subprograms for Southern Bluefin Tuna and Atlantic Salmon. The CRC attracted $16.5 millions of investment by the Australian Government and more than treble that amount from other CRC participants. It wound up in 2008.

- AFFA appointed the FRDC to project-manage the aquatic animal health components of the Australian Government's initiative, 'Building a national approach to animal and plant health', with a budget of $3.1 million over four years, to be invested in accordance with AFFA's strategic plan for aquatic animal health, Aquaplan.

[29] The methodology, called the "Green Chooser", was at first solely an SSA activity and evolved into a collaborative activity with OceanWatch Australia, which eventually took it over.

[30] Succeeded in 2002 by Glenn Hurry.

[Subsequently, the FRDC instigated an Aquatic Animal Health Subprogram.[31]
AQUAPLAN 2022-27, Australia's fourth national strategic plan for aquaculture, was released in December 2022.]

- The FRDC co-funded an Aboriginal fishing strategy in WA to incorporate subsistence fishing practices in a framework of sustainable use of fish and fish habitat, and to increase Aboriginal people's involvement in commercial fishing, charter operations and fisheries management.

- The Parliamentary Secretary approved a national R&D levy for the prawn farming sector. This levy process — new for the FRDC but commonplace in all other R&D corporations — has resulted from the prawn farming sector's realisation of the benefits of funding and managing R&D within the aegis of the FRDC.

  [The prawn farming sector Commonwealth levy remains the only FRDC R&D levy.]

- The FRDC commenced negotiations with appropriate state governments to have a component of recreational licence revenue provided to the FRDC for investment in R&D related to the recreational sector. The FRDC funded a workshop of recreational fishing representatives and fostered the subsequent development of a recreational sector R&D plan.

  [No untied contributions to the FRDC remain from the recreational sector, except from WA starting 2011-12.]

- The first pilot course of what was to become the Australian Seafood Industry Leadership Program was conducted.

  [The FRDC has subsequently funded the course annually.]

The seafood industry's determined AGVP was $2.44b, of which wild-catch was $1.73b and aquaculture $0.71b.

[31] Led by Dr Eva-Maria Bernoth and subsequently Dr Mark Crane; and re-named the Aquatic Animal Health and Biosecurity Subprogram at the start of the 2015-20 RD&E Plan

2001–02: Major initiative for industry development

Despite the industry's many success stories, market and institutional failure in the seafood supply chain continued to impede the industry's ability to identify and capitalise on many of its opportunities. Increasingly sophisticated global markets require prompt, efficient access to the best knowledge, processes and technology if the Australian seafood industry is to be globally competitive. Seafood Services Australia Ltd (SSA), until then a series of joint-venture R&D projects, had sufficiently demonstrated its potential to deal with those challenges for the FRDC and ASIC to incorporate it as a company limited by guarantee. The inaugural Managing Director of SSA was Ted Loveday.[32]

[ASIC ceased to be a company member of SSA when ASIC was wound up in 2006. The FRDC withdrew as a company member of SSA in 2007, acting on legal advice. By 2009 the company members were the National Aquaculture Council Inc., Seafood Experience Australia Ltd and Sydney Fish Market Pty Ltd. Details of SSA's winding up in 2013 and its legacies are at **2013-14: New roles for the FRDC**]

[To avoid duplication, SSA and FRDC partnership projects are not referenced year by year but are summarised in the description of SSA's legacies.]

Seafood Services Australia Ltd

The company was established with a mission "to enhance the profitability, international competitiveness, sustainability and resilience of the Australian seafood industry".
SSA activity areas were:

- cost-efficient production and processing
- environmental management
- trade and market access
- capitalising on seafood health benefits
- seafood incident response planning
- standards development and implementation
- certification and branding
- networks, alliances and information.

These activity areas were achieved through many relationships with industry associations and other industry entities; agencies of the federal, state and territory governments; international entities; research providers and other service providers.

Other significant activities in 2001–02 were as follows:

- A new Chair, Denis Byrne, was appointed.

- The FRDC celebrated its tenth anniversary during the year. During a celebratory dinner, FRDC achievements were acknowledged by many industry leaders. Inaugural Chair Bill Widerberg recalled that the fishing industry remained unattracted to the idea of contributing financially to the FRDC: The problem was that research had been used against industry — to take away access or quota — or for researchers to investigate their areas of special interest. It was the inaugural board's aim to assist industry to find solutions and remove barriers to progress.

  Dr Russell Reichelt, upon retiring as FRDC Chair, commented that statutory authorities such as the FRDC were often confronted with the need to satisfy government and industry stakeholders in ways that may conflict, even to the point of having legal consequences. So far, the FRDC had managed these tensions well and to the satisfaction of all stakeholders. FRDC chair Denis Byrne emphasised that the message from the largest investor in fisheries R&D — the Australian Government — was that R&D corporations must increasingly focus on delivering good outcomes to the wider

[32] Succeeded in 2013 by Michelle Christoe.

community, not just immediate stakeholders, and that communication of research results to all potential end-users is essential.
Noted Sydney restaurateur Peter Doyle said:

The seafood industry owes the directors and staff of the FRDC a vote of thanks for your tremendous efforts. Congratulations!

- In Oct 2001 the Australian prawn farming industry became the first Australian seafood sector to implement a compulsory federal levy based on production, to fund research and development.

- DAFF initiated an amendment to the PIERD Act to change the way in which the AGVP was calculated; without consulting with, or advising, the FRDC.

  [The consequence of the way in which this change was handled was that DAFF overpaid the FRDC $1.9 million over six years - the FRDC paid the debt off over a further six years.]

- The board determined the activities in which the FRDC would not invest, consistent with the FRDC's legislative and policy underpinnings.

  Activities in which the FRDC will not invest
  - routine stock assessment or other routine management activities
  - fisheries re-stocking
  - exploratory fishing
  - direct marketing of fish and fish products
  - direct promotion of the fishing industry
  - environmental or quality certification of fisheries or enterprises
  - training when other funding sources are more appropriate
  - capital, unless related directly to the marginal costs of undertaking R&D
  - venture capital.

  [In more recent years the FRDC has taken a more discretionary approach to activities in which it will not invest.]

- The FRDC played a major role in helping the Tasmanian oyster industry to incorporate Australian Seafood Industries Ltd to commercialise the results of selective breeding of Pacific Oysters.

  [This was the culmination of years of FRDC investment in the genetic improvement of Pacific Oysters. In a similar vein, the FRDC later worked with the NSW oyster sector to form the Select Oyster Co. Ltd (SOCo) to commercialise the Sydney Rock Oysters breeding program. SOCo was wound up on 15 March 2021 because it was not financially sustainable. This was due to a number of factors: a wild supply of Sydney Rock Oyster spat (in contrast to Pacific Oysters), a shortfall in hatchery spat, and less than optimum performance of hatchery spat (perceived or otherwise), and lack of industry comprehension of the program.]

- In pursuing its R&D plan, the FRDC worked with the Aboriginal and Torres Strait Islander Commission to develop a cost-effective consultative framework with the aim of having the Minister appoint an Indigenous body to join with ASIC and Recfish Australia as a representative organisation. In parallel, the FRDC wrote to each FRAB requesting the appointment of a suitably qualified Aboriginal or Torres Strait Islander person on each FRAB, as was the case on the NSW FRAB. In a similar vein, the Minister for Agriculture, Fisheries and Forestry, Warren Truss, wrote to all RDCs seeking support for the Government's advance towards Indigenous reconciliation. In particular, the Minister encouraged the RDCs to ensure their programs were responsive to the needs of Aboriginal and Torres Strait Islander people and that they considered how the corporations' activities might affect them.

  [After several efforts proved unsuccessful, an Indigenous Reference Group was formed in 2011. See **2011–12: Telling the story: science for the community**. However, no Indigenous body has yet been appointed as a representative organisation.]

The seafood industry's determined AGVP was $2.43b, of which wild-catch was $1.70b and aquaculture $0.73b.

2002–03: Increased focus on R&D outcomes

In an address to the chairs of rural R&D corporations, Senator Judith Troeth, Parliamentary Secretary, stated that:

> Many research organisations measure performance on the basis of the number of patents, or level of commercialisation, as an indicator of performance. However, demonstrating that research is actually being adopted by rural end-users is fundamental to the rural R&D corporation model.

She added that the R&D corporations had to provide hard evidence of success and the value delivered to the nation through the funding partnership between government and industry. To this end, the FRDC asked the Australian Fisheries Management Forum, comprising directors of Australia's fisheries management agencies, to help it in quantifying R&D outcomes — i.e., what happens when the results of R&D are implemented — of FRDC's investment in projects related to fisheries management. Such involvement of fisheries managers was significant, because they were the end-users of the 60% of the FRDC's R&D budget that was invested through the Natural Resources Sustainability Program.

Until 2002, the FRDC had expressed its R&D investment priorities in a very broad way to allow researchers and end-users of R&D to respond more freely than they would have been able to do if the priorities had been highly prescriptive. However, the board decided that if R&D were to achieve significant, measurable outcomes from FRDC investment, a higher degree of prescription was needed. As part of its own activities in line with the Australian Government's increased focus on outcomes, the board held a workshop with the FRABs and other stakeholders to identify more explicit R&D priorities within the FRDC's program structure. The priorities (listed below) took particular account of key elements of the nine challenges concerning the fishing industry and fisheries natural resources identified in the R&D plan, and issues identified by the Australian Fisheries Management Forum.

Other significant activities 2002–03 were as follows:

- For some years, state governments had queried why they had a role in collecting industry contributions to be passed to the FRDC for fisheries R&D, in contrast with other industries, which were sustained by a Commonwealth R&D levy that did not involve state governments. The FRDC therefore obtained legal advice, which was that there was no obligation on the Commonwealth to match industry payments that were made directly to the FRDC, rather than through a state or territory, and that in order for an obligation to be imposed on the Commonwealth to rectify this anomaly, an amendment would need to be made to the PIERD Act regulation.

  [The lack of Commonwealth R&D levies required the collection mechanism to continue and to remain a point of contention between the FRDC and some jurisdictions. It also occasionally resulted in the contributions from some jurisdictions being less than the maximum that would be matched by the Commonwealth. The 2013 amendments to the Act provided for a fishery to be declared a "separately levied fishery", and for levies collected by Commonwealth processes to be matched without state or territory government involvement. A separately levied fishery is yet to be created.]

  Priorities for FRDC investment

  - Develop alternative fisheries management structures and methods that:
    - provide for ecosystems-based fisheries management
    - are based on the precautionary principle[33] and appropriate risk management strategies

[33] The precautionary principle, sometimes erroneously cited contrary to its intent (i.e., as a rationalisation for postponement of action), is defined in clause 3.5.1 of the **Intergovernmental Agreement on the Environment 1992** as follows:

  - provide for maximisation of economic and social returns from fisheries through robust resource allocation methods
  - provide for effective management of recreational fishing
  - recognise the varying levels of need for government involvement in fisheries management (i.e., as reflected by large self-managed fisheries, full-cost-recovered fisheries, small fisheries, data-rich fisheries and data-poor fisheries)
  - recognise varying levels of property rights
  - are cost-effective.
- Develop ways of increasing the quality and numbers of new industry leaders to accept increased responsibility for fisheries management and industry development.
- Assess Australia's potential to address its likely 80,000-tonne seafood deficit in 2020 through high-volume, low-value aquaculture and improved use of wild-catch resources.

- Australia's first national research priorities[34] were announced by the Prime Minister in December 2002, dealing with an environmentally sustainable Australia; promoting and maintaining good health; frontier technologies for building and transforming Australian industries; and safeguarding Australia. Subsequently, the Parliamentary Secretary issued updated Australian Government priorities for rural R&D in the light of the new national research priorities. The FRDC responded quickly to both sets of new priorities, incorporating them into its reporting processes.

- As a result of the FRDC working with potential industry shareholders, Australian Seafood Co-products Pty Ltd was incorporated to commercially utilise the many thousands of tonnes of fish waste thrown away each year by the processing and retail sectors of Australia's seafood industry.

  [The company ceased operating in 2020 without having the envisaged national impact.]

- The National Strategy for the Survival of Released Line Caught Fish examined the mortality rate of fish caught on lines and released by Australia's four million recreational fishers and commercial fishers.[35] The project employed the reverse of the usual science-directed approaches. First, surveys conducted by the Roy Morgan polling company determined which sources of information recreational fishers most trusted and how amenable they were to change. The information gained was then used to focus the science on "the art of the possible" in influencing the fishers to modify their practices.

- The FRDC collaborated with the Kondinin Group, Primary Industries and Resources SA and the fishing industry to develop a high-quality educational book, *The Story of Seafood in Australia*, for children of primary school age. A comprehensive teacher's resource kit applied the material across all subject areas, including mathematics. The project won one of *The Australian* Awards for Excellence in Educational Publishing.

  [This Perth-based initiative achieved varying levels of success, particularly in the eastern states, and was overtaken by other activities such as the Seafood Industry Partnership In Schools (SIPS) Program funded by the FRDC and undertaken by OceanWatch Australia (OceanWatch). The program opened new channels of communication between the seafood industry and the community through interactions with schools. A pilot was held in Tasmania between 2009 and 2011 that created a formal collaborative partnership between OceanWatch, the Tasmanian Seafood Industry Council, the Tasmanian Department of Education, and members of the Tasmanian seafood industry. It had two streams: Adopt a Fishing Boat and Adopt a Marine Farm. Over thirty partnerships were created delivering face-to-face information, including career advice, to over five hundred school students and teachers. As a result of this success, SIPS won the 2011 Tasmanian Seafood Industry Award

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Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:

1. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment
2. an assessment of the risk-weighted consequences of various options.

[34] See Appendix C: National Science and Rural Research Priorities

[35] Led by Bill Sawynok.

for Promotion. In following years OceanWatch continued its SIPS program with various sources of funding, including FRDC. It expanded the program to include the metropolitan areas of Sydney, Newcastle and Wollongong. The program used commercial fishers, aquaculturists and other workers as educators and advocates for the seafood industry. SIPS also broadened its reach into the community through involvement in events such as fetes, festivals and shows, as well as through online and print media and publications, helping raise the profile of the seafood industry. In December 2023, with funding from the NSW Government Department of Primary Industries and the NSW Seafood Industry Council, OceanWatch released a series of educational materials on sustainable seafood harvested in NSW that provided teachers with a comprehensive set of resources that could, among other things, lead to the strengthening community support for NSW commercial fishing and aquaculture based on an increased awareness of the economic and social contributions of NSW seafood production to local and regional communities. These materials (SIPS 2030) were used by teachers at the start of the 2024 academic year, with the hope that the new online format would enhance the longevity of the resources to 2030.]

The seafood industry's determined AGVP was $2.43b, of which wild-catch was $1.73b and aquaculture $0.70b.

2003–04: Where river meets sea

Estuary health is key to the productivity of most Australian fisheries; and key to ecosystem resilience in the face of climate change.

In developing the *Natural Resources Land and Water Audit* (1997 – 2002) its Executive Director, Colin Creighton, specifically added two issues to those natural resources issues to be assessed by the Audit; namely soil health and estuaries. These additions received approval from the then Ministers for Agriculture and the Environment (Minister John Anderson and Senator Robert Hill respectively). Both these additions have proven to be particularly important to Australia's terrestrial and marine productivity and profitability. These approvals cleared the way for an Australia-wide assessment of estuary condition lead by the University of Queensland in collaboration with all states and territories. One of the summary outputs was the 2004 *Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management* (Coastal CRC) publication *Where river meets sea*. This publication, and the extensive work underpinning it, was funded by the *National Land & Water Resources Audit* (*Natural Heritage Trust*) and, to a smaller extent, the FRDC. The Audit spatially referenced and assessed all Australian estuaries (over one thousand); and aimed to enhance estuary literacy among Australians and to champion the cause of estuary protection and management.

The Audit had been preceded by many decades of draining wetlands for farming, urban or flood mitigation in Australia. For example, the Clarence is the largest NSW coastal catchment and has the largest NSW floodplain. The Clarence supports the largest estuarine-based fishery in NSW. The onset of ostensibly "flood mitigation" activities in the 1970's co-funded by Australian and state governments led to major wetland losses, blocks to fish passage, and exposure of acid sulphate soils. Fish kills and diseases such as red spot resulted from low dissolved oxygen and very acidic discharges to the estuary following floods. These impacts on estuary productivity are substantial, and have grossly impacted on the school prawn, king prawn and scale fish fisheries dependent on estuaries.

FRDC funded work in the early 1990s on wetlands, acid sulphate soils and floodgates around the Clarence and Richmond rivers.

Australia is still missing the major investments and the major repair opportunities with the greatest long-term impact. To address this gap would require significant Australian Government leadership building on strong support from both recreational and commercial fishers.

[In 2005 OceanWatch Australia(OceanWatch), a national marine natural resource management organisation, commenced a program entitled "Tide to Table". Tide to Table was adopted to reinforce the message that actions on land affect the productivity of fisheries, specifically fish habitat and water quality. The program integrated the seafood industry's needs into local natural resource management, actioning $8 million in on-ground works between 2005 and 2013 in Queensland and New South Wales. The program's success was due to its ability to engage local farmers and seafood producers, businesses, communities and government agencies in a common cause; to rehabilitate a river system or estuary and improve its water quality, fish and seafood habitat and rebuild the health of the immediate environment. OceanWatch continues to invest in blue green innovations such as living shorelines (a softer

alternative for foreshore erosion), whale entanglement mitigation, shellfish reef repair, threatened, endangered and protected (TEP) species education, and foster a number of marine community of practices to extend research to practical implementation.]

In 2012 the FRDC invested in:

- documenting the decline in fisheries productivity due to habitat loss Australia-wide and estimating the productivity opportunities of repair. For example, with over 1500 blockages estuary channels / loss of habitat on the Burdekin floodplain and over 5500 barriers to connectivity in the wet tropics between Ingham and Port Douglas, fisheries productivity has been significantly lost.
- developing a business plan aimed at revitalising estuaries and wetlands for carbon sequestration, biodiversity, fisheries and the community. The Ozfish initiative (reference below), focussing on recreational fishers, grew out of this work. See page 74.

Over time a number of states have invested in small scale and very useful habitat repair. Examples include restoration of shellfish reefs (oysters and mussels) in Port Phillip Bay in 2014 (led by the Albert Park Fishing Club in partnership with The Nature Conservancy). The methods have since been applied to reefs in South Australia, Western Australia and Queensland. The South Australian initiative (refer https://pir.sa.gov.au/fishing/recreational_fishing/windara_reef) was supported by $1m from the Australian Government's Department of Infrastructure – its first natural infrastructure investment.

In 2018-19 The National Habitat Strategy building on multiple collaborative initiatives and FRDC projects was completed, and will be used in future to inform large scale rehabilitation programs (refer https://ozfish.org.au/national-fish-habitat-strategy/)]

Other significant activities in 2003–04 were as follows:

- Board appointments were new directors John Harrison, Professor Tor Hundloe, Dr Nick Rayns and Stuart Richey, and re-appointed directors Simon Bennison and Ian Cartwright. Denis Byrne continued as Chair and Glenn Hurry as Government Director.

  For the first time, voluntary contributions to the FRDC exceeded the maximum levels that were matchable by the Australian Government. Although this matching incentive for industry to contribute to the FRDC softened, contributions have continued to exceed the maximum matchable due to several factors that include confidence that the industry has in FRDC's governance arrangements; and cash contributions tied to specific projects. See **Appendix G: Voluntary contributions as a percentage of the maximum matchable** for the history through time.

- Two surveys — spanning five years, more than 100 projects and more than 300 end-users conducted as a PhD project by Alex Wells, a former FRDC staff member, showed that "the vast majority of end-users considered the FRDC's R&D projects to be valuable in terms of results, to be of high priority and to be meaningful for the fishing industry and/or the community". A majority also reported that objectives were achieved, and results were adopted. At the same time, they identified areas where improvements may be warranted, such as in communication between end-users and researchers, and in participation by industry.

- The FRDC had recognised that the seafood industry, unlike other primary industries, had little capacity, through a marketing authority or otherwise, for generic promotion. The higher value of the Australian dollar, the outbreak of Severe Acute Respiratory Syndrome and the strengthening of competition in overseas markets had increased the need for the seafood industry to do more product promotion at the industry sector level — as distinct from enterprise level. Several sectors shared this view and looked at ways to fund promotion. In response, the FRDC took the first steps towards gaining legislative capacity to receive and manage sector levies for such promotion activities, much as it did for the sea-caught prawn sector under the former *Prawn Export Promotion Act*. The FRDC received strong support for the initiative from industry; however, further action depended on a Government response that was not to be forthcoming for six years.

  [The response came in a letter dated 6 July 2010 from the minister responsible for fisheries, the Hon. Tony Burke, who sought advice from industry leaders about support for a compulsory marketing levy and whether it should be applied at sector level or whole-of-industry level. The resulting amendment to the Act in 2013 enabling the FRDC to undertake

marketing activities was in keeping with the Productivity Commission's recommendations about best-practice science investment in its 2011 report, *Rural Research and Development Corporations* (page 36).]

- Elements of the FRDC annual report were singled out as examples of good practice in a review by the Australian National Audit Office and the Department of Finance and Administration, and were extensively featured in the resulting book, *Better practice in annual performance reporting*.

The seafood industry's determined AGVP was $2.21b, of which wild-catch was $1.48b and aquaculture $0.73b.

2004–05: Hand-over at the helm

Peter Dundas-Smith, Executive Director of the FRDC since its establishment, retired. Reflecting the increasing focus on developing people in the industry and those who support it, and with a reference to the strong personal theme of Dundas-Smith's tenure, the board instigated a Leadership Scholarship in his name. It provided personal mentoring and $10,000 towards "an activity that will improve [the winners'] ability to contribute as leaders in their chosen field". Mr Dundas-Smith's successor was Dr Patrick Hone, previously FRDC Programs Manager.

[The leadership Scholarship ceased in 2016 after an internal People Development Program review.]

Other significant activities in 2004–05 were as follows:

- John Harrison resigned from the board with effect from 30 April 2005: on becoming an executive of a representative organisation he ceased, in accordance with s.18 of the PIERD Act, to hold office as a director. David Bateman, whose expertise was in recreational fishing, began attending board meetings as an observer until the next board was appointed in 2007.

- The FRDC's first stakeholder survey was conducted. It revealed that the FRDC had a very high level of recognition by the industry and was well regarded. Areas for increased investment were identified. Responses supported a view that the best partnerships for future investment were with industry councils.

  [The FRDC now commissions regular stakeholder surveys. See https://www.frdc.com.au/market-research See also **2014-15: New roles for the FRDC** regarding a significant uplift in the number of indicators of stakeholder awareness.]

- The stakeholder survey also revealed that *R&D News*, the FRDC's magazine, needed a revamp: many people thought there was too much focus on researchers and that more content should focus on the interests of industry people. The magazine adopted a new focus in February 2006, before being significantly re-branded as *FISH* in June 2007.

  [In 2016 the FRDC started sending extracts from FISH in the form of Fish E-Newsletter to food service and retail operators. In 2022 the FRDC published its final edition of FISH. In announcing this, Patrick Hone said, "The research project articles or media releases that were shared through FISH magazine will still be written, but they are now being communicated through a range of channels. FRDCs primary communications channel will be the monthly digital FRDC News.]

- In conjunction with the National Aquaculture Council and the Tasmanian Aquaculture Council, the FRDC sponsored the inaugural *Australasian Aquaculture* conference.

  [The FRDC continued to sponsor the conference biennially until 2014, alternating with *Seafood Directions* conferences.]

The seafood industry's determined AGVP was $2.09b, of which wild-catch was $1.45b and aquaculture $0.64b.

2005–06: Chefs and consumers engaged

In a closer focus on consumers, the FRDC set out to educate many of the next generation of opinion leaders in the food sector. It did so by engaging with chefs, who are uniquely positioned to provide advice on the best way to prepare and eat seafood. Chefs influence consumers hugely, especially through the print media and television food programs. As end- users of large volumes of seafood, chefs can also help producers to understand trends in the marketplace, including changes in consumer tastes, the need for quality and consistency, and appropriate ways in which seafood should be sold.

Other significant activities in 2005–06 were as follows:

- *Investing for tomorrow's fish: the FRDC's research and development plan 2005–2010*, the FRDC's fourth five-year plan, came into effect. Like its predecessor, the plan was based on forecast changes to the FRDC's business environment and redefined the Corporation's strategic challenges. The FRDC's program structure was further enhanced, as shown in **Appendix A: Evolution of the FRDC's programs in successive R&D plans.**]

- Following a wide review of Australian Government statutory authorities' corporate governance by John Uhrig, the Government announced that R&D corporations would remain in place under the CAC Act, with their own boards. The Government ratified the rural R&D corporation model as the preferred mode for engaging in government–industry partnerships. However, the PIERD Act was amended to discontinue the position of government director and expand the range of desired expertise for selection of directors to include government policy processes and administration. The reasons were that appointment of government directors was inconsistent with a skills-based approach and that discontinuance would remove potential conflicts of interests in responsibilities to the department and the minister and responsibilities to the board and the R&D corporation. The loss of the government director reduced FRDC's interaction with the Department, and meant that it had to work more actively to engage with the Commonwealth Government. The review clearly identified that the FRDC board's role was to establish strategy, manage risk and opportunity (entrepreneurial), and monitor and respond to performance from its R&D investment.

  [Subsequently the FRDC prepared a Statement of Intent required by the Government, incorporated it into the 2007–08 annual operational plan, and started to integrate it into its reporting framework. The loss of the government director reduced FRDC's interaction with the Department, and meant that it had to work more actively to engage with the Commonwealth Government; for example, by increasing communication with the Minister and DAFF through monthly reporting.
  The Parliamentary Secretary also suggested that RDCs improve their level of collaboration, implement a quantitative impact assessment and reporting framework between them, and improve their level of investment in people development.]

- The Productivity Commission issued a report, *Public Support for Science and Innovation*. It made no RDC-specific recommendation but commented on what it saw as best-practice science investment. It reinforced the collective need of the RDCs to measure the benefits of the Australian Government's investment. Further, its commentary on spill-over benefits shifted the emphasis of public good funding to include measures of community benefit since in recent years public good funding had focused more on direct industry or commercial benefits. The Commission acknowledged that government funding could be seen as industry subsidy and that taxing powers could be considered as being used to give private benefit. It concluded that the Australian Government needed to focus more on public good research.

- A new FRDC funding framework was implemented, with five key areas:
  1. an annual competitive open round that focussed on the public good
  2. a tactical research fund to invest $1.75 million on small projects (less than $75,000 and fewer than 18 months maximum duration) through four rounds a year (subsequently three)
  3. national strategic investment (in which the board would initiate partnerships to fill nationally applicable R&D gaps that it identified in the interests of public good)

4. increased partnership with large industry sectors (such as Southern Bluefin Tuna, Southern Rock Lobster and Atlantic Salmon) through Industry Partnership Agreements (IPAs), replacing memoranda of understanding
   [Subsequently, additional IPAs were signed with major sectors and sectors with growth potential. The status of IPAs is in **Appendix D**: **Status of Industry Partnership Agreements**]
5. further increased focus on people development, reflected in allocation of 10% of the FRDC R&D budget to people development.

- A review and assessment of the impacts of the proposed broad areas of interest for Marine Protected Area (MPA) development in the South East Region was concluded. Professor Colin Buxton and an expert team examined 14 proposed MPAs in a way that could be substantiated by science; the Australian Government accepted a majority of the recommendations. In a win–win outcome for the industry and the environment, the final agreed MPAs provided a marginally improved set of conservation and biodiversity outcomes compared with those originally proposed. The impact on the commercial wild-catch sector and its infrastructure and associated communities was expected to be far less than what may have been the case under the original proposals. The project brought a benefit–cost ratio of 959:1 for its $37,500 cost.

The seafood industry's determined AGVP was $2.17b, of which wild-catch was $1.42b and aquaculture $0.75b.

2006–07: Seafood Cooperative Research Centre established

Cooperative research centres relating to the seafood industry had existed alongside the FRDC since 1993 and co-invested significant Australian Government funds into many FRDC-managed projects. The need for a new CRC stemmed from recognition that the Aquafin CRC was due to wind up in 2008–09: without a follow-on entity, significant increased demand would be put on FRDC funding. Previous CRCs had focused on aquaculture development, so the challenge was to find a theme for a new CRC that would meet the Australian Government's criteria and not to be, nor appear to be, "more of the same".
Many of the major sectors of the seafood industry, both wild-catch and aquaculture, had benefited from the millions of dollars that the FRDC and previous CRCs had invested in ensuring the sustainable development of their production, and were now shifting their R&D priorities further along their supply chains. Consequently, at an initial workshop of industry and research leaders, it was decided that any new CRC should be built around the R&D needs of the "big end of town" as this would afford the CRC most opportunity to realise the significant economic outcome required by the CRC programme criteria.

Spurred by the urgent need for a national approach to closing major gaps in the seafood industry value chain, during 2005 and 2006 the FRDC and key industry entities developed a case for investment by the Australian Government's Cooperative Research Centres programme.

In December 2006, the Australian Government approved the establishment of the Australian Seafood Cooperative Research Centre with a cash investment of $35.5 million, making it the second-largest of all Australian CRCs until then. The FRDC invested some $31 million (including participants' contributions made through the FRDC) over seven years. Non-FRDC participants contributed some $16 million over the seven years. Total Australian Government and industry investment was $152 million ($82 million in cash and $70 million in-kind). In 2007 the Seafood CRC Company Ltd was formed; the CRC board, Chaired by Peter Dundas-Smith, was elected by participants; and associated governance arrangements were put in place.[36]

The Seafood CRC's planned outcomes

- Substantial increase in the production and profitability of selected wild-harvest and aquaculture species.

[36] The Seafood CRC's agreement with the Australian Government took effect on 1 July 2007.

- Increased demand and access to premium markets for Australian seafood; fulfilment of consumer demands for safe, high-quality, nutritious seafood products; and increased profitability throughout the value chain.

The scope of the CRC's research (both pre-harvest and post-harvest activity) spans the entire value chain from production to consumer. The economic benefits of the CRC are estimated to add $445 million to gross domestic product in Year 5 and more than $520 million in Year 10.

[The Australian Government approved a non-funded extension to the Seafood CRC to take it to June 2015. Details of the Seafood CRC's winding up in 2015, and its legacies are at **2014-15 Seafood CRC leaves its mark**]
[To avoid duplication, Seafood CRC and FRDC partnership projects are not referenced year by year but are summarised in the description of Seafood CRC's legacies.]

Other significant activities in 2006–07 were as follows:

- Board appointments were new directors Dr Ray Johnson, Dr Paul McShane, Frank Prokop, Richard A. Stevens and Richard N. Stevens, and re-appointed director Stuart Richey. Denis Byrne continued as Chair and Glenn Hurry as Government Director.

- ASIC ceased trading because of lack of financial support from the state industry councils. This had wide ramifications, particularly for the FRDC because ASIC was — together with Recfish Australia — a representative organisation under the PIERD Act, and because it was a company member of Seafood Services Australia Ltd.

- The Minister declared the National Aquaculture Council and the Commonwealth Fisheries Association representative organisations under the PIERD Act.

  [NAC was deregistered as an incorporated association in Feb 2018[37].]

- In the absence of an Australian Government response for the FRDC to manage a levy for seafood promotion, Seafood Experience Australia Ltd was incorporated by some industry leaders. The FRDC contributed to the establishment cost of the company in its endeavour to have seafood promotion legislation and an associated levy enacted.

  [The SEA initiative was overtaken by a number of events including the role undertaken by the Seafood CRC in market development; the collection of voluntary funds from the Abalone and prawn sectors for marketing; and the amendment to the FRDC enabling legislation to provide "for the funding and administration of marketing relating to products of primary industries".]

The seafood industry's determined AGVP was $2.22b, of which wild-catch was $1.41b and aquaculture $0.81b.

[37] See Appendix B: FRDC's representative Organisations

2007–08: People development ramped up

For some years, the board had been disappointed by the relatively low numbers of applications for funding under the People Development (previously Human Capital Development) Program: they were inadequate, in number and focus, to meet the challenges identified in the R&D plan. In 2006, they totalled less than 5% of R&D expenditure. The board therefore commissioned a review of the People Development Program to assess how far it met the current needs of industry, and how it could be re-oriented to meet future needs. The review found that, although the FRDC had demonstrated a long-standing commitment to investing in people development, its investment had lacked a strong strategic focus and had been confined largely to sponsoring leadership development programs and research scholarships.

In response to the review's recommendations, in May 2007 the FRDC recruited a manager to implement the recommendations of the review through a more focused program; and appointed an advisory group to guide activities.

[The FRDC has always recognised the pivotal role that people play in marine estate management and has devoted significant resources to developing people through, for example, its People Development Program. FRDC has invested in people with a view to making a difference, and leaving a legacy of resilience and adaptation in the face of change.]

Other significant activities in 2007–08 were as follows:

- Peter Neville was appointed as FRDC Chair.
- The FRDC started R&D focused on the needs of the recreational fishing sector under the guidance of a new working group named *Recfishing Research*.

  [*Recfishing Research* continued for over a decade, eventually becoming a FRDC coordination program. The program has an aspiration to take a more delegated approach to the management of the coordination program in partnership with the national peak recreational fishing body; the Australian Recreational Fishing Foundation (ARFF). Discussions between FRDC and ARFF continue to explore the best model for this, noting the limited capacity within the peak body. Recfishing Research held a future-focussed workshop in November 2018.]
- The FRDC joined the new Council of Rural Research & Development Corporations (CRRDC) charged with instigating high-level reports to the Minister for Agriculture, Fisheries and Forestry concerning, for example, national rural RD&E strategy and priorities and assessment of current delivery mechanisms.

  [The Council of Rural RDCs serves as a forum for Australia's 15 Rural Research and Development Corporations (RDCs and IOCs) to discuss and address issues collectively, ensuring that they work together effectively to deliver economic, environmental, and social benefits for rural communities. By focusing on collective action, the Council aims to achieve the best outcomes and maximise impact in the rural sector.
  The CRRDC was instrumental in the formation of Agriculture Innovation Australia (AIA) in late 2020. FRDC was a founding member, along with the other Rural Research and Development Corporations. AIA focuses on areas with greatest impact across multiple agricultural industries, where individual industry investment is unlikely to be effective. Refer 2021–22: Agriculture Innovation Australia Ltd (AIA)]
- Following a board review of its functions, the board issued its first Corporate Plan to guide its own activities. The aim was to make the FRDC more effective as a successful business delivering outcomes to its stakeholders. It included the following corporate goals:
  1. Demonstrate the rate of return on R&D investment.
  2. Evaluate options for alternative business models and implement the preferred model.
  3. Conduct a business efficiency review.
  4. Build and maintain effective industry and government partnerships.
  5. Develop an effective communication plan.
  6. Establish a national investment allocation framework for public-good R&D.

7. Develop mechanisms to deliver better adoption of fisheries R&D results.

[In February 2024 the Board agreed an update to those corporate goals (renamed "strategic goals") as follows:
1. To have the partnerships and co-investment necessary to deliver maximum RD&E impact in priority areas
2. To broaden the investment base and ensure the investment across the corporations evolving stakeholder mix is balanced.
3. To have flexibility in how business is conducted to ensure:
    a. heightened capacity for embracing failure.
    b. support for calculated risk taking and appropriate increase in risk appetite.
    c. exploration of complex and uncharted territories.
    d. ability to refine, iterate and/or swiftly reject ideas as appropriate.
    e. opportunities to address emerging stakeholder needs are actively sought and acted upon.
4. To have a robust and defensible method applied for the evaluation and quantification of economic and social impacts of FRDC investments.
5. To have stakeholders aware and supportive of who we are and what we do.
6. To optimise our people's efficiency through streamlined administrative processes]

- Changes were introduced to reduce the time spent by the board evaluating R&D projects and devolving more of that function to experts in industry and government. More emphasis was placed on thematic development of R&D[38].

- The FRDC launched *Co-management: Managing Australia's fisheries through partnership and delegation*, a report by the FRDC's national working group[39] on fisheries co- management. Since fisheries managers cannot manage wild fish — only the behaviour of fishers and, to a severely limited extent, some aspects of the ecosystems on which they depend — far closer collaboration is needed for "total ecosystem" management of fisheries. Genuine interaction and partnerships are at the heart of co- management, but practical ways of achieving it had proved exasperatingly difficult. This practical "How to" guide provided a flexible framework to be applied at various levels of co-management. It was widely hailed by industry and fisheries managers.

[FRDC started investing in fisheries co-management research in the early 2000s focused on delivering cost savings for industry and government, and the opportunities for building on social capital development across fisheries, stakeholders and the community. FRDC invested in some 20 co-management projects just between 2005 and 2011. Most industry organisations (and some government agencies) have adopted a "wait and see" attitude dependent on the reviews of current co-management trials to demonstrate that real costs and benefits are achievable. Others continue to seek funding for additional trials designed to confirm successful results in different situations. The FRDC is taking the following approach:
1. limiting further investment in co-management to those projects which contribute to the proving of concepts and the understanding of costs and benefits.
2. supporting the development of a "mentoring" capacity within its extension program to communicate the lessons and research outcomes on co-management implementation within fisheries.
3. using its People Development Program to support the development of individual skills and organisational capacity building relevant to co-management
4. taking every opportunity to involve recreational fishers, wild harvest fishers, conservationists, indigenous fishers and community members in discussions about co-management]

The seafood industry's determined AGVP was $2.21b, of which wild-catch was $1.34b and aquaculture $0.87b.

[38] This FRDC board further devolved RD&E investment decision making in 2019. (See 2018–19: Kingfish the new salmon?)

[39] Led by Peter Neville.

2008–09: World breakthrough in innovation

The huge progress made by Australian fisheries research since the 1990s was exemplified by a world scientific coup: the raising of juvenile Southern Bluefin Tuna (SBT) in captivity.

Since 1992, SBT caught off the SA coast had been fattened for about 12 months in sea cages for the Japanese sashimi market, now worth about $250 million a year. Clean Seas Tuna Ltd, with the support of the FRDC, Seafood CRC and other agencies, selected some of those fish as broodstock and transferred them to a purpose-built onshore facility. Their spawning in spectacular fashion was an exciting development: spawning had been notoriously difficult to induce in this species because it resulted not from biological inevitability but from environ- mental cues during migration from the Great Australian Bight to spawning grounds in the Java Sea. These cues of the sea migration route were mimicked in a tank in which variables such as water quality, light, temperature and feed were assiduously controlled. The breakthrough presented huge potential for Australian aquaculture to help to materially fill the growing gap between world demand for premium seafood and its supply.

[In 2013, Clean Seas Tuna made the business decision to suspend its SBT breeding program.]

Other significant activities in 2008–09 were as follows:

- The FRDC funded the University of Tasmania to build economic capability to improve the management of marine resources in Australia.

  [FRDC funding ceased in 2011, however, the University of Tasmania continues to deliver courses in fisheries economics.]

- The FRDC established its Social Sciences Research Co-ordination Program to work with industry, researchers, and government agencies to increase awareness and develop tools to help them incorporate people considerations into their work.

  [In 2017 the FRDC renamed the program *Human Dimensions Research (HDR) Subprogram*.].

- The FRDC implemented a formal RD&E Investment Evaluation Framework that included:
  - an agreed national plan
  - key performance indicators and targets for measuring success
  - an investment framework that ensured investment against priorities where research can contribute to a significant improvement
  - total portfolio evaluation based on RDC evaluation methodology
  - ongoing review by the board of planning and investment framework based on performance against KPIs.

  [In 2020 FRDC joined the Council of Rural RDCs in developing cross-RDC key performance measures and indicators. In 2021 FRDC instigated and led the first joint RDC Performance Community of Practice, and added bi-annual web-based performance reporting with the aim of providing a more accessible account of performance for a broader range of stakeholders. In March 2022 FRDC published its first annual digital performance report aimed at helping communicate the outcomes of its research and shape its future investments. It is a dynamic, six-monthly report and is a companion to the annual report. (See Interim Performance Report)]

- In conjunction with the National Aquaculture Council (NAC) the FRDC, at the 2008 *Australasian Aquaculture* conference, proposed an annual target for aquaculture production of 100,000 tonnes by 2015. Production, at that stage about 56,000 tonnes, was expected to increase particularly through Atlantic Salmon, Barramundi, Yellowtail Kingfish, oysters and abalone.

  [In 2015 the aquaculture tonnage was 89,217 tonnes. See **2018-19 Is kingfish the new salmon**]

- Following a decision to unify the processes for evaluating cost–benefits across the entire RDC portfolio, the FRDC started to evaluate 18 clusters of R&D projects conducted between 2003–04 and 2007–08 that would produce statistically valid results. The clusters were aggregated from 34 projects in which the FRDC had invested $96 million. The return on FRDC investment across three programs during the previous five years was found to average 5.6:1.

  [This process continued: see **2012-13**. Evaluation of non-economic benefits remains difficult.]

- Land and Water Australia, the R&D corporation that received funding from the Australian Government for public good activities, was abolished. This was the second R&D corporation to be abolished, the first having been the Energy R&D Corporation in 1997.

The seafood industry's determined AGVP was $2.21b, of which wild-catch was $1.35b and aquaculture $0.87b.

2009–10: New national strategy for RD&E

Working Together: the national fishing and aquaculture research, development and extension strategy 2010 was approved by the Primary Industries Ministerial Council (PIMC) as a component of the new National Primary Industries Research, Development and Extension Framework.[40] Its intent was to encourage collaboration and promote continual improvement in national investment in primary industry RD&E. Developing the strategy involved unprecedented collaboration between fishing and aquaculture industry leaders, the RD&E community and other key stakeholders. It was considered to potentially move fishing and aquaculture RD&E towards greater integrated planning — particularly for addressing national priorities — leading to more cost-efficient, effective delivery of RD&E.

[Implementation of the first edition of the strategy was varied. Little evidence ensued that it had made a measurable difference to the extent of collaboration between research providers or to the quality of research beyond that achieved through extant FRDC processes.

In 2015-16 the second edition of the National Fishing and Aquaculture RD&E Strategy 2015-20 was implemented with evidence, during its developmental phase, of greater commitment to the process than with the first edition. The governance committee that oversaw its development was chaired by the Australian Fisheries Management Forum that also oversaw its implementation. Also important is that a major element of this document was the roles each partner undertook, with respect to "lead" or "support" in the various areas of RD&E covered by the Strategy. The FRDC continued to provide secretariat support to the governance committee. Although the Strategy was part of a broader framework across agriculture, appetite for it waned through the years.

In 2019-20 the Australian Government facilitated a consultative process that developed the Agriculture Innovation Policy agenda, (announced September 2020) that sought to encourage alignment of investment, improved leadership, and cohesion. As part of this Agenda the Australian Government released the National Agricultural Innovation Policy Statement on 11 October 2021. It outlined a strategy for how Australia could use agricultural innovation to position the sector as resilient, profitable and internationally competitive. To align efforts, and target investment within the innovation system, the Statement established the following four new priorities

1. Trusted exporter of premium food and agricultural products
2. Champion of climate resilience to increase the productivity, profitability and sustainability of the agricultural sector
3. World leader in preventing and rapidly responding to significant pests and diseases through future-proofing our biosecurity system
4. Mature adopter, developer and exporter of digital agriculture

Together these elements provided priorities across the agrisystem, and more directly to enhance coordination in driving sustainable growth of fishing and aquaculture. See **2021-22: Agriculture Innovation Australia Ltd (AIA)**].

In April 2022 the Department of Agriculture, Water and Environment released Australia's 2022-30 National Fisheries Plan. This was the first of its kind and provided a blueprint for the sustainable growth of the fishing and aquaculture sectors. Its primary purpose was to create a shared vision for the future of fishing, aquaculture and seafood in Australia so as to align the strategic planning, prioritisation and investment of Commonwealth, state and territory governments and sectors. The Department's vision was for the *Sustainable*

[40] A significant component of the National Framework was a concept of major, supporting, and linking roles in RD&E — initially termed "major–support–link" and later "major–support". The concept was to conduct national *R* with regional *D&E*, recognising that basic and strategic research could be provided from a distance but that regional adaptive development and local extension was required to improve industry's uptake of innovation.

growth and development of Australia's fishing, aquaculture and seafood community for the benefit of all Australians and our aquatic ecosystems now and into the future.

Other significant activities in 2009–10 were as follows:

- FRDC board appointments were new directors Heather Brayford, Renata Brooks, Brett McCallum, Dr Daryl McPhee and Professor Keith Sainsbury, and re-appointed directors Stuart Richey and Richard A. Stevens.

- To coordinate national investment and encourage adoption, the FRDC worked with the industry, DAFF, fisheries managers and the Department of Climate Change to develop a national climate change program, following several reports on the likely effects of climate change on marine and freshwater environments. The FRDC committed a minimum of $2.7 million to this $6 million program.

  [The resulting program, which concluded in 2013–14, enhanced the industry's capacity to adapt, mitigate against, and take advantage of further climate change.]

- Sequencing of the genome of AbHV and development of sensitive molecular techniques to diagnose viral ganglioneuritis in Abalone led to improved biosecurity and, in turn, better management and reduced impacts on the fishery.

  [The research team subsequently won several science achievement and seafood industry awards.]

- Atlantic Salmon rickettsia vaccine developed (rickettsia being significant pathogens of farmed salmonids).

- Higher production volumes of tiger prawns (*Penaeus monodon*) resulted from previous research into domestication.

- Assessment of current fisheries management approaches identified the potential for substantial triple-bottom-line benefits to Australian wild-catch fisheries and annual gains, without increasing catch volume, of more than $350 million under "best use" compared with current performance.

The seafood industry's determined AGVP was $2.20b, of which wild-catch was $1.31b and aquaculture $0.89b.

2010–11: Productivity Commission recognises RDC benefits

Following the Minister's request to the Productivity Commission to consider the effectiveness of the RDC model in improving competitiveness and productivity and whether other models could address policy objectives more effectively, the Commission concluded that the Australian Government should continue with the RDC model since the research sponsored by RDCs had, in aggregate, significantly benefited the rural sector and the wider community. The Commission noted that while much of this benefit came from research-induced productivity improvements, there had also been positive environmental and social impacts. The Commission also suggested mechanisms for increasing cross-sectoral R&D and recommended permitting statutory RDCs to undertake industry-funded marketing and promotion activity, thereby removing the difference between those corporations and the industry-owned corporations.

[This led to the *Rural Research and Development Legislation Amendment Bill 2013* that allowed: a marketing function for statutory RDCs; the removal of the need for Ministerial approval for RDC Annual Operating Plans; and the Commonwealth to enter into Statutory Funding Agreements with RDCs. Refer 2013–14: Expanded roles for the FRDC.]

Other significant activities in 2010–11 were as follows:

- A new FRDC Chair, the Hon. Harry Woods, was appointed.

- *Investing for tomorrow's fish: the FRDC's research, development and extension plan 2010– 2015*, the FRDC's fifth five-year plan, came into effect. The plan's five programs and 14 themes mirrored those of the N*ational fishing and aquaculture research, development and extension strategy* released earlier in 2010. A shift in emphasis, to which the FRDC's stakeholders contributed substantially, resulted in the three principal R&D programs being named "Environment", "Industry" and "Communities", and two enabling programs being instituted to add value to them: "People Development" and "Extension and Adoption".
  The renewed emphasis on extending R&D outputs to end-users also resulted in "extension" being added to the title of the plan.

  [A table showing the evolution of the R&D program structure is at **Appendix A: Evolution of the FRDC's programs in successive R&D plans.**]

- The transaction costs of applying for FRDC funding were substantially reduced by introducing a two-page expression of interest. In a related move, the role of the FRABs was changed from ranking long lists of applications to supporting only projects within an allocated budget for the jurisdiction[41].

- The FRDC established the Indigenous Reference Group (IRG) to develop a nationally focussed and better way of addressing Indigenous RD&E needs.

  [In 2010 42 FRDC established an Interim Indigenous Reference Group (IIRG) 43. The group was made up of Indigenous and non-indigenous people, with an overarching goal to provide advice to improve FRDC's investment in fishing and aquaculture for Indigenous people. Based on advice from the IIRG, in 2011 the FRDC convened the first National Indigenous Fisheries RD&E Forum to build capacity and enhance the value of advice that the IIRG could offer to FRDC. This forum was seen as an opportunity to allow

[41] In early calendar 2021 the FRDC introduced a new process for obtaining R&D priorities, removed assessment of applications from the FRAB/RAC process (including removing RAC budget allocations, and requirements for RAC R&D plans. [See **2015-16: Major reform of advisory committees**]

[42] In the late 1990s the FRDC had sought advice from the then Aboriginal and Torres Strait Islander Commission (ATSIC). This arrangement came to an end when ATSIC was abolished in 2005.

[43] In April 2010 the National RD&E Strategy for Fishing and Aquaculture was endorsed by the Primary Industries Ministerial Council (PIMC). Established under this Strategy was the National Priorities Forum, a high-level stakeholder partnership to focus national RD&E strategy, and industry priority issues. The Strategy identified a gap in engagement and identification of Indigenous priorities, and that a mechanism for Indigenous representation to the NPF hadn't been determined.

the expansion of the IIRG's capacity by broadening its network through the inclusion of additional people, who could provide expertise and links to improve FRDC's strategic investment in Indigenous focussed RD&E, as well as provide an environment conducive to building trust, and securing genuine and well-considered input. This forum was also seen as an opportunity to help address the needs of the FRDC, as well as RD&E needs for the Indigenous commercial and cultural sectors. At the forum the group developed the Eleven Key Principles for Indigenous focused RD&E in the fishing and seafood industry – the 11 Cairns Principles. These principles mapped to the five strategic research areas of: primacy for Indigenous people; acknowledgment of Indigenous cultural practices; self-determination of Indigenous rights to use and manage resources; economic development opportunities and rights for Indigenous people; and enhancement of capacity-building opportunities for Indigenous people.

In 2011, following the forum, the FRDC established the IRG, based on advice from the Forum's Indigenous participants. The IRG members were all Indigenous and drawn from a range of expertise in cultural, recreational and commercial fishing, fisheries management, fisheries policy development (international and national), fisheries research and education, natural resource management, and Indigenous community governance and consultation. The membership was drawn from all state and territory fisheries jurisdictions and the Torres Strait. The group's goal was to provide advice to improve FRDC's RD&E investment in fishing and aquaculture priorities for Indigenous people. IRG members strongly acknowledged that they did not speak on behalf of all Indigenous people and communities, but with the endorsement of the Indigenous participants at three National Indigenous Fisheries RD&E Forums they felt they can provide high level strategic input and advice based on the 11 Cairn Principles and Five RD&E Priorities developed and endorsed via the forum process. (See: **2013-14: New roles for the FRDC**)

In 2012 the IRG convened the second National Indigenous Fisheries RD&E Forum (Forum 2) where participants endorsed the Context and Outputs document that built the 11 Cairns Principles and supported the Five RD&E Priorities for Fishing and Aquaculture to identify priorities areas of RD&E.

In 2014-15, noting the progress made by the IRG but acknowledging the ongoing challenges the program had in delivering on key Indigenous national RD&E priorities, the FRDC board supported an Indigenous RD&E Subprogram, and requested that the IRG manage it. The subprogram had an annual budget for RD&E investment and an administrative budget to support the IRG to manage the subprogram.

In 2016 the FRDC supported a third National Indigenous Fisheries RD&E Stakeholders Forum (Forum 3) to provide an update on the current IRG research projects, to review the 11 Cairns principles and Five RD&E Priorities, to identify RD&E gaps, and extend the details around the IRG process and operations. Participants endorsed and supported the work that the IRG had undertaken to date and noted the importance of current research projects, while encouraging research that delivered concrete outputs for Indigenous fishers and communities.

In 2017 the FRDC provided a further 5 years support for the IRG and the IRDES, subject to a review after year 3.

In 2020-21 the FRDC, through the IRG, developed its Indigenous Reconciliations Statement of Intent and Actions (IRSIA). While the IRG continued its advisory role, the IRSIA embedded these aspirations within both the internal culture of FRDC and the R&D activities it funds across its entire portfolio. As well as directly funding research activities, FRDC sought to act as a conduit to organisations seeking to do similar work, such as the Indigenous Land and Sea Council (ILSC), CSIRO, AIATSIS, the federal agriculture department, and various state government agencies. The IRSIA confirmed that FRDC:

- acknowledged the special relationship that Aboriginal and Torres Strait Islander people have with their traditional lands and waters
- valued the experiences, knowledge, perspectives and cultures of Aboriginal and Torres Strait Islander peoples, including in a formal sense within projects where appropriate, and protect these as we would any other intellectual property elements
- consistently sought to demonstrate informed respect for Indigenous Australians and works with our partners to achieve the same in developing R&D projects and realising their outcomes
- incorporated Indigenous knowledge where relevant into research projects and delivery of outcomes.

Key actions from the IRSIA which FRDC advanced in 2020-21 included the development of a FRDC affirmative traineeship role, continued collaboration with entities like ILSC, and the extension of AIATSIS' cultural awareness training to FRDC staff.]

In 2021-22 FRDC initiated a MOU between the IRG and the Indigenous Land and Sea Corporation.

In March 2022, an agreement was signed at a ceremony on Aboriginal land at Murrayfield on Bruny Island, to enable the Land and Sea Aboriginal Corporation of Tasmania to fish 40 state-owned abalone quota units under a three-year lease. A catalyst for this agreement was Wave to Plate research funded by FRDC that laid the groundwork for the establishment of cultural fisheries in Tasmania. It ensured that Aboriginal elders and their knowledge was respected, and that sea country was sustainably managed for future generations. Wave to Plate also tested the appetite in Tasmania for cultural fisheries at a restaurant at Eaglehawk Neck and helped established a market for cultural fisheries.]

- Blood fluke was identified as the key factor in Southern Bluefin Tuna mortality and the intermediate host identified as a polychaete worm in sediment. In a treatment trial, mortality declined from about

13% experienced in the previous growing season to about 1% for the subsequent season. Growth also improved as a result of the animals' health not being compromised.

[The results of the project were subsequently adopted by industry, saving about $20 million per year.]

- With FRDC assistance, the Australian Mussel Industry Association was formed to unify the industry under a national peak body covering production in five states. The association committed to implementing both an R&D levy and a marketing and promotion levy.

  [Neither of these levies has eventuated.]

- Research by the FRDC Pearl Research Consortium resulted in a significant increase in productivity per hectare and reduced time between seeding oysters and harvesting pearls.

- Commercial production of *Artemia* commenced following FRDC investment in utilising salt ponds in the production of cysts. Subsequently the FRDC, jointly with Cognis Australia Pty Ltd and the WA Department of Fisheries, won an award in the 'Developing the Economy' category of the WA Premier's Awards.

- Following adoption of FRDC research by the Commission for the Conservation of Antarctic Marine Living Resources, the Patagonian Toothfish fishery was acknowledged as one of the world's leading sustainable fisheries.

- In the Commonwealth gillnet fishery, fisheries scientists had identified sea-lion interactions as a major problem. A partnership of the FRDC, fisheries management agencies, environment departments and NGOs in on-boat research led to the interactions being significantly reduced.

- A $1.9 million investment in targeted recreational fishing research resulted from DAFF engaging the FRDC to manage the Recreational Fishing Industry Development Strategy.
  Building capacity in the recreational sector and acquiring data to support decision-making in recreational fisheries management were the strategy's two main priorities. [See **2022-23: Valuing fishing and aquaculture sectors**].

The seafood industry's determined AGVP was $2.25b, of which wild-catch was $1.29b and aquaculture $0.96b.

2011–12: Telling the story: science for the community

Previously, the FRDC had focused most of its extension and communication efforts on industry, managers and scientists, generally at project level. Responding to increasing public concerns about the sustainability of fishing and aquaculture, FRDC increased its promotion of factual, science-based information to the community through four linked strategies:

- industry unity – developing consensus on fishing and aquaculture through unified messages on key science issues
- media relations – providing the FRDC's science outputs in a format that is better suited for utilisation by the media (included developing a whole-of-industry media science strategy and "science ambassadors" who would ensure a professional approach to presenting science)
- community relations – engaging with regional and urban communities about positive science stories
- stakeholder advocacy "influencers" – working with both allies and detractors to develop an agreed "common language" on issues where there is differences of opinion about the science evidence.

Related to these FRDC strategies, the extension working group of the **Success through innovation: The National Fishing and Aquaculture Research, Development and Extension Strategy 2016** developed a draft national extension strategy and six extension and adoption principles. A new Research Provider Network finalised major–support– link allocations for delivering research.

[These strategies have been absorbed into the FRDC's core business practices.]

Other significant activities in 2011–12 were as follows:

- The House of Representatives Standing Committee on Agriculture, Resources, Fisheries and Forestry called an **Inquiry into the Role of Science for Fisheries and Aquaculture**. The holding of the inquiry coincided with the FRDC's assessment that a rethink was needed on how science was informing the needs of ministers, the community, industry and managers.

- The FRDC contributed to DAFF's development of a **National Food Plan**, highlighting opportunities for seafood, Australia's reputation, health benefits and the importance of RD&E in addressing future challenges and opportunities.

- The *Seafood Directions 2011* conference highlighted the need to establish third-party environmental certification for fishing and aquaculture. Subsequently the WA Government budgeted $14.5 million to certify all WA fisheries and aquaculture activities, with the preferred certifier being the Marine Stewardship Council. The FRDC supported further work on establishing an Australian Fisheries Management Standard.

  [The work funded by the FRDC resulted in the 2019 publication of Best practice guidelines for Australian fisheries management agencies – the Guidance Document.]

- Western Rock Lobster became a quota-managed fishery and both the Spencer Gulf Prawn Fishery and the Antarctic Patagonian Fishery achieved MSC certification. A large body of FRDC science contributed to the certifications.

- Oysters Australia was established as the peak body for all oyster- producing states. It had evolved from the oyster consortium that, with FRDC assistance, facilitated the oyster sector to participate in the Seafood CRC. [See **2014-15 Seafood CRC leaves its mark**]

- In 2010[44] FRDC established an Interim Indigenous Reference Group (IIRG) [45]. The group was made up of Indigenous and non-Indigenous people, with an overarching goal to provide advice to improve FRDC's investment in fishing and aquaculture for Indigenous people. Based on advice from the IIRG, in 2011 the FRDC convened the first National Indigenous Fisheries RD&E Forum. This forum was seen as an opportunity to allow the expansion of the IIRG's capacity by broadening its network through the inclusion of additional people, who could provide expertise and links to improve FRDC's strategic investment in Indigenous-focussed RD&E, as well as provide an environment conducive to building trust, and securing genuine and well-considered input. This forum focussed on the needs of all Indigenous fishers, that is, those engaged in commercial, recreational and cultural activities. At the forum the group developed the Eleven Key Principles for Indigenous focused RD&E – the 11 Cairns Principles. In 2011, following the forum, the FRDC established the IRG, based on advice from the Forum's Indigenous participants. The IRG members were all Indigenous and drawn from a range of expertise in cultural, recreational and commercial fishing, fisheries management, fisheries policy development (international and national), fisheries research and education, natural resource management, and Indigenous community governance and consultation. The membership was drawn from all state and territory fisheries jurisdictions and the Torres Strait. IRG members strongly acknowledged that they did not speak on behalf of all Indigenous people and communities; but with the endorsement of the Indigenous participants at three National Indigenous Fisheries RD&E Forums they felt they could provide high level strategic input and advice based on the 11 Cairns Principles and Five RD&E Priorities developed and endorsed via the forum process. (See: **2013-14: New roles for the FRDC**)

The seafood industry's determined AGVP was $2.31b, of which wild-catch was $1.27b and aquaculture $1.04b.

[44] In the late 1990s the FRDC had sought advice from the then Aboriginal and Torres Strait Islander Commission (ATSIC). This arrangement came to an end when ATSIC was abolished in 2005.

[45] In April 2010 the National RD&E Strategy for Fishing and Aquaculture was endorsed by the Primary Industries Ministerial Council (PIMC). Established under this Strategy was the National Priorities Forum (NPF), a high-level stakeholder partnership to focus national RD&E strategy, and industry priority issues. The Strategy identified a gap in engagement and identification of Indigenous priorities, and that a mechanism for Indigenous representation to the NPF hadn't been determined.

2012–13: *Status of key Australian fish stocks* released

For years the seafood industry had claimed that fisheries management decisions were being made contrary to science. A "fightback" strategy was developed that included this report as a major step forward for transparency and reporting of fish stock health and sustainability for policy makers, industry and the general public.

More than 80 scientists of the FRDC, the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), and state and territory fisheries management agencies collaborated to produce the first 2012 *Status of key Australian fish stocks* (SAFS) report and an associated website (**www.fish.gov.au**).

Forty-nine key wild-catch fish species (representing more than 80% of the value and 70% of the volume of Australian wild-caught species) were assessed across Australia. In total, 150 stocks were assessed across the 49 key species, with 98 stocks (which contribute 90.6% of the total catch of the species assessed) being classified as sustainable. Eight stocks were classified as transitional–recovering, three as transitional–depleting, and two as overfished: Southern Bluefin Tuna and School Shark, which have management plans in place.

The report comprised the most comprehensive review of the status of Australian fish stocks ever undertaken, and shows that the majority of Australia's fish stocks are well managed and healthy. It also assist in highlighting priorities for research and management to address species and stocks of concern.

[Subsequent editions of the SAFS report were produced in 2014 (68 species or species complexes); 2016 (83 species); 2018 (120 species made up of 406 stocks, along with the Report Card of Australia's Sharks (194 species of sharks and rays with shark-like bodies); June 2021 (148 species covering over 90% of the volume of Australian commercially fished species found in the markets) and July 2024 (this sixth edition included an additional seven species as well as 25 new stocks; now covering over 90% of the stocks Australians consumed and assessed 85% of Australian fish stock species as either 'sustainable' or 'recovering'. SAFS 2024 also delivered in-depth data, such as key results by jurisdiction or state, classifications by fishing gear, and author relationships to species analysis; showcasing the depth of expertise in fisheries scientists. SAFS also provided the basis for the Australian Government's report against United Nations Sustainable Development Goals Indicator 14.4 - Proportion of fish stocks within biologically sustainable levels). From 2016 the overall management of SAFS was undertaken by the FRDC guided by the multi-agency *Status of Australian Fish Stocks Reports* Advisory Group that oversaw coordination, technical review, an external peer review process, and the construction of a data-driven website.]

The arrival in 2012 of a large factory freezer vessel (FV *Margiris* renamed *Abel Tasman*) to fish the Commonwealth Small Pelagic Fishery[46] put the spotlight on the fishery's sustainability and gave rise to concerns by some stakeholders, widespread negative media attention, and campaigns by people opposed to its operation. Amendments were promptly made to the *Environment Protection and Biodiversity Conservation Act 1999* to allow the temporary prohibition of certain declared fishing activities. There followed a two-year ministerial prohibition of large factory-freezer vessels from mid-water trawling or in trans-shipment operations in the Small Pelagic Fishery, to allow an expert panel to conduct an assessment to determine the environmental impacts of the declared commercial fishing activity, particularly on species protected by Australia's national environment law.

The Department of Agriculture then worked with AFMA and the FRDC to identify research needs for the fishery. One activity was a review by CSIRO of the harvest strategy used in the fishery which inferred that key predators were not as reliant on the target species of the fishery as had been expected and that the Commonwealth fisheries harvest strategy was sufficiently precautionary. Other research activities initiated included the estimation of spawning biomass for Jack Mackerel, Sardines and Blue Mackerel, which are target species for the fishery, using the daily egg production method as well as an expert workshop to review the Daily Egg Production methodology used. To assist in the coordination of this research, the FRDC developed a Small Pelagic Fishery Research Coordination Program.

[46] This fishery extends from just north of Perth, through the Great Australian Bight to southern Queensland.

[The expert panel reported in late 2014, when at-sea sampling commenced. In April 2015 the 95-metre trawler *Geelong Star* started fishing the Small Pelagic Fishery; subsequently, marine mammal deaths led to AFMA imposing further restrictions on the way in which it could fish. This vessel left the fishery in 2017.
In 2013 the Commonwealth Government committing to a fisheries communication strategy (See https://www.agriculture.gov.au/agriculture-land/fisheries/communication). This strategy included market research on community attitudes towards Australian fisheries management. As part of the strategy to defend fisheries science, social licence was discussed at the 2015 Seafood Directions with a focus on the need for generic seafood industry marketing. FRDC funded an assessment of possible collection methods and the amount of funds needed to be collected.

Other significant activities in 2012–13 were as follows:

- Board appointments were new directors Dr Bruce Mapstone, Dr Peter O'Brien and David Thomason; Heather Brayford, Renata Brooks and Brett McCallum were reappointed. Dr Daryl McPhee, Stuart Richey, Dr Keith Sainsbury and Richard A. Stevens retired.

- Following a series of consultative meetings held by DAFF nationally, a ministerial Rural Research and Development Policy Statement supporting the current RDC model was issued in response to the Productivity Commission's inquiry into the rural RDCs. The statement also commented that some changes should be made to the PIERD Act to broaden the FRDC's role to manage investment of levies raised by industry for purposes other than R&D, such as product marketing.

  [Many of the issues identified in the policy statement were reflected in subsequent amendments made to the PIRD Act. See **2013–14: New roles for the FRDC**.]

- The FRDC commissioned an independent economic analysis of a further eight clusters of 173 R&D projects following the evaluations of 2009–10 (page 34). Most benefits identified were economic, although significant numbers of environmental and social benefits were also identified. The major beneficiaries were the fishing and aquaculture industry (56%); 44% of identified benefits were public good. The results demonstrated the significant spill-over of these benefits to the Australian public. When all eight clusters were aggregated, the benefit–cost ratio for the $99.3 million investment (FRDC and partners) was 2.5:1, with present value benefits of $251.7 million and net present values of $152.4 million. The FRDC's component comprised $32.9 million in present value terms, with a net present value of $48 million.

  [The results of the analysis are available on the FRDC website.]

- Participants in the Seafood CRC, including the FRDC, unanimously agreed to seek from the Department of Industry, Innovation, Science, Research and Tertiary Education a one-year extension to improve the impact of legacy projects proposed to extend beyond the CRC's closure in June 2014. The Australian Government approved the extension.

  [The Seafood CRC attempted to gather industry support for an application to continue the CRC for another term of three years or more, largely to continue its marketing-related activities while industry and the FRDC developed strategies for implementing long-term marketing capacity. Although there was strong support from the industry sectors that were undertaking market development under the CRC — abalone and wild-catch and farmed prawns — overall support was insufficient to warrant proceeding with an application. This turned out to be the right decision, albeit for the wrong reason, in that the timing coincided with an Australian Government decision not to approve new CRCs for that year and to reduce funding for the following years. **See 2014-15: Seafood CRC leaves its mark** for a summary of the CRC's legacies.]

- The FRDC reviewed its 2008–13 People Development Program, focusing especially on integrating it with existing program areas of environment, industry, communities, and extension and adoption. The conclusions were incorporated into a People Development Plan 2013-15 that. among other things, supported the Australian Government's capacity-building priorities. Although the goal was to integrate people development with the FRDC's other planning structures, evidence indicated that a dedicated program was still needed, consistent with the findings of other RDCs.

[Subsequently the People Development Program was renamed the Human Dimensions Research (HDR) subprogram, and later the HDR coordination program. Refer the 2017-20 HDR Plan]

- The Climate Change Coordination Program concluded after being initiated in 2009–10 to enhance the fishing industry's capacity to adapt, militate against and take advantage of further climate change. It provided knowledge to help marine users and managers to adapt; reinforced the need to rethink marine management paradigms; equipped inshore fisheries for increased productivity and resilience to more extreme shock events; fostered multi-objective marine resilience; fostered climate-informed action through shared knowledge; and contributed to smarter energy use. Funding for climate-related research during 2009–10 to 2012–13 exceeded $10 million through co-investment from DAFF[47] and the Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education.[48]

- The FRDC funded R&D to ensure the Australian Shellfish Quality Assurance Program provided the foundation for internationally acceptable protection of public health and market access, following a biotoxin outbreak in which Tasmanian mussels were affected by a bloom of naturally occurring algae, leading to rejection of an export shipment and consequent economic cost of about $8.5 million to $10.5 million. Other shellfish were also affected.

The seafood industry's determined AGVP was $2.38b, of which wild-catch was $1.35b and aquaculture $1.03b.

Many other significant activities that would normally have been recorded against this year have been included in the Seafood CRC legacies section (see 2014–15: Seafood CRC leaves its mark) as the result of these FRDC–CRC joint partnership projects having been realised and adopted.

[47] DAFF was re-named as the Department of Agriculture in 2013–14.

[48] Formerly the Department of Climate Change and Energy Efficiency, later Department of Industry and Science.

2013–14: Expanded roles for the FRDC

Amended legislative objects[49]

In 2013, the objects of the rural R&D corporations specified in section 3 of the PIERD Act (listed on page 8) were supplemented following an amendment to the Act, which was renamed the *Primary Industries Research and Development Act 1989* (PIRD Act). The added provisions were contained in sub-sub-clauses iv, v and, in respect of the FRDC, sub-clause b — delineated in blue in this panel.

"The objects of this Act are to:

a) make provision for the funding and administration of research and development relating to primary industries with a view to:
   (i) increasing the economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries; and
   (ii) achieving the sustainable use and sustainable management of natural resources; and
   (iii) making more effective use of the resources and skills of the community in general and the scientific community in particular; and
   (iv) supporting the development of scientific and technical capacity; and
   (v) developing the adoptive capacity of primary producers; and
   (vi) improving accountability for expenditure on research and development activities in relation to primary industries; and

b) make provision for the funding and administration of marketing relating to products of primary industries."[50]

The RDCs' new legislative objects provided a very important authority for a number of changes in addition to those listed above, including:

- the requirement for the FRDC to enter into a Funding Agreement with the Commonwealth of Australia represented by the Department of Agriculture. The main function of the funding agreement was to specify the terms and conditions for expenditure of R&D and Commonwealth matching payments. This included expectations of performance and transparency, as well as accountability to levy payers, the government and the public. The funding agreements prevent the RDCs from using funds to engage in agri-political activity.
- the ability to declare a part of the fishing industry as a "separately levied fishery" and for its contributions to the FRDC to be matched by Australian Government up to the 0.25% AGVP cap
- a requirement for the FRDC to spend funds raised from a particular jurisdiction or industry sector on RD&E activities relevant to that jurisdiction or sector. Schedule 4 of the Bill related specifically to the FRDC and allowed individual fisheries industry levies to be collected and matched subject to a relevant industry cap ("separately levied fishery"); and required the FRDC to spend funds raised from a particular jurisdiction or industry sector on R&D activities of relevance to that jurisdiction or industry sector (legislating Minister Crean's previous Direction).
- a requirement for board selection committees to create a "reserve list" that can be used to fill unplanned vacancies over the following twelve months

[49] **Refer 2012–13: *Status of key Australian fish stocks* released**

[50] A drafting oversight prevented the FRDC from using voluntary marketing contributions for marketing purposes. The Department of Agriculture undertook to amend the legislation to remedy it. On 16 August 2018, the Primary Industries Research and Development Amendment Bill 2017 was passed by both houses of parliament. This Bill amended the PIRD Act to allow the FRDC to use voluntary marketing contributions to invest in marketing activities. It allowed a more flexible approach to deliver marketing services for Australian fishing and aquaculture. It also opened the doors for FRDC to work with other research and development corporations, such as Wine Australia, to deliver integrated Australian marketing activities. Although Seafood Industry Australia (SIA) covered marketing in its original prospectus, little has yet eventuated in this space.

- preparation for an independent review of FRDC operations and consistent benefit–cost analysis of projects
- improvement in collaboration and cross-sector investment, and reporting on it annually.

Seafood Services Australia, which had commenced in unincorporated form in 1999 and as a not-for-profit industry development company in 2001, was wound up. During its 13 years of operation, SSA had invested more than $7.32 million in seafood industry development initiatives: a leverage of an additional $3.07 million over the $4.25 million that the FRDC had invested in its projects. The SSA board concluded that the company's future was financially unsustainable in light of the inability to attract industry support and alternative funding and after the FRDC introduced a new project-by-project funding arrangement. Some of SSA's major legacies are outlined on the following page.

On SSA's winding up, the FRDC took over three SSA functions to ensure they were maintained for the benefit of the seafood industry, by continuing to:

- develop and promote the Australian Fish Names Standard (the FRDC gained approval from the Accreditation Board of Standards Development Organisations as a Standards Development Organisation in lieu of SSA)
- conduct trade and market access activities
- convene the Common Language Group.

Seafood Services Australia's major legacies

Seafood trade and market access

The Seafood Trade and Market Access Forum was established to provide an inclusive, transparent mechanism to identify, prioritise and action critical trade and market access issues faced by the Australian seafood industry (the initiative, and associated activities, was the first by the Australian seafood industry that took a coordinated, strategic approach to these issues; the Seafood CRC's market development research also achieved significant outcomes — see **2014-15 Seafood CRC leaves its mark.**

The online Seafood Trade and Market Access Database was re-ignited to provide industry and government with up- to-date, comprehensive technical data and other crucial information on the trade and market access requirements of all of Australia's key seafood trading partners (this was a collaborative activity involving the Seafood CRC and its participants, including with SARDI on the provision of technical data for the database — see **2014-15 Seafood CRC leaves its mark.**

Standards

SSA was accredited as a Standards Development Organisation (SDO) under the stringent requirements of Standards Australia (SSA one of only five SDOs in Australia and the only SDO in Australia with seafood industry standards development capacity)

Australian fish names

The Australia Fish Names Standard — the definitive document on common and scientific names for seafood that resolved longstanding confusion about marketing names and improved consumer confidence in seafood purchasing was developed

The online Fish Names Database extended the Fish Names Standard nationally and internationally (it is now utilised on a daily basis by the scientific community and seafood wholesalers, retailers and consumers to clarify marketing and scientific names)

National Seafood Incident Response Plan

An enlarged plan was developed that included how to deal with incidents that could be detrimental to the seafood industry; additionally, SSA coordinated a national biennial trial of the plan to evaluate the responsiveness of industry to a major incident and the level of interaction between industry and government agencies.

[The seafood industry did not take responsibility for the plan after SSA's demise; however, Safefish was established (see https://www.safefish.com.au) to provide consolidated technical advice and risk assessment to support Australian seafood safety standards and market access negotiations. See 2014-15 Seafood CRC leaves its mark. The plan has remained non-operational, albeit SIA in partnership with Safefish expressed interest in reviving it in 2019. In 2023-24 SIA developed a Crisis Management Plan with DAFF's Agricultural Trade and Market Access Cooperation (ATMAC) Program alongside the Australian Seafood Export Strategic Plan, both of which were limited to the export market.]

There is no active plan to reactivate the work below but that could change at any time! On another note, SIA has developed a Crisis Management Plan with ATMAC grant funding alongside the Australian Seafood Export Strategic Plan however its currently limited to the export market. The work incorporated the SafeFish work referenced below.

"Seafood for Life"

A "Seafood for Life" campaign was conducted aimed at increasing consumer awareness of the health benefits of seafood with a view to increasing per-capita seafood consumption

[This continued under the Seafood CRC see **2014-15 Seafood CRC leaves its mark**.]

Common Language Group

The Common Language Group forum was established for stakeholders to agree on terminology and definitions relating to the fishing and aquaculture industry.

[The Common Language Group was disbanded in 2014-15.]

National Seafood Industry Environmental Management Systems

The National Seafood Industry Environmental Management Systems (EMS) program was carried forward by SSA to help commercial fishers to manage their fisheries towards sustainability, principally through improving environmental outcomes but with consideration of economic and social factors (although this was not an active role for SSA at the time of its winding up, having been assumed by OceanWatch, the program is included here because it remains a good example of how SSA's intervention in the face of market failure achieved much faster adoption by industry).

Other significant activities in 2013–14 were as follows:

- To counter the diminished social licence of NSW commercial fishers, the FRDC funded two projects, respectively to scope the development of a fisheries management standard with the Sydney Fish Market and the Seafood CRC, and to develop a Master Fisherman's Certificate with OceanWatch Australia. Under the latter project, 54 estuary fishers in NSW were recognised as OceanWatch Master Fisherman; information on their activities and the sustainability of their catches was made available at the point of sale through Quick Response Codes.

- Two new subprograms[51] were created: Recfishing Research and Indigenous. Unlike earlier subprograms, these had an allocated investment budget. In addition to the usual role of subprograms, Recfishing Research was working towards the Australian Government's agreeing to the determination of an AGVP for the sector and matching its contributions as it does for the commercial sector. The Indigenous subprogram is supported by the FRDC's Indigenous Reference Group. (See **2022-23: Valuing fish and aquaculture sectors**)

- In her FRDC-funded project "Let's Talk Fish", Nicki Mazur tackled the challenge of identifying how perceptions about the sustainability of the wild-catch sector are formed and underpin the community's "social licence to operate". She recommended that industry improve its

[51] These were later renamed as Coordination programs.

engagement with the public and with stakeholders, especially those who have significant influence in decision-making contexts and the ability to galvanise parts of society with similar interests. Another recommendation was that industry establish a strategic vision, consistent with predominant social values, demonstrating a commitment to environmental sustainability.

- FRDC research led to the doubling of Yellowtail Kingfish hatchery production, with more high-quality fingerlings being produced more cost-effectively. Larvae and juvenile deformity and survival rates materially were improved through altered hatchery practices based on earlier Striped Trumpeter work. Having to cull more than 30% of stock at 50–60 days after hatching was almost entirely eliminated by changes to tank design, management and colour.

  [See 2018-19 Kingfish the new salmon?]

- The Atlantic Salmon industry, the Tasmanian Government, and the FRDC jointly funded the creation of the Centre of Excellence for Aquatic Animal Health and Vaccines in Launceston (refer Strategic Plan). The Centre plays a key role in promoting aquatic animal health and managing disease risk, with a focus on Tasmania's aquaculture industries. It works on aquatic animal disease surveillance, health testing and disease diagnosis, research involving the development and testing of vaccines for bacterial and viral infections, and research and development of responsive fish health diagnostic capabilities.

- The FRDC boosted investment to mitigate the impacts of Pacific Oyster Mortality Syndrome that has devastated oyster-growing industries throughout Europe and Asia since 2008. The FRDC funded research to understand the virus and its vectors, to develop diagnostic capabilities, and to develop farm management practices. Breeding for genetic resistance to the disease was undertaken in parallel to this work through the Seafood CRC.

  [See **2015–16: Major reforms of advisory committees for** further developments].

The seafood industry's determined AGVP was $2.45b, of which wild-catch was $1.57b and aquaculture $0.89b.

Many other significant activities that would normally have been recorded against this year have been included in the Seafood CRC legacies section (**2014-15 Seafood CRC leaves its mark**) as the result of these FRDC–CRC partnership projects having been realised and adopted.

2014–15: Seafood CRC leaves its mark

The Seafood CRC was incorporated in June 2007, and was anticipated to wind up in 2014 but, in practice, wound up in 2015. During this eight-year period, the 39 participants in the company conducted 540 projects that produced benefits to aquaculture, fisheries, domestic and export markets. The value of the benefits was estimated to be $529 million net present value over the 15-year period from 2007 to 2022.

Financially, the CRC exceeded expectations. Against the cash contribution of $73.5 million specified in the Commonwealth Agreement, the actual contribution was $82.5 million, of which $30 million was invested by the FRDC ($6 million more than envisaged in the Commonwealth Agreement).

[Although the CRC ceased operating under the auspices of the Commonwealth CRC program on 30 June 2015, the underlying legal entity, the Seafood CRC Company Ltd, continued operating until 2017 to assist in voluntary marketing arrangements established with the prawn and abalone sectors.]

Throughout the life of the CRC there was a strong collaborative relationship with the FRDC. The FRDC continues to drive some of the major CRC legacy activities and has retained copies of all CRC materials for future reference and archiving.

[The CRC website, **www.seafoodcrc.com**, which encompasses all CRC project outputs and is the best source of information for anyone interested in the products of the Seafood CRC, will be maintained by the FRDC for the foreseeable future.]

The Seafood CRC's major legacies

Aquaculture

The Yellowtail Kingfish sector expanded through improved genetics and nutrition, with Clean Seas Tuna Ltd in SA tripling its production in three years. Production was expected to reach 6,000 tonnes with a farm gate value of $90 million by 2020. [See 2018-19 Kingfish the new salmon?]

Cobia, a tropical marine finfish new to Australian aquaculture, was successfully produced in commercial quantities over two seasons in prawn ponds by Pacific Reef Fisheries Pty Ltd in North Queensland, in 2015 winning the Royal Agricultural Society of NSW President's Medal recognising outstanding achievement in Australia's food, wine and dairy industries.

Use of microbial floc pond management reduced water usage by 70% and nitrogen discharge by 77% on prawn farms. It also produced a 50% increase in harvest yields, resulting in $65,000 per hectare increase in value of production.

Genetic selection of oysters over the life of the CRC resulted in improved growth rates, saving the $100 million industry at least $6 million per annum.

Pacific Oysters genetically resistant to the disease Pacific Oyster Mortality Syndrome were selectively bred and were expected to be commercially available through the industry-owned company ASI Ltd in 2018.

The expected saving for the sector was $65 million, based on a scenario of 30% of the sector going out of production for two years if the disease were to recur.

A 9% improvement in growth rate of abalone was achieved by modifying protein: energy ratios according to the season and age of the abalone. A 15:1 return on the additional feed input costs resulted for farmers. Three feed companies incorporated the findings into the formulations of their commercially available diets.

Sea Cucumber ranching technology was developed by Tasmanian Seafoods Pty Ltd in conjunction with the Aminjarringa Enterprises Indigenous Corporation on Groote Eylandt. In 2014, 100 tonnes were produced for export to China — expected to rise to 2,000 tonnes by 2022, valued at $20 million.

An innovative instrument was developed, and subsequently commercialised by Ridley Aquafeeds, for early detection of Heterosigma toxic algae in prawn ponds. The instrument allowed early intervention that prevented total loss of prawn crops through algal growth.
Research and modelling into expansion options for the Atlantic Salmon industry in Tasmania found that moving production into deep-water offshore sites was the best option to achieve the sector's strategic production growth objectives.

Two natural treatments for Barramundi production ponds were developed to remove geosmin from the water, eliminating the muddy taint sometimes found in these fish.

Wild harvest

Tasmanian fishers' translocation of low-value, small, pale Southern Rock Lobsters from deep-water fisheries to shallow waters, where the lobsters grow faster and turn redder, was proven to be commercially successful. The process can double the value of each lobster in the Chinese market. Translocation of 160,000 lobsters over two seasons resulted in increased revenue of $6 million for a total outlay of $250,000.

Bio-economic models were developed to identify harvest strategies and changes in fisheries management to improve profit from fisheries without affecting sustainability. Fisheries regulators in SA and Tasmania incorporated model outputs into decision settings.
A new refrigeration design standard was developed: estimated savings of $3.5 million in replacing obsolete freezer systems were expected to accrue to the fishing fleet across northern Australia during 2015–18.

Market development
Under the CRC's auspices, the industry conducted research into the detail of consumer preferences for a wide range of seafood types, individual species, product formats, dining occasions, retail preferences and physical characteristics of seafood. The results, a basis for future market development activity in Australian and Asian markets, are on the dedicated website managed by the FRDC: www.seafoodconsumerresearch.com.

In a historic collaboration, prawn farmers and fishers combined to use CRC consumer research to implement the Love Australian Prawns® market development strategy. This national campaign across supermarkets and retailers was funded directly by industry contributions. Evaluation showed that it increased sales volumes by 30% to 50%, with prices remaining strong.

Three years of consumer research resulted in the Australian Barramundi Farmers Association launching a national branding strategy under the theme of Gold Tick Certified Barra and agreeing to develop and implement a voluntary contribution scheme similar to that of the prawn sector.

Using CRC research results, Australia's major abalone exporters established the Australian Wild Abalone™ market development program in China. Consumer research, quality standards, an industry trademark approved by the Australian Competition and Consumer Commission and a distributor education campaign in China all contributed to maintaining Australian abalone as a high-priced, luxury product against competition from other countries. The estimated yearly benefit to the industry was $12 million.

Processing technologies and practices
A large-scale Mud Crab recovery unit was developed to operate at Sydney Fish Market to reduce crab mortalities caused by the stress of transport. The unit consistently returned a recovery rate of more than 50%, saving more than $250,000 a year.

A new value-added crab product was developed with Abacus Fisheries in WA using an accelerated product development approach developed by CRC scientists. The product was very successful, with more than 1.5 million crab cakes sold by 2015.

Sardines caught in Australia are normally sold for bait, but they are highly nutritious. Following research with chefs, Cape Le Grande Australian Sardines started to sell raw, frozen Sardine fillets and lemon-flavoured, crumbed frozen fillets to supermarkets, seafood retailers and food service outlets in Perth and Melbourne.

Supply chain improvements
The CRC investigated seafood supply chains in detail across Australia and made improvements using Quality Index manuals and predictive microbiology. One company saved $150,000 by introducing improved cold-chain management.

Quality assurance and traceability systems were developed with the prawn and abalone industries.

Food safety
The SafeFish advisory committee was established to provide consolidated technical advice and risk assessments to support Australia's seafood safety standards and market access negotiations. Significant outcomes were achieved in negotiations on oyster transport, marine biotoxins, Vibrio, cadmium and parasites in fish.

International trade
The Seafood Trade Advisory Group, established to represent seafood exporters, demonstrated the importance of unified industry representation, consistent communication with government and well-researched data to support negotiating positions. It successfully contributed to negotiations on Free Trade Agreements and technical issues concerning exports.

Consumer health benefits
More than 20,000 tests on 20 of the most popular fish species determined that chemical and heavy metals levels in seafood are consistently below regulatory limits. High levels of nutrients such as omega-3 oils and iodine were also confirmed in most species.

Downloadable resources for seafood processors were at **www.superseafood.com** and a booklet, *Super Seafood*, was available for consumers.
Curtin University established the Centre of Excellence in Seafood Science and Health as part of the CRC. The centre produced a range of research-based information resources for the community, schools and health professionals on the role of seafood in a healthy diet and in managing chronic conditions.

An App based on the Seafood Quality Index Manual was developed to enable consumers and businesses to determine the freshness of fish by comparing images to actual fish.

Education and training
The CRC supported 44 PhD students, 9 MSc students and 17 Honours students. More than half of these "industry ready" graduates are now working in the seafood industry.

More than 1,000 people attended 13 CRC master classes designed to meet the specialist training needs of CRC Participants. Thirty international experts were brought to Australia to participate in the classes.

Research results from the CRC were provided to update 15 existing units of competency and 10 new ones for the National Seafood Industry Training Package managed by AgriFood Skills Australia.

Education for chefs in the preparation of seafood was dramatically updated with the production of high-quality training videos that have been distributed nationally.

Industry structure
The CRC contributed to the creation or further development of several entities that are likely to receive ongoing investment, thus establishing legacies for the seafood industry.
They included a nationally coordinated seafood marketing capability, the South Australian Research and Development Institute SafeFish food safety specialist group , the Seafood Trade Advisory Group, the University of Tasmania Experimental Aquaculture Facility, the Curtin University Centre of Excellence for Seafood Science and Health, the Australian Centre for Marine Biotoxin Testing, the oyster breeding company Australian Seafood Industries Ltd, and the two industry associations: Oysters Australia Ltd and Australian Council of Prawn Fisheries Ltd.

Other significant activities in 2014–15 were as follows:

- The Public Governance, Performance and Accountability Act 2013 (PGPA Act) replaced both the CAC Act and the Financial Management and Accountability Act 1997. The Act introduced a number of new performance-related tasks. Other changes included:
  - The FRDC became a 'corporate Commonwealth entity' (CCE).
  - As a CCE, the FRDC board became the 'accountable authority'.
  - FRDC employees became 'officials'.

- The FRDC and DAWR signed a Funding Agreement (foreshadowed at **2013-14 New roles for the FRDC**) that sets out the expectation for FRDC performance, transparency and accountability to stakeholders, the government and the community. It defined and governed key aspects of the relationship between the FRDC and the Department. The Agreement is part of a more consistent framework supporting the government's relationship with all rural RDCs, both statutory and industry owned. The Agreement incorporated, directions previously outlined in a letter from former Minister for Resources, the Hon. David Beddall which required the FRDC to spend funds raised from a particular fishery on projects relevant to that fishery sector or state/territory and to consult through the relevant industry sectors in that state or territory. The completion of the first year of this Agreement was reported to the Department and covered in the FRDC's 2015-16 Annual Report. A copy of the funding agreement is available at https://www.frdc.com.au/en/about/corporate-documents/funding-agreement .

  [See **2019-20** for the signing of the 2020-30 Statutory Funding Agreement with the Minister.]

- The Parliamentary Secretary to the Minister for Agriculture, Senator Richard Colbeck, hosted the first Fisheries Ministers meeting in over a decade. Ministers and senior officials from Australian, state and Northern Territory governments including the FRDC met to discuss a collaborative approach to the management of wild- catch commercial, recreational and Indigenous cultural fisheries and aquaculture. The meeting provided an opportunity to strengthen relationships, and to ensure effective and coordinated management of Australia's fish stocks. There was a focus on the streamlining of regulations, with the goal of reducing the fishing industry's compliance costs.

- The Minister for Agriculture announced the results of the first round of the "Rural R&D for Profit" grants programme. The FRDC and its industry partners were successful in obtaining $3 million from the programme towards the $6 million project: *Growing a profitable, innovative, collaborative Australian Yellowtail Kingfish aquaculture industry: bringing 'white' fish to the market*. This was a collaboration between FRDC, Clean Seas, SARDI, Indian Ocean Fresh, Challenger TAFE, NSW Fisheries and its commercial partner, Huon Aquaculture. A steering committee was formed involving all the partners to coordinate the research programme which is centred on nutrition and feeds with the primary aim of reducing the feed conversion ratio and subsequently cost of production.

  [See **2018-19: Kingfish the new salmon?** for a Yellowtail Kingfish update]

- The 2014 stakeholder survey (the fifth undertaken by the FRDC) showed that there had been a significant uplift in several indicators over the past three years, and in particular with respect to:
  - acknowledgement from stakeholders that they have visibility of, and contact with, the FRDC — both direct contact (in person or at events) and indirect contact (communications and through the digital channels)
  - "top of mind" awareness by stakeholders of FRDC, disposition (attitudes) towards FRDC, acknowledgement of the importance of the FRDC to the industry, and satisfaction with how the FRDC invests and deploys its levies

  The research also confirmed that the different channels and approaches to stakeholder engagement delivered different impacts. The more indirect channels (such as *FISH*, the FRDC website and social channels) were likely to have less impact than direct, one-on-one personal contact and interaction.

The seafood industry's determined AGVP was $2.75b, of which wild-catch was $1.73b and aquaculture $1.02b.

2015–16: Major reforms of advisory committees

The earlier referenced review of the FRAB system by Greg d'Arville resulted in wide-ranging recommendations aimed at making it more effective, cost efficient and accountable.[52] The recommendations were considered by the FRAB chairs at a FRDC workshop[53] in 2015, and received varying levels of endorsement. Specifically, the chairs did not endorse the structural option to consolidate the FRABs to reduce their number in preference to retaining the jurisdictional model because of the link that they had with their respective jurisdictional governments; they did endorse the need for FRDC to take on the capacity to provide the FRABs with greater levels of operational management; and they had varying opinions on the FRDC providing administrative support of FRABs.

The FRDC responded to the review by renaming the FRABs, research advisory committees (RACs) and internalising the RAC system. It employed two programs managers to each manage four RACs with respect to, inter alia, meetings, RD&E prioritisation, project management and extension. The programs managers were each supported by a part time project officer.

The reform of the advisory committees coincided with a request from Minister for Agriculture for the FRDC along with other Canberra-based RDCs to consider relocating their offices to regional centres. This was the start to a lengthy process that culminated in a request from the Minister that the FRDC board consider relocating its office to Hobart with a cost estimate of $4 million to be met by the FRDC. As a compromise the Minister agreed to a proposal by the FRDC to open and staff a regional office in Adelaide at the Adelaide Wine Centre while maintaining its head office in Canberra.

These two occurrences – the internalising of the RAC system and the opening of the Adelaide office – converged to provide a satisfactory outcome for all parties. All RAC support staff were located in Adelaide.

Inaugural RAC Chairs and members were appointed in September 2016; with subsequent appointments being on a need's basis.

[As a consequence of the Commonwealth Performance review of the FRDC (see **2019-20 Government Reviews the FRDC's performance**) in 2018-19 Forest Hill Consulting undertook a review of the FRDC's partnership models to identify:

1. how the various partnership models were managed by the FRDC and how that management might be improved
2. the degree to which the FRDC's partnership models met stakeholder needs
3. how well the FRDC's partnership models met the FRDC's extension/adoption/impact goals
4. areas for improvement in the FRDC's partnership models generally
5. how well the FRDC's partnership models contributed to the FRDC realising its planned outcome

The draft report was circulated to the Research Advisory Committees (RACs), Industry Partnership Agreements and Subprograms[54] for comment. In its final report Forest Hill Consulting found that there was broad support for maintaining the status quo, but recommended simplification of FRDC processes.

Following the release of the Forest Hill report the FRDC organised a closed meeting of RAC chairs in January 2020 to provide candid advice to the FRDC on the report and the way forward. In their written recommendations to the FRDC board, the RAC chairs supported the retention of the RACs in their current form, and suggested the FRDC should:

1. focus more on its core business (do fewer things better) and restrict activity creep
2. focus on maximising its expenditure on RD&E and reducing overheads
3. increase investment in the development of extension and adoption strategies
4. use public good funds to invest in cross-cutting strategic projects; for example, climate change research
5. improve the balance between tactical projects and longer term, more strategic projects
6. improve the development of good strategic, cross jurisdictional/sector projects

[52] Hitherto the FRABs were largely independent with ill-defined accountability to the FRDC.

[53] In 2016 the annual workshop was renamed 'FRDC - National Lead Collaborate Partner Workshop'>. It was later renamed the 'FRDC stakeholder annual planning workshop'., and more recently the "Stakeholder Planning Workshop".

[54] Effective 01 July 2020 "subprograms" were renamed "Co-ordination" programs

7. simplify its RD&E architecture by modifying existing arrangements; for example, improve RAC processes, collaboration, and coordination, including an annual RAC Chairs meeting; rather than create 'super RACs' or similar structures
8. ensure there is systematic review of all completed project outputs, and an occasional review of the impact of selected project outcomes; with the process for reviewing projects to be included in the extension and adoption strategy.
9. provide direction on public good versus private benefit RD&E
10. trial FRDC board and RAC Chairs meetings
11. institute a process of regular review of RAC support service provision

The FRDC implemented a staged approach to improving its planning, prioritisation and assessment processes to address the report's and RAC chairs' recommendations.

In early 2021 the FRDC:

- redefined the role of RACs to:
    - act as the lead mechanism to identify, synthesise and aggregate priorities articulated by stakeholders
    - consider avenues for delivery of R&D outputs to end users through identification of suitable extension activities
    - assist in monitoring invested activities to aid in the delivery of outputs to end users
    - aid in identifying potential external technical reviewers of applications – this may include RAC members with suitable expertise (and where there are no conflicts of interest).
- continued with the process of RAC selection being undertaken by the relevant Director of Fisheries and the FRDC
- had each RAC Chair (3-year appointment) oversee two RACs (to encourage cross-pollination of ideas between jurisdictions and aid collaboration). The pairings were as follows:
    - Commonwealth and Northern Territory (Dr Cathy Dichmont)
    - New South Wales and Queensland (Dr James Findlay)
    - South Australia and Western Australia (Mr Brett McCallum)
    - Tasmania and Victoria (Dr Heidi Mumme)
- expanded RAC committee membership (2-year appointment) from purely expertise-based individuals to include representatives of industry or sectors (to enhance the RACs' focus on the end users of research)
- removed reviewing and assessing applications against a set budget from the RACs role (although RAC members were still able to review applications as part of a separate process)
- removed the requirement for a separate RAC R&D Plan
- asked RACs to focus on setting priorities
- introduced sitting fees for RAC members (except for government employees without a separate ABN)]

Other significant activities in 2015–16 were as follows:

- Board appointments were new directors Dr Colin Buxton, John Harrison, Dr Daryl McPhee, Dr Lesley McLeod, John Susman; Renata Brooks was reappointed. Heather Brayford, Dr Bruce Mapstone, Brett McCallum and Dr Peter O'Brien retired. The FRDC and its stakeholders were saddened by the death of director David Thomason.

- *Knowledge for fishing and aquaculture into the future: FRDC's research, development and extension plan 2015-20*, the FRDC's sixth five-year plan, came into effect. The Plan focussed on the three national priorities: Ensuring that Australian fishing and aquaculture products are sustainable and acknowledged to be so; improving productivity and profitability of fishing and aquaculture; developing new and emerging aquaculture growth opportunities. And the FRDC used three approaches to implement it:
    - lead - a significant portion of the Australian Government's public good funding was allocated and FRDC took the lead in priority setting for RD&E with a national focus
    - collaborate - incentives were provided for those under partnership agreements to leverage their funding where there was alignment with priorities at the national level
    - partner - greater responsibility was given to the end users of RD&E to set priorities; funded from industry contributions, the matching contribution from the Australian Government, and some additional funding from the jurisdictions.

- The Minister of Finance the Senator the Hon. Mathias Corman approved a change to the FRDC outcome statement on 15 March 2016 to incorporate the changes to the *PIRD Act (1989)*, allowing Research and

Development Corporations to fund marketing activities, as well as placing a greater emphasis on extension and adoption activities. The new outcome statement was:

Increased economic, social and environmental benefits for Australian fishing and aquaculture, and the wider community, by investing in knowledge, innovation, and marketing.

- A new National Marine Science Plan (NMSP) was launched by the Hon. Ian Macfarlane, Minister for Industry and Science and National Marine Science Committee, on 11 August 2015 at Australian Parliament House. It drew together the knowledge and experience of more than 23 marine research organisations including the FRDC, universities and government departments and more than 500 scientists. It outlined the science needed to provide the knowledge, technology and innovation cornerstones that will grow a sustainable blue economy. The Plan identifies seven critical challenges facing Australia and provided recommendations about how, in a coordinated way, marine science can support Australia in meeting those challenges. The FRDC was a principal driver for the development of the food security challenge. For further details see www.marinescience.net.au .

- The Hon. Senator Anne Ruston announced that the FRDC and its Seafood CRC and industry partners were successful in obtaining $236,000 in the second round of the "Rural R&D for Profit" grants programme to investigate the use and commercialisation of an automated oyster opening system.

  [A prototype was developed and tested during 2018. Consumer testing showed the Easy-Open oysters produced by the machine were very appealing. Also, the shelf life of treated Easy-Open oysters was tested and found to be identical to untreated oysters. Operation of the machine in a commercial environment identified several program faults and areas for design improvement. It was returned to the manufacturer for modifications during 2019 for further evaluation. Considerable effort was put into modifying the machine to make it suitable for routine commercial use. However, the upgraded machine ultimately did not pass commercial evaluation. It was possible to run the machine for small periods and process several dozen oysters successfully. But the machine was unusable for most of the time due to failure of a range of components. Consequently, development of the machine was ceased. However, an alternative semi-automated approach was developed that enabled reliable processing of 30 dozen oysters per hour. The semi-automated setup was routinely used to produce batches of 100 dozen or more Easy-Open oysters. These oysters were available commercially through Barossa Fine Foods in SA. However, the product did not achieve sufficiently high sales volumes, and was discontinued after three months.]

- There was a significant biosecurity and disease incident: an outbreak of Pacific Oyster Mortality Syndrome (POMS) in Tasmania. The first POMS event in Australia occurred in late 2010, when high mortalities occurred in two estuaries in NSW - Botany Bay and Port Jackson - and subsequently in the Hawkesbury estuary. In January 2016 POMS was identified in Tasmania, and by the end of February there were six marine growing areas confirmed as POMS infected. This is a major issue as Tasmanian hatcheries supply around 90% of Australia's Pacific Oyster spat. The FRDC, Seafood CRC, state governments and industry provided funds to address this emergency. Subsequently the Australian Government provided a further $1.47 million, and in June it approved an additional $3 million through the approval of CRC- P application that leveraged an additional $8 million of industry and partnership funding to rebuild and grow Australia's oyster industry, and develop collaboration between industry and researchers nationally.

  [Australian Seafood Industries (a company selectively breeding oysters) was the recipient of much of this funding and had anticipated the Australia-wide risk based on its experiences in NSW. Having selective bred oysters for POMS resistance, it was able to progressively commercialise the outcomes of its research to the point where commercial Tasmanian stock losses in 2018-19 are minimal. In general Tasmanian growers have returned to pre-POMS stocking and employment levels. Although South Australia is still classified as POMS free, its dependence on imported Tasmanian spat meant the industry was hit just as hard as Tasmania in 2016. The two major Tasmanian spat suppliers have set up hatcheries in South Australia using ASI stock, and ramped up production with the help of the South Australian Aquatic Sciences Centre. Without the ASI breeding program, the Tasmanian oyster industry would still be decimated by POMS, and growers in other states would not have access to POMS resistant stock.]

Community perceptions surveys have been undertaken since 2003, (see 2006 National Seafood Consumption Omnibus Survey). In 2015 the FRDC started to undertake the surveys annually as part of evaluation for the RD&E Plan 2015-20. The surveys seek to understand and track the perceptions held by the community on fishing and aquaculture in Australia in achieving sustainability. The surveys extend to look at total responsibility (fishers, managers, researchers and community) and what activities are being undertaken to improve their views. The FRDC's 2015-20 RD&E Plan outlined targets for positive community perceptions of the commercial fishing industry to increase from 28% to 40% by 2020 as measured by the independently-commissioned FRDC stakeholder surveys. In 2016 FRDC commissioned an initial baseline study to explore and measure consumer experiences with the purchase, preparation and eating of seafood. This survey was conducted in 2017 and provided valuable insights into consumer attitudes, perceptions and behaviours. The community perceptions held in relation to the sustainability of the Australian fishing industry commercial wild-catch sector increased from 24% to 32%. (see 2016 Unpacking the seafood consumer experience report and 2016 Unpacking the seafood consumer experience summary brochure). As consumer attitudes towards seafood continued to evolve, a need to update this baseline information was identified. The 2019 survey used the same information framework used in the 2016 research but looked to expand areas where clear changes in consumer behaviours had been identified. The 2019 research then collected information about what consumers do, what they like and don't like, and what information would be useful to help them overcome the challenges they face in buying, cooking and eating seafood. In the 2019 survey the community perceptions held in relation to the sustainability of the Australian fishing industry commercial wild-catch sector increased to 65%. FRDC continues to have a program to understand stakeholder needs and perceptions.

- The FRDC contributed to a DAWR project aimed at developing a strategy for improving public understanding of the seafood industry and fisheries management (refer The Great Australian Seafood Campaign). The final report was launched by the Assistant Minister at the Seafood Directions Conference in Perth, in October 2015. It remained uncertain as to who would take carriage of this strategy as industry was focusing on a related process to reignite its national peak body - Seafood Industry Australia. The FRDC continued to assist with the implementation of the strategy where appropriate. Once formed[55], SIA came to address improving the community perception and social licence of the Australian seafood industry as its number one priority.

- In 2014 the Australian Government proposed an amendment to the PIRD Act that would have enabled it to have the FRDC pay its costs of membership of a number of regional fisheries management organisations. The amendment passed through the House of Representatives but was subjected to an Inquiry when it reached the Senate. The legislation stalled in the Senate, and lapsed at prorogation 17 April 2016. Had the amendment to the PIRD Act passed into law, the FRDC would have needed to provide $1,146,000 annually for these memberships.

- The Senate referred the existing arrangements for agricultural sector R&D levies to the Rural and Regional Affairs and Transport References Committee for inquiry and reporting. Following extensive consultation, the Committee tabled its report on 30 June 2015. On 05 May 2016 the Australian Government responded to the report agreeing with 10 of the 15 recommendations. The Department of Agriculture and Water Resources undertook to establish levy payer registers, and, subject to privacy provisions, make such data available to underpin an effective voting system for levy payers, and to increase the transparency, effectiveness, and cost-effectiveness of the levy paying system.

[The prawn farming sector Commonwealth levy is the only FRDC R&D levy – see: **2000–01: Industry response to ESD**]

[55] SIA was incorporated on May 12, 2017 and formally launched on June 9 of that year in Adelaide.

- At the end of 2015 the Aquatic Animal Welfare Working Group (AAWWG) of the federal government's Australian Animal Welfare Strategy (AAWS) completed the last of its research projects[56]. It had developed and approved them with funding provided from the Australian Government and the FRDC, along with direct contributions from commercial and recreational fishers, aquaculturalists, and aquarium fish wholesalers (the four sectors it had identified under the 'aquatic' heading of the AAWS). During its existence the AAWWG had:
    - undertaken a stock-take of existing aquatic animal welfare practices to understand where the sectors were situated at the time (including gaps that needed to be filled)
    - conducted workshops with various sectors to initiate consideration and conversation on aquatic animal welfare
    - established a set of aquatic animal welfare Overarching Principles against which the various sectors assessed and reviewed extant specific best practice guidelines practiced by their respective sector stakeholders
    - assisted sectors to establish specific 'guidelines' for their operations designed as a basis for the development of specific codes of practice; and aligned with the Aquatic Animal Welfare – Overarching Principles (that appeared as an appendix to each set of guidelines)
        - In 2005 the National Aquaculture Council of Australia published Aquatic Animal Welfare Guidelines, endorsed by the Aquatic Animal Health Unit of the Department of Agriculture, Fisheries and Forestry, that covered the welfare of finfish and shellfish in aquaculture and/or in live holding systems for human consumption (Dr Colin Johnston and Pheroze Jungalwalla). [57]
        - Between 2011 and 2012 Australian commercial fishing guidelines were developed for vertebrate fish species, covering six fishing methods in common use (Mesh, Pot-trap, Purse seine, Beach seine, Trawl, and Rod/handline).
        - In late 2008, the recreational fishing sector, through its peak national body, Recfish Australia, produced its own code of practice ("The National Code of Practice for Recreational and Sport Fishing), and additionally accepted and promoted Position Statement PSN23 issued by the National Consultative Committee on Animal Welfare (NCCAW) covering animal welfare aspects of recreational fishing.
        - In 2008 the ornamental fish industry, through the Pet Industry Joint Advisory Council (PIJAC), developed its "Code of Practice for Aquarium Operations". In late 2013 the Pet Industry Association of Australia (PIAA) commissioned and published guidelines for "Humane Euthanasia for Ornamental Fish".
    - road-tested the guidelines in practice within sectors to provide working examples for wider stakeholders
    - communicated and promoted the principles, guidelines and templates to the broader aquatic community for application across the various sectors.

[56] The production of the AAWS was coordinated by the Australian Government's Department of Agriculture, Fisheries and Forestry on behalf of the Primary Industries Standing Committee (refer the AAWS website). The Primary Industries Ministerial Council endorsed the AAWS in May 2004 and the first National Implementation Plan for the strategy in May 2006. The AAWS provided a national framework to identify priorities, coordinate stakeholder action, and improve consistency across all animal use sectors, including aquatic animals. It outlined directions for future improvements and provided national and international communities with an appreciation of animal welfare arrangements in Australia. Six broad working groups were established as part of the AAWS, including the AAWWG in 2005.
The first formal meeting of the AAWWG was a workshop held 9-10 Feb 2006. Invitees included representatives from Agriculture, Fisheries and Forestry Australia (AFFA), SA, WA, Tas; as well as University of Tasmania, RecFish Australia, Animals Australia, and National Aquaculture Council (NAC), Pearl, Tuna, and Salmonid aquaculture sectors. Although the AAWS was terminated by the Australian Government in 2013, the members of the AAWWG had agreed to continue on a voluntary basis, especially as several projects were underway or had funding approved and were about to commence.
[57] A 2020 review of legislation and guidelines can be found at https://www.frdc.com.au/project/2020-040

In delivering the outputs above, the AAWWG collected a range of findings that produced a valuable series of practical outcomes and materials for circulation and use within the various aquatic sectors. These findings were centralised in FRDC final report 2013-049: *Aquatic Animal Welfare in Perspective: An initiative of the Aquatic Animal Welfare Working Group of the Australian Animal Welfare Strategy Group* (July 2017) found at: Aquatic Animal Welfare in Perspective Final Report. Detail of the associated research projects are at: http://frdc.com.au/issues/aquatic-animal-welfare/aaw---research or at the Aquatic Animal Welfare Research Page .

[The animal welfare landscape changed significantly after 2017 with implications for "in-field" practices (e.g. methods used to kill aquatic animals) and other practices (e.g. transportation of live aquatic animals). In 2020 FRDC funded a project covering the commercial wild-catch, aquaculture and recreational fishery sectors titled "Aquatic animal welfare – a review of guidance documents and legislation". The project aimed to make recommendations to improve the alignment of industry practice with legislation by:

1. conducting a stocktake of Australia's aquatic animal welfare policies, programs, and procedures as expressed in legislation, Codes of Practice, Standards or other relevant guidance documents
2. developing case studies to assess the suitability and practicality of Codes of Practice, Standards or other relevant guidance documents to align with industry practice and government legislation]

The seafood industry's determined AGVP was $2.93b, of which wild-catch was $1.90b and aquaculture $1.03b.

2016–17: 25th anniversary

The FRDC reached its 25-year milestone this year, and in a story he wrote for *FISH,* Executive Director Patrick Hone reflected on the major changes over his time with the Corporation.

Many of the changes are recorded in this *Evolution of the FRDC* and are summarised as follows:

- Developing a quality management systems approach to all aspects of business
- Developing a custom-built real-time integrated accounting and project management system
- Moving from a 'grant' mentality to an 'investment' mentality in funding RD&E
- Improving planning processes aimed at clearly defining commercial outcomes
- Leading a national approach to ecological sustainable development
- Driving the need for a collaborative approach to RD&E planning and investing
- Adopting a more flexible investment framework
- Acquiring income from sources outside the Commonwealth- industry matching model
- Taking on a service provider role including marketing

Dr Hone attributed a lot of industry's successors to the role that FRDC has played in people development and particularly in leadership.

Projects Manager Annette Lyons, who remains the FRDC's longest-serving employee, also wrote the following story (unedited) for *FISH*:

I started at the FRDC in 1992 when there were only five employees – the executive director, the business manager, office and quality manager, program manager and one project manager. I started as an office assistant. They sat me down in front of a computer, I asked what it was and was told that was how I had to work. I had never worked on a computer. At that stage, we had inherited 51 projects from the Fishing Industry Research and Development Council, and then invested in an additional 42 projects, bringing it to a total portfolio of 93. We now have in excess of 400 projects.

With a small staff there were always things to do and everyone did everything, even the executive director. You always felt valued, you actually felt like everything made a difference and you gained a lot of knowledge. All final reports were stored in a cupboard with a maroon ribbon around them. At one point we even charged for the final reports based on weight. Now we don't receive hard copies and we have been evolving to a paperless office – almost. Some sayings come to mind, such as "join the dots", "the big end of town", "hit the ground running", "peaks and troughs", "think quality", "don't do things twice, avoid rework" – these seem to define the FRDC.

I have seen many changes over the years: three iterations of our project management systems, from keying in applications to an online system; the expansion of the FRDC (now with an Adelaide office); a small newsletter that has grown into a national magazine; two office locations; and various chairs, boards, Fisheries Research Advisory Bodies and Research Advisory Committees (so much paperwork). My reason for sticking it out for so long is loyalty, and an ever-changing environment. I have really appreciated that the FRDC has always been very supportive of family, allowing me to attend school activities or be home with sick children. I hold close to my heart all the relationships and friendships I have made with many stakeholders throughout my time at the FRDC and many ex-staff and board members.

Congratulations FRDC on 25 years. It is an honour to serve.

[Annette Lyons retired 02 January 2019. She had been with the FRDC since 1994 and had been involved in the many changes that made up the evolution of the FRDC to this point in time. On her retirement the inaugural FRDC Executive Director, Peter Dundas-Smith (with whom she had worked in their former careers) said: "You excelled in whatever position you held, be it administration, quality management or programs management. Even so, I don't think your capacity for learning and working has ever been fully realised…You can leave FRDC knowing you have made a significant contribution to an organisation which is highly regarded by all its stakeholders; a regard for which you can take a lot of credit.]

Other significant activities in 2016–17 were as follows:

- Effective 01 September 2016 the Hon. Ron Boswell was appointed as FRDC's Chair.

- In July 2016 the Department of Agriculture and Water Resources commissioned the FRDC to manage the development of the National Carp Control Plan (NCCP) to be finished by December 2018, and costing some $10m. To ensure preparedness for the possible release of the Cyprinid herpesvirus 3 (the carp virus) as a biological control agent for introduced common carp in Australia this investment facilitated:
    - national coordination of planning and communication activities
    - delivery of stakeholder education and consultation activities
    - completion of research to address remaining knowledge gaps
    - completion of risk assessment activities

  [In September 2018 the Department of Agriculture extended the NCCP contract to 30 December 2019 with a reduced scope. In January 2020, the FRDC delivered its assessment for consideration by the Australian Government of the feasibility of using the carp virus, as part of the National Carp Control Plan. The National Carp Control Plan was delivered to the Australian Government in January 2020. Additional research designed to increase confidence in the final assessment by augmenting and cross-checking previous scientific work was identified, and commissioned. The COVID-19 pandemic caused some delays to these additional projects, as the biosecure facilities necessary for working with the virus prioritised COVID research. Noting there were additional pieces of research underway, the department and the FRDC decided that integrating results from this research into a single document would best facilitate assessment and government consideration of the carp virus's potential as a biocontrol agent. The outputs of this research were provided by the FRDC to the Department in late September 2022 to allow consideration of all the completed scientific research undertaken as part of the National Carp Control Plan (scientific feasibility). The Plan is one of several important inputs that will inform a decision by the Australian, state and territory governments on the carp virus. In addition to the FRDC's work, a final decision on carp biocontrol will require further public consultation and regulatory approval. (The National Carp Control Plan was released in November 2022; see Carp Control Plan).]

- From 22 November 2016 until February 2017 a hepatopancreatitis (white spot disease) outbreak spread across seven farms in close proximity to each other along the Logan River (south Queensland) culturing black tiger prawns (*Penaeus monodon*). All ponds on these farms were treated with chlorine following a decontamination protocol and a progressive discharge procedure. After the detection of white spot on prawn farms, it was subsequently confirmed in wild prawns collected from the Logan River on 08 December 2016. Subsequently white spot was detected at a number of sites in the Logan River and northern Moreton Bay. A Biosecurity Control Program was established for the area surrounding all farms within a Control Zone established by Queensland Department of Agriculture and Fisheries and a Movement Control Zone was established around the farms. Subsequently, movement restrictions were imposed across Moreton Bay. As part of the strategy to eradicate white spot all decontaminated prawn farming ponds were dried and fallowed until 31 May 2018. The Queensland Government has spent some $20 million on its white spot eradication program. FRDC funded research on the extent of the pathogen occurrence, and to better understand the epidemiology of the outbreak. Testing of uncooked prawns purchased from retail outlets around southern Queensland during the outbreak identified a very high incidence of white spot syndrome virus suggesting that the most likely introduction pathway was recreational fishers using retail prawns for bait. Following the outbreak FRDC assisted the Australian Prawn Farmers Association to develop National Biosecurity Guidelines for prawn farming. Biosecurity Queensland managed the response to the outbreak and, partnering with Queensland Seafood Industry Association, continued to communicate the threat posed by white spot through a multitude of platforms.

  [All states and territories in Australia underwent proof of freedom surveillance for the virus that causes white spot disease. Crustacean samples collected outside of Moreton Bay along the east coast of Queensland between Caloundra to Cairns, tested negative for white spot. No positive detections have been recorded in Moreton Bay during the March 2019

surveillance sampling program. Due to the detection of white spot in wild crustacean samples from the northern part of Moreton Bay in March 2018, surveillance had to continue at least until March 2020 as the World Organisation for Animal Health (01E) requires that targeted surveillance be undertaken for two years without detection of the disease.
In response to the white spot outbreak the Australian Government conducted an import risk assessment for raw prawns and imposed new import conditions on breaded, battered and crumbed prawns effective 28 Sep 2018.
During the 2018-19 season three of the farms impacted by white spot recommenced prawn production. All farms implemented additional biosecurity measures include water filtering systems, crab fencing, modified farm layouts and fishing restrictions imposed around the farms. All farms successfully harvested prawns without any occurrence of white spot.
From 1 January 2020, a white spot disease repayment (WSDR) component at a rate of 3.01 cents per kilogram was introduced to the farmed prawns levy and charge to repay the government-underwritten assistance package provided to prawn farmers affected by white spot disease in the Logan River area of Queensland. The industry contribution to the package, initially paid by the Australian Government, amounts to $3.998 million to be repaid through the WSDR levy. In 2019-20 white spot broke out again on one farm in south east Queensland. On 18 August 2022 the virus was detected in a biosecure facility at a prawn farm on the north coast of NSW. Decontamination was completed on 02 September 2022 and the farm was released from Individual Biosecurity Direction. The source of the outbreak was not identified and genetic analysis indicated the virus to be different to the one detected in SE Queensland between 2016 and 2020.].

- The Productivity Commission released its draft report on Marine Fisheries and Aquaculture. The report can be found at: https://www.pc.gov.au/inquiries/completed/fisheries-aquaculture/report

- Minister's Morrison and Ruston announced a Productivity Commission inquiry into the regulation of the Australian marine fisheries and aquaculture sectors. A summary of the recommendations can be found at: https://www.pc.gov.au/news-media/pc-news/pc-news-november-2016/fisheries#key

- Seafood Industry Australia (SIA) was incorporated 12 May 2017 and launched in Adelaide 09 June 2017.

- The FRDC was successful in bidding for a CRC-P grant titled "Future Oysters". The application for the CRC-P was developed by Oysters Australia and Australian Seafood Industries Pty Ltd. The Department of Industry, Innovation and Science entered into a CRC project funding agreement with Australian Seafood Industries Pty Ltd., and Participants agreements were finalised. Future Oysters CRC-P has a total cash budget of $5,011,040 of which the FRDC contributed some $417k.
  The Future Oysters CRC-P focussed on three R&D programs:
  1. Better Oysters - Advance genetic selection and progeny testing to accelerate availability of disease resistant Pacific and Sydney rock oysters Outcomes - High POMS resistant Pacific oysters - Improved disease resistant Sydney Rock oysters
  2. Healthy Oysters - Employ novel methods to assess oyster health and manage diseases – Identify environmental factors implicated in oyster diseases Outcomes - Better farm management strategies - Improved profitability
  3. More Oysters - Assess commercial potential of alternative species to diversify production - Develop and assess new technologies to increase production and profitability Outcomes – More resilient farming systems - Increased production to supply new domestic and global markets.

  [The Future Oysters CRC-P completed during 2019-20, having facilitated the advancement of the Australian oyster industry by increasing its productivity and profitability. Its combined industry benefit was conservatively estimated in present value terms at $127m for an investment of $8.3m. It strengthened Australian edible oyster aquaculture R&D networks across states, regions and industry participants; and delivered greater knowledge of edible oyster R&D associated with managing oyster diseases and health. It made improvements to Pacific Oyster and Sydney Rock Oyster survival as a result of enhanced breeding program methodologies, farm management and oyster production procedures; biosecurity and surveillance protocols; and a better understanding of the influence of the environment and microbiome on oyster health.
  - Tasmania: A re-energised and more efficient industry, with production approaching pre-POMS levels. An improved and biosecure breeding facility was established; POMS resistance was delivered at a rate of 10% pa along with accelerated maturation. Decreased surveillance costs were achieved due to the establishment of a rapid, low cost, flow cytometry-based POMS testing procedure that delivered improved confidence about translocations, and a faster response to address future incursions of POMS.
  - New South Wales: The industry demonstrated new enthusiasm, with increased production due to considerable improvements occurring in relation to hatcheries and on-farm technologies. Selective breeding was accelerated by

doubling the number of families produced, fertilisation success was increased by 18%, improved storage techniques for gametes was delivered, and three million triploid oysters was provided to industry at a significantly reduced cost. Hatcheries provided up to 20% of industry stock, with an increasing proportion derived from selective breeding. Advances were made in relation to "winter mortality" and Queensland Unknown (QX) diseases; including through enhanced disease detection and selective breeding based on molecular technologies.

- South Australia: A much better prepared industry, able to detect and address the associated issues if/when it is directly impacted on-farm by POMS. It was estimated that if a POMS mortality event did occur, the Future Oysters CRC-P would have reduced its impact on the GVP in the state in the year it occurred by about $15.1 million. An ongoing selective breeding program was established delivering POMS resistant family lines. A greater understanding of South Australia Oyster Mortality Syndrome (SAMS) was delivered.
- Other Parts of Australia: In 2019-20, other than in NSW, SA and TAS, the oyster industry was in an early development phase. WA and NT were seeking to develop novel sub-tropical-tropical oyster industries, and in doing so, were accessing and adapting information from the exiting Australian oyster industry to facilitate growth and reduce risks.
- In relation to diversifying the oyster species available to the Pacific Oyster industry, improved farm management procedures for Flat Oysters were identified, enhanced communications were delivered for those interested in farming Flat Oysters; and a translocation protocol was established to enable Western Rock Oyster translocation from WA to SA.]

- Seismic testing and its impacts on fisheries became a high priority for research. FRDC invested in a number of related projects, and has informally coordinated industry discussions around seismic testing impacts on the marine environment, facilitating conversations between jurisdictions and the fishing and aquaculture industry. Discussions included how to best engage with petroleum companies as they prepare their Environmental Plans as part of the broader submission process to the National Offshore Petroleum Safety and Environment Management Authority (NOPSEMA). Seafood Industry Australia nominated seismic testing as a high priority national issue.

  [FRDC continued to invest in seismic testing impacts on octopus, scallops, and Rocklobster; including in 2021-22 trialling low noise solutions.]

- FRDC commenced a trial of risk-based reporting on 20 domestic species. The trial of 20 species, managed by Sevaly Sen, was to observe how a risk based reporting tool will consider bycatch, habitat and fisheries management [this is similar to the UK Seafish RASS tool (see: http://www.seafish.org/rass/].

  [This work led to the development of *Whichfish* (see www.whichfish.com.au) in conjunction with Seafood NZ (www.openseas.org.nz) to assist businesses in rapidly screening wild-caught for their relative environmental risks and other performance measures based on publicly available information.]

- Department of Agriculture and Water Resources commissioned the FRDC to manage work on technical non-tariff barriers to trade affecting Australia's highly-traded or trade-ambitious agricultural commodities across key markets. This involved collaboration with other Rural Research and Development Corporations and focused on a small number of highly-traded or trade-ambitious primary industry commodities as case studies. The project focused on the countries negotiating the Regional Comprehensive Economic Partnership (RCEP), which include China, India, Japan, the Republic of Korea and ASEAN member states.

- FRDC asked Dr Len Stephens to undertake an intellectual property and commercialisation audit, and the board agreed to take a more proactive approach to intellectual property management.

The seafood industry's determined AGVP was $2.92b, of which wild-catch was $1.68b, aquaculture was $1.24b.

2017–18: Underutilised fish still on the plate

Since the FRDC established the National Seafood Centre in 1993 (see **1991-94**) it has made varying levels of investment in RD&E aimed at 'making the most of the catch'[58] through product and market development, and utilisation of undervalued fish, discarded fish and processing waste. Investment in this area increased significantly between 2007 and 2015 through the Seafood Cooperative Research Centre.

[See **2006-07: Seafood Cooperative Research Centre established** and **2014–15: Seafood CRC leaves its mark.**]

Notwithstanding a reasonably high level of investment, but an overall low success rate in terms of getting products to market or making a difference to fishers' profits; such value-adding remains a high priority for industry as evidenced through the priority setting processes of the Research Advisory Committees. The challenge for the FRDC, therefore, is how to improve the success rate of such projects. Consequently, this year the FRDC commissioned Dr Len Stephens, former Managing Director of the Seafood Cooperative Research Centre, to undertake a comprehensive analysis of underutilised species projects, with a view to developing a set of success criteria to be used as guidance for the development and evaluation of such future projects.

His analysis revealed that only seven of 30 randomly selected and completed projects were successful in that they achieved a commercial outcome, or are likely to achieve one, defined as significant volumes of fish being regularly harvested and sold into a market consistently. All the successful projects had substantial involvement of a seafood wholesaler, and used a whole supply chain approach.

The report stated that the fundamental problem with underutilised species is lack of demand for the product. Therefore, the decision to attempt exploitation of an underutilised species in the domestic or export market is a business one, likely to be based on low profit margins that must be made by a commercial operator using their own data and networks.

In view of the low success rate of these projects, Dr Stephens developed a checklist of 34 success criteria, and recommended that in future FRDC only support projects of this nature that are led by a commercial entity and meet most of the success criteria. However, he noted that underutilisation may just be a stage in a decades-long continuum of development of any fishery. For example, the West Australian octopus and Patagonian Toothfish fisheries were undeveloped or non-existent thirty years ago, however, are now thriving.

At a national policy level, Dr Stephens noted that the volume of underutilised seafood produced in Australia each year exceeds 50,000 tonnes. The seven commercially successful projects had an impact on a scale of hundreds of tonnes of fish, rather than thousands of tonnes. They reflected successful commercialisation of a niche opportunity, however, are unlikely to produce a transformative impact on underutilised species at a national scale.

Therefore, he also suggested that the FRDC might have a role in investigating fisheries management policy options that drive better utilisation of underutilised species. Such policies have been implemented by the European Union and are the subject of considerable debate.

Other significant activities in 2017–18 were as follows:

[58] 'Making the Most of the Catch' was the title of a 1996 post-harvest symposium hosted in Brisbane by the Centre for Food Technology of the Department of Primary Industry, Queensland, and sponsored by the National Seafood Centre. See 1996–97.

- The Hon David Littleproud MP was appointed Minister for Agriculture and Water Resources 20 December 2017.

- On 14 September 2017 Assistant Minister for Agriculture and Water Resources, The Hon Anne Ruston, declared Seafood Industry Australia a representative organisation in relation to the FRDC and revoked National Seafood Industry Alliance (NSIA) as a representative organisation. In February 2018 NSIA deregistered as an incorporated association.

- The FRDC partnered with X-Lab Ventures to foster innovation to solve challenges in the fisheries and aquaculture sector by helping seafood businesses realise their innovation ideas. This entrepreneurial training had two core innovation streams: hands-on workshops where innovators were trained in the 'Lean Start-up' approach to better understand their business and test de-risking business models; and a three-month business accelerator program where teams were mentored through a disciplined process to explore new growth opportunities. Over time the FRDC developed a number of other innovation initiatives such as "Spacefish", "Wildcatch Decarbonisation", and "Finnovation" that related to the X-Lab activities. Finnovation is a fund set up by the FRDC to accelerate the growth of Australia's aquatic innovation system by co-investing in early-stage small-to-medium enterprises to drive commercialisation of novel solutions throughout the entire value chain with a focus on end-users.

- The FRDC, in partnership with state and territory industry councils, initiated the national Fish and Chips Awards. The aim of the awards was to engage with consumers, and deliver key messages on the sustainability that underpins Australia's fisheries management. It involved two award categories – people's choice and judge's choice. Over 75,000 votes were received for some 900 fish and chips shops. The inaugural awards were presented at the biennial National Seafood Industry Awards.

The seafood industry's determined AGVP was $3.03b, of which wild-catch was $1.68b and aquaculture $1.35b.

2018–19: Kingfish the new salmon?

The rapid development of Yellowtail Kingfish (YTK), *Hiramasa S. lalandi,* aquaculture in Australia over the past two decades can largely be attributed to three factors. First, farming of the species proved to be biologically and commercially viable overseas; second, appropriate infrastructure and industry capability pre-existed; and third, a robust partnership formed between industry and researchers from the outset. This is illustrated by the following stories:

In South Australia

In the early 1990s interest in marine finfish farming on the Eyre Peninsula resulted in the formation of the Northern Spencer Gulf Aquaculture Alliance by the Whyalla Industry Development Enterprise. The Alliance, comprising a group of interested local business owners and enthusiasts, originally pursued Snapper aquaculture in collaboration with the South Australian Research and Development Institute. The Alliance constructed a rudimentary hatchery at Port Augusta, and some members subsequently formed the company South Australian Aquaculture Management. While holding Snapper within the warm seawater outlet channel of the adjacent Northern Power Station, technicians observed groups of large YTK; and during the spring of 1997 captured about twenty 15–30-kilogram fish in a nearby bay and held them in broodstock holding tanks. Within four months spontaneous spawning commenced, and continued every 4-5 days. Larval rearing was conducted that produced a few thousand fingerlings in early 1998, and these were transferred to sea cages in Fitzgerald Bay.

Following the interest in Snapper farming in northern Spencer Gulf, a local farmer in southern Eyre Peninsula established another private hatchery on the coast near Arno Bay, and proceeded to produce Snapper, Mulloway and Black Bream. In 2000 the Southern Bluefin Tuna grow-out company, Stehr Group, founded the company Clean Seas Tuna Ltd (Clean Seas), and subsequently purchased and further developed this hatchery. In 2005 Clean Seas became a publicly listed company that was producing 400 tonnes per annum of YTK. A year later, Clean Seas acquired South Australian Aquaculture Management, which included the aforementioned hatchery in Port Augusta, and more grow-out leases in Fitzgerald Bay; leaving Clean Seas as the only company producing YTK in SA.

In 2007, fingerling production increased to 600,000 from 150,000 in the previous year. Grow-out production in 2008 was 3,280 tonnes (combined YTK and Mulloway) from 1.25 million fingerlings produced at the Arno Bay hatchery. While the production targets for 2009 and 2010 were 4,600 and 5,300 tonnes respectively, they were not achieved.

Beginning in 2010, performance began to decline further, with poor growth and high mortality. As a result of these production problems, and associated financial issues, production declined to about 500 tonnes per annum. In 2012, following a wide-scale review and assistance from experts in Japan and elsewhere, the cause of the poor performance was identified as a taurine deficiency in the feed. Once remedied, mortality stopped, and growth rates improved. Following the resolution of these problems, a major company restructure, and its decision to discontinue R&D into Southern Bluefin Tuna hatchery production, Cleans Seas switched its business focus to solely YTK production with the aim of increasing production back to 3,000 tonnes per annum in the next five years; currently at 2,350 tonnes in 2017-18.

Clean Seas (now Clean Seas Seafood Limited) developed a strong market for YTK, both domestically and internationally. In 2008 it was reported that approximately 60 % of production was exported, with the remainder sold domestically. However, significant proportions of its markets were lost when production fell to 500 tonnes. The company has since been rebuilding its market presence with a high cost, new branding and market activation program planned for 2017 onwards. Export markets include Europe, North America and Asia. Its YTK have been endorsed by Euro-Toques International, an association of more than 4,000 of Europe's finest chefs, and have won many industry awards for quality. Demand has been strong, and farm gate prices continue to rise (currently >$15-16/kg whole). Recent reports from the company show that about 45% of production is exported, with the remainder being sold domestically.

In Western Australia

YTK aquaculture commenced in Jurien Bay 200 kilometres north of Perth in 2007 after Western Kingfish Ltd raised $8 million in a public share offering on the Australian Stock Exchange. The company's aim was to utilise the warmer warmers off the mid-west coast to provide a competitive advantage over the SA industry. The company aimed to produce 500 tonnes per annum within three years of its capital raising; and 10,000 tonnes in the long term. While the concept of growing YTK in this region was sound, the company folded in 2009 due to a number of different factors, including fish health and funding issues.

Meanwhile Erica Starling, through her company Indian Ocean Fresh Australia Pty Ltd (IOFA), had been pursuing her family (Boschetti and Newbold) interest in the licensed 800-hectare site in the Zeewijk Channel at the Abrolhos Islands. This site was originally approved in 2003 for the grow-out Yellowfin Tuna. This never eventuated. However, in 2007, due to changes in the tuna market, this licence was varied to provide for finfish production focusing on hatchery available species such as YTK and Mulloway. In 2008 IOFA trialled a near shore, Geraldton site with a batch of Mulloway. This was successfully completed in 2010.

In 2010 IOFA joined with the Mid West Development Commission (MWDC) to conduct R&D into YTK, with MWDC providing some operating funds, and IOFA providing the infrastructure, capital equipment and expertise. The first trial (YTK1) encountered a number of significant challenges, due to the extreme warm water event off the coast of WA; but was successfully completed in late 2011. MWDC brought together a team to address the challenges, and a project reference group was formed to provide a body of expertise and capability that would assist in determining the viability of the species in the region.

A second trial (YTK2) was commissioned in 2014 to examine the potential economic benefits to the State and the mid-west region of a sea-cage aquaculture industry. The trial was completed in 2016, and as a result IOFA commenced transitioning its business from an R&D phase to a commercialisation phase. In late 2016 it received approval to expand its aquaculture licence and is now in commercial production.

[In 2020 IOFA paused its production for at least 12 months, citing the adverse impact of the COVID-19 pandemic on its eastern state markets; particularly in Melbourne.]

In New South Wales

In NSW the Department of Primary Industries established a 20-hectare marine aquaculture research lease off Port Stephens in 2013 and sought a commercial partner. In 2014 Huon Aquaculture (a large salmon producer in Tasmania founded by Peter and Frances Bender) was accepted as the commercial partner. Shortly after, Huon Aquaculture purchased a 30-hectare unused lease adjacent the research site that was originally established to grow out Snapper. In 2016, approval was granted to move the two leases further offshore into 40 meters of water. The new location was 6 kilometres offshore in Providence Bay. The move allowed the use of larger cages and provided the potential to increase the maximum possible stocking density from 998 to 1,200 tonnes on each lease. The relocation also saw the leases increase to 62 hectares, largely to accommodate the longer mooring lines needed for deeper water. The first fingerlings were stocked in October 2016, and three subsequent batches of fingerlings were deployed.

The aim of the project was to prove the suitability and commercial viability of the area for farming YTK over a period of five years; with an overall aim of contributing to the development of sustainable marine aquaculture along the coast of NSW. There were two major challenges. First, there was excessive fouling through the presence of new forms of barnacle fouling that posed challenges for cleaning equipment. Second, high sea swells and rough seas with waves of over 11 metres accounted for one major incident when about 20,000 fish escaped from damaged nets; about 5,000 were recaptured and a further 3,000 were taken by commercial fishers, with an unknown quantity recovered by recreational fishers.

Despite these challenges two sea pens were successfully harvested using a specially developed on-board harvesting system, and the market acceptance had been positive.

The project clearly demonstrated the biological feasibility of YTK farming in NSW. Environmental monitoring found no significant impacts on the surrounding ecosystems. The fish grew well, and the quality was exceptional. However, the aforementioned physical damage to the lease infrastructure hastened the removal of cages that required structural modification and the remaining tenure period precluded lease re-establishment. The information gained through the project paved the way for further aquaculture development in NSW coastal waters.

The future

The combined YTK industry produced about 2,700 tonnes in 2017-18 worth about $43 million[59].
Based on 2018-19 forecasts[60] by 2028 this could increase to 34,000 tonnes worth $440 million.

[In 2021-22 Clean Seas, the only kingfish producer, produced 3,700 tonnes worth some $66 million.]

Other significant activities in 2018–19 were as follows:

- On 29 May 2019 Senator Bridget McKenzie was sworn in as federal Minister for Agriculture (Australia's first female agriculture minister); and Senator Jonathon Duniam was sworn in as Assistant Minister for Forestry and Fisheries.

- Board appointments were Dr Kate Brooks, Professor Colin Buxton (reappointed), Katie Hodson-Thomas, Mark King, John Lloyd, and Dr Lesley MacLeod (reappointed). Renata Brooks, John Harrison, Professor Daryl McPhee, and John Susman retired.

- At its April 2019 meeting the FRDC board approved an Investment Fund approach to approving funding of RD&E. This entails the board annually approving investment in RD&E against partners key planning documents. The board delegated the assessment of individual applications deemed to be medium to low risk to the FRDC Managing Director.

- FRDC established the National RD&E Seafood Industry Safety Initiative with a terms of reference and overseen by a steering committee comprised of national seafood industry leaders and representatives from the Australian Maritime Safety Authority. The Strategic Plan broadly focused on the integration of previous and new investments made in the area of workplace health and safety, and mental health and culture. A key component of the Strategy was project "SeSAFE – Delivering Industry Safety through Electronic Learning" for Australia's commercial fishers and aquaculturalists. (See www.sesafe.com.au). Commencing in 2018, SeSAFE developed a series of online, pre-sea training modules for both new and experienced crew[61]. The FRDC, with eight other RDCs, also joined the Rural Safety and Health Alliance (RSHA; https://www.rsha.com.au/). The RSHA aims to improve Australia's primary production safety record by investing in practical RD&E solutions informed by industry input on work, health and safety risks.

- Following a collaborative stakeholder engagement process, Ernst and Young developed a shared vision for agricultural innovation. The vision report titled *Agricultural Innovation—a national*

[59] Currently separate estimates are not published for YTK, and therefore are not included in ABARES Australian Fisheries Statistics
[60] Taken from the Department of Agriculture and Water Resources grant application, Growing a profitable, innovative and collaborative Australian Yellowtail Kingfish aquaculture industry: bringing white fish to the market
[61] More than 40 modules are now available, including modules specific to the prawn and rock lobster fisheries. In addition FRDC, with the support of SIA and other industry bodies subsequently established Fishsafe Australia (https://fishsafeaustralia.com.au) a one-stop shop for industry to access health and safety resources. This includes providing no-cost assistance to fishers to develop, maintain, and improve their Safety Management Systems, and to learn about new safety equipment. Fishsafe also provides information about incident reporting requirements as well as serious incident summaries.

approach to grow Australia's future was launched 5 March 2019; and was focused on delivering a world class agricultural innovation system to help Australia to reach the National Farmers Federation's target for a $100 billion sector by 2030. The report made recommendations aimed at benefiting all participants in Australia's agricultural innovation system, including researchers, research and development corporations (RDCs), industry representatives, producers, processors, investors, government agencies and companies across the start-up, accelerator and incubator communities. There are five recommendations in the report:

- strengthening leadership for strategic direction, but also for improving connections, collaboration, and culture
- balancing funding and investment to solve short-term challenges as well as targeting transformational and cross-commodity outcomes
- establishing world-class innovation practices including disruptive thinking, ambition and entrepreneurship to maximise opportunities from our investments
- strengthening the regions to maximise innovation uptake and provide regions with a greater role in national priority-setting
- establishing the next generation innovation platform for our data, physical infrastructure, and regulatory environment.

[See **2021–22: Agriculture Innovation Australia Ltd (AIA)**]

- In December 2018, and in parallel with the Ernst & Young work; the RDCs, through the Council of Rural Research and Development Corporations, released its *Vision 2050* for the future of Australia's rural innovation system. The vision is at: http://www.ruralrdc.com.au/news/council-releases-vision-2050-new-thinking-about-rural-innovation-in-australia/ and includes developing and implementing:
  - a national framework to drive a globally-connected, high-performing and effective knowledge and innovation ecosystem
  - a national, integrated, whole-of-government strategy for an enhanced agrisystem.

  As part of this initiative the FRDC worked with the eight other RDCs to develop a new investment vehicle that aimed to enhance collaborative research, development and extension to deliver transformational, cross-sectoral outcomes to the stakeholders of the agricultural value chain in Australia. The FRDC led the development of a new *Climate Initiative* which aimed to fast-track investment and response to the key areas associated with changing environmental conditions.

- The FRDC partnered the global FISH 2.0 Program (refer https://www.fish20.org/about/overview) to run the first Australian seafood innovation series. The first event ran at the Melbourne Business School in October and drew 16 groups of seafood entrepreneurs and innovators. In addition, over 40 investors and seafood experts attended an investor pitch session. The second and larger Australia–Asia-Pacific regional event run in Brisbane in March 2019, saw FRDC partner with the US State Department. The event brought together another 20 teams of innovators from Australia and the pacific to work on and share ideas. The event also drew investors from Australia, the Pacific Islands and South-East Asia to listen to the teams pitch their ideas.

- The National Habitat Strategy was completed and will be used in future to inform large scale rehabilitation programs (refer https://ozfish.org.au/national-fish-habitat-strategy/). See **2003-04: Where river meets sea.**

The seafood industry's determined AGVP was $3.14b, of which wild-catch was $1.7b and aquaculture $1.4b. (Tasmania became the first jurisdiction to exceed $1b AGVP.)

2019–20: The Australian Government reviews the FRDC's performance

As required under its 2015-19 Funding Agreement with the Commonwealth of Australia represented by the Department of Agriculture, the FRDC engaged Forest Hill Consulting to undertake an independent review of its performance. The purpose of the review, in broad terms, was to assess how well FRDC has met its obligations to levy payers and other stakeholders, as set out in its Funding Agreement 2015-19 with government, and in the Primary Industries Research & Development Act 1989 (PIRD Act). The review, the first of its kind, was completed in December 2018, and both the full report and the FRDC board's response are at: http://frdc.com.au/about/corporate-documents/funding-agreement. In summary the review found that FRDC:

- was a very well-managed, high-performing organisation
- was respected by its stakeholders as a vital part of fishing and aquaculture
- management was highly regarded for its expertise and its navigation of a highly complex environment
- managed compliance well
- had strong relationships with stakeholders
- collaborated constructively with other RDCs
- investments delivered benefits to levy payers, government and other investors

In addition to reporting against the terms of reference, the Forest Hill Consulting review recommended FRDC simplify the complexity of its investment and evaluation framework, and strengthen its approach to extension. The review made ten recommendations, of which the following three were rated as important:

- simplify key targets per area of investment; and continue the refinement of management / governance targets that are more relevant to organisational performance
- develop, produce and promote to stakeholders a stand-alone performance report that summarises the FRDC's key outputs and impacts relative to targets in its RD&E plan and AOP on an annual basis
- review the way it organises and manages its RD&E program (its investment and evaluation framework) during the development of its next RD&E plan with the aim of simplifying it

The FRDC developed a Response and Implementation Plan addressing all ten recommendations

On 05 April 2020 the Minister for Agriculture, Drought and Emergency Management on behalf of the Commonwealth of Australia represented by the Department of Agriculture, Water and the Environment signed a new ten-year FRDC Statutory Funding Agreement with the FRDC. The agreement outlined what the Minister expected of the FRDC over ten years, including in relationship to performance and transparency, as well as accountability to levy-payers, the government and the public (refer: funding-agreement).

Other significant activities in 2019–20 were as follows:

- In August 2019 The Hon. Ron Boswell was reappointed as FRDC Chair for a second three-year term by the Minister for Agriculture Bridget Mackenzie; however, in January 2020, due to ill health, he announced that he would step down as FRDC Chair. Following his resignation Professor Colin Buxton, FRDC's Deputy Chair, acted in the role until 10 March 2020; when Mr John Williams was appointed FRDC Chair by The Hon. David Littleproud, Minister for Agriculture, Drought and Emergency Management.

- In 2019 the Australian National Audit Office (ANAO) undertook a probity audit of the five statutory Research and Development Corporations. The objective of the audit was to assess the effectiveness of the rural research and development corporations' management of probity. The report was published on 18 December 2019. In managing probity issues, key conclusions were the Cotton RDC was largely effective and AgriFutures Australia, the Fisheries and Grains RDCs and Wine Australia

were partially effective. The FRDC supported all recommendations; and a subsequent audit found FRDC had exceeded the audit review requirements.

- Two marketing levies were voted upon. Although a majority of members of the Australian Prawn Farmers Association (APFA) supported a marketing levy there remained some who did not. APFA Management Committee agreed that writing to the Minister requesting the levy without the support of all farms was not the preferred option; and decided not to progress a compulsory marketing levy for the Australian Prawn Farm industry. The Abalone Council Australia's formal Abalone Consumer Education and Promotion ballot closed on 15 December 2019 with just under 70% of quota holders participating in the vote. The proposed compulsory marketing levy was not supported by the industry (either by numbers of individuals or by ownership) with a majority 76% voting not to progress the levy.

The seafood industry's determined AGVP was $2.979b, of which wild-catch was $1.6b and aquaculture $1.4b.

2020–21: Covid-19 impacts and responses.

In January 2020, after one of Australia's worst droughts, Australia faced widespread, intense bushfires followed in March by the coronavirus (Covid-19) pandemic. These events had a significant impact on those working in and support of fishing and aquaculture, including on the FRDC. From February 2020 FRDC monitored the international progression of Covid-19 and prepared for what might occur. By March 2020 it was clear significant changes would need to be implemented. First, was to ensure the welfare and safety of staff and stakeholders. Travel was suspended, board meetings were held via videoconference, and staff members were asked to work from home. From March to June the FRDC undertook a major engagement and communication program to provide stakeholders with Covid-19 updates (for example Government assistance packages) and information to assist them. Central to this were two Covid-19 editions of *FISH* Magazine and the initiation of a new weekly *Message in a bottle* e-newsletter. FRDC contacted all its researchers to gauge an understanding of the impacts Covid-19 restrictions would have on them and their projects. Where projects and activities, such as fieldwork, were impacted, the FRDC varied project agreements accordingly. Further, FRDC suggested existing Principal Investigators prepare a Covid-19 Management Plan; and advised that a Covid-19 Management Plan would be required for all new project agreements. The FRDC postponed its trade bursaries and leadership programs, delayed progressing new applications received, and cancelled the April 2020 call for applications.

In a report covering the period from January to June 2020 by Dr Emily Ogier (*2016-128 Human Dimensions research Subprogram management)* found the overall impacts of COVID-19 had not been uniform. Sectors supplying domestic retail markets and the take away food service sector mostly prospered, while producers selling into export markets and the domestic dine-in food service sector were often severely impacted. Businesses, irrespective of sector, that were both willing and able to be innovative and agile also benefited. For example, in 2020-21 Australia's Southern Bluefin Tuna exports to Japan were heavily affected by the pandemic (albeit they had been in decline for some time). This prompted the next generation of three fishing families (Blaslov, Stehr and Kinko) to unite and form Kin Premium Australian Seafood (Kin). Rather than selling whole gilled and gutted fish, Kin transformed the fish into 20 different cuts for direct sale in small portions to Australian consumers.

In a subsequent and more comprehensive report covering the period from 2019-2021 Dr Ogier summarised the impacts of covid-19 (2021-042: *Impact of COVID-19 on the Australian Seafood Industry: January 2020-June 2021 and beyond).* Australian fisheries and aquaculture had been disrupted to an unprecedented extent by the pandemic. At the same time, the sector experienced a number of other disruptions including natural disasters and trade barriers. Countermeasures and responses by government and sectors were also occurring simultaneously, making it challenging to isolate the residual impacts of the COVID-19 pandemic.

Throughout the second half of 2020-21 the key impacts across fishing and aquaculture revolved around workforce shortages, disruptions to supply chains, restrictions on recreational and Indigenous fishing, instances of panic buying which made stocking vessels difficult, and collapse of markets and lack of sales, requiring companies to hold stock. The most exposed parts of the seafood industry were those with products destined for export markets or associated with food service. On a positive note, there was an increase in seafood consumed at home.

The medium-term negative impacts attributable to the COVID-19 pandemic during this period included: sustained lower value and business turnover in some commercial fisheries and aquaculture sectors including live fish, abalone, some tunas, lobsters (although also attributable to other disruptions); significant decline in demand and activity for charter vessel fishing tour businesses; reduced levels of financial and organisational resilience amongst firms, industry organisations, clubs and agency staff most exposed to disruptions to export supply chains and markets; and reduced availability of strategic funds available to management agencies due to re-direction of these funds toward COVID-19 support measures.

However, the extent of evident medium-term impact was low overall, and there was limited structural change. Instead, changes in operating conditions accelerated by the COVID-19 pandemic included: challenges in ensuring labour supply, and growth in food retail, ready-to-eat food service, online purchasing and home delivery. Directly attributable to the COVID-19 pandemic were the policy effects of increased borrowing costs faced by most governments as a result of the debt that continued due to the cost of stimulus and financial support measures for eligible Australian businesses and households. Overall, the disruptions caused by the COVID-19 pandemic accelerated change in some practices across industry, government and research institutions and further highlighted the vulnerability of export reliant sectors with only one or two markets.

Gross Value of Production (GVP) in 2018-19 was $3.210b; fell to $3.147 in 2019-20; and fell again to $3.011 in 2020-21. These falls were not as pronounced as initially feared, and were the result of both the souring of the Australia-China trade relationship, and Covid-19. The significant falls were in Western Australia and South Australia. The WA Western Rocklobster fishery was particularly hard hit. GVP reductions had a downward impact on both the income of Australian fisheries and aquaculture, and the FRDC.

By mid-2021 many Australian fisheries and aquaculture sectors had or were returning to pre-COVID-19 levels of activity and production. Overall, production levels, business and employment continuity were largely maintained, with many businesses benefiting from high demand and price for seafood. Recreational fishers and businesses had resumed pre-COVID-19 levels of activity. Responses and adaptation by those within fisheries and aquaculture and by the Australian and state and territory governments appeared to have mitigated or dampened major negative impacts and assisted this recovery.

Other significant activities in 2020-21 were as follows:

- On 24 February 2021, the Hon David Littleproud MP, Minister for Agriculture, Drought and Emergency Management, reappointed Mr John Williams as Chair of the FRDC for three years to 09 March 2024.

- On 18 June 2020, after more than a year of consultation, the Assistant Minister Jonathon Duniam approved the FRDC's 2020-25 Research and Development Plan – *Imagining the future of fishing and aquaculture* which can be found at: https://www.frdc.com.au/research/rde-planning-and-priorities. (see **Appendix A: Evolution of the FRDC's programs in successive R&D plans.**] The Plan was informed by:
    - the December 2018 report by Forrest Hill Consulting on its review of FRDC's performance
    - key national initiatives; such as the *National Marine Science Plan, and the* Australian Government's target to grow Australian agriculture to $100 billion by 2030

- the draft shared vision for all sectors of fishing and aquaculture entitled "*Fish Forever: A shared 2030 vision for Australia's fishing and aquaculture community"*.
- key international plans and obligations such as the United Nations *Sustainable Development Goals*.

and aimed to be adaptable and responsive to further input from FRDC stakeholders through jointly developing more detailed roadmaps for achieving each of the five outcomes.

- The FRDC signed detailed service agreements with each of its representative organisations: Seafood Industry Australia (SIA); Australian Recreational and Sport Fishing Confederation (Recfish Australia); Commonwealth Fisheries Association; and the National Aquaculture Council (NAC)[62].

- On 28 August 2020 the Minister for the Environment, The Hon Sussan Ley MP and Assistant Minister for Forestry and Fisheries, Senator the Hon Jonathon Duniam announced that the Eastern Tuna and Billfish Fishery (ETBF) had achieved the global gold standard for sustainability - Marine Stewardship Council (MSC) accreditation.

- The FRDC provided a submission to the Standing Committee on Agriculture and Water Resources Inquiry into the Australian aquaculture sector. The purpose of the Inquiry was to identify opportunities to grow aquaculture in Australia. The FRDC's submission covered the following three topics:
  - the nature and current status of Australia's aquaculture sector
  - opportunities and barriers to the expansion of the aquaculture sector; including ability to access capital and investment
  - the ability for businesses to access and commercialise new innovations to expand aquaculture.

- The FRDC provided a submission to the Senate Standing Committees on Rural and Regional Affairs and Transport on the "fisheries quota system and examining whether the current 'managed microeconomic system' established around a set of individual transferable quotas results in good fishing practice"

- In February 2021 the FRDC made a submission to the Department of Agriculture, Water and the Environment on the draft report of the Review of the Agvet Chemicals Regulatory Framework.

- After 18 months of review and consultation, the FRDC implemented a number of changes to its R&D partnerships and engagement processes (designed to reduce complexity, increase collaboration, and improve effectiveness (see 2015–16: Major reforms of advisory committees).

- In June 2021 the FRDC replaced its quarterly "Stakeholder briefings" with "Research and Innovation Investment Briefings" re-focussing its purpose towards research and development.

- On 09 July 2020 John Wilson, the FRDC's second longest-serving employee (after Annette Lyons – see 2016–17: 25th anniversary) retired; after being on long service leave since October 2019. John joined the FRDC in 1992 as the Business Manager (becoming General Manager Business) and apart from the period 1996-2000, when he left to work for Airservices Australia, it was the position he held for 24 years. John played a pivotal role in establishing the FRDC, particularly its support systems and processes as described in 1991-94: Formative years. Dr Hone, in his farewell speech for John, described him as the 'heart' of FRDC.

- [62] NAC s wound up 24 Aug 2021. On 27 October 2021 Seafood Industry Australia (SIA), the national peak-body representing Australia's commercial fishing and aquaculture industry, announced the absorption of the responsibilities of the National Aquaculture Council (NAC) and the launch of its own Aquaculture Advisory Committee.

- On 31 May 2021 Peter Horvat, FRDC's General Manager Communications, left after 17 years. Peter was responsible for 17 annual operational plans and annual reports; input to three R&D plans; edited and produced 69 editions of FISH magazine; developed a longitudinal community perceptions dataset; developed the Australian Fish and Chips Awards; ran conferences and trade tours; input to the Status of Australian Fish Stocks Reports; and was involved in the production of the television series *Escape Fishing with ET* and *Seafood Escape with ET*.

The seafood industry's determined AGVP was $3.123b, of which wild-catch was $1.548b and aquaculture $1.462b.

2021–22: Agriculture Innovation Australia Ltd (AIA)

Innovation in the agriculture sector (including fisheries and forestry as well as pre and post farm gate value chains) and the role of RDCs had been the subject of numerous reviews for more than a decade. The majority of these reviews (for example, refer the 2019 Ernst and Young "Agricultural Innovation — A National Approach to Grow Australia's Future") highlighted the difficulties in addressing cross-sectoral issues, the need for a balance of incremental and transformational innovation, and the benefits associated with closer links between private and public sector efforts.

After numerous requests, in August 2020 the Minister for Agriculture held a roundtable with all RDC chairs and CEOs; and wrote to the Chair of the Council of Rural RDCs making it clear that a joint RDC effort was required to:

- increase investment into research and development (R&D) that targets transformational productivity gains, cross-sectoral and public good challenges
- accelerate the uptake and adoption of R&D outcomes, including commercialisation of R&D where appropriate
- improve collaboration and partnerships across the agricultural innovation system
- increase the flow of private sector and international investment into Australia's agricultural innovation system
- maximise the opportunities presented by Agtech

At its August 2020 meeting, the FRDC board agreed to FRDC becoming a founding member, along with the other Rural Research and Development Corporations, of AIA. The not-for profit company was incorporated by its members 01 October 2020 (https://www.aginnovationaustralia.com.au) with the following objects:

- to promote the research into, and development of, Australia's national agricultural resources
- to increase the productivity, profitability and sustainability of the agricultural value chain by:
    - identifying nationally significant cross-sectoral opportunities
    - developing strategies that facilitate a collaborative approach to investing in research and development, and the adoption of new knowledge and innovation required to realise those opportunities
    - raising and acquiring funding and resources from members, government and third parties and managing that funding and those resources to implement Company strategies.

On 01 Oct 2020 the Australian Government announced that it would provide $1.3 million in seed funding for AIA to help facilitate the achievement of the target of $100 billion farm gate value by 2030, as per the National Farmers' Federation (2018) *2030 Roadmap: Australian agriculture's plan for a $100 billion industry,* under the Australian Government's *National Agricultural Innovation Agenda.* AIA's ongoing funding comes from a combination of member subscription fees and investment from public, private, not-for-profit and global commercial entities.

AIA is initially concentrating on reducing duplication by brokering collaboration and investment with the 15 RDCs in key priorities such as climate; enhancing public and private sector collaboration and partnerships across the broader innovation ecosystem; and identifying existing opportunities within the RDCs that have cross-sectoral potential. These activities are laying the foundation, and prepare AIA for attracting new and non-traditional investment into Australian agriculture and taking a strong leadership role in fostering further innovation, and a more commercially focused and risk-taking culture. Together, these activities contribute to AIA targeting the big, cross-sectoral opportunities and challenges which will drive transformational change.

In May 2022 AIA held its first Member Forum; and on 27 May 2022 released its inaugural Strategic Plan, detailing how it will drive cross-sectoral collaboration and leverage public and private sector investment to target transformational innovation for Australian agriculture, fisheries and forestry (refer: https://www.aginnovationaustralia.com.au/siteassets/aia-strategic-plan-final.pdf). The Plan included an Impact Framework.

During 2021-22 AIA started its first project addressing climate resilience and adaptation ("Agri-Climate Outlooks") and distributed a memorandum for its second project ("Know and Show your Carbon Footprint"). These projects have secured RDC investment commitments of $18 million. A third project ("Climate Atlas") was in the design phase.

[Since its formation AIA has delivered an environmental accounting platform, a state-of-play report on regenerative agriculture in Australia; a Climate Atlas; an Environmental, Social, and governance report; a Common approach to sector-level greenhouse gas accounting for Australian agriculture; agri-climate outlooks; and circular economy work in partnership with Circular Australia.]

Other significant activities in 2021-22 were as follows:

- Board appointments effective 01 Sep 2021 were, Professor Colin Buxton (reappointed), Dr Chris Calogeras, Dr Saranne Cooke (reappointed), Suzi Hullick, Boris Musa, Alex Ogg, and Dr Lyndal Thorburn.
  Dr Kate Brooks, Katie Hodson-Thomas, Mark King, John Lloyd, and Dr Lesley MacLeod retired.

- FRDC signed on as a partner in the Marine Bioproducts Cooperative Research Centre (MBCRC) bringing three seaweed-related research projects it had underway into the MBCRC program. Two projects are investigating the use of seaweeds in water treatment processes, with the third project investigating year-round seaweed propagation. Additionally, researchers have identified that the active cultivation of the red seaweed *Asparagopsis* could reduce methane emissions by 90 per cent or more, when fed as a dietary supplement to cattle. The MBCRC consolidated and coordinated Australian seaweed-related research to make the best use of available resources and share knowledge. When Australian Government funding of $59m over 10 years is combined with contributions from industry partners, the MBCRC is a $270 million initiative. See https://mbcrc.com

- FRDC established the IMAS and CSIRO Salmonid Science Alliance and held a public meeting to showcase salmon science in Hobart in June 2022.

- FRDC launched the 'Adaptation of fisheries management handbook to climate change' and funded a follow-up project to deliver implementation training.

- FRDC partnered with Seafood Industry Australia (SIA) to obtain funding from the federal agriculture department's AgUP[63] grant program for a national digital seafood industry platform. The grant was to support a capability and capacity building investment plan linked to the recommendations relevant to RDCs in the federal National Agricultural Workforce Strategy and associated Roadmap. FRDC also became a leading partner in the Australian AgriFood Data Exchange initiative, a consortium of partners to collaboratively design, select/implement and build a trusted industry-wide data exchange that can be governed and owned by industry.

- As per its 2020-23 Workforce Plan, FRDC completed a major restructure of its business, under five general managers: General Manager Finance and Business; General Manager Information Communications Technology and Digitisation; General Manager Research and Development Investment; General Manager Stakeholder Engagement (responsible for corporate affairs, communications, and significantly the Extension Officer Network, one extension officer in each of the jurisdictions) and General Manager Strategy and Innovation (responsible for planning, cross-functional issues, and the development and maintenance of strategic partnerships). This grew the team to 40

[63] AgUP provides grants to co-fund industry-led (agriculture, fisheries and forestry) initiatives aimed at supporting jobs and retaining the Australian workforce by building skills, establishing and enhancing career progression pathways and mentoring opportunities.

people. The extension officers were recruited in early 2022 to engage directly with people and organisations involved in fishing and aquaculture so as to extend FRDC R&D outputs and incorporate input from these stakeholders into FRDC's R&D priorities. FRDC also began the process of filling its Indigenous graduate position.

- In June 2022 the FRDC published a study that analysed the energy use and greenhouse gases emitted by Australia's seafood sector, resulting in the first ever mapping of Australian seafood's carbon footprint.

The seafood industry's determined AGVP was $3.233b, of which wild-catch was $1.427b and aquaculture $1.806b. For the first time Australian aquaculture overtook wild-catch in terms of dollar value.

2022–23: Valuing fishing and aquaculture sectors

Quantifying and valuing sectors are considered under the following the three headers: quantifying, valuing, and valuing sectoral impacts on communities.

Quantifying

Before FRDC (1992), fisheries management agencies collected catch and effort data from commercial fishers in order to achieve sustainable levels of harvesting by either controlling the quantity of fish taken ("output" control) or the effort required to catch fish ("input" control). Over following years there was continual improvement and accuracy in the way in which the data was collected – from paper logbooks to electronic transfer. These data included aquaculture – a commercial activity that steadily grew over time. There was also an increasing awareness that managing the catch and effort of commercial fishers alone would not protect fisheries ecosystems. For example, in some fisheries the catch of some species by recreational fishers exceeds that of commercial fishers. Consequently in 2000-01 a national survey was undertaken in order to quantify the catch that fisheries managers could factor into their fisheries quota settings (refer FRDC projects 1998-169: Development of a national recreational and traditional fishing survey and 1999- 158: The National Recreational and Indigenous Fishing Survey). The national survey was a multifaceted project designed to provide a range of information about non-commercial fishing in Australia. The project comprised three independent surveys, the National Recreational Fishing Survey, the Indigenous Fishing Survey of Northern Australia, and the Overseas Visitor Fishing Survey.

Despite these surveys, there is little evidence that the data plays a significant part in sectoral access entitlements or factored into commercial quota setting. A further complication is the growing appreciation that it is not only fishing impacting the health of fisheries ecosystems. Other impacts include illegal and ghost fishing, terrestrial run-offs, development, and various forms of pollution and this has led to the concept of an "ecosystems approach" to fisheries management. Again, there is little evidence of its implementation. Alternative approaches to fisheries management have been the subject of FRDC projects described elsewhere in this document.

Valuing

In early 2000, the FRDC funded the first of a number of projects (see table below) aimed at quantifying the value of fish caught by the recreational sector in order for fisheries managers to make valid comparisons with the commercial sector (the value of which was based on its gross value of production (GVP)). Such comparisons were thought necessary when determining fisheries access entitlements. One such FRDC project was aimed at determining a GVP in the hope of a recreational FRDC R&D levy (see table below). The most significant of the early studies resulted in the 2002 publication *Valuing Fisheries – An Economic Framework* edited by Professor Tor Hundloe. It was funded by the FRDC, and was primarily directed towards using an economic method for calculating the equivalent of a gross value of production (GVP) for the recreational sector that could be used by fisheries managers in the allocation of fisheries resources between the commercial and recreational sectors. Despite the study involving leaders in fisheries economics and management, the framework was not accepted by the recreational sector that interpreted the results as playing down its economic importance. These value methodologies remained questionable, and there was no evidence of their consideration in access determinations which largely remain political.

Valuing sectoral impacts on communities

In FRDC project 2012-214 *Measuring the economic value of recreational fishing at a national level* Ridge Partners found that catch based (i.e. GVP based) valuation approaches were not appropriate, in-principle, to estimate the economic value of the recreational fishing sector as they did not appropriately capture all the community benefit elements of the sector. Consistent with the Australian Government's endorsement of the expenditure-based valuation approach in its 2005 Campbell Report the project found that expenditure-based valuation approaches were far more appropriate to value the economic contribution of the recreational fishing sector. This valuation approach is based on fishers' estimated direct attributable annual expenditure as a proxy, and recognises the sector's recreational service values beyond catch. The report recommended that all fishers, policy makers and other stakeholders adopt this standard valuation method across the national

recreational fishing sector; and that the approach be adopted as the basis for the second national recreational fishery survey.

So, after over two decades of investment by FRDC and other agencies, there was a move away from trying to determine a "farm-gate" GVP equivalent for the recreational sector to a comparison of the respective direct and indirect economic contributions to regional communities.

More recently, the FRDC funded projects (see table below) aimed at determining the economic contributions that fishing – and more recently aquaculture – make to coastal communities. Once again, the purpose of the results of such projects is to influence fisheries management and political decision making in matters that could impact detrimentally on fishing and aquaculture communities.

Fishing surveys by jurisdiction:

	Nationally	NSW	NT	Qld	SA	Tas	Vic	WA
Recreational	2018-161 Executive Summary[64] 2018-161 2012-214 2011-217: Wellbeing benefit of fishing	2012 NSW survey Being updated 2023-24 2010-050: game fishing valuation	2009-10 NT survey Being updated for 2022	2019-20 Qld survey	2021-22 SA survey	2017-18 Tas survey 2013 Tas survey	2020 Vic survey	2018 WA survey
Commercial	2017-210: Social and economic contributions 2002-223: National Atlas	2009-054: Regional valuation 2014-301: Social and economic valuation				2018-067: Benefits of small-scale fisheries	2016-17 Valuing the seafood sector	2022-038: Value through the supply chain

* This table will be updated as jurisdictions update their surveys.

Other significant activities in 2022-23 were as follows:

- On 29 March 2023 the Hon. John Kerin AO died. He was the Minister for Primary Industries and Energy from 11 March 1983 to 03 June 1991 and, amongst other important initiatives, created the 1989 Primary Industries Research and Development (PIRD) Act: the legislation underpinning the establishment of the rural research and development corporations, and under which the FRDC was formed in 1991. As the Minister he delivered three major statements on rural research and development, one with the personal involvement of the Prime Minister. He significantly contributed to the prosperity and welfare of all Australians specifically through the research and development corporations

- On 25 June 2023 The Hon. Simon Findlay Crean died. He was the FRDC's first Minister, serving as the Minister for Primary Industries and Energy from 04 June 1991 to 23 December 1993. His achievements ranged across many portfolios, but were always characterised by a focus on the national interest, engagement with stakeholders and acting with courage, principle and determination.

[64] The National Social and Economic Survey of recreational Fishers was released at the World Recreational Fishing Conference in Melbourne in February 2023.

- In March 2023 the FRDC and the Australian Recreational Fishing Foundation (ARFF) established a committee representing recreational fishing bodies to oversee research, development and extension (RD&E) priorities; and to help recreational fishing bodies implement the cultural and behavioural changes needed to ensure fish populations remain healthy.

- FRDC signed a memorandum of Understanding with the Land and Sea Aboriginal Corporation Tasmania, and the University of Tasmania: Research to Rights: Supporting cultural fisheries for Aboriginal Tasmanians.

- FRDC research developed a vaccine that helped achieve a substantial reduction in the severity of nodavirus outbreaks in farmed juvenile Queensland Groper.

- FRDC developed a new Cumulative Effects Assessment framework and applied it to 409 species around Australia to better understand the effects of fisheries on marine systems.

- FRDC research developed a novel isotope chemical tool to determine the provenance of Southern Rock Lobster.

- On 01 Aug 2022 Kylie Dunstan returned to the FRDC as its General Manager Stakeholder Engagement. Kylie worked at the FRDC as the FRDC's Communication and Extension Manager between 02 Nov 1998 and 04 Jan 2004, (after working for the Queensland Commercial Fishermen's Organisation). She left the FRDC to work for the Bureau of Rural Sciences (BRS) before moving to the Grains Research and Development Corporation, becoming its Head of Corporate Affairs; and later worked at media monitoring company Isentia as its Head of Government Business. Kylie also co-owns a commercial fishing company based in Bundaberg. She focusses on fostering relationships with key stakeholders, and leading both the FRDC's communications team and the FRDC's network of seven jurisdictional extension officers.

The seafood industry's determined AGVP was $3.316b, of which wild-catch was $1.420b and aquaculture $1.895b.

2023–24: Breakthrough on Rock Lobster aquaculture

In 1997-98 the FRDC created the "Rock Lobster enhancement and aquaculture subprogram" led by Dr Bruce Phillips. See **1997-98 Major gains in bycatch reduction**. Between 2000 and 2007, the subprogram delivered two main projects, each with dozens of subprojects nationwide, and included all four rock lobster species [Ornate Rock Lobster (*Panulirus ornatus*), Southern Rock Lobster (*Jasus edwardsii*), Western Rock Lobster (*Panulirus cygnus*) and Eastern Rock Lobster (*Sagmariasus verreauxi*)]. A major outcome of this work was developing technology for the large-scale collection of rock lobster purulis, technology for taking the pusulis through to larval stage, and developing capacity to re-seed wild fisheries taking aquaculture reared juveniles. The research also developed cooperation between research providers, scientists and commercial partners across Australia, allowing for longer-term, self-sustaining management of rock lobster research. By the end of the research subprogram in 2007, the FRDC had invested over $16 million in the subprogram and other rock lobster projects.

Separate from this FRDC investment, MG Kailis continued for several years as a commercial investor in research for Ornate Rock Lobster with the Queensland Department of Agriculture and Fisheries and James Cook University, using the Kailis company's Exmouth Hatchery. At the same time the University of Tasmania (UTAS) and a restaurant industry investor, the Darden group from the US, formed a joint venture and secured an Australian Research Council (ARC) grant for the commercial development of rock lobster culture systems, including hatchery technologies. However, closing the whole production cycle, in a way that was scalable, proved elusive, leading successive commercial investors to withdraw.

Finally in 2017, the UTAS Institute for Marine and Antarctic Studies (IMAS) announced that it had developed a world first consistently successful, scalable method to rear rock lobsters through their full life cycle from broodstock in a commercial hatchery environment. Southern Rock Lobster, although highly prized, has a significantly longer larval phase than other species, which made it less commercially viable for aquaculture. Efforts focused instead on the faster-growing Ornate Rock Lobster and commercial production opportunities in tropical Australia. In 2018 Tasmanian-owned business PFG Group Pty Ltd came on board as a new investor, after winning the bid to commercialise the UTAS technology, and establishing the spin-off body Ornatas Pty Ltd to do so.

In early 2021, over 25 years of research culminated in *Ornatas Pty Ltd* first producing a commercial batch of Ornate Rock Lobster (Tropical Rock Lobster) juveniles at its hatchery in Townsville. Later in the same year *Ornatas* Pty Ltd and *Maxima Rock e*stablished a grow-out trial of hatchery-bred Ornate Rock Lobster at Cone Bay in Western Australia. This established Australia's first ocean grow-out facility for commercial juvenile rock lobster aquaculture, with the aim of producing 1100 tonnes of hatchery-bred grown-out Ornate Rock Lobster by 2030. The FRDC and the (CRCNA) contributed $1.9 million to this $4.5 million Cone Bay project. Research priorities for the trial included raft design, animal translocation issues, health and biosecurity, feeding strategies, growth performance, environment and market acceptability. The use of formulated feeds became the focus of a $26 million UTAS-led ARC Research Hub for Sustainable Onshore Lobster Aquaculture.

Ornatus Pty Ltd delivered the world's first whole-of-life-cycle Ornate Rock Lobster aquaculture industry. The animals are grown in rafts for 18 months to a market size of 1.2 kilograms; and available all year round to domestic and international buyers. *Ornatas Pty Ltd* projects the industry to be worth $160 million by 2030, with the potential to generate more than $500 million in economic activity a year and create 900 new jobs in northern Australia.

Other significant activities in 2023-24 were as follows:

- On 19 March 2024 Senator the Hon. Murray Watt, Minister for Agriculture, Fisheries and Forestry, appointed Mr Travis Dowling as the Presiding Member of the FRDC Selection Committee until 20 November 2026.

- John Williams retired as FRDC Chair effective 10 March 2024.

- On 03 June 2024, Senator the Hon Murray Watt, Minister for Agriculture, Fisheries and Forestry, appointed Dr Elizabeth (Beth) Woods OAM Chair of the FRDC for three years to 02 June 2027.

- The national five year Business Plan for the collaborative management of Centrostephanus was implemented. Two Long-spined Sea Urchins (Centrostephanus rodgersii) were first identified in Tasmania in 1978, and by 2018 were estimated to number around 20 million. Centro range expansion has had a significant impact on the ecological integrity and functioning of large areas of Tasmania's East Coast rocky reef ecosystems, with some impacts along the Victorian and New South Wales coastlines. Incipient barrens became more numerous, causing critical changes in the systems. Over time the FRDC invested in a number of Centro research projects in all three affected jurisdictions that culminated on 01 February 2023 with the FRDC and The Department of Natural Resources and Environment Tasmania (NRE Tas) co-sponsoring a National Centrostephanus Workshop with the goal of contributing to the design of a coordinated regional approach for the sustainable management of Centro; that is, a 'Regional Management Strategy'. The workshop established a Task Force comprising representatives from the NSW (NSW DPI), Victorian (VFA) and Tasmanian (NRE Tas) state fisheries agencies, the CSIRO and the FRDC. In Sep 2023 the Task Force produced a national five year Business Plan for the collaborative management of Centrostephanus. The Plan involved a national investment of $55m; continuation of the national Task Force to govern the national investment delivery, and the establishment of a National Centro Advisory Group including representatives from Aboriginal community-controlled organisations, industry, researchers, commercial dive, processing and the recreational dive sector. The Plan provided a roadmap of actions to achieve effective management of Centro impacts on the Great Southern Reef marine habitat to ensure balanced ecosystems. The Plan is working to:
    - identify and manage priority management areas
    - monitor reef recovery (eg preventing seagrass destruction, regenerating kelp beds)
    - prevent barren formation
    - protect, restore and rehabilitate reef health
    - foster sustainable business enterprises (eg developing new seafood product from roe, and using urchin waste as agricultural fertiliser)
    - restore sea country

- FRDC research on the role of the recreational fisher in the stewardship of the Southern Bluefin Tuna fishery, influenced responsible rule changes in prominent fishing competitions resulting in anglers using social media platforms to correct other anglers' behavior thereby improving fish welfare.

- FRDC research led to the development of a first-of-its-kind mobile diagnostic tool allowing Southern Bluefin Tuna (*Thunnus maccoyii*) farmers to quickly identify blood fluke parasites in their stocks. This technology can be applied world-wide to any pathogen or infection present in aquaculture species.

- FRDC research helped the salmon industry use nanobubble technology to increase oxygen levels in Macquarie harbour and help conserve the Endangered Maugean Skate.

- Under FRDC's Statutory Funding Agreement 2020-30 with the Department of Agriculture, Fisheries and Forestry (DAFF), a periodic independent review of FRDC's performance against the Performance Principles outlined in the Agreement was undertaken. Forest Hill Consulting finalised the review for 2020-24 on 5 July 2024 following engagement with stakeholders to obtain broad feedback. The review found, "FRDC is performing at a very high level in a complex and challenging environment. It is a standout among research and development corporations (RDCs) in its drive to find better ways to deliver innovation to its stakeholders". The report made ten recommendations all of which the FRDC accepted and is implementing.

- FRDC delivered the Shark and Rays report card providing a science-based assessment of Australia's response to the National Plan of Action for Sharks and underpins Australia's reporting to the UN

- FRDC produced the first comprehensive report on fishing and aquaculture carbon – Greenhouse Gas (GHG) – emissions as well as a comprehensive report which investigated the opportunities for decarbonisation in commercial fisheries.

- FRDC investment in its national Extension Officer Network (EON) increased FRDC's ability to facilitate extension of post-project outputs beyond the term of the investment. One of the strengths of the EON is its ability to place emerging jurisdiction-based research outputs into a broader strategic context. EON provide another means for FRDC to be embedded in nationally focused projects. FRDC continues to expand its strategic partnership networks with government, commercial industry, philanthropic and other groups to broaden its understanding of relevant global drivers and socio-political landscape. Extension Officers in each jurisdiction provide another two-way conduit between FRDC and its knowledge base and industry stakeholders. To support these new efforts, FRDC continues to produce a suite of communications materials across several communications and media platforms to highlight project investments and disseminate post-project outputs. This includes FRDC staff attending and having input into a range of meetings and forums with stakeholders so project level extension occurs.

The seafood industry's determined AGVP was $3.462b, of which wild-catch was $1.423b and aquaculture $2.038b.

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Appendix A: Evolution of the FRDC's programs in successive R&D plans

1993 to 1995

Research and Development Plan 1993-94 to 1997-98

Natural Fish Resources	Aquaculture	Harvesting	Marketing
Knowledge of fisheries resources. Fisheries resource maintenance and improvement. Management of fisheries Fisheries habitat – the ecosystem.	*Aquaculture*: Growth and survival. General biology and genetics. Management and the environment.	*Harvesting*: Production handling and preservation. Marine environment. Processing.	*Marketing*: Customer needs analysis. Competitor analysis. Industry analysis.

1996 to 2000

Investing in tomorrows fish: RFDC's research and development plan 1996-2001

Resources Sustainability	Ecosystems Protection	Industry Development
Resources status. Fisheries management Improvement.	Ecosystems status. Ecosystems maintenance and improvement. Ecosystems management improvement.	Aquaculture development. Health and safety. Information delivery. Market development. People development. Quality. Technology. Value adding.
		[Operational, communication and management objectives were included, but not within a separate program]

2000 to 2005

Investing for tomorrows fish: RFDC's research and development plan 2000-2005

Natural Resources Sustainability	Industry Development	Human Capital Development	Management and Accountability
Fish biology. Interactions between fish and their ecosystems. Effects of fishing activities on fish and their ecosystems. Effects of non-fishing activities, pests and pollution on fish and their ecosystems. Health of fish and their ecosystems. Rehabilitation and enhancement of fisheries and their ecosystems Legislative, institutional, compliance and policy arrangement and their impacts. Access to fisheries resources. Stock assessment. Fisheries and Ecosystems.	Economic and social values of the industry and its impacts. Fishing technology. Legislative, institutional, compliance and policy arrangements and their impacts. Market development. Health and safety associated with fishing activities. Quality, food safety and consumer health. Value-adding.	Leadership development. Vocational development. Consumer education. Community education. Community involvement.	Fisheries R&D leadership. Strategic investment. Effective, efficient management. Communication and extension of results.

2005 to 2010

Investing for tomorrows fish: RFDC's research and development plan 2005-2010

Natural Resources Sustainability	Industry Development	People Development	Management and Accountability
Challenge 1: Natural resources sustainability. *Challenge 2*: Resource access and resource allocation.	*Challenge 3*: Response to demand; profitability.	*Challenge 4*: People development. *Challenge 5*: Community and consumer support.	Strategies for: • providing leadership in fisheries R&D • investing in high-priority R&D that has the potential to deliver the highest benefits • making R&D results widely known, and facilitating their adoption and (if appropriate) commercialisation • expanding the FRDC revenue base to increase investment in fisheries R&D • developing and maintaining effective, efficient, open and accountable management procedures and systems.

2010 to 2015

Investing for tomorrows fish: RFDC's research, development and extension plan 2010-2015

Environment	**Industry**	**Communities**	**People development (Enabling program)**	**Extension and adoption (Enabling program)**
Theme 1: Biosecurity and aquatic animal health. *Theme 2:* Habitat and ecosystem protection. *Theme 3:* Climate change. *Theme 4:* Ecologically sustainable development.	*Theme 5:* Governance and regulatory systems. *Theme 6:* Resource access and allocation. *Theme 7:* Production, growth and profitability. *Theme 8:* Consumers, products and markets. *Theme 9:* Value from aquatic resources.	*Theme 10:* Resilient, supportive communities.	*Theme 11:* Leadership development. *Theme 12:* Workforce development. *Theme 13:* Innovation skills.	*Theme 14:* Extension and adoption.

2015 to 2020

Knowledge for fishing and aquaculture into the future: FRDC's research, development and extension plan 2015-20

Environment	Industry	Communities	People	Adoption
RD&E that supports natural resource sustainability in managing fishing and aquaculture activities in Commonwealth, state and territory waters.	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. This program aims to help all sectors improve their overall performance.	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. It is enhanced by knowledge about the social importance of fisheries.	RD&E that is needed to attract and advance people who will lead fishing and aquaculture towards a sustainable and profitable future. The FRDC has taken a strong role in this area, from employing and developing young researchers, through to facilitating access to leadership development for all sectors of fishing and aquaculture.	How project outputs are delivered so they can be easily adopted and support stakeholder decision making and practices. The FRDC continually works with researchers and end users to determine and implement the best way of extending these results. In addition, the FRDC is continuing to develop its systems to ensure its 'knowledge bank' is widely accessible.

2020 to 2025

Imagining the future of fishing and aquaculture. The FRDC's research and development plan 2020-25

Five outcomes

Growth for enduring prosperity	**Best practice in production systems**	**A culture that is inclusive and forward t**hin**king**	**Fair and secure access to aquatic resources**	**Community trust, respect and value**

supported by five enabling strategies

Drive digitisation and advanced analytics	Strengthen adoption for transformative change	Promote innovation and entrepreneurship	Build capability and capacity	Provide foundational information and support services

Appendix B: FRDC's Representative Organisations

Representative Organisation		Date declared	Date revoked
National Fishing Industry Council (previously called the Australian Fishing Industry Council – AFIC)	NFIC	1991	
Australian Seafood Industry Council (previously called NFIC)	ASIC		(Ceased trading in 2006-07)
Australian Recreational and Sport Fishing Confederation	Recfish Australia	1995-96	
National Aquaculture Council	NAC	2006-07	Deregistered as an incorporated association Feb 2018
Commonwealth Fisheries Association	CFA	2006-07	
National Seafood Industry Alliance	NSIA	12 Sep 2011	14 Sep 2017 (Assistant Minister for Agriculture and Water Resources Anne Ruston)
Seafood Industry Australia (Incorporated 12 May 2017)	SIA	14 Sep 2017 (Assistant Minister for Agriculture and Water Resources Anne Ruston)	

Appendix C: National Science and Rural Research Priorities (work in progress)

Date	National Science and Research Priorities *(federal science department)*	Rural Research and Development Priorities *(federal agriculture department)*
		Sustainable management and use of our marine resource base through the integration of effective, scientifically based resource assessments and mitigation strategies into our fishing and aquaculture industries. Whole-of-industry approach: A whole-of-industry approach to production, processing and marketing to ensure an effective supply chain approach that maximises our competitive advantages. Bio-technology: Development of bio-technology to support our aquaculture industries, along with sensitive handling to accommodate consumers' concerns, to supplement and replace wild-catch fisheries where appropriate. Increases in trade and market access: A need for data and associated market analysis to allow for informed debate and to support Australia's negotiating position in international forums. Clean and green: Maintenance and enhancement of Australia's "clean, green" image. Food safety: Addressing food safety concerns of consumers. Improving our human resources: Cultivating creativity and innovation among our human resources.
2002	1. Promoting and maintaining good health 2. An environmentally sustainable Australia 3. Safeguarding Australia 4. Frontier technologies for building and transforming Australian industries	
21 Aug 2003	The National Research Priorities are: 1. An Environmentally Sustainable Australia 2. Promoting and Maintaining Good Health 3. Frontier Technologies for Building and Transforming Australian Industries 4. Safeguarding Australia (https://webarchive.nla.gov.au/awa/20030821031057/http://www.pm.gov.au/news/media_releases/2002/media_release2018.htm)	
30 Oct 2006	The National Research Priorities are: 1. An Environmentally Sustainable Australia 2. Promoting and Maintaining Good Health 3. Frontier Technologies for Building and Transforming Australian Industries 4. Safeguarding Australia (https://webarchive.nla.gov.au/awa/20061030034213/http://pandora.nla.gov.au/pan/60441/20061026-0000/www.pm.gov.au/news/media_releases/2002/media_release2018.html)	
2007		1. Productivity and adding value 2. Supply chain and markets 3. Natural resource management 4. Climate variability and climate change 5. Biosecurity
23 Feb 2008	The National Research Priorities are: 1. An Environmentally Sustainable Australia 2. Promoting and Maintaining Good Health	

	3. Frontier Technologies for Building and Transforming Australian Industries 4. Safeguarding Australia 5. (https://webarchive.nla.gov.au/awa/20080223021505/http://pandora.nla.gov.au/pan/10052/20080118-1528/pm.gov.au/media/Release/2002/media_release2018.html)	
26 Jun 2013	1. Living in a changing environment a. Identify vulnerabilities and boundaries to the adaptability of changing natural and human systems b. Manage risk and capture opportunities for sustainable natural and human systems c. Enable societal transformation to enhance sustainability and wellbeing 2. Promoting population health and wellbeing d. Optimise effective delivery of health care and related systems and services e. Maximise social and economic participation in society f. Improve the health and wellbeing of Aboriginal and Torres Strait Islander people 3. Managing our food and water assets g. Optimise food and fibre production using our land and marine resources h. Develop knowledge of the changing distribution, connectivity, transformation and sustainable use of water in the Australian landscape i. Maximise the effectiveness of the production value chain from primary to processed food 4. Securing Australia's place in a changing world j. Improve cybersecurity for all Australians k. Manage the flow of goods, information, money and people across our national and international boundaries l. Understand political, cultural, economic and technological change, particularly in our region 5. Lifting productivity and economic growth m. Identify the means by which Australia can lift productivity and economic growth n. Maximise Australia's competitive advantage in critical sectors o. Deliver skills for the new economy (https://webarchive.nla.gov.au/awa/20140212000221/http://www.innovation.gov.au/Research/Pages/StrategicResearchPriorities.aspx)	
2015	1. Food 2. Soil and water 3. Transport 4. Cybersecurity 5. Energy 6. Resources 7. Advanced manufacturing 8. Environmental change 9. Health (https://webarchive.nla.gov.au/awa/20240612083249/https://www.industry.gov.au/publications/australias-science-and-research-priorities-2015)	
2016	1. Digital Data and eResearch Platforms 2. Platforms for HASS (including Platforms for Indigenous Research) 3. Characterisation	

	4. Advanced Fabrication and Manufacturing 5. Advanced Physics and Astronomy 6. Earth and Environmental Systems 7. Biosecurity 8. Complex Biology 9. Therapeutic Development.	
2020		1. Australia is a trusted exporter of premium food and agricultural products by 2030 2. Australia will champion climate resilience to increase the productivity, profitability and sustainability of the agricultural sector by 2030 3. Australia is a world leader in preventing and rapidly responding to significant incursions of pests and diseases through futureproofing our biosecurity system by 2030 4. Australia is a mature adopter, developer and exporter of digital agriculture by 2030
12 Aug 2024	1. transitioning to a net zero future 2. supporting healthy and thriving communities 3. elevating Aboriginal and Torres Strait Islander knowledge systems 4. protecting and restoring Australia's environment 5. building a secure and resilient nation	

Appendix D: Status of Industry Partnership Agreements

Industry partner	First signed	Expiry date of current IPA
Abalone Council of Australia	04 July 2013	30 June 2029
Australian Abalone Growers Association	30 June 2015	30 June 2026
Australian Barramundi Farmers Association	04 March 2015	30 June 2026
Australian Council of Prawn Fisheries	16 March 2016	30 June 2026
Australian Prawn Farmers Association *(Compulsory R&D levy in place since Oct 2001.)*	01 Jul 2021	*30 Jun 2026*
Australian Southern Bluefin Tuna Industry Association	1999-2000 *(MOU with the Australian Tuna Boat Owners' Association)*	30 June 2023
Oysters Australia	01 July 2014	30 June 2026
Pearl Consortium	29 Aug 2011	30 Oct 2026
Southern Oceans	24 July 2017	31 Jan 2028
Southern Rock Lobster Limited	13 December 2005 (MOU)	30 June 2025
Tasmanian Salmonid Growers Association	01 June 2006 (MOU)	30 June 2020
Western Rock Lobster Council Limited	08 June 2006 (lapsed: 30 June 2010 to 14 March 2014)	30 June 2025

Note: "MOU" indicates Memorandum of Understanding, the precursor to Industry Partnership Agreement.

Appendix E: Commonwealth Fisheries Ministers

From	To	Minister	Assistant Minister (Parliamentary Secretary)
4 Apr 1990	4 Jun 1991	The Hon. John Charles Kerin Minister for Primary Industries and Energy	
4 Jun 1991	23 Dec 1993	The Hon. Simon Findlay Crean Minister for Primary Industries and Energy	To 23 Dec 1993 MJ Lee Minister for Resources Blewett, N Minister Assisting the Minister for Primary Industries and Energy
23 Dec 1993	11 Mar 1996	Senator the Hon. Robert Lindsay Collins Minister for Primary Industries and Energy	From 23 Dec 1993 The Hon. David Beddall, MP Minister for Resources Senator the Hon. Nick J Sherry Parliamentary Secretary to the Minister for Primary Industries and Energy
11 Mar 1996	21 Oct 1998	The Hon. John Duncan Anderson (NPA) Minister for Primary Industries and Energy	Senator the Hon. Warwick Parer Minister for Resources and Energy To 09 Oct 1997 Brownhill, Senator DGC (NPA) Parliamentary Secretary to the Minister for Primary Industries and Energy From 9 Oct 1997 Senator Judith M Troeth Parliamentary Secretary to the Minister for Primary Industries and Energy
21 Oct 1998	20 Jul 1999	The Hon. Mark Anthony James Vaile MAJ (NPA) Minister for Agriculture, Fisheries and Forestry	Tuckey, CW Minister for Forestry and Conservation Senator Judith M Troeth Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry

From	To	Minister	Assistant Minister (Parliamentary Secretary)
20 Jul 1999	26 Nov 2001	The Hon. Warren Errol Truss (NPA) Minister for Agriculture, Fisheries and Forestry	Tuckey, CW Minister for Forestry and Conservation Senator Judith M Troeth Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
26 Nov 2001	26 Oct 2004	The Hon. Warren Errol Truss (NPA) Minister for Agriculture, Fisheries and Forestry	Senator Ian D Macdonald Minister for Fisheries, Forestry and Conservation Senator Judith M Troeth Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
26 Oct 2004	06 Jul 2005	The Hon. Warren Errol Truss (NPA) Minister for Agriculture, Fisheries and Forestry	To 27 Jan 2006 Senator Ian D Macdonald Minister for Fisheries, Forestry and Conservation To 27 Jan 2006 Senator Richard M Colbeck Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
06 Jul 2005	O3 Dec 2007	McGauran, PJ (NP) Minister for Agriculture, Fisheries and Forestry	From 27 Jan 2006 Senator Eric Abetz Minister for Fisheries, Forestry and Conservation From 27 Jan 2006 The Hon. Susan P Ley Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry The Hon. Senator Ian D Macdonald Minister for Fisheries, Forestry and Conservation Senator Richard M Colbeck Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry To 27 Jan 2006 Senator Richard M Colbeck Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry

From	To	Minister	Assistant Minister (Parliamentary Secretary)
03 Dec 2007	14 Sep 2010	The Hon. Anthony Stephen Burke Minister for Agriculture, Fisheries and Forestry	
14 Sep 2010	27 Jun 2013	Senator the Hon. Joseph William Ludwig Minister for Agriculture, Fisheries and Forestry	From 14 Dec 2011 PS Sidebottom Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry To 14 Dec 2011 Mike Kelly Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
27 Jun2013	01 Jul 2013	Senator the Hon. Joseph William Ludwig Minister for Agriculture, Fisheries and Forestry	PS Sidebottom Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
01 Jul 2013	18 Sep 2013	The Hon. Joel Andrew Fitzgibbon Minister for Agriculture, Fisheries and Forestry	PS Sidebottom Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry
18 Sep 2013	21 Sep 2015	The Hon. Barnaby Thomas Gerard Joyce Minister for Agriculture (Deputy Leader of the Nationals)	Senator Richard M Colbeck Parliamentary Secretary to the Minister for Agriculture
21 Sep 2015	26 Oct 2017	The Hon Barnaby Joyce MP Minister for Agriculture and Water Resources	Senator the Hon Anne Ruston Assistant Minister for Agriculture and Water Resources
27 Oct 2017	18 Dec 2018	The Prime Minister	Senator the Hon Anne Ruston Assistant Minister for Agriculture and Water Resources
20 Dec 2017	29 May 2019	The Hon David Littleproud Minister for Agriculture and Water Resources	Senator the Hon Anne Ruston Assistant Minister for Agriculture and Water Resources From 28 August 2018 Senator the Hon. Richard Colbeck was Assistant Minister for Agriculture and Water Resources responsible for fisheries and aquaculture.

From	To	Minister	Assistant Minister (Parliamentary Secretary)
29 May 2019	02 Feb 2020	Senator Bridget McKenzie Minister for Agriculture (the first woman to serve in this role)	Senator the Hon Jonathon Duniam Assistant Minister for Forestry and Fisheries Assistant Minister for Regional Tourism *[The Hon David Littleproud continued his linkages with fishing and aquaculture via retaining responsibility for water (Minister for Water Resources, Drought, Rural Finance, Natural Disaster and Emergency Management)]*
02 Feb 2020	06 Feb 2020	Deputy Prime Minister Michael McCormack Acting Minister for Agriculture	Senator the Hon Jonathon Duniam Assistant Minister for Forestry and Fisheries
06 Feb 2020	01 Jul 2021	The Hon David Littleproud Minister for Agriculture, Drought and Emergency Management	Senator the Hon Jonathon Duniam Assistant Minister for Forestry and Fisheries
02 Jul 2021	07 Oct 2021?	The Hon David Littleproud Minister for Agriculture and Northern Australia	Senator the Hon Jonathon Duniam Assistant Minister for Forestry and Fisheries
08 Oct 2021	22 May 2022	The Hon David Littleproud Minister for Agriculture and Northern Australia	Senator the Hon Jonathon Duniam Assistant Minister for Forestry and Fisheries
23 May 2022	31 May 2022	Members of an interim Ministry were appointed to administer all Departments of State until such a time as a full Ministry was sworn in. The Hon Anthony Albanese MP (Prime Minister); The Hon Richard Marles (Deputy Prime Minister, Minister for Employment); Senator the Hon Penny Wong (Minister for Foreign Affairs); The Hon Jim Chalmers MP (Treasurer); Senator the Hon Katy Gallagher (Minister for Finance, Minister for Women, Attorney-General)	
01 June 2022	29 July 2024	Senator the Hon Murray Watt – Minister for Agriculture, Fisheries and Forestry Minister for Emergency Management	No Assistant Minister for Fisheries
29 July 2024	Current	The Hon Julie Collins MP – Minister for Agriculture, Fisheries and Forestry	Senator the Hon Anthony Chisholm Assistant Minister for Agriculture, Fisheries and Forestry

Refer:
http://www.aph.gov.au/about_parliament/parliamentary_departments/parliamentary_library/parliamentary_handbook/current_ministry_list

Appendix F: FRDC directors

Board	Appointed	Director	Detail
1	01 Mar 1992 to	Bill Widerberg	Chair
	31 Dec 1994	Dale Bryan	
		Dr Brian Hickman	Deputy Chair, appointed 16 Mar 1992
		Dr Burke Hill	
		George Kailis	
		Dr Robert Kearney	
		Ted Loveday	
		Bruce O'Meagher	Government Director, to 20 Feb 1994
		Dr Alison Turner	Government Director, from 21 Feb 1994
		Peter Dundas-Smith	Executive Director, appointed 17 Aug 1992
2	01 Jan 1995 to	Dr Russell Reichelt	Chair
	31 Dec 1997	Dr Diana Day	
		Dr Burke Hill	
		George Kailis	
		Ted Loveday	Deputy Chair, appointed 30 Mar 1995
		Peter Shelley	
		Richard A. Stevens	
		Dr Alison Turner	Government Director to 23 Jan 1997
		Mary Harwood	Government Director from 24 Jan 1997
		Peter Dundas-Smith	Executive Director

Board	Appointed	Director	Detail
3	01 Jan 1997 to	Dr Russell Reichelt	Chair
	31 Dec 2000	Simon Bennison	
		Dr Diana Day	
		Dr Jim Penn	
		Bill Sawynok	
		Richard A. Stevens	
		Sandy Wood-Meredith	Deputy Chair, appointed 18 Apr 1998
		Mary Harwood	Government Director to 13 Feb 2000
		Dr Derek Staples	Government Director from 14 Feb 2000
		Peter Dundas-Smith	Executive Director
4	01 Jan 2001 to	Dr Russell Reichelt	Chair, to 31 Dec 2001
	31 Aug 2003	Denis Byrne	Chair, appointed 01 Jan 2002
		Simon Bennison	
		Dr Diana Day	
		Ian Cartwright	
		David Newton	
		Bill Sawynok	
		Sandy Wood-Meredith	Deputy Chair, appointment date unknown
		Dr Derek Staples	Government Director to 12 Sep 2002
		Glenn Hurry	Government Director from 13 Sep 2002
		Peter Dundas-Smith	Executive Director

Board	Appointed	Director	Detail
5	01 Sep 2003 to 31 Aug 2006	Denis Byrne	Chair
		Simon Bennison	
		Ian Cartwright	
		John Harrison	John Harrison resigned effective 30 April 2005 when he became an " executive" of a representative organisation thereby ceasing, in accordance with s.18 of the then PIERD Act, to hold office as a director. David Bateman, whose expertise was in recreational fishing, began attending board meetings as an observer until the next board was appointed 28 Sep 2006
		Professor Tor Hundloe	
		Dr Nick Rayns	
		Stuart Richey	Deputy Chair, appointed 20 Oct 2003
		Glenn Hurry	Government Director
		Peter Dundas-Smith	Executive Director to 20 April 2005
		Dr Patrick Hone	Executive Director from 21 April 2005
6	28 Sep 2006 to 31 Aug 2009	Denis Byrne	Chair to 31 Aug 2007
		Peter Neville	Chair, appointed 01 Sep 2007
		Dr Ray Johnson	
		Dr Paul McShane	
		Frank Prokop	
		Stuart Richey AM	Deputy Chair, appointment date unknown
		Richard A. Stevens OAM	
		Richard N. Stevens	
		Glenn Hurry	Government Director to 28 May 2007
		Dr Patrick Hone	Executive Director
			From 01 -27 Sep 2006 the board comprised Denis Byrne, Dr Patrick Hone, and Glenn Hurry.

Board	Appointed	Director	Detail
7	01 Sep 2009 to	Peter Neville	Chair to 31 Aug 2010
	31 Aug 2012	the Hon. Harry Woods	Chair, appointed 01 Sep 2010
		Heather Brayford	
		Renata Brooks	
		Brett McCallum	Appointed 09 Sep 2009
		Dr Daryl McPhee	
		Stuart Richey AM	Deputy Chair, appointed 23 Nov 2009
		Professor Keith Sainsbury	Appointed 15 Sep 2009
		Richard A. Stevens OAM	
		Dr Patrick Hone	Executive Director
			In adopting the recommendations of the Uhrig report, the Australian Government abolished the position of Government Director
8	12 Sep 2012	the Hon. Harry Woods	Chair
	31 Aug 2015	Heather Brayford	
		Renata Brooks	
		Dr Bruce Mapstone	
		Brett McCallum	Deputy Chair, appointed 06 Dec 2012
		Dr Peter O'Brien	
		David Thomason	Died 23 Nov 2014
		Dr Patrick Hone	Executive Director

Board	Appointed	Director	Detail
9	01 Sep 2015 to 31 Aug 2018	the Hon. Harry Woods the Hon. Ron Boswell Renata Brooks Professor Colin Buxton John Harrison Dr Lesley McLeod Associate Professor Daryl McPhee John Susman Dr Patrick Hone	Chair to 31 Aug 2015 Chair, appointed 01 Sep 2016 Deputy Chair, appointed 07 Oct 2015 Executive Director *Following a review of corporate positions; in 2017-18 the title Executive Director was changed to Managing Director*
10	10 Oct 2018 to 31 Aug 2021	the Hon. Ron Boswell John Williams Dr Kathryn (Kate) Brooks Professor Colin Buxton Dr Saranne Cooke Katina (Katie) Hodson-Thomas Mark King John Lloyd Dr Lesley McLeod Dr Patrick Hone	Chair, until he resigned 10 January 2020 due to ill health Chair, appointed 10 March 2020 to 09 March 2021; allowing for the possible return of the Hon. Ron Boswell Deputy Chair, appointed 05 Feb 2019 Acted as FRDC Chair from 01 Nov 2019 to 09 Mar 2020 Managing Director *The Minister expanded the board from 8 to 9 members*

Board	Appointed	Director	Detail
11	01 Sep 2021 to 31 Aug 2024	Dr Elizabeth (Beth) Woods OAM John Williams Emeritus Professor Colin Buxton Dr Chris Calogeras Dr Saranne Cooke Suzanne (Suzi) Hullick Boris Musa Alex Ogg Dr Lyndal Thorburn Dr Patrick Hone	Chair from 03 June 2024 to 02 June 2027 Chair from 10 March 2021 to 09 Mar2024 Deputy Chair, appointed 10 Nov 2021 to 31 Mar 2023 (with the goal of increasing continuity for the next board) Deputy Chair from 01 April 2023 Managing Director
12	01 Sep 2024 to 31 Aug 2027?	Dr Elizabeth (Beth) Woods OAM Dr Chris Calogeras Manuwuri Forester Boris Musa Alex Ogg Yorick Piper Lyndal Thorburn Katherine Winchester Dr Patrick Hone	Chair Deputy chair Appointed 08 Jan 2025 by Senator the Hon Anthony Chisholm Assistant Minister for Agriculture, Fisheries and Forestry Managing Director

Appendix G: Voluntary contributions as a percentage of the maximum matchable

Table 9: Industry contributions maximum matchable contributions by the Australian Government and return on investment.

	A	B	C	D	E	F	G	H	I	J
Jurisdiction — by year	**Maximum matchable contribution**	**Actual industry contribution amounts**	**Percentage of matchable**	**Distribution of FRDC spend**	**Return on contribution (D/B)**		**Additional cash contribution**	**Percentage of total contributions (A/(B+G))**	**Return on contribution (D/(B+G))**	
	[note 1]	**[note 2,3]**		**[note 4,8]**	**[note 5,6]**			**[note 8]**	**[note 5,6]**	
	$	**$**	**%**	**$**	**2023-24**	**5 years**	**$**	**%**	**2023-24**	**5 years**
Commonwealth	1,514,262	1,316,728	87	5,337,498	4.05	3.64	0	87	4.05	3.47
New South Wales	449,845	442,807	98	4,818,835	10.88	8.29	579,356	227	4.71	3.44
Northern Territory	329,145	303,694	92	2,551,559	8.40	6.46	10,000	95	8.13	6.15
Queensland	711,105	350,000	49	4,613,138	13.18	8.54	385,000	103	6.28	5.42
South Australia	1,052,210	763,540	73	6,114,633	8.01	5.19	1,146,364	182	3.20	3.05
Tasmania	3,219,833	3,423,307	106	11,648,733	3.40	3.02	794,172	131	2.76	2.58
Victoria	263,385	163,839	62	2,370,001	14.47	10.78	350,000	195	4.61	5.72
Western Australia	1,114,873	1,124,214	101	5,427,152	4.83	3.16	240,000	122	3.98	2.44
Total	**8,654,658**	**7,888,129**	91	**42,881,548**	5.44	4.35	**3,504,892**	132	3.76	3.23
Australian farmed prawns [note 7]	486,940	349,189	72	848,322	2.43	2.24		-	-	

Voluntary contributions as a percentage of the maximum matchable

Year	APFA %	Common-wealth %	New South Wales %	Northern Territory %	Queensland %	South Australia %	Tasmania %	Victoria %	Western Australia %	TOTAL %
1991-92										20
1992-93										34
1993-94		77	57	10	66	84	79	14	50	62
1993-94		77	57	10	66	84	79	14	50	62
1994-95		122	97	11	59	65	96	20	45	71
1995-96		104	82	15	48	78	45	21	37	57
1996-97		99	78	20	59	100	6	23	43	57
1997-98		86	70	25	51	80	11	100	49	59
1998-99		88	78	31	86	88	51	95	60	72
1999-00		90	63	29	65	83	48	98	58	68
2000-01		90	76	33	81	69	70	100	55	72
2001-02	42	100	88	38	92	76	101	87	51	79
2002-03	94	101	81	43	100	81	67	83	80	84
2003-04	166	153	100	105	106	110	82	81	99	109
2004-05	167	168	117	89	94	111	100	94	102	114
2005-06	117	117	106	105	99	165	135	96	136	128
2006-07	107	120	122	197	100	183	109	131	116	129
2007-08	103	195	134	476	94	145	105	108	89	133
2008-09	103	322	74	517	90	199	104	110	164	169
2009-10	125	195	111	418	94	139	96	231	121	138
2010-11	106	189	105	440	121	179	108	365	133	153
2011-12	100	104	113	287	83	208	109	292	125	135
2012-13	84	95	193	187	70	194	99	335	105	128

Year	APFA %	Common-wealth %	New South Wales %	Northern Territory %	Queensland %	South Australia %	Tasmania %	Victoria %	Western Australia %	TOTAL %
2013-14	93	112	194	322	98	163	135	214	105	136
2014-15	114	122	195	141	111	80	120	156	101	115
2015-16	83	98	196	150	121	92	103	183	100	109
2016-17	92	104	161	124	121	119	108	151	100	113
2017-18	71	114	169	119	143	106	123	103	116	119
2018-19	63	140	196	99	160	133	122	89	126	130
2018-19	63	140	196	99	160	133	122	89	126	130
2019-20	80	81	148	131	140	106	112	96	131	113
2020-21	87	87	118	113	155	140	86	97	198	119
2021-22	62	91	531	106	143	168	101	119	144	141
2022-23	103	120	96	176	106	110	144	163	120	120
2023-24	72	87	227	95	103	182	131	195	122	132

Note that these calculations include project related income

Appendix H: A summary of legislative changes, Ministerial directions, and other stakeholder influences on the FRDC's modus operandi

[This is not an executive summary of the full story of FRDC's evolution. It has been created by selectively copying text from the full document. It serves as a ready reference for readers to look up influences on the FRDC's modus operandi. Unlike the full story, it is chronological. Further, notes and cross-references from the full document have been included where relevant to give the text wider context.]

1991-94

The Minister established the FRDC under the provisions of the PIERD Act (1989)

On 02 July 1991 the Minister for Primary Industries and Energy, The Hon. Simon Crean, established the FRDC under the provisions of the PIERD Act (1989).

The Minister declared the National Fishing Industry Council a representative organisation

The Minister declared the National Fishing Industry Council — later called the Australian Seafood Industry Council (ASIC) — a representative organisation to which the FRDC was required to report in accordance with the PIERD Act.

The FRDC's activities pursued, and were aligned with, the objects specified in section 3 of the PIERD Act

From the Corporation's inception until they were amended in 2013, the FRDC's activities pursued, and were aligned with, the following objects specified in section 3 of the PIERD Act:

"The objects of this Act are to:

a) make provision for the funding and administration of research and development relating to primary industries with a view to:

(i) increasing the economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries; and

(ii) achieving the sustainable use and sustainable management of natural resources; and

(iii) making more effective use of the resources and skills of the community in general and the scientific community in particular; and

b) improve accountability for expenditure upon research and development activities in relation to primary industries."

Minister directed how industry funds were to be spent

Early on, the chair and the manager of the secretariat met with state government and industry representatives to explain the role of the FRDC and to seek agreement on operational arrangements. A common stumbling block was the expectation that (unlike with FIRTA) industry funds raised by jurisdictions be unconditionally forwarded to the FRDC and subsequently accessed through a competitive R&D funding round.

Such discussions were appeased by two measures. First, in May 1992 Minister Crean issued a direction under section 143(1) of the PIERD Act that the FRDC was to ensure that spending of industry contributions was to be of direct relevance, within a five-year period, to the fishery, region or state/territory in which funds were collected, based on advice from management agencies and industry sectors.

Second, the FRDC agreed to establish a trust fund within each state and Commonwealth (CSIRO-administered) jurisdiction and to pay into that trust fund the first year's Australian Government contribution of $6.5 million in proportion to the AGVP of each jurisdiction. The FRDC guaranteed that it would support such funds being invested in R&D without competitive processes. In doing so the FRDC achieved expenditure of the Australian Government contributions in the inaugural year, 1991, in which there were no R&D project applications to fund.

The first 5-year R&D plan

The first 5-year R&D plan came into effect. With a sole focus on the commercial sector, it identified four areas for its R&D investment: natural fish resources, aquaculture, harvesting and marketing.

Fisheries Research Advisory Bodies
The Australian Bureau of Agricultural and Resource Economics (ABARE) was commissioned to develop a priority-setting process. As a consequence, the FRDC, in consultation with state and Commonwealth jurisdictions, established Fisheries Research Advisory Bodies (FRABs) or made existing bodies relevant to the FRDC. Their role was to ensure that R&D was directed to the needs of industry and other end-users.

1994-95

The Prawn Export Promotion Act 1995
At the request of the Australian Prawn Promotion Association, the Australian Government enacted the *Prawn Export Promotion Act 1995*. Under this Act, funding in the order of $700,000 per year was collected through a compulsory marketing levy on wild-catch prawn fishers. The initiative, the first of its kind for the seafood industry but similar to those of other primary industries, brought a number of benefits to the sector, including the capacity to successfully negotiate reductions in import tariffs.

[In 2001 the Act was repealed by the federal minister following a representation to a Queensland based MP with interests in the seafood industry by a minority of Queensland prawn exporters who regarded the initiative as a threat to their businesses.]

Minister amends previous direction on how industry funds were to be spent
M*inisterial direction of 11 May 1995 by the Minister for Resources, the Hon. David Beddall, MP:*
"Pursuant to my powers under sub-section 143(1) of the *Primary Industries and Energy Research and Development Act 1989*, and replacing the Ministerial direction given to FRDC on 21 May 1992, I hereby direct that:

d. FRDC is to ensure that industry funds raised from a particular fishery, industry sector or State/Territory are spent within a five-year period starting from the year of receipt on research and development projects that are of direct relevance to:
    a. that fishery; or
    b. industry sector; or
    c. the State/Territory in which the funds were collected;
e. in determining the projects on which funds are to be spent under (a), FRDC is to have regard to the advice of the relevant management agency and industry sectors acting in collaboration through the relevant FRAB; and
f. FRDC is to recognise the Australian Fisheries Management Authority, operating in consultation with its Management Advisory Committees, as the FRAB relevant to Commonwealth-managed fisheries, including Joint Authority fisheries managed under Commonwealth law."

[As a consequence of amendments to the PIERD Act (renamed the PIRD Act) in 2013, the FRDC entered into a 2015–19 Funding Agreement with the Commonwealth of Australia represented by the Department of Agriculture and Water Resources as a new basis for receiving Australian Government funding. In a letter of 28 May 2015, Senator the Hon. Richard Colbeck, Parliamentary Secretary to the Minister for Agriculture, referred to his signing of the Funding Agreement and set out a written direction to the FRDC, for the purposes of s143(1) of the PIRD Act, to the effect that in entering into the Funding Agreement the Ministerial direction issued in 1995 was no longer to apply, effective from 1 July 2015. See 2019–20: Government reviews the FRDC's performance]

1995-96

The second 5-year R&D plan
Investing for tomorrow's catch: the FRDC's research and development plan, 1996 to 2001 (its second plan), specifying the FRDC's strategic R&D priorities for the next five years, came into effect. It recognised recreational fishing, and cultural fishing by Indigenous people, as principal sectors of the fishing industry. This significant change widened the scope of the FRDC beyond its

previous focus on the commercial sector. Subsequentially, the Minister for Resources and Energy declared the Australian Recreational and Sport Fishing Confederation (Recfish Australia) as the second representative organisation of the FRDC.

The R&D plan re-structured the FRDC's programs into Resources Sustainability, Ecosystems Protection and Industry Development to reflect Government and industry priorities, and specified indicators against which the FRDC could measure its performance. [A table showing the evolution of the R&D program structure is at Appendix A: Evolution of the FRDC's programs in successive R&D plans.]

1997-98

The Government reduced its contribution to the FRDC for one year

The Australian Government, through a once-off regulation, reduced its contribution from the 0.5% component of the AGVP for the coming financial year by $3.6 million. Minister for Resources and Energy, the Hon. Warwick Parer, at a meeting of the Ministerial Council for Forestry, Fisheries and Aquaculture, encouraged his state counterparts to maximise the Australian Government's matching contributions to the FRDC by ensuring that state industry contributions were at least 0.25% of the AGVP.

1998-99

The **Commonwealth Authorities and Companies Act 1997**

In January 1999, the Parliamentary Secretary to the Minister for Agriculture, Fisheries and Forestry, Senator Judith Troeth, informed the FRDC of sweeping new accountability arrangements for statutory authorities. Under the new *Commonwealth Authorities and Companies Act 1997* (CAC Act), which mirrored the *Corporations Act 1989*, the directors of the Corporation were to include a report of operations in their annual reporting. Other significant changes to accountability arrangements resulted from the Australian Government's moves to an accrual-based "outcomes and outputs" budget framework, to be used first in the 1999–2000 financial year. Accordingly, the FRDC developed a new strategic structure to focus on outcomes and encouraged outcomes-based priority setting through the FRABs and other entities. Figure 1 shows the essential elements in relation to the program structure at the time. [The Public Governance, Performance and Accountability Act 2013 (PGPA Act) replaced both the CAC Act 1997 and the Financial Management and Accountability Act 1997. See **2014-15: Seafood CRC leaves its mark**]

1999-2000

Measurement of ESD performance

Following an inaugural national workshop to engage all stakeholders in developing a national fisheries ESD framework, the FRDC — in conjunction with the Australia-New Zealand Standing Committee for Fisheries and Aquaculture and with representatives of the fishing industry — established a suite of projects to speed the development of ESD criteria and indicators. They were expected to allow reliable measurement, over time, of the ESD performance of all Australian fisheries, and to be important in helping commercial operators to meet the requirements of the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 1999*. [Subsequently the FRDC formed an ESD Reporting and Assessment Subprogram. The Subprogram's ESD and risk assessment processes have now been adopted by FAO as their model for fisheries assessment worldwide.]

2000-01

The third 5-year R&D plan

Investing for tomorrow's fish: the FRDC's research and development plan, 2000 to 2005, the FRDC's third five-year R&D plan, came into effect. It contained the most comprehensive available description of the Australian fishing industry and its future challenges, based on the changes in the FRDC's business environment envisaged for the following 20 years. The Plan

modified the previous program structure with the three R&D programs becoming Natural Resources Sustainability, Industry Development and Human Capital Development.

2001-02

Seafood Services Australia Ltd

Despite the industry's many success stories, market and institutional failure in the seafood supply chain continued to impede the industry's ability to identify and capitalise on many of its opportunities. Increasingly sophisticated global markets require prompt, efficient access to the best knowledge, processes and technology if the Australian seafood industry is to be globally competitive. Seafood Services Australia Ltd (SSA), until then a series of joint-venture R&D projects, had sufficiently demonstrated its potential to deal with those challenges for the FRDC and ASIC to incorporate it as a company limited by guarantee. [ASIC ceased to be a company member of SSA when ASIC was wound up in 2006. The FRDC withdrew as a company member of SSA in 2007, acting on legal advice. By 2009 the company members were the National Aquaculture Council Inc., Seafood Experience Australia Ltd and Sydney Fish Market Pty Ltd. Details of SSA's winding up in 2013 and its legacies are at 2013-14: Expanded roles for the FRDC]

Australian prawn farming sector R&D levy.

In Oct 2001 the Australian prawn farming industry became the first Australian seafood sector to implement a compulsory federal levy based on production, to fund research and development.

Amendment to the way the Government contribution to the FRDC is calculated

DAFF initiated an amendment to the PIERD Act to change the way in which the AGVP was calculated; without consulting with, or advising, the FRDC. [The consequence of the way in which this change was handled was that DAFF overpaid the FRDC $1.9 million over six years - the FRDC paid the debt off over a further six years.]

2002-03

Minister states the need for R&D corporations to measure investment outcomes

In an address to the chairs of rural R&D corporations, Senator Judith Troeth, Parliamentary Secretary, stated that:

> Many research organisations measure performance on the basis of the number of patents, or level of commercialisation, as an indicator of performance. However, demonstrating that research is actually being adopted by rural end-users is fundamental to the rural R&D corporation model.

She added that the R&D corporations had to provide hard evidence of success and the value delivered to the nation through the funding partnership between government and industry. To this end, the FRDC asked the Australian Fisheries Management Forum, comprising directors of Australia's fisheries management agencies, to help it in quantifying R&D outcomes — i.e., what happens when the results of R&D are implemented — of FRDC's investment in projects related to fisheries management. Such involvement of fisheries managers was significant, because they were the end-users of the 60% of the FRDC's R&D budget that was invested through the Natural Resources Sustainability Program.

Legislative changes to R&D contribution collection options

For some years, state governments had queried why they had a role in collecting industry contributions to be passed to the FRDC for fisheries R&D, in contrast with other industries, which were sustained by a Commonwealth R&D levy that did not involve state governments. The FRDC therefore obtained legal advice, which was that there was no obligation on the Commonwealth to match industry payments that were made directly to the FRDC, rather than through a state or territory, and that in order for an obligation to be imposed on the

Commonwealth to rectify this anomaly, an amendment would need to be made to the PIERD Act regulation.

[The lack of Commonwealth R&D levies required the collection mechanism to continue and to remain a point of contention between the FRDC and some jurisdictions. It also occasionally resulted in the contributions from some jurisdictions being less than the maximum that would be matched by the Commonwealth. The 2013 amendments to the Act provided for a fishery to be declared a "separately levied fishery", and for levies collected by Commonwealth processes to be matched without state or territory government involvement. A separately levied fishery is yet to be created.]

Prime Minister announces first national research priorities
Australia's first national research priorities were announced by the Prime Minister in December 2002, dealing with an environmentally sustainable Australia; promoting and maintaining good health; frontier technologies for building and transforming Australian industries; and safeguarding Australia. Subsequently, the Parliamentary Secretary issued updated Australian Government priorities for rural R&D in the light of the new national research priorities. The FRDC responded quickly to both sets of new priorities, incorporating them into its reporting processes.

2004-05

First stakeholder survey
The FRDC's first stakeholder survey was conducted. It revealed that the FRDC had a very high level of recognition by the industry and was well regarded. Areas for increased investment were identified. Responses supported a view that the best partnerships for future investment were with industry councils. [The FRDC now commissions regular stakeholder surveys. See https://www.frdc.com.au/market-research See also 2014-15: New roles for the FRDC regarding a significant uplift in the number of indicators of stakeholder awareness.]

2005-06

The fourth 5-year R&D plan
Investing for tomorrow's fish: the FRDC's research and development plan 2005–2010, the FRDC's fourth five-year plan, came into effect. Like its predecessor, the plan was based on forecast changes to the FRDC's business environment and redefined the Corporation's strategic challenges. The FRDC's program structure was further enhanced, as shown in Appendix A: Evolution of the FRDC's programs in successive R&D plans.]

The Uhrig Report
Following a wide review of Australian Government statutory authorities' corporate governance by John Uhrig, the Government announced that R&D corporations would remain in place under the CAC Act, with their own boards. The Government ratified the rural R&D corporation model as the preferred mode for engaging in government–industry partnerships. The PIERD Act was amended to discontinue the position of government director and expand the range of desired expertise for selection of directors to include government policy processes and administration. The reasons were that appointment of government directors was inconsistent with a skills-based approach and that discontinuance would remove potential conflicts of interests in responsibilities to the department and the minister and responsibilities to the board and the R&D corporation. The review clearly identified that the FRDC board's role was to establish strategy, manage risk and opportunity (entrepreneurial), and monitor and respond to performance from its R&D investment.
[Subsequently the FRDC prepared a Statement of Intent required by the Government, incorporated it into the 2007–08 annual operational plan, and started to integrate it into its reporting framework. The FRDC also increased communication with the Minister and DAFF

through monthly reporting. The Parliamentary Secretary also suggested that RDCs improve their level of collaboration, implement a quantitative impact assessment and reporting framework between them, and improve their level of investment in people development.]

2006-07

Seafood Cooperative Research Centre

Cooperative research centres relating to the seafood industry had existed alongside the FRDC since 1993 and co-invested significant Australian Government funds into many FRDC-managed projects. The need for a new CRC stemmed from recognition that the Aquafin CRC was due to wind up in 2008–09: without a follow-on entity, significant increased demand would be put on FRDC funding. Previous CRCs had focused on aquaculture development, so the challenge was to find a theme for a new CRC that would meet the Australian Government's criteria and not to be, nor appear to be, "more of the same".

Many of the major sectors of the seafood industry, both wild-catch and aquaculture, had benefited from the millions of dollars that the FRDC and previous CRCs had invested in ensuring the sustainable development of their production, and were now shifting their R&D priorities further along their supply chains. Consequently, at an initial workshop of industry and research leaders, it was decided that any new CRC should be built around the R&D needs of the "big end of town" as this would afford the CRC most opportunity to realise the significant economic outcome required by the CRC programme criteria.

In December 2006, the Australian Government approved the establishment of the Australian Seafood Cooperative Research Centre with a cash investment of $35.5 million, making it the second-largest of all Australian CRCs until then. The FRDC invested some $31 million (including participants' contributions made through the FRDC) over seven years. Non-FRDC participants contributed some $16 million over the seven years. Total Australian Government and industry investment was $152 million ($82 million in cash and $70 million in-kind). In 2007 the Seafood CRC Company Ltd was formed

ASIC ceased trading

ASIC ceased trading because of lack of financial support from the state industry councils. This had wide ramifications, particularly for the FRDC because ASIC was — together with Recfish Australia — a representative organisation under the PIERD Act, and because it was a company member of Seafood Services Australia Ltd. [In 2015 the Australian Government provided the National Seafood Industry Alliance a grant to develop a national seafood peak body. As a result of this Seafood Industry Australia was formally incorporated 12 May 2017. The Minister declared the National Seafood Industry Alliance Inc. a representative organisation in 2011 and revoked the NSIA declaration in 2017 in favour of Seafood Industry Australia.]

2007-08

Council of Rural Research & Development Corporations

The FRDC joined the new Council of Rural Research & Development Corporations charged with instigating high-level reports to the Minister for Agriculture, Fisheries and Forestry concerning, for example, national rural RD&E strategy and priorities and assessment of current delivery mechanisms.

2009-10

Working Together: the national fishing and aquaculture research, development and extension strategy 2010

Working Together: the national fishing and aquaculture research, development and extension strategy 2010 was approved by the Primary Industries Ministerial Council (PIMC) as a component of the new National Primary Industries Research, Development and Extension Framework. Its intent was to encourage collaboration and promote continual improvement in

national investment in primary industry RD&E. Developing the strategy involved unprecedented collaboration between fishing and aquaculture industry leaders, the RD&E community and other key stakeholders. It was considered to potentially move fishing and aquaculture RD&E towards greater integrated planning — particularly for addressing national priorities — leading to more cost-efficient, effective delivery of RD&E.

[Implementation of the first edition of the strategy was varied. Little evidence ensued that it had made a measurable difference to the extent of collaboration between research providers or to the quality of research beyond that achieved through extant FRDC processes.
In 2015-16 the second edition of the National Fishing and Aquaculture RD&E Strategy 2015-20 was implemented with evidence, during its developmental phase, of greater commitment to the process than with the first edition. The governance committee that oversaw its development was chaired by the Australian Fisheries Management Forum that also oversaw its implementation. Also important is that a major element of this document was the roles each partner undertook, with respect to "lead" or "support" in the various areas of RD&E covered by the Strategy. The FRDC continued to provide secretariat support to the governance committee. Although the Strategy was part of a broader framework across agriculture, appetite for it waned through the years.

Agriculture Innovation Policy agenda,
In 2019-20 the Australian Government facilitated a consultative process that developed the Agriculture Innovation Policy agenda, (announced September 2020) that sought to encourage alignment of investment, improved leadership, and cohesion. As part of this Agenda the Australian Government released the National Agricultural Innovation Policy Statement on 11 October 2021. It outlined a strategy for how Australia could use agricultural innovation to position the sector as resilient, profitable and internationally competitive. To align efforts, and target investment within the innovation system, the Statement established the following four new priorities

1. Trusted exporter of premium food and agricultural products
2. Champion of climate resilience to increase the productivity, profitability and sustainability of the agricultural sector
3. World leader in preventing and rapidly responding to significant pests and diseases through future-proofing our biosecurity system
4. Mature adopter, developer and exporter of digital agriculture

Together these elements provided priorities across the agrisystem, and more directly to enhance coordination in driving sustainable growth of fishing and aquaculture. See **2021-22: Agriculture Innovation Australia Ltd (AIA)**].

Australia's 2022-30 National Fisheries Plan
In April 2022 the Department of Agriculture, Water and Environment released Australia's 2022-30 National Fisheries Plan. This was the first of its kind and provided a blueprint for the sustainable growth of the fishing and aquaculture sectors. Its primary purpose was to create a shared vision for the future of fishing, aquaculture and seafood in Australia so as to align the strategic planning, prioritisation and investment of Commonwealth, state and territory governments and sectors. The Department's vision was for the *Sustainable growth and development of Australia's fishing, aquaculture and seafood community for the benefit of all Australians and our aquatic ecosystems now and into the future.*

2010-11

Productivity Commission reports on effectiveness of RDCs
Following the Minister's request to the Productivity Commission to consider the effectiveness of the RDC model in improving competitiveness and productivity and whether other models could address policy objectives more effectively, the Commission concluded that the Australian Government should continue with the RDC model since the research sponsored by RDCs had, in aggregate, significantly benefited the rural sector and the wider community. The

Commission noted that while much of this benefit came from research-induced productivity improvements, there had also been positive environmental and social impacts. The Commission also suggested mechanisms for increasing cross-sectoral R&D and recommended permitting statutory RDCs to undertake industry-funded marketing and promotion activity, thereby removing the difference between those corporations and the industry-owned corporations.

The fifth 5-year RD&E plan

Investing for tomorrow's fish: the FRDC's research, development and extension plan 2010–2015, the FRDC's fifth five-year plan, came into effect. The plan's five programs and 14 themes mirrored those of the N*ational fishing and aquaculture research, development and extension strategy* released earlier in 2010. A shift in emphasis, to which the FRDC's stakeholders contributed substantially, resulted in the three principal R&D programs being named "Environment", "Industry" and "Communities", and two enabling programs being instituted to add value to them: "People Development" and "Extension and Adoption".
The renewed emphasis on extending R&D outputs to end-users also resulted in "extension" being added to the title of the plan.

2011-12

Indigenous Reference group

In 2011 the FRDC convened the first National Indigenous Fisheries RD&E Forum. At the forum the group developed the Eleven Key Principles for Indigenous focused RD&E – the 11 Cairns Principles. In 2011, following the forum, the FRDC established the IRG, based on advice from the Forum's Indigenous participants. The IRG members were all Indigenous and drawn from a range of expertise in cultural, recreational and commercial fishing, fisheries management, fisheries policy development (international and national), fisheries research and education, natural resource management, and Indigenous community governance and consultation. The membership was drawn from all state and territory fisheries jurisdictions and the Torres Strait. IRG members strongly acknowledged that they did not speak on behalf of all Indigenous people and communities; but with the endorsement of the Indigenous participants at three National Indigenous Fisheries RD&E Forums they felt they could provide high level strategic input and advice based on the 11 Cairns Principles and Five RD&E Priorities developed and endorsed via the forum process.
(See: 2013-14: New roles for the FRDC)

Inquiry into the Role of Science for Fisheries and Aquaculture

The House of Representatives Standing Committee on Agriculture, Resources, Fisheries and Forestry called an **Inquiry into the Role of Science for Fisheries and Aquaculture**. The holding of the inquiry coincided with the FRDC's assessment that a rethink was needed on how science was informing the needs of ministers, the community, industry and managers.

2013-14

Expanded roles for the FRDC

In 2013, the objects of the rural R&D corporations specified in section 3 of the PIERD Act were supplemented following an amendment to the Act, which was renamed the *Primary Industries Research and Development Act 1989* (PIRD Act). The added provisions were contained in sub-sub-clauses iv, v and, in respect of the FRDC, sub-clause b — delineated in blue in this panel.

"The objects of this Act are to:
(a) make provision for the funding and administration of research and development relating to primary industries with a view to:

(i) increasing the economic, environmental and social benefits to members of primary industries and to the community in general by improving the production, processing, storage, transport or marketing of the products of primary industries; and
(ii) achieving the sustainable use and sustainable management of natural resources; and
(iii) making more effective use of the resources and skills of the community in general and the scientific community in particular; and
(iv) supporting the development of scientific and technical capacity; and
(v) developing the adoptive capacity of primary producers; and
(vi) improving accountability for expenditure on research and development activities in relation to primary industries; and

(b) make provision for the funding and administration of marketing relating to products of primary industries."

A drafting oversight prevented the FRDC from using voluntary marketing contributions for marketing purposes. The Department of Agriculture undertook to amend the legislation to remedy it. On 16 August 2018, the Primary Industries Research and Development Amendment Bill 2017 was passed by both houses of parliament. This Bill amended the PIRD Act to allow the FRDC to use voluntary marketing contributions to invest in marketing activities. It allowed a more flexible approach to deliver marketing services for Australian fishing and aquaculture. It also opened the doors for FRDC to work with other research and development corporations, such as Wine Australia, to deliver integrated Australian marketing activities.

The RDCs' new legislative objects provided a very important authority for a number of changes in addition to those listed above, including:

- the requirement for the FRDC to enter into a Funding Agreement with the Commonwealth of Australia represented by the Department of Agriculture
- the ability to declare a part of the fishing industry as a "separately levied fishery" and for its contributions to the FRDC to be matched by Australian Government up to the 0.25% AGVP cap
- a requirement for the FRDC to spend funds raised from a particular jurisdiction or industry sector on RD&E activities relevant to that jurisdiction or sector
- a requirement for board selection committees to create a "reserve list" that can be used to fill unplanned vacancies over the following twelve months
- preparation for an independent review of FRDC operations and consistent benefit–cost analysis of projects
- improvement in collaboration and cross-sector investment, and reporting on it annually.

2014-15

Seafood CRC leaves its mark

The Seafood CRC was incorporated in June 2007, and was anticipated to wind up in 2014 but, in practice, wound up in 2015. During this eight-year period, the 39 participants in the company conducted 540 projects that produced benefits to aquaculture, fisheries, domestic and export markets. The value of the benefits was estimated to be $529 million net present value over the 15-year period from 2007 to 2022.

Financially, the CRC exceeded expectations. Against the cash contribution of $73.5 million specified in the Commonwealth Agreement, the actual contribution was $82.5 million, of which $30 million was invested by the FRDC ($6 million more than envisaged in the Commonwealth Agreement). [Although the CRC ceased operating under the auspices of the Commonwealth CRC program on 30 June 2015, the underlying legal entity, the Seafood CRC Company Ltd, continued operating until 2017 to assist in voluntary marketing arrangements established with the prawn and abalone sectors.]. Throughout the life of the CRC there was a

strong collaborative relationship with the FRDC. The FRDC continues to drive some of the major CRC legacy activities and has retained copies of all CRC materials for future reference and archiving.

The Public Governance, Performance and Accountability Act 2013
The Public Governance, Performance and Accountability Act 2013 (PGPA Act) replaced both the CAC Act and the Financial Management and Accountability Act 1997. The Act introduced a number of new performance-related tasks. Other changes included:

- The FRDC became a 'corporate Commonwealth entity' (CCE).
- As a CCE, the FRDC board became the 'accountable authority'.
- FRDC employees became 'officials'.

The FRDC and DAWR signed a Funding Agreement (foreshadowed at **2013-14 Expanded roles for the FRDC**) that sets out the expectation for FRDC performance, transparency and accountability to stakeholders, the government and the community. It defined and governed key aspects of the relationship between the FRDC and the Department. The Agreement is part of a more consistent framework supporting the government's relationship with all rural RDCs, both statutory and industry owned. The Agreement incorporated, directions previously outlined in a letter from former Minister for Resources, the Hon. David Beddall which required the FRDC to spend funds raised from a particular fishery on projects relevant to that fishery sector or state/territory and to consult through the relevant industry sectors in that state or territory. The completion of the first year of this Agreement was reported to the Department and covered in the FRDC's 2015-16 Annual Report. A copy of the funding agreement is available at https://www.frdc.com.au/en/about/corporate-documents/funding-agreement .

[See **2019-20** for the signing of the 2020-30 Statutory Funding Agreement with the Minister.]

2015-16

FRAB restructure
The earlier referenced review of the FRAB system by Greg d'Arville resulted in wide-ranging recommendations aimed at making it more effective, cost efficient and accountable. The recommendations were considered by the FRAB chairs at a FRDC workshop in 2015, and received varying levels of endorsement. Specifically, the chairs did not endorse the structural option to consolidate the FRABs to reduce their number in preference to retaining the jurisdictional model because of the link that they had with their respective jurisdictional governments; they did endorse the need for FRDC to take on the capacity to provide the FRABs with greater levels of operational management; and they had varying opinions on the FRDC providing administrative support of FRABs.

The FRDC responded to the review by renaming the FRABs, research advisory committees (RACs) and internalising the RAC system. It employed two programs managers to each manage four RACs with respect to, inter alia, meetings, RD&E prioritisation, project management and extension. The programs managers were each supported by a part time project officer.

The reform of the advisory committees coincided with a request from Minister for Agriculture for the FRDC along with other Canberra-based RDCs to consider relocating their offices to regional centres. This was the start to a lengthy process that culminated in a request from the Minister that the FRDC board consider relocating its office to Hobart with a cost estimate of $4 million to be met by the FRDC. As a compromise the Minister agreed to a proposal by the FRDC to open and staff a regional office in Adelaide at the Adelaide Wine Centre while maintaining its head office in Canberra. These two occurrences – the internalising of the RAC system and the opening of the Adelaide office – converged to provide a satisfactory outcome for all parties. All RAC support staff were located in Adelaide. Inaugural RAC Chairs and members were appointed in September 2016; with subsequent appointments being on a need's basis.

[As a consequence of the Commonwealth Performance review of the FRDC (see **2019-20 Government Reviews the FRDC's performance**) in 2018-19 Forest Hill Consulting undertook a review of the FRDC's partnership models to identify:

- how the various partnership models were managed by the FRDC and how that management might be improved
- the degree to which the FRDC's partnership models met stakeholder needs
- how well the FRDC's partnership models met the FRDC's extension/adoption/impact goals
- areas for improvement in the FRDC's partnership models generally
- how well the FRDC's partnership models contributed to the FRDC realising its planned outcome

The draft report was circulated to the Research Advisory Committees (RACs), Industry Partnership Agreements and Subprograms [65] for comment. In its final report Forest Hill Consulting found that there was broad support for maintaining the status quo, but recommended simplification of FRDC processes.

Following the release of the Forest Hill report the FRDC organised a closed meeting of RAC chairs in January 2020 to provide candid advice to the FRDC on the report and the way forward. In their written recommendations to the FRDC board, the RAC chairs supported the retention of the RACs in their current form, and suggested the FRDC should:

1. focus more on its core business (do fewer things better) and restrict activity creep
2. focus on maximising its expenditure on RD&E and reducing overheads
3. increase investment in the development of extension and adoption strategies
4. use public good funds to invest in cross-cutting strategic projects; for example, climate change research
5. improve the balance between tactical projects and longer term, more strategic projects
6. improve the development of good strategic, cross jurisdictional/sector projects
7. simplify its RD&E architecture by modifying existing arrangements; for example, improve RAC processes, collaboration, and coordination, including an annual RAC Chairs meeting; rather than create 'super RACs' or similar structures
8. ensure there is systematic review of all completed project outputs, and an occasional review of the impact of selected project outcomes; with the process for reviewing projects to be included in the extension and adoption strategy.
9. provide direction on public good versus private benefit RD&E
10. trial FRDC board and RAC Chairs meetings
11. institute a process of regular review of RAC support service provision

The FRDC implemented a staged approach to improving its planning, prioritisation and assessment processes to address the report's and RAC chairs' recommendations.

In early 2021 the FRDC:

- redefined the role or RACs to:
    - act as the lead mechanism to identify, synthesise and aggregate priorities articulated by stakeholders
    - consider avenues for delivery of R&D outputs to end users through identification of suitable extension activities
    - assist in monitoring invested activities to aid in the delivery of outputs to end users
    - aid in identifying potential external technical reviewers of applications – this may include RAC members with suitable expertise (and where there are no conflicts of interest).

[65] Effective 01 July 2020 "subprograms" were renamed "Co-ordination" programs

- continued with the process of RAC selection being undertaken by the relevant Director of Fisheries and the FRDC
- had each RAC Chair (3-year appointment) oversee two RACs (to encourage cross-pollination of ideas between jurisdictions and aid collaboration). The pairings were as follows:
    - Commonwealth and Northern Territory (Dr Cathy Dichmont)
    - New South Wales and Queensland (Dr James Findlay)
    - South Australia and Western Australia (Mr Brett McCallum)
    - Tasmania and Victoria (Dr Heidi Mumme)
- expanded RAC committee membership (2-year appointment) from purely expertise-based individuals to include representatives of industry or sectors (to enhance the RACs' focus on the end users of research)
- removed reviewing and assessing applications against a set budget from the RACs role (although RAC members were still able to review applications as part of a separate process)
- removed the requirement for a separate RAC R&D Plan
- asked RACs to focus on setting priorities
- introduced sitting fees for RAC members (except for government employees without a separate ABN)]

The sixth 5-year RD&E plan

Knowledge for fishing and aquaculture into the future: FRDC's research, development and extension plan 2015-20, the FRDC's sixth five-year plan, came into effect. The Plan focussed on the three national priorities: Ensuring that Australian fishing and aquaculture products are sustainable and acknowledged to be so; improving productivity and profitability of fishing and aquaculture; developing new and emerging aquaculture growth opportunities. And the FRDC used three approaches to implement it:

- lead - a significant portion of the Australian Government's public good funding was allocated and FRDC took the lead in priority setting for RD&E with a national focus
- collaborate - incentives were provided for those under partnership agreements to leverage their funding where there was alignment with priorities at the national level
- partner - greater responsibility was given to the end users of RD&E to set priorities; funded from industry contributions, the matching contribution from the Australian Government, and some additional funding from the jurisdictions.

Minister approves amended outcome statement

The Minister of Finance the Senator the Hon. Mathias Corman approved a change to the FRDC outcome statement on 15 March 2016 to incorporate the changes to the *PIRD Act (1989)*, allowing Research and Development Corporations to fund marketing activities, as well as placing a greater emphasis on extension and adoption activities. The new outcome statement was:

> *Increased economic, social and environmental benefits for Australian fishing and aquaculture, and the wider community, by investing in knowledge, innovation, and marketing.*

National Marine Science Plan

A new National Marine Science Plan (NMSP) was launched by the Hon. Ian Macfarlane, Minister for Industry and Science and National Marine Science Committee, on 11 August 2015 at Australian Parliament House. It drew together the knowledge and experience of more than 23 marine research organisations including the FRDC, universities and government departments and more than 500 scientists. It outlined the science needed to provide the knowledge, technology and innovation cornerstones that will grow a sustainable blue economy. The Plan identifies seven critical challenges facing Australia and provided recommendations about how, in a coordinated way, marine science can support Australia in meeting those challenges. The FRDC was a principal

driver for the development of the food security challenge. For further details see www.marinescience.net.au .

Failed amendment to the PIRD Act

In 2014 the Australian Government proposed an amendment to the PIRD Act that would have enabled it to have the FRDC pay its costs of membership of a number of regional fisheries management organisations. The amendment passed through the House of Representatives but was subjected to an Inquiry when it reached the Senate. The legislation stalled in the Senate, and lapsed at prorogation 17 April 2016. Had the amendment to the PIRD Act passed into law, the FRDC would have needed to provide $1,146,000 annually for these memberships.

Senate inquiry into R&D levies

The Senate referred the existing arrangements for agricultural sector R&D levies to the Rural and Regional Affairs and Transport References Committee for inquiry and reporting. Following extensive consultation, the Committee tabled its report on 30 June 2015. On 05 May 2016 the Australian Government responded to the report agreeing with 10 of the 15 recommendations. The Department of Agriculture and Water Resources undertook to establish levy payer registers, and, subject to privacy provisions, make such data available to underpin an effective voting system for levy payers, and to increase the transparency, effectiveness, and cost-effectiveness of the levy paying system. [The prawn farming sector Commonwealth levy is the only FRDC R&D levy – see: 2000–01: Industry response to ESD]

2016-17

Ministers Morrison and Ruston announced a Productivity Commission inquiry into the regulation of Australian Marine Fisheries and Aquaculture. The report can be found at: https://www.pc.gov.au/inquiries/completed/fisheries-aquaculture/report

Seafood Industry Australia

Seafood Industry Australia (SIA) was incorporated 12 May 2017 and launched in Adelaide 09 June 2017.

2017-18

Minister declares SIA a representative organisation

On 14 September 2017 Assistant Minister for Agriculture and Water Resources, The Hon Anne Ruston, declared Seafood Industry Australia a representative organisation in relation to the FRDC and revoked National Seafood Industry Alliance (NSIA) as a representative organisation.

2019-20

Performance review

As required under its 2015-19 Funding Agreement with the Commonwealth of Australia represented by the Department of Agriculture, the FRDC engaged Forest Hill Consulting to undertake an independent review of its performance. The purpose of the review, in broad terms, was to assess how well FRDC has met its obligations to levy payers and other stakeholders, as set out in its Funding Agreement 2015-19 with government, and in the Primary Industries Research & Development Act 1989 (PIRD Act). The review, the first of its kind, was completed in December 2018, and both the full report and the FRDC board's response are at: http://frdc.com.au/about/corporate-documents/funding-agreement. In summary the review found that FRDC:

- was a very well-managed, high-performing organisation
- was respected by its stakeholders as a vital part of fishing and aquaculture
- management was highly regarded for its expertise and its navigation of a highly complex environment
- managed compliance well

- had strong relationships with stakeholders
- collaborated constructively with other RDCs
- investments delivered benefits to levy payers, government and other investors

In addition to reporting against the terms of reference, the Forest Hill Consulting review recommended FRDC simplify the complexity of its investment and evaluation framework, and strengthen its approach to extension. The review made ten recommendations, of which the following three were rated as important:

- simplify key targets per area of investment; and continue the refinement of management / governance targets that are more relevant to organisational performance
- develop, produce and promote to stakeholders a stand-alone performance report that summarises the FRDC's key outputs and impacts relative to targets in its RD&E plan and AOP on an annual basis
- review the way it organises and manages its RD&E program (its investment and evaluation framework) during the development of its next RD&E plan with the aim of simplifying it

The FRDC developed a Response and Implementation Plan addressing all ten recommendations.

Ten-year Statutory Funding Agreement
On 05 April 2020 the Minister for Agriculture, Drought and Emergency Management on behalf of the Commonwealth of Australia represented by the Department of Agriculture, Water and the Environment signed a new ten-year FRDC Statutory Funding Agreement with the FRDC. The agreement outlined what the Minister expected of the FRDC over ten years, including in relationship to performance and transparency, as well as accountability to levy-payers, the government and the public (refer:
funding-agreement).

ANAO probity audit
In 2019 the Australian National Audit Office (ANAO) undertook a probity audit of the five statutory Research and Development Corporations. The objective of the audit was to assess the effectiveness of the rural research and development corporations' management of probity. The report was published on 18 December 2019. In managing probity issues, key conclusions were the Cotton RDC was largely effective and AgriFutures Australia, the Fisheries and Grains RDCs and Wine Australia were partially effective. The FRDC supported all recommendations; and a subsequent audit found FRDC had exceeded the audit review requirements.

First two marketing levies voted down
Two marketing levies were voted upon. Although a majority of members of the Australian Prawn Farmers Association (APFA) supported a marketing levy there remained some who did not. APFA Management Committee agreed that writing to the Minister requesting the levy without the support of all farms was not the preferred option; and decided not to progress a compulsory marketing levy for the Australian Prawn Farm industry. The Abalone Council Australia's formal Abalone Consumer Education and Promotion ballot closed on 15 December 2019 with just under 70% of quota holders participating in the vote. The proposed compulsory marketing levy was not supported by the industry (either by numbers of individuals or by ownership) with a majority 76% voting not to progress the levy.

2020-21

The seventh 5-year RD&E plan

On 18 June 2020, after more than a year of consultation, the Assistant Minister Jonathon Duniam approved the FRDC's 2020-25 Research and Development Plan – *Imagining the future of fishing and aquaculture* which can be found at: https://www.frdc.com.au/research/rde-planning-and-priorities. (see **Appendix A: Evolution of the FRDC's programs in successive R&D plans.**] The Plan was informed by:

- the December 2018 report by Forrest Hill Consulting on its review of FRDC's performance
- key national initiatives; such as the *National Marine Science Plan, and the* Australian Government's target to grow Australian agriculture to $100 billion by 2030
- the draft shared vision for all sectors of fishing and aquaculture entitled "*Fish Forever: A shared 2030 vision for Australia's fishing and aquaculture community"*.
- key international plans and obligations such as the United Nations *Sustainable Development Goals*.

and aimed to be adaptable and responsive to further input from FRDC stakeholders through jointly developing more detailed roadmaps for achieving each of the five outcomes.

Representative organisation service agreements

The FRDC signed detailed service agreements with each of its representative organisations: Seafood Industry Australia (SIA); Australian Recreational and Sport Fishing Confederation (Recfish Australia); Commonwealth Fisheries Association; and the National Aquaculture Council (NAC).

2021-22

Agricultural Innovation Australia

Innovation in the agriculture sector (including fisheries and forestry as well as pre and post farm gate value chains) and the role of RDCs had been the subject of numerous reviews for more than a decade. The majority of these reviews (for example, refer the 2019 Ernst and Young "Agricultural Innovation — A National Approach to Grow Australia's Future") highlighted the difficulties in addressing cross-sectoral issues, the need for a balance of incremental and transformational innovation, and the benefits associated with closer links between private and public sector efforts.

After numerous requests, in August 2020 the Minister for Agriculture held a roundtable with all RDC chairs and CEOs; and wrote to the Chair of the Council of Rural RDCs making it clear that a joint RDC effort was required to:

- increase investment into research and development (R&D) that targets transformational productivity gains, cross-sectoral and public good challenges
- accelerate the uptake and adoption of R&D outcomes, including commercialisation of R&D where appropriate
- improve collaboration and partnerships across the agricultural innovation system
- increase the flow of private sector and international investment into Australia's agricultural innovation system
- maximise the opportunities presented by Agtech

At its August 2020 meeting, the FRDC board agreed to FRDC becoming a founding member, along with the other Rural Research and Development Corporations, of Agricultural Innovation Australia (AIA). The not-for profit company was incorporated by its members 01 October 2020 (https://www.aginnovationaustralia.com.au) with the following objects:

- to promote the research into, and development of, Australia's national agricultural resources
- to increase the productivity, profitability and sustainability of the agricultural value chain by:
    - identifying nationally significant cross-sectoral opportunities

- developing strategies that facilitate a collaborative approach to investing in research and development, and the adoption of new knowledge and innovation required to realise those opportunities
- raising and acquiring funding and resources from members, government and third parties and managing that funding and those resources to implement Company strategies.

On 01 Oct 2020 the Australian Government announced that it would provide $1.3 million in seed funding for AIA to help facilitate the achievement of the target of $100 billion farm gate value by 2030, as per the National Farmers' Federation (2018) *2030 Roadmap: Australian agriculture's plan for a $100 billion industry,* under the Australian Government's *National Agricultural Innovation Agenda.* AIA's ongoing funding comes from a combination of member subscription fees and investment from public, private, not-for-profit and global commercial entities.

AIA is initially concentrating on reducing duplication by brokering collaboration and investment with the 15 RDCs in key priorities such as climate; enhancing public and private sector collaboration and partnerships across the broader innovation ecosystem; and identifying existing opportunities within the RDCs that have cross-sectoral potential. These activities are laying the foundation, and prepare AIA for attracting new and non-traditional investment into Australian agriculture and taking a strong leadership role in fostering further innovation, and a more commercially focused and risk-taking culture. Together, these activities contribute to AIA targeting the big, cross-sectoral opportunities and challenges which will drive transformational change.

In May 2022 AIA held its first Member Forum; and on 27 May 2022 released its inaugural Strategic Plan, detailing how it will drive cross-sectoral collaboration and leverage public and private sector investment to target transformational innovation for Australian agriculture, fisheries and forestry (refer: https://www.aginnovationaustralia.com.au/siteassets/aia-strategic-plan-final.pdf). The Plan included an Impact Framework.

Since its formation AIA has delivered an environmental accounting platform, a state-of-play report on regenerative agriculture in Australia; a Climate Atlas; an Environmental, Social, and governance report; a Common approach to sector-level greenhouse gas accounting for Australian agriculture; agri-climate outlooks; and circular economy work in partnership with Circular Australia.

Workforce plan and restructure

As per its 2020-23 Workforce Plan, FRDC completed a major restructure of its business, under five general managers: General Manager Finance and Business; General Manager Information Communications Technology and Digitisation; General Manager Research and Development Investment; General Manager Stakeholder Engagement (responsible for corporate affairs, communications, and significantly the Extension Officer Network, one extension officer in each of the jurisdictions) and General Manager Strategy and Innovation (responsible for planning, cross-functional issues, and the development and maintenance of strategic partnerships). This grew the team to 40 people. The extension officers were recruited in early 2022 to engage directly with people and organisations involved in fishing and aquaculture so as to extend FRDC R&D outputs and incorporate input from these stakeholders into FRDC's R&D priorities. FRDC also began the process of filling its Indigenous graduate position.

For FRDC directors:

Custodianship

Australia has first nations Indigenous fishers, over 140 wild-catch fisheries, over 60 aquaculture species, and millions of recreational fishers.

Since its inception, FRDC has not only survived but flourished; due largely to its responsiveness to both changed circumstances and evolving stakeholder needs.

By the time you reach this final page, the huge strides the FRDC has made since 1991 on behalf of all sectors of the fishing and aquaculture industry and the people of Australia will be very apparent.

Directors, past and present, have been deeply conscious of the responsibility and privilege to be charged with the custodianship of the FRDC and with continually — sometimes radically — striving to improve the way it goes about achieving its mission.

As you in turn meet this responsibility, you will find much satisfaction in contributing to FRDC's great cause through your wise directorship.