



Western Rock Lobster Research, Development & Extension Plan

2014-2023



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Foreword

Research, development and extension (RD&E) is well known for contributing to a range of technological advances and expertise that leads to productivity growth, increasing our knowledge bank on our fishery and the important long term sustainability of our fishery. Funding of RD&E for the development of new technologies and knowledge is a fundamental component of the innovation and adoption processes.

This Western Rock Lobster (WRL) Fishery RD&E Plan will strategically focus our efforts on achieving the research priorities and objectives identified. The strategy has been informed by research strengths, opportunities, needs and metrics evident within the WRL industry along the value chain to our consumers.

If the WRL industry is to continue to grow and to take advantage of new opportunities, we must continue to innovate by using RD&E to develop new technologies, processes and products which will lift productivity, increase sustainability of production, and aid in opening new markets.

We have ensured that strong governance principles have been adopted and that there is close collaboration between industry, agencies and researchers.

The WRL industry contributes a compulsory 0.25% of our annual harvest GVP to the Fisheries Research and Development Corporation (FRDC) and the Australian Government matches that contribution. This Plan will facilitate a wide range of projects over the next 10 years to help fishers improve their production techniques, compile reliable information and to potentially increase the profitability of their businesses.

This RD&E Plan is a foundation for the future and has been designed to endure and yet be dynamic. For industry to reap the rewards and for objectives to be achieved it is important for all of industry to take up the innovation challenge and commit to the Plan.

I strongly believe that this RD&E Plan offers many opportunities for the WRL industry to advance. I am confident that it will serve as a catalyst for moving the industry into a leadership role for RD&E within the Australian fishing industry over the next decade.

Many thanks to those in the WRL industry and related sectors who freely gave their time to participate in the interviews, surveys and the joint RD&E and strategic planning workshops held as part of the WRL Council's development process. Thanks also to those who commented on the various drafts of this RD&E Plan. This final version now incorporates many of their useful suggestions. We will periodically revisit and, as necessary, modify this Plan to ensure the continued productivity of our research, development and extension efforts to meet our research goals.

It is indeed my pleasure to write this foreword for the first strategic RD&E Plan for Australia's most valuable wild harvest fishery; I commend it to one and all.

Basil Lenzo,
Chairman, Western Rock Lobster Council (WRLC).

Acknowledgements

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Western Rock
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WA
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FRDC
FISHERIES RESEARCH &
DEVELOPMENT CORPORATION

1. RD&E in Context

In August 2013 the Council met to determine its strategic view of the next decade to 2023. Time was also taken to address RD&E priorities and investments.

WRLC Strategic View

Strategic Vision: The Western Rock Lobster industry will be a confident, viable and well respected industry. This will mean:

- Co-management of our industry;
- Secure rights of access to resources;
- Stewardship that results in stock abundance;
- Producing a premium product for world markets;
- Profitability for operators;
- Secure returns for investors;
- High public acceptance; and
- Working towards opportunity and security for the next generation of the industry.

Purpose: As the peak body for the industry, the Council provides leadership through information, consultation and representation.

Guiding Principles: The Council's critical principles are:

- Good governance and leadership;
- Integrity in terms of making decisions and standing by them;
- Transparency in dealings with industry and government; and
- Independence through self-funding.

Challenges: The Council's key issues are:

- Lack of market certainty;
- Zone allocations and access;
- Whale entanglements; and
- Uncertainty of funding.

Our critical challenge is Maintaining Unity.

Our Goals and Strategies: Three strategic goals have been set:

- Goal 1.** To increase industry confidence in the role and achievements of the Council.
- Goal 2.** To grow the value of the industry by 2 – 4% per annum.
- Goal 3.** To develop sources of independent funding within three years.

RD&E Priorities and Investment

For the next two years (2014 and 2015) the Council's strategic intent in terms of RD&E is to focus discretionary research funding onto four critical investment areas:

- Resource access, including whale entanglements;
- Market knowledge;
- Communication and education; and
- Fish stocks.

From Year 3 (2016) onwards, discretionary research funds will be invested more broadly, to include processing, value adding, labour and skills, harvest efficiency and contingency areas.

Three Base Case assumptions were agreed:

1. The TACC and harvest tonnage will increase at ~2% p.a. enabling all products to sell into premium live markets just-in-time. (Note: the WRL Harvest Strategy is currently being developed.);
2. Effective nominal annual \$A beach prices will increase at 2.0% p.a., comprised of:
 - 1.0% p.a. gain in long term nominal \$A beach prices, plus
 - 0.5% p.a. productivity gain, plus
 - 0.5% p.a. price gain from in-market impacts of promotion, FTAs, etc.
3. Additional RD&E capacity will accrue from the WRLF's co-investors.

On this basis, over the 10 year life of this plan the:

- WRLF TACC will increase from 5,500 tonnes to 6,573 tonnes p.a.,
- Nominal beach price will increase from \$36.40/kg to \$40.21/kg,
- Nominal GVP will increase from \$200 million to \$264 million p.a.

Eight RD&E investment areas were identified (in decreasing order of priority):

- Resource access;
- Market knowledge;
- Communication & education;
- Fish stocks;
- Processing & value adding;
- Labour & skills;
- Harvest efficiency;
- Other contingency RD&E projects.

The need for RD&E across these eight areas will drive industry's investment strategy. As a guide, assuming the base case development assumptions defined above, the industry will need to contribute and invest a minimum of \$500,000 of its own funds in RD&E in the first year, rising to \$660,000 p. a. in Year 10.

2. WRL Fishery Snapshot

Fishery Context

Fish is the world's largest meat category - 81% of marine harvest tonnage is edible. Seafood consumption will double by 2050 – rising nearly 300% per capita in Asia.

Australian wild fisheries are ranked in the top 5 globally for sustainability but access to this resource will be further constrained by marine planners.

Western Rock Lobster is Australia's most valuable single species wild capture fishery. The fishery is based on the spiny lobster *Panulirus cygnus*, a species native to Western Australia.

The WRLF ranges over 1400 kms of WA's continental shelf, fed by the south flowing warm waters of the Leeuwin Current. At 5,500 kms long (100 kms wide and 300 m deep), this current is the world's longest continuous coastal boundary current. In some La Nina years when it is flowing strongly, it extends from NW Cape to the west coast of Tasmania. The Leeuwin is a southward flowing current – this is unlike other southern-hemisphere western-continental boundary currents (African Benguela, South American Humboldt) that flow north. Leeuwin Current waters are warm and generally suppress nutrient upwelling. Therefore it delivers relatively low marine finfish catches.



Figure 1. Western Rock Lobster Fishery

However marine research in WA has long identified that the Leeuwin's characteristic flows and related water temperatures have a major influence on the WRLF's performance. This may also affect other factors related to seasonal migration patterns of whales.

Both the Western and, to a lesser extent, Southern (SA, TAS, VIC) Rock Lobster fisheries are directly influenced by the Leeuwin Current, and both yield large catches of high quality Australian lobster and other seafood.

Recruitment to the WRLF has been and remains a critical issue for all stakeholders. The latest research by industry and governments leads to the view that many factors impact puerulus settlement and recruitment to the fishery, including water column temperature variability, and storm and rainfall activity. This research continues.

The WRLF was one of the first limited entry fisheries established in the world (1963), and it was also the world's first fishery certified by the Marine Stewardship Council (MSC). The ongoing high environmental values and sustainable practices maintained in the fishery underpin the fishery's integrity and its MSC status today.

Fishery Management

The commercial fishery's three zones service a large marine commercial harvest (~95% of the Total Allowable Harvest), and a recreational inshore fishery that has been allocated up to 5% of the TAH. Recent changes to the management structure of the fishery and the TACC (Total Allowable Commercial Catch) are having, and will continue to have, a substantial direct and indirect impact on all WRLF stakeholders – customers, license holders, social, environmental, community, and government.

Operating as an input fishery (Total Allowable Effort) since 1963, the commercial harvest averaged ~11,000 tonnes per annum. However the changing needs of stakeholders over the last 5 years, together with low fishery recruitment, has resulted in a restructure of the management of the WRLF to be a full tradable output (ITQ) fishery. Based on the interim harvest strategy guidelines the WRLC has recommended a 2014 season TACC of 5859 tonnes, a level that is around half of the long term harvest tonnage. However, the fishing season has been extended from 7.5 months to 12 months.

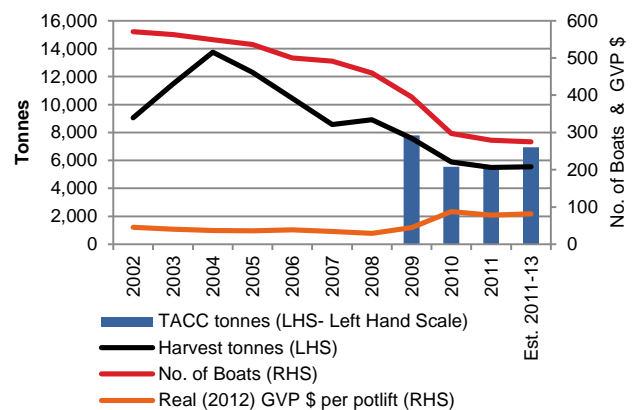


Figure 2. Trends in WRLF Harvest Volume, Boats, and Pot-lift Productivity to 2013

The WRLF quota is owned by individuals and enterprises from three groups: fishers, boat owners, and silent investors. This reflects the long standing history of both cross generational fishing families and the fishery generally.

No longer in a race-to-fish, license holders can now fish their quota to optimise overall margins at both ends of their value chain – higher productivity per pot-lift, and higher net beach prices driven by scarcity-in-market and a focus on fishing to meet the higher value live export trade. This live-just-in-time-to-market strategy (where supply of live fish is managed to just meet demand for premium live product) will also reduce through-chain holding costs.

Volume and Value

The move to a quota management system has delivered early productivity gains per pot-lift (per Figure 2). While the detailed costs per pot-lift across the fishery are unknown (industry estimate in 2013 of \$7/pot-lift and \$10/kg landed), the real beach value of each pot-lift has increased significantly in the last 4 years. The exit of more than 50% of the boats from the fishery in the last decade has seen the fishery consolidate around more experienced and better capitalised fishers, with resultant improvements in average productivity.

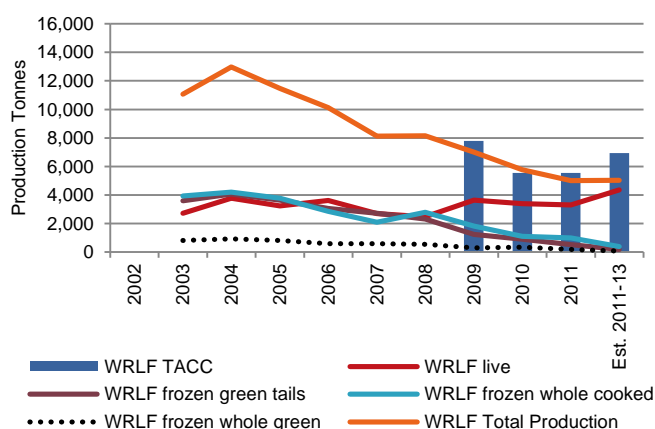


Figure 3. Trend in WRLF Production Volume by Product Line to 2011-13

The 2009-10 TACC reduction (which commenced before Quota introduction) reflects the trend in fishery harvest resulting from reduced puerulus settlement. While the TACC tonnage is rising (and adjusted for the 2011-13 transition to a 12 month season), the estimated lobster production tonnage (from WA Fisheries data, up to June 2013) confirms that live product's share has risen to dominate total WRLF output, per Figure 3.

Since 2002 the nominal (ie not adjusted for inflation) commercial beach value of the catch has fallen from \$305m in 2002, to an estimated \$195m in 2011. However when viewed in real value terms (2012 dollars), the GDP has fallen from just over \$400m to the current \$195m – a decline of 51% in the decade.

Beach prices over the last 20 years highlight two trends:

- the real 2012 \$ beach price for WRLF has risen just \$1.24/kg to \$36/kg (a 3.6% gain), well below the corresponding rise in aggregate catch costs (labour, fuel, infrastructure), and
- from 1992 when WRLF and SRLF product had the same real beach price (\$32-35/kg), SRLF product rose to \$60/kg in 2012 (up 88%), compared to the WRLF increase of 3.6%. This variance has arisen due largely to three issues:
 - WRLF has had much larger volumes than SRLF (avg. 2.3 times) to move through export markets and therefore had to rely on processed lines (cooked, tails) at lower prices and margins,
 - A decade of slow growth in the WRLF's key market, Japan, meant that \$A prices were depressed and new markets had to be opened and developed elsewhere, predominantly in China,
 - A preference for a more robust live lobster able to survive international airfreight has favoured SRLF over WRLF.

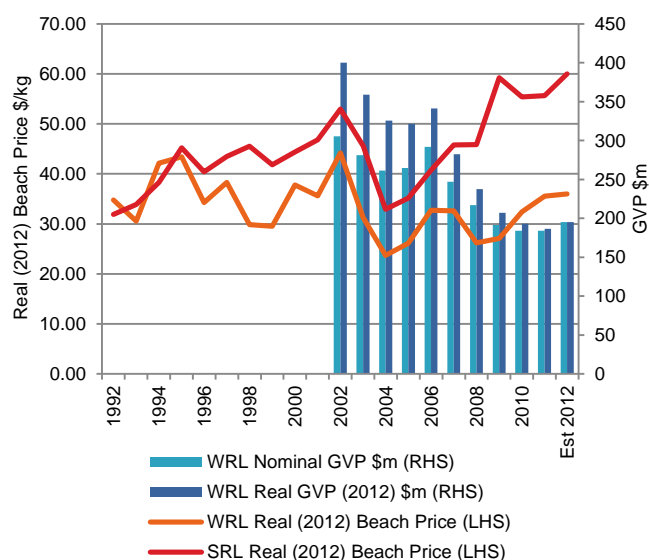


Figure 4. Trend in WRLF and SRLF Real Price and Value to 2012

In mid-2013, it appears that export volume and value trends are responding in new ways to the growth of the Chinese middle class consumer, as noted in the following discussion of markets. One outcome appears to be a sustained dramatic recovery in the WRLF price back up to par with SRLF prices.

Markets

WRL product competes on global markets across four traditional product lines – whole cooked, whole raw, raw tails, and live lobster. Over the decade to 2012 WRLF product has averaged 63% of Australian lobster production, although this percentage has fallen to just over 50% in recent years since the WRLF TACC was reduced.

Individual global markets prefer specific product lines, but in aggregate volume terms the largest markets for WRLF product are China, Hong Kong, Japan, Taiwan, USA, and the Australian domestic market.

According to ABARES data, China is Australia's (and WRLF's) largest market by volume. Putting aside the dramatic rise since 2002 in the value of the \$A and the 2008-11 impact of the Global Financial Crises, it is clear that the China-Hong Kong market dominates Australian lobster supply (Figure 5).

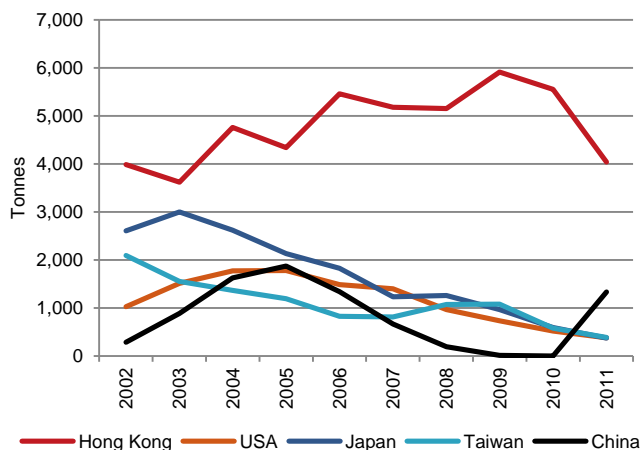


Figure 5. Trends in Australian Lobster Exports by Market Tonnage to 2011

Live product comprises an increasing share of Australian and WRLF supply, especially since the emergence of China's middle class consumers. This share is currently estimated to be 96% of harvest weight.

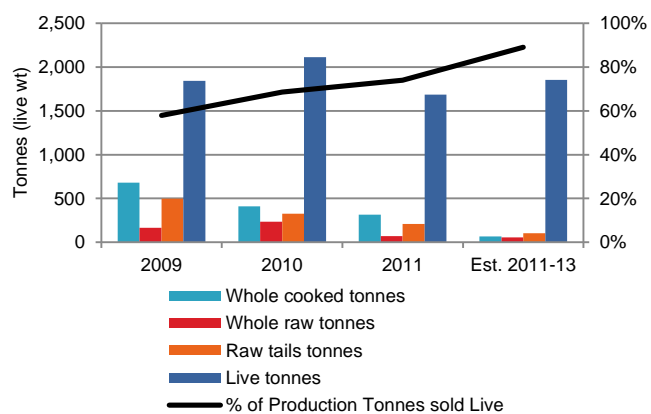


Figure 6. Trends in WRLF Production Tonnage by Product Line

Free Trade Agreements

Free Trade Agreements (FTAs - bilateral, regional and multilateral) seek to maximise trade and market access benefits for all Australian producers, including seafood.

As the bulk of Australian lobster is exported in a live and highly perishable form, Australia's lobster fisheries are very exposed to export trade arrangements. Since 1983 Australia has established seven FTAs (Figure 7). However Australian trade representatives continue to face significant trade negotiation challenges with

economies that are Australia's key lobster markets – China, Taiwan, and Japan.

In April 2005 Australia and China commenced negotiations on a comprehensive FTA. In 2012 total trade between Australia and China/Hong Kong amounted to A\$125.2Bn – including Australian seafood exports of \$537 million (0.4% of total trade) and Australian lobster exports of \$295 million. Clearly seafood is a very small component of this bilateral trade. In October 2013 the Abbott Government announced its aim is to secure an FTA with China within 12 months.

FTA with	Status	Aggregate Market GDP - Lobster Market Impact
Existing FTAs (\$US Bn)		
New Zealand	From 1983	\$167 - lobster exporter
Singapore	From 2003	\$223 - lobster importer
Thailand	From 2005	\$346 - minimal lobster impact
USA	From 2005	\$15,700 - lobster importer & exporter
Chile	From 2009	\$248 - minimal lobster impact
ASEAN	From 2010	\$4,000 - importer & potential exporter
Malaysia	From 2013	\$304 - importer & potential exporter
FTAs under Negotiation (\$US Bn)		
China	Began 2005	\$8,227 - lobster importer – *NTBs also
Japan	Began 2007	\$5,964 - lobster importer – **food trade
Gulf Coop. Council	Began 2007	\$1,547 - lobster importer
Trans Pacific P'ship	Began 2008	\$27,558 - Canadian lobster exports
South Korea	Began 2009	\$1,156 - lobster importer – NTBs also
India	Began 2011	\$1,825 - minimal lobster impact
Indonesia	Began 2012	\$878 - minimal lobster impact

*NTBs – Non Tariff Trade Barriers ** More liberal Food Trade is a core objective

Figure 7. Status of Australian Free Trade Agreements June 2013

According to China's official import trade statistics (excluding Hong Kong), China imported US\$5.76 Bn of seafood in 2011 (Ridge Partners Research 2013), which was driven by annual seafood tonnage import growth of 4.1% between 2006 and 2011. The bulk of imports are commodities (79% is frozen whole finfish) used largely as inputs to China's large export seafood processing industry. The main suppliers by value are shown in Figure 8.

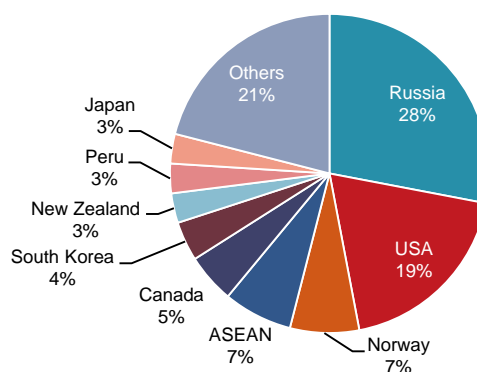


Figure 8. Value of China's Imports of Fish and Seafood by Source 2011

Official trade data for premium seafood only, suggests that China imported around 60,000 tonnes (some for

processing and re-export) in 2011, around 1% of the whole China market on a volume basis. While it is very difficult to verify this premium niche trade data, Chinese wholesalers with a substantial import trade in coastal Fujian Province, estimate in mid 2013 that the premium seafood market in China is currently worth between \$US 5-15 Bn at wholesale prices. By comparison the total value of all food and grocery imports to Australia (AFBC 2011) in 2009 was A\$25 Bn. Clearly the market potential for premium seafood and lobster exports into China is substantial and very attractive to Australia, New Zealand, Canada, USA and other exporters.

In 2008, New Zealand became the first western country to secure a Free Trade Agreement with China. In 2012, 96% of New Zealand made / sourced goods became tariff free into China, and Chinese Customs now guarantees FTA product entry within 48 hours of landing. New Zealand Southern Rock Lobster therefore has a more flexible entry strategy into China – to go direct to outlets via FTA sanctioned routes or via alternate entry channels. The result is that New Zealand product can match or better competitor importers' economics, product quality and outturn freshness.

In June 2013, New Zealand became the first member of the Organisation for Economic Cooperation and Development (OECD) to secure a Free Trade Agreement with Taiwan, another significant importer of lobster.

Likely Market Trends

While the available ABARES data are limited to 2011, recent market trends in 2013, indicate that:

- China will be the dominant global lobster market for the next decade. While trade channels (both access and volume) remain quite volatile it is clear the Chinese Government is seeking to better control the consumption of imported luxury goods, especially by government employees. However the fact remains that live lobster imports to China continue to grow strongly and new import channels for the product are being identified every year. New entry and distribution channels are emerging due to development of high-end hospitality and food services; better logistics infrastructure; heightened concerns over food health and safety; and increasingly sophisticated consumer demand. These new access routes include direct importers, high-end distributors and specialist channel sub-distributors.
- Increased supply of lobster is landing in the greater China market, especially *Homarus* lobsters live from Canada and whole frozen lobster from Florida, as well as spiny lobsters from the Caribbean.
- Small but increasing availability of refrigeration is now prompting consumers to look for higher quality frozen products – this opens the opportunity for processing of lobster in secondary Chinese markets that are not prepared to pay the higher prices for live product.

- Increased lobster supply to the greater China market is boosting competition and driving greater market segmentation and offer-differentiation. Live prices in mid-2013 range from \$40-50/kg for larger fish, compared to \$50-70/kg for smaller (400-700g) sizes. As noted earlier, live landed prices for WRLF product in China are now very similar to live landed prices for SRLF product.
- Prices for live product (especially for smaller fish under 700g) in global markets are increasing at a faster rate than prices for processed product, due largely to maturing high-end consumer preferences in the China market. Given the 50% reduction in the WRLF TACC, fishers face increased pressure to high-grade their catch quota. In addition, processors with 50% less input volume now have limited incentive to invest capital in value adding¹ through cooking, freezing or tailing, but greater incentive to differentiate and leverage their live offer sourced from a globally sustainable fishery. The focus is on consumer differentiation of live product offers.
- The Australian domestic market continues to maintain the highest pricing and demand for larger WRLF frozen product.

Aquaculture – Friend or Foe?

Global wild capture seafood supply has peaked and many fisheries are overfished and in recovery mode (FAO, 2010). Aquaculture will dominate fish-for-food by 2015 and be the only seafood source available to meet growth in global consumption. Aquaculture growth has averaged 8.7% p.a. since 1970.

OECD-FAO (FAO Agricultural Outlook 2011-2020) confirms that prices for aquaculture are growing faster than for wild catch, and will increase by 50% by 2020 (see Figure 9).

By definition, aquaculture controls inputs and productivity, and can therefore deliver greater certainty in supply volume, processing specification, and consumer product benefits. This attracts and motivates supermarkets and consumers to generally pay higher prices.

Global food and industrial production is evolving to include greater use of marine resources. Sustainable aquaculture will move its systems (by iterations in science, technology and investment risk) from wild harvest to near-shore pondages, to sea ranching, to marine cage systems, and on to comprehensive marine

¹ A number of stakeholders have noted the difficulty in adding value to a product that is already in its most valuable consumer form – live lobster. However, not all premium lobster consumers want live product, and selective development of premium lobster processed lines will meet this market need. In addition, the diversion of lower grade / out-of-spec lobsters to such processed markets will ensure WRLF's live branded offer always achieves premium prices against global competitors.

farms designed to survive marine engineering challenges.

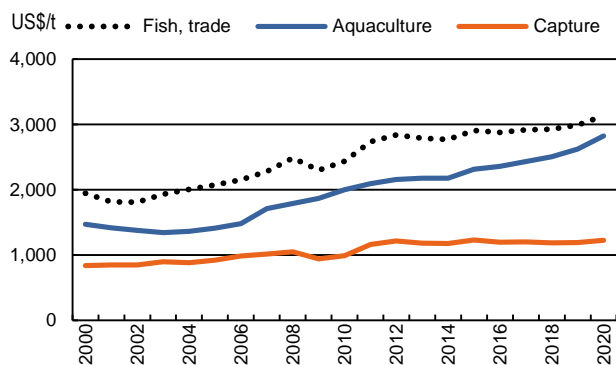


Figure 9. Trend and Forecast in Prices for Aquaculture and Wild Capture Seafood

Aquaculture demands viable species produced with appropriate technologies in sustainable locations. The intersection of unique species attributes, eating qualities, and food nutritional value drives the higher aquaculture margins required to finance domestication, selective breeding, efficient production and promotion. Prawns, Salmon, and Pangasius (catfish) are global examples of wild species that are now high volume - low margin global commodities.

Will lobster become an aquaculture species in the foreseeable future? And if so, will this threaten or enhance consumer demand for wild lobster? Given aquaculture's global track record the answer to the first question has to be "yes", but the timing is very uncertain. The rise of the farmed spiny lobster will likely enhance the niche market appeal for existing wild catch spiny lobster (as is evident across other global seafood species including abalone).

Aquaculture contributes 40% to Australia's domestic seafood beach value (including Pearls, but excluding Algae) and will dominate supply in coming decades. Australia produces only 28% of its seafood needs from wild catch. Trends indicate this will fall to 20% by 2050 as wild catch peaks and marine planners limit resource access. Australia will remain a net seafood importer – any gains in national seafood security must therefore come from new aquaculture.

Recent media from the world's largest full-service restaurant company (Darden Restaurants Inc., a USA corporation) suggests consumers will see aquaculture spiny lobster in the mid-long term. Darden (the world's largest single buyer of wild lobsters) has recently made two media announcements:

- 2012 - a US\$60 million investment in a joint venture greenfield spiny lobster aquaculture breeding and production facility in Sabah, Malaysia, and
- 2013 - an ongoing long term investor commitment in rock lobster aquaculture research. On the back of investments with University of Tasmania's specialist Institute for Marine and Antarctic Studies (IMAS) over the last

4 years, Darden and two Australian partners with IMAS are committing a further A\$16.9 million to ongoing rock lobster aquaculture research (hatchery, larval rearing systems and lobster health). The IMAS Director said: "The new investment places Australia at the cutting edge of aquaculture research, attracting global business opportunities. It provides opportunities for new aquaculture industries in Australia, not only for rock lobsters, but also longer-term through application of novel aquaculture systems to other sectors such as abalone, mud crabs, prawns and marine fish. An exciting prospect for this research is the potential for stock enhancement (the release of cultured seed lobsters), with consequent fisheries and conservation benefits."

Sustainable, viable new aquaculture sites are increasingly hard to find for these key species, including lobster. WA's extensive marine coastline and near shore waters offer a limited number of potential aquaculture development sites. The state has recently enacted new legislation to progress aquaculture zones near to current WRLF grounds.

Fishery Snapshot Summary

It is clear that supply and market changes to fishery management and practices are resulting in fundamental changes in the risk profile of the WRLF. These impacts are already demanding changes at the next level as stakeholders reset the drivers for operational cash flows, capital allocation and returns, and welfare outcomes from the fishery.

In turn these changes will realign and reweight the investment incentives for all supply chain members – fishers, processors, agencies, and communities. Fishers have an incentive to innovate and implement productivity changes that leverage and then capture more of the aggregate WRLF chain margin.

WRL Fishers must determine how best to invest their limited funds in these RD&E opportunities – most opportunities are pre-competitive in nature and so collaborative co-investment is the most efficient approach. The drive for efficient investment will prompt stakeholders to realign fishery RD&E investment plans, governance structures, and RD&E funding streams to optimise fishery performance for all stakeholders.

3. Human Capacity

Context and Learnings

There is limited data available to identify current trends in labour market availability and status for the WRLF. Only two studies have been identified.

A study in 2009 (Baseline Economic Data Survey – Industry Update, Bird Cameron 2009) estimated the average age of active lobster fishermen to be 46 years, down from 47 years in 2007. Survey respondents ranged from 25-62 years. Approximately 30% (ie 120) of the boats active in the WRLF in 2009 have since left the fishery.

Industry advice in 2013 suggests that the average age of WRLF license holders in 55 years, and approximately 30% of the license holdings are operated by 2nd or 3rd generation fishing families.

The social wellbeing of industry participants has been reviewed on two occasions since 2007 (WRLF Industry Consultation to Review ITQ Impacts, KAL Analysis, 2011; and Social Impact Assessment, FRDC 2004/247, Huddleston & Tonts, 2007). The 2011 review specifically focussed on social impacts flowing from the WRLF transition to ITQs. The relevant conclusions from the study were that:

- The roles of WAFIC and WRLC were ill defined and this had led to a lack of trust in the industry's communication process,
- There was a widely felt concern that the industry was losing its skills base, and that steps should be taken to protect and nurture skills for future industry security,
- There was little opportunity for young people to develop leadership skills or capacity, thereby limiting the future development of the industry,
- A number of industry capacity building initiatives and adjustment strategies should be implemented to overcome these adverse social impacts.

Governance

The industry's governing body for the WRLF is the Western Rock Lobster Council. Formed in 2001, the Council is a non-profit incorporated organisation addressing issues affecting fishermen (MFL holders), and representing their interests in the fishery.

The Council's Constitution identifies a number of objectives relevant to the effective pursuit and management of RD&E in the WRLF, including specifically the following:

- (e) to act as an advisor to or intermediary between the catching sector, Government and its agencies and the community;
- (f) to promote efforts within the Western Rock Lobster industry for the resolution of common problems;
- (g) to appoint and/or nominate representatives to various bodies;

- (h) to ensure the sustainable development of the Western Rock Lobster fishery;
- (i) to conduct projects relevant to research and development in and the promotion of the Western Rock Lobster Fishery and industry;
- (j) to conduct an industry conference no less than every two years;
- (k) to do any of those activities that are considered necessary by the Council to obtain for the Western Rock Lobster industry the best economic conditions that can be achieved, or otherwise promote the interests of the members of the Council.

The linkages between the WRLC and related policy and RD&E organisations are illustrated in Figure 10.

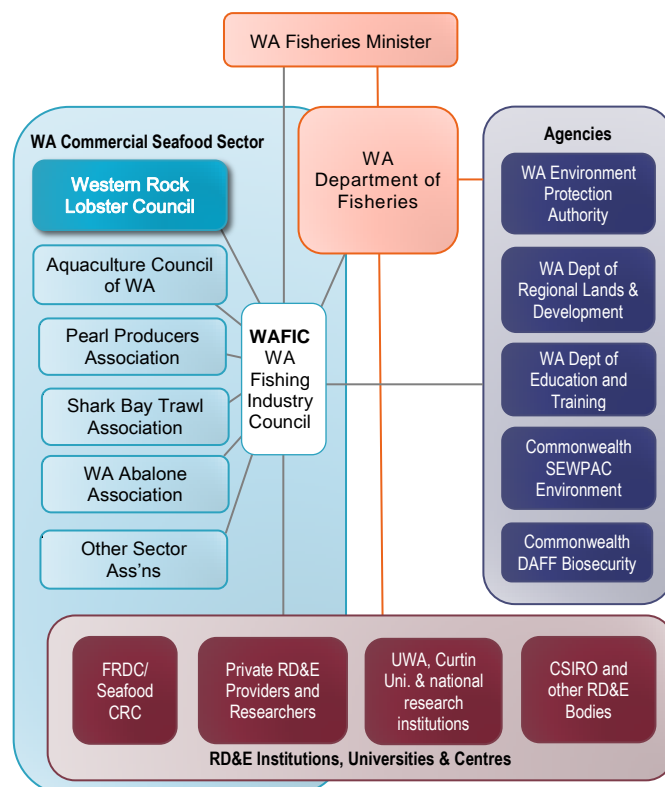


Figure 10. WRLC Organisational Landscape

Within the WRLF, the WRLC liaises with a number of Professional Fishermen's Associations (PFAs) and industry groups, including:

- Central West Coast PFA,
- Dongara PFA,
- Geraldton PFA,
- Kalbarri PFA,
- Leeman PFA,
- Latitude 31 PFA,
- Southwest Coast PFA,
- United Mid West Fishers Association,
- WA Rocklobster Fishers Federation,
- Combined Zone C Association
- Combined Zone B Management Advisory Committee (MAC).

4. RD&E Co-investment

Collaboration and Management

Regarding RD&E matters, the Western Rock Lobster Council works with the WA Fishing Industry Council (WAFIC - the state's peak commercial fishing organisation), key agencies in state government (including WA Fisheries), the Seafood Cooperative Research Centre, the FRDC, and a number of specialist institutional and private researchers (Curtin University, WA University, etc.)

Up to now management of the WRLF RD&E investment has been a joint effort between WRLC, WAFIC and WA Fisheries, with projects considered and approved by the WAFIC FRAB (Fisheries Research Advisory Body). RD&E projects have been implemented by WA Fisheries, by WRLC and some via WAFIC. It is important to WRLC and other stakeholders that this co-investment is well planned and efficient, ensuring that duplication of investment is minimised and that industry is aware of and endorses the RD&E portfolio.

A new investment arrangement is currently under discussion between the parties. The WRLC and FRDC propose to establish an Industry Partnership Agreement (IPA). An IPA is between the FRDC and a sector body to manage a suite of sectoral projects over a specified time period against an agreed industry strategic plan. The priorities and projects selected are generally identified by the industry body and are specific to its needs. IPAs are currently in place in a number of sectors including Southern Rock Lobster and Southern Bluefin Tuna.

This new agreement will set out the RD&E investment and management arrangements linked to:

- WRLC's RD&E Plan,
- WA Fisheries' Research, Monitoring, Assessment and Development Plan (see RMAD Plan extract in Appendix 1), and to
- a dedicated governance structure (Figure 11).

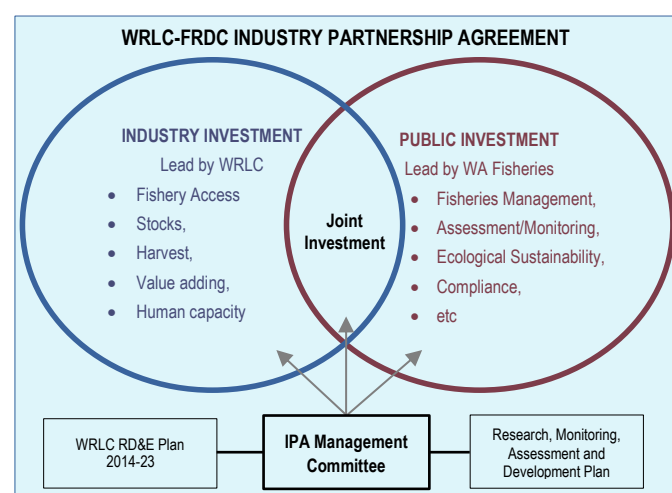


Figure 11. Proposed IPA structure for WRLC

The IPA will be between WRLC and FRDC, but WA Fisheries will be an active member of the IPA Management Committee.

The parties intend to establish the IPA in the first half of 2014.

WRLC Funding Model

The WRLC currently has no secure independent funding model to sustain its industry role or manage the fishery's RD&E Investment Plan. The review of this funding arrangement is being considered as part of the development of the IPA.

As these discussions are still to be concluded, it is not yet confirmed how funds will be contributed and leveraged under the proposed IPA. However regardless of the new arrangements between WRLC, WAFIC and FRDC, the development of an IPA will mean that the RD&E investment funds previously managed by the WAFIC FRAB will now be invested by the IPA Management Committee guided by the WRLC RD&E, and RMAD Plans.

WRLF license holders currently contribute to funding streams to support fishery management, industry administration, advocacy, and to invest in RD&E.

Based on GVP ~\$200m	% of GVP	Approx. \$p.a.	Use of Funds
WA Fisheries	5.000%	\$10,000,000	Fishery management, compliance, ongoing monitoring and assessment with RD&E focussed on stock and environmental issues
WAFIC	0.375%	\$750,000	Community investment to support fisheries industry
WAFIC/WRLC	0.125%	\$250,000	Returned to WRLC to run that organisation
RD&E	0.250%	\$500,000	Allocated to RD&E and leveraged via FRDC, SCRC, etc
Total	5.750%	\$11,500,000	

Figure 12. Source and Use of WRLF Funds

The WRLC considers these cash streams are insufficient in size and inappropriate in form to enable it to discharge its charter on behalf of members and license holders.

It is proposed that the WRLC receives all / or a proportion of, its funds directly from WRLF license holders. This approach will provide funding certainty to WRLC and provide the flexibility to directly seek additional resources from license holders (from time to time) with their consent to manage key issues (eg industry engagement regarding whale mitigation) as they arise.

5. The WRL Business

Value Chain and Risks

Resource Access and Harvesting

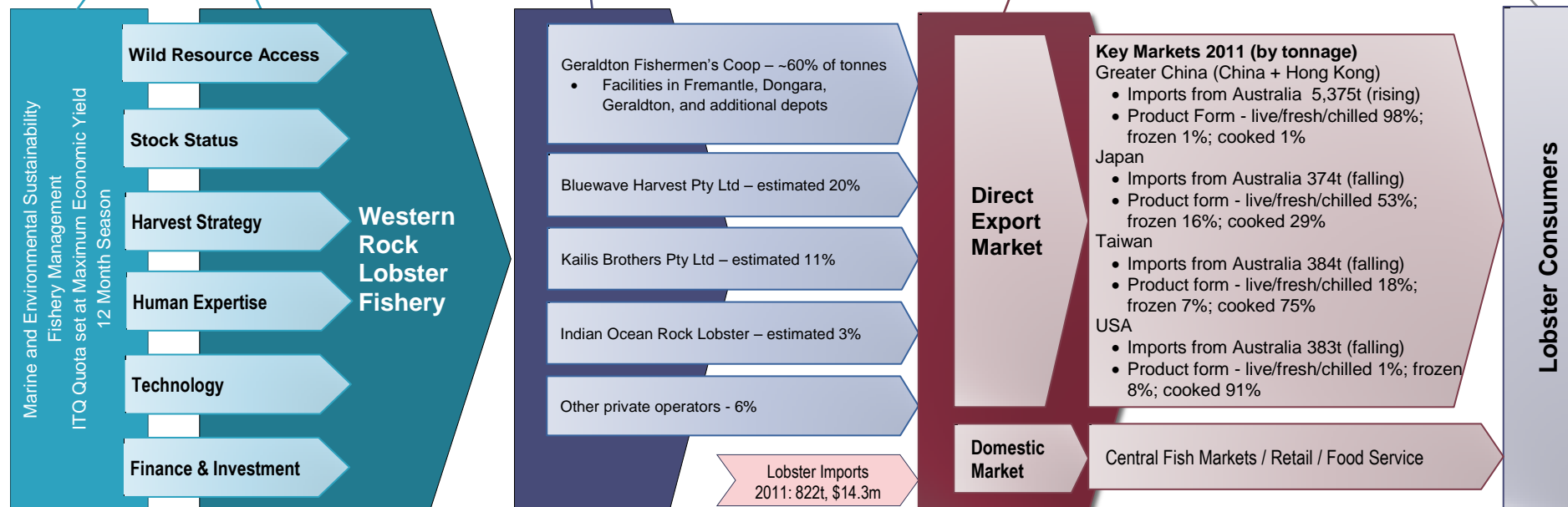
- WA State Fishery
- 3 Harvest Zones
- Certified by MSC
- ~250 boats
- 774,586 quota units
- Full quota managed fishery
- 12 month harvest season

Processing & Distribution

- One large cooperative with global market share. Cooperative profit share distributed to members on basis of supply tonnage.
- Other private seafood processing firms
- Lack of airfreight capacity to key export markets
- Increased focus on live product along a just-in-time supply chain

Markets & Competition

- China is world's largest consumer, importer, exporter and producer of seafood
- Chinese consumers regard live imported seafood (e.g. lobster, abalone) as luxury social symbols. Live catch is popular with wealthy urban elite on the east coast.
- Chinese see Australian and New Zealand lobster as homogenous - assume it is all Australian
- Food safety and sustainability are very important to Chinese – must be branded
- Increasing lobster supply to China including from competitors (Canada, USA, Caribbean, and New Zealand under Free Trade Agreements).
- Processing to service viable non-live markets where appropriate. This includes opportunities in Europe and USA, and emerging in China.



SWOT Analysis

The following individual responses and opinions have been provided by the members of the Council.

	Today's Reality	Tomorrow's Strategy
Beneficial capacity and options to be captured by WRLF	<p>STRENGTHS</p> <ul style="list-style-type: none"> • Quota - Catch spread over 12 months and large coastline to maximise price • Documented history as an industry • Still have a reasonable level of participation • Stable government • Good research on the animals • Future looks good although coming out of low recruitment years • Professional, modern, efficient and innovative fleet, mostly financially sound • Have pristine waters - the biggest and most reliable aquarium (ocean) • No biodiversity problems • Efficient catching ability • Efficient product handling ability (98% live) and efficient trucks (in most factories) • Skills improving amongst fishermen – great job • Great improvement in technology on the catcher vessel and factories • Air freight good (but space limited at times) • Good profit and stock abundance • Huge demand for product, and also relative to the limited resource • Recovering stocks of all grades • MSC certified – sustainable fishery and premium product 	<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Educate and train WRL fishers and stakeholders, and community • More research into Big Bank lobster • Develop gear solutions to alleviate whale entanglements • Utilise the whale migration for financial gain via a public relations strategy • Lobster aquaculture in WA based on <i>Panulirus cygnus</i> • Improve the marketing of WRL to key markets • Build alternative markets (eg USA) as insurance against collapse of China • Free trade agreement urgently needed with China • Maintain quality exporting live into more distant markets (Europe) • Establish a single desk marketing program for WRL • Promote the positives of marine stewardship across WRLF stakeholders • Identify and source airfreight alternatives • Improve the catch rate by better pots/bait/use of technology • Manage the harvest to just meet the market at the best price • Selling different products, setose, oversize - grow the market • Electronics, technology to lower the cost of production • Understand public views - to counter media hype re marine environment • Industry working together and across Australian lobster fisheries
Detrimental challenges to be managed or resolved by WRLF	<p>WEAKNESSES</p> <ul style="list-style-type: none"> • Decreasing number of processors – potential local lack of beach price competition • Only one real main market for premium price in larger quantities • Highly reliant on one market (China) and channel - additional border entry issues • Lack of fishers' support - fishers form lobby groups against WRLC • Not easy market access into China - no free trade agreement with China • Whale interactions (EPBC & CITES listed) threaten removal of WRLF export license • Understanding of whale migration and lack of industry induced mortality • Bureaucracy provides limited assistance in assessing whale risks to WRLF exports • Lack of ample funding for a quality lobster representative body (WRLC) • Still no real understanding of the big decline in puerulus settlement • Government interference, incompetence and over charging for services • Inequity between industry on harvest – WRLF zonal factions – fisher infighting • Fishermen apathy about investing in RD&E – 580 licenses/250 boats, many leased • There are no new participants entering the fishery 	<p>THREATS</p> <ul style="list-style-type: none"> • Main market is communist state – highly unpredictable policy on imports • Closing of borders to China and other markets and/or high tariffs • Loss of access to part/all of fishery season due to whale threat or other threat • Limited capacity on airlines to fly to market • Warmer and more acidic oceans adversely impacting fishery • Low puerulus settlement • Green Groups • Ongoing whale interactions that restrict/preclude fishery access • Socio-economic study (Veronica Huddleston-2006) now that quota is in place • Increased designation of marine parks by governments • Overfishing if quota is set to high • Inefficient fishing methods reduce enterprise returns • Risk of access to live export market approval (whales) • Access to resource/supply/green groups/recreational fishers

WRLF Development Scenarios

The key risks have been identified, and the likely development scenarios framed, based on consultation responses from industry presented in the SWOT Analysis above,

	Sustainability & Resource Access	WRL Fishery & Harvest	Processing & Distribution	Markets & Consumers	What does this Mean?
KEY RISKS	<ul style="list-style-type: none"> ➤ Lack of access to the resource ➤ Unplanned /adverse management or quota changes ➤ Stock availability, specification and health uncertainty ➤ Adverse whale interactions 	<ul style="list-style-type: none"> ➤ Inefficient fishing / productivity ➤ Growth in real beach price ➤ RD&E Effectiveness thru chain ➤ Low RD&E funds/governance ➤ Low human capacity and skills ➤ WRL Fisher infighting 	<ul style="list-style-type: none"> ➤ Decreasing processor capacity and investment ➤ Lack of airspace for product ➤ Viability of processing sector ➤ Lack of RD&E collaboration between fishers & processors 	<ul style="list-style-type: none"> ➤ China market exposure/reduced live take ➤ Market access denied ➤ Consumers prefer other product ➤ WRLF lobster not differentiated ➤ Aquaculture reduces floor price 	
Favourable (Hi) Scenario	<ul style="list-style-type: none"> • ITQ resource access ongoing; 12 month season; MSC certification • Increasing fishery recruitment • 3% pa. growth in TACC at MEY • WRLF Innovations overcome all adverse whale interactions 	<ul style="list-style-type: none"> • 3% pa. growth in real price • 3% pa. fishery productivity gain • Whole-of chain RD&E Plan • Secure funding for RD&E, >5 yrs • Whole-of-Chain RD&E governance engagement, skills 	<ul style="list-style-type: none"> • Increasing beach price competition from processors • Access to Just-in-time airspace for all WRLF product • Processor collaboration in WRLF RD&E funding/governance 	<ul style="list-style-type: none"> • 4% pa Growth in China live • FTA between China and Aust. • Secure access in key markets • WRLF is preferred live supplier • WRLF co-invests to promote • WRLF finds secondary markets 	<p><u>Volume</u> impact: 4% pa TACC gain</p> <p><u>Value</u> impact: 4% real avg. price gain 1% productivity gain 2% market margin gain</p>
Baseline Scenario	<ul style="list-style-type: none"> • Stable Fishery Management, but resource access threatened • Minimal growth in recruitment • 1% pa. growth in TACC at MEY • WRLF ignores adverse whale interactions and fallout 	<ul style="list-style-type: none"> • 1% pa. growth in real price • No gain in fishery productivity • WRL Fishers only in RD&E Plan • Current funding for RD&E • Fishers only in RD&E governance, engagement, skills 	<ul style="list-style-type: none"> • Limited beach price competition from processors • No change in access to Just-in-time airspace for WRLF product • Benign processor impact on WRLF RD&E funding/governance 	<ul style="list-style-type: none"> • Good growth in China live market • Uncertain access in markets • WRLF is one of many suppliers • WRLF does limited promotion • WRLF has few alternate markets 	<p><u>Volume</u> impact: 2% pa TACC gain</p> <p><u>Value</u> impact: 1% real avg. price gain 0.5% productivity gain 0.5% market margin gain</p>
Unfavourable (Low) Scenario	<ul style="list-style-type: none"> • Volatile Fishery Management, and resource access eroding • Volatile / declining recruitment • 0% pa. growth in TACC at MEY • WRLF unable to stem adverse whale interactions and fallout 	<ul style="list-style-type: none"> • 0% pa. growth in real price • Falling fishery productivity • Falling support for RD&E • Falling investment in RD&E • Fragmented RD&E governance, engagement, skills 	<ul style="list-style-type: none"> • Reduced number of processors • Decreasing access to Just-in-time airspace for WRLF product • Processors obstructing WRLF RD&E funding/governance 	<ul style="list-style-type: none"> • Fair growth in China live market • Risky access in key markets • WRLF has not differentiated • WRLF loses market share and margin as commodity supplier • WRLF has no alternate markets 	<p><u>Volume</u> impact: 1% pa TACC gain</p> <p><u>Value</u> impact: 0% real avg. price gain 0% productivity gain -1% market margin gain</p>

6. RD&E Investment Capacity 2014-2023

The WRLF Base Case Growth Scenario is based on 4 core assumptions:

1. TACC and harvest tonnage increases at 2% p.a. which enables all WRLF product to be sold on a just-in-time basis in premium live markets;
2. Long term nominal \$A beach price will increase at a conservative 1% per year (\$A beach prices react to market forces and have increased at over 15% in the last year);
3. In addition to the increase in nominal beach price, the returns to license holders will increase by a productivity gain of 0.5% p.a., plus a market premium gain of 0.5% p.a. based on in-market promotion under a China-Australia Free Trade Agreement. The effective nominal annual \$A beach price increase is therefore approximately 2.0%.
4. Additional RD&E capacity will accrue from the WRLF's co-investors.

The growth assumptions and related RD&E investment funds presented here in the Base Case Scenario are therefore quite conservative.

WRLF BASE CASE GROWTH SCENARIO		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2014-23
Forecast Harvest	tonne	5,500	5,610	5,722	5,837	5,953	6,072	6,194	6,318	6,444	6,573	60,223
Forecast Nominal Beach Price	\$/kg	36.40	37.13	37.50	37.88	38.26	38.64	39.03	39.42	39.81	40.21	
Est. Nominal WRLF GVP	\$Mill.	200	208	215	221	228	235	242	249	257	264	2,318
Est. RD&E Funds Pool (matched)	\$'000	1,000	1,042	1,074	1,106	1,138	1,174	1,208	1,246	1,282	1,322	11,592
Investment Area	Share	Estimated Nominal Base Case RD&E Funding Available \$'000										
1. Resource Access	31.0%	800	834	322	221	228	235	242	249	231	238	3,599
2. Market Knowledge	14.6%	70	73	322	221	228	176	181	137	141	145	1,695
3. Communication & Education	13.0%	70	73	107	177	182	188	193	199	154	159	1,502
4. Fish Stocks	10.2%	60	63	107	111	137	141	145	137	141	145	1,186
5. Processing & Value Adding	9.2%	0	0	107	100	102	94	157	162	167	172	1,061
6. Labour & Skills	7.5%	0	0	54	144	148	164	85	87	90	93	864
7. Harvest Efficiency	5.2%	0	0	54	133	114	106	48	50	51	53	608
8. Other contingency areas	9.3%	0	0	0	0	0	70	157	224	308	317	1,077
TOTAL INVESTMENT \$'000	100%	1,000	1,042	1,074	1,106	1,138	1,174	1,208	1,246	1,282	1,322	11,592

7. The RD&E Plan - Investment Horizon 2014-23

This table presents target outcomes and co-investments under 3 investment horizons – near, mid and long term. This approach enables strategic and tactical flexibility across the investment portfolio, for example the relatively large investment in Resource Access issues (primarily whale mitigation) in Years 1-2.

Investment Area	Summary of Key Investment Outcomes	Co-Investors in RD&E	Near Term	Mid Term	Long Term
Base Case			Yrs 1-2 \$'000	Yrs 3-6 \$'000	Yrs 7-10 &'000
1. Resource Access	<ul style="list-style-type: none"> This Investment Area aims to reduce interactions with marine wildlife, including whale migration pathways and risk Monitoring of whale interactions, plus other access risks Solutions to reduce gear interactions and impacts, noting that sonar activated sunken buoys have been tested in NSW, and may be an appropriate off-the-shelf solution for WRLF. 	<ul style="list-style-type: none"> WA Fisheries WA agencies Federal agencies 	1,634	1,006	1,006
2. Market Knowledge	<ul style="list-style-type: none"> China access - FTA, live plus other products, channels, competitors China market - growth in 2nd /3rd tier cities, etc Generic branded promotion of WRLF product Investigate "Australian Lobster" Alternative markets for live and value added product Lobster aquaculture and ranching - competitors 	<ul style="list-style-type: none"> Other Australian seafood export sectors Other Australian exporters to China 	143	947	947
3. Communication & Education	<ul style="list-style-type: none"> WRLC Communication Plan - identify/sell key messages Internal and external engagement - fishers, processors, etc Education and awareness of key issues 	<ul style="list-style-type: none"> WAFIC WA Fisheries 	143	654	654
4. Fish Stocks	<ul style="list-style-type: none"> Tagging program Deep water puerulus 	<ul style="list-style-type: none"> WA Fisheries 	123	495	495
5. Processing & Value Adding	<ul style="list-style-type: none"> Processing and distribution chain efficiencies Innovation for the live China markets Processing that enables lower China market risk 	<ul style="list-style-type: none"> Seafood Processors 	0	403	403
6. Labour & Skills	<ul style="list-style-type: none"> Skills development/retention in Harvest & Processing Occupational Health & Safety – this Investment Area is currently under review by WAFIC and any WRLC investment will be made subject to the outcomes from that review when available. 	<ul style="list-style-type: none"> FRDC / Primary Industries Health & Safety Partnership 	0	510	510
7. Harvest Efficiency	<ul style="list-style-type: none"> WRL Fishery economics and productivity data Pot design and innovation 	<ul style="list-style-type: none"> Not applicable 	0	406	406
8. Other	<ul style="list-style-type: none"> Whole-of-Chain RD&E Investment within the WRLC Governance model Whole-of-Chain Fishery economics and market offer 	<ul style="list-style-type: none"> WA State and Federal agencies 	0	70	70
TOTAL INVESTMENT \$'000			\$2,042	\$4,492	\$5,058

Investment Area 1 – Resource Access

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
1.1 To understand whale migration pathways and risks relative to WRLF activity	<p>Whale migrations are dynamic, subject to variability (in biology, climate and the Leeuwin Current), and other factors.</p> <p>Whale migration pathways will not be constrained by the WRLF or any related policy intervention in the foreseeable future. Existing legislation is clear – per EPBC Act, and CITES.</p> <p>The WRLF must therefore take full responsibility with other fisheries, to manage interaction risks across its license holders, through spatial and temporal mitigation initiatives.</p>				
1.2 To understand the range of whale interactions, gear entanglements, and adverse outcomes	Work with industry partners and agencies to collate data, identify and detail the risks, impacts, and develop a range of solutions appropriate for WRLF license holders.	WRLC WAFIC WA Fisheries	WRLC WAFIC	Near Term	WAFIC WRLC
1.3 To reduce Whale Interactions and Impacts	Use Participatory Action Research approaches to develop solutions into fishery gear designs and procedural activities.	WA state agencies Federal agencies	WRLC PFAs	Both strategic and tactical	WA agencies Federal agencies
1.4 To determine the socio economic impact on the WRLF, communities and other stakeholders from whales and other marine interactions	WRLF fishers are most at risk from ongoing interactions through potential loss of fishery access. They will respond to both regulator imposed legislative controls and to self- regulation based on commercial incentives.	Other marine resource users, eg petroleum	WA Fisheries		
1.5 To establish a WRLF strategy jointly with stakeholders to ensure ongoing fishery access	<p>Raise awareness across all license holders of the risk of loss of WRLF access.</p> <p>Educate fishers and WRLF stakeholders regarding optimal risk mitigation strategies.</p> <p>Monitor whale interactions and other access risks.</p>				

Investment Area 2 – Market Knowledge

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
<p>2.1 To document impacts on supply chains and markets, resulting from elimination of input controls and extension to 12 month season</p>	<p>The WRLF move to ITQ output fishery management has had limited impact on the environment, but dramatic financial (reduction in harvest and GVP) and social (exit of boats from the fishery) impacts.</p> <p>WRLC Membership is now mostly by owner operators. Other supply chain and market impacts need to be identified, analysed and shared through the chain.</p>	<p>WRLC</p> <p>Processors</p> <p>Chain partners</p> <p>WA agencies – re socio economic impacts</p>	<p>WRLC</p> <p>Processors</p>	<p>Near-Mid Term</p>	<p>WRLC</p> <p>Processors</p>
<p>2.2 To understand market access, supply risks, demand growth and opportunities in China and other key markets (USA, Asia, Europe, domestic)</p> <p><i>(Note that initial discussions have been held between WRL/SRL and NZRL re potential research collaboration)</i></p>	<p>Chinese consumers hold the bulk of WRLF's future income. WRLF is highly exposed to China's live market.</p> <p>Understand the market opportunities for selected WRLF lines in USA, Europe, and the domestic market.</p> <p>A Free Trade Agreement is required, in order to be competitive.</p> <p>Understand aquaculture/ranching – uncertain timing/impact.</p> <p>Assess increased domestic consumption of WRLF product.</p> <p>Assess benefits and cost effectiveness of WRLF single desk.</p>	<p>WRLC</p> <p>Processors</p> <p>Chain partners</p> <p>Federal Dept. of Foreign Affairs and Trade</p>	<p>WRLC</p> <p>Processors</p> <p>WAFIC</p> <p>WA Agencies</p>	<p>Near-Mid Term</p>	<p>WRLC</p> <p>SRL</p> <p>Processors</p> <p>FRDC/SCRC</p>
<p>2.3 To facilitate market knowledge to WRL Fishers and key stakeholders – establish a WRLF thru - chain Marketing Subcommittee</p>	<p>Moves to ITQs, TACC reduction, and a season extension have all collectively increased WRLF's market risk.</p> <p>Market risks (price/quality/consumer preferences/in-market competition/product delivery/political) have all increased due to smaller WRLC volumes. Need to better understand these risks in order to manage them.</p>	<p>WRLC</p> <p>Processors</p> <p>Chain partners</p>	<p>WRLC</p> <p>Processors</p>	<p>Mid Term</p>	<p>WRLC</p> <p>Processors</p>
<p>2.4 To investigate the viability of an “Australian Lobster” branding and export concept</p>	<p>Australian lobster (WRL, SRL, Tropical Rock Lobster, and Eastern Rock Lobster) is well established and highly regarded. But reduced share of market volume means our live exports must differentiate a premium offer, targeted at specific consumers in their preferred food service outlets. Branding is essential.</p>	<p>WRLC</p> <p>Processors</p> <p>Chain partners</p>	<p>WRLC</p> <p>SRL</p>	<p>Mid Term</p>	<p>WRLC</p> <p>Processors</p> <p>FRDC / SCRC</p>

Investment Area 3 – Communication & Education

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
3.1 To establish a Communication Plan for WRLC	<p>WRL Fishers and industry stakeholders face many dynamic risks – from resource access through to consumer markets.</p> <p>Effective media management is a core component of resolving/reducing risk for many of these issues (eg whale entanglements). Embed the required RD&E communication strategies within a WRLC Communication Plan.</p>	<p>WRLC</p> <p>WAFIC</p>	WRLC	Near Term	<p>WRLC</p> <p>External experts</p>
3.2 To maintain a close working relationship with all PFA's and related fishery groups: in order to identify and manage industry issues, engage license holders, and update industry codes of conduct, and promote best practices	<p>WRLC is a membership based organisation as defined in its Constitution, Vision, and Strategic Plan.</p> <p>The RD&E Plan and related investment strategy will be ineffective and potentially fail, without a close working relationship between WRLC and local fisher associations and groups. Engage more closely with all PFAs.</p> <p>Industry education and understanding of key issues is critical both among fishers (eg results of the tagging program), and jointly with processors, researchers and agencies.</p>	<p>WRLC</p> <p>PFAs</p>	<p>WRLC</p> <p>PFAs</p>	Near-Long Term	<p>WRLC</p> <p>PFAs</p>
3.3 To continue to invest in the education and training of all participants in the industry	<p>The commercial viability of the modern WRLF increasingly demands that license holders are engaged in many complex and dynamic issues, from the marine resource through to export consumers.</p> <p>Resolving commercial risks and making an acceptable commercial return for a fisherman relies on a comprehensive understanding of lobster biology and habitat, fishery laws and management rights, community expectations, harvest and distribution technologies, market dynamics and consumer preferences.</p> <p>Ensure all fishermen are aware of the key issues, impacts and practices.</p>	<p>WRLC</p> <p>PFAs</p>	<p>WRLC</p> <p>PFAs</p>	Mid-Long Term	<p>WRLC</p> <p>PFAs</p> <p>External experts</p>

Investment Area 4 – Fish Stocks

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
4.1 To understand the ongoing health and status of the WRLF lobster biomass	<p>The unforeseen and compounding changes to WRLF recruitment (reduced settlement) have resulted in large and prolonged impacts on the viability of the fishery and many license holders, and the fishery management approach used.</p> <p>Ensure fishers and fishery managers invest in and maintain the research capacity and related tools to accurately forecast fishery stock status and performance through to markets.</p>	<p>WRLC</p> <p>WA Fisheries</p> <p>WA agencies</p> <p>Federal agencies</p>	WRLC	Mid Term	<p>WRLC</p> <p>WA Fisheries</p>
4.2 To document and monitor fishery status by selective use of a WRLF tagging program	<p>Fish tagging is an essential and often cost effective approach to monitor changes in the status of the fishery stocks.</p> <p>Use a Participatory Action Research approach to engage fishers in the tagging program. This is the most cost effective and efficient pathway to extend learnings and outcomes to fishers.</p>	<p>WRLC</p> <p>WA Fisheries</p>	WRLC	Mid Term	<p>WRLC</p> <p>WA Fisheries</p> <p>External experts</p>
4.3 To establish and maintain a deep water puerulus monitoring program	<p>Deep waters in the fishery are critical to breeding stock. Current puerulus monitoring occurs in shallow near-shore environments. Several studies have assessed the level of deep water puerulus settlement with no settlement recorded. Mesh pots indicate some settlement may occur in deep water but it is minor compared to that of near-shore waters. The indices generated by near-shore sites have been highly accurate predictors of future catches. Independent monitoring of these waters is essential to understanding the breeding status of the stocks.</p> <p>Participatory Action Research approaches that engage fishers in research will be the most cost effective and efficient pathway to extend learnings and outcomes to fishers.</p>	<p>WRLC</p> <p>WA Fisheries</p>	WRLC	Mid Term	<p>WRLC</p> <p>WA Fisheries</p>
4.4 To understand the movement of lobsters across the fishery, between zones, and on the overall TACC.	<p>Migration of lobsters across WRLF zonal boundaries results in changes in quota, allowable commercial catch and harvest values. This is a contentious issue between license holders.</p> <p>Understand migratory patterns and movements to improve harvest planning and scheduling for fishers.</p>	<p>WRLC</p> <p>WA Fisheries</p>	WRLC	Mid Term	<p>WRLC</p> <p>WA Fisheries</p>

Investment Area 5 – Processing & Value Adding

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
<p>5.1 To maintain adequate processing capacity for the WRLF across key target markets and product lines</p> <p><i>(Note that while Processors did not attend the RD&E planning workshop, the WRLC intends to engage with processors in long term market support and investment planning.)</i></p>	<p>Processors and distributors play a central role in the WRLF supply chain. Undertake RD&E analysis to ensure:</p> <ul style="list-style-type: none"> there is adequate "arms-length" beach competition for their product, changing consumer preferences (by product and market) can be fully met via existing processors and distributors, there is adequate flexibility in their supply chain to respond to unplanned risks, such as food contamination issues, bioterrorism, or unplanned market closures. 	<p>WRLC</p> <p>Processors</p>	<p>WRLC</p>	<p>Near –Long Term</p>	<p>WRLC</p> <p>Processors</p>
<p>5.2 To ensure and monitor a high standard of thru-chain product integrity</p>	<p>WRL fishers and their supply chain partners intend to maintain high level chain of custody and product integrity systems to support WRLF's MSC credentials and related offer to premium consumers. Refer Investment Area 8 for details.</p>	<p>WRLC</p>	<p>WRLC</p> <p>MSC</p>	<p>Near-Long Term</p>	<p>WRLC</p> <p>Processors</p> <p>External experts</p>
<p>5.3 To determine viable options for increasing airfreight capacity to key markets</p>	<p>Airfreight is the only viable logistics route for the WRLF live product to market.</p> <p>Airfreight capacity risk is direct and large. Undertake analyses to define, quantify and manage this risk.</p>	<p>WRLC</p> <p>Processors</p> <p>Chain partners</p>	<p>WRLC</p> <p>Processors</p>	<p>Near Term</p>	<p>WRLC</p> <p>Processors</p>
<p>5.4 To assess the opportunity for investment in a new CRC and other investment leverage opportunities</p>	<p>WRLC can be a direct investor in new RD&E investment leverage opportunities, including possible new CRCs or similar structures.</p>	<p>WRLC</p> <p>WAFIC</p> <p>FRDC</p>	<p>WRLC</p>	<p>Near-Long Term</p>	<p>WRLC</p>
<p>5.5 New WRLF product development</p>	<p>The prospective development of a branded Australian Lobster concept (possibly jointly with SRL, TRL & ERL) for export consumers, to target up-scale Chinese consumers.)</p>	<p>WRLC</p> <p>Processors</p> <p>FRDC</p>	<p>WRLC</p> <p>Processors</p>	<p>Mid-Long Term</p>	<p>WRLC</p> <p>Processors</p> <p>External experts</p>

Investment Area 6 – Labour & Skills

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
6.1 To document and understand the human capacity required to maintain a viable and efficient WRLF - a Skills Audit	<p>WRLF and its related supply chain partners have limited data regarding or understanding of the status of their collective human capacity needs and related operational risks.</p> <p>As a significant regional employer the WRLF is often competing economically for skills and labour with the mineral and resource sectors. Undertake appropriate skills and human capacity analyses and audits.</p>	WRLC WAFIC	WRLC	Mid Term	WRLC WAFIC External experts
6.2 To work with WAFIC to establish and maintain an appropriate OH&S Code	<p>Wild catch fishing entails many Occupational Health & Safety risks for WRLF operators and their employees.</p> <p>Participate in the FRDC's upcoming joint national seafood OH&S initiative to provide the most cost effective pathway to meet required standards and manage OH&S risks for WRLF stakeholders.</p>	WRLC WAFIC FRDC	WRLC	Near Term	WRLC WAFIC External experts
6.3 To deliver desired training to WRLF members	<p>Understand the human capacity gaps revealed by the Skills Audit (see 6.1). Establish a training program to fill these gaps.</p> <p>Continue to develop career path opportunities that will attract, retain and train people across the fishing industry and WRLF.</p>	WRLC	WRLC	Mid Term	WRLC WAFIC External experts
6.4 To provide opportunities for WRLC and PFA representatives to attend coaching and leadership programs	<p>WRLF viability depends on WRLC's ability to negotiate issues and risks beyond the control of each license holder (eg access to the marine resource and access to the live China market).</p> <p>It is critical that WRLC maintain the professional skills and capacity to lead WRLF members on key issues. (Refer Investment Area 8 for more details).</p>	WRLC PFAs	WRLC PFAs	Mid-Long Term	WRLC PFAs WAFIC External experts
6.5 Continuing to provide a safe workplace for all participants in the fishery	<p>Safe food and safe work places are essential prerequisites to attract employees, and access premium global markets.</p> <p>WRLF must ensure it maintains and monitors systems to achieve these outcomes.</p>	WRLF WAFIC	WRLC WAFIC	Near-Long Term,	WRLC WAFIC External experts

Investment Area 7 – Harvest Efficiency

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
<p>7.1 To establish and maintain up to date WRLF economics and productivity data through the supply chain</p>	<p>Managing for profit requires all decisions to be based on sound and comprehensive knowledge. In turn this demands good ongoing access to operational and economic data.</p> <p>The WRLF maintains up-to-date data capacity to determine MEY and guide sustainable harvest strategies (see SCRC Project 209/714.10 – WA Fisheries). However there is very limited data available downstream of harvest. There is no benchmarking of supply chain efficiency or performance.</p> <p>As Australia's largest (and oldest) wild fishery by value, the WRLF has not yet established an effective data recording and management system beyond the catching sector. This gap is evident in contrast to all South Australian fisheries where economic data is well maintained, up to date and widely used by stakeholders and external professionals to guide investment decisions.</p> <p>Undertake appropriate analyses and establish ongoing economic data collation and management systems.</p>	<p>WRLC</p> <p>Processors</p> <p>WA agencies</p>	<p>WRLC</p>	<p>Mid-Long Term tactical</p>	<p>WRLC</p> <p>External experts</p>
<p>7.2 To improve harvest efficiency under a new ITQ fishery management system</p>	<p>The move to a 12 month season and quota based management system offers a range of possible cash flow and profit advantages to license holders.</p> <p>Fishers have limited capacity to undertake private/individual assessments of these impacts.</p> <p>Implement a limited number (say 3-5) of targeted RD&E efficiency and impact assessment projects that would offer gains to most fisher members, including Timing of harvest, Frequency of fishing, and Pot redesign. Opportunities will be supported with investment funds where harvest efficiencies can be demonstrably improved.</p>	<p>WRLC</p>	<p>WRLC</p> <p>PFAs</p>	<p>Mid Term</p>	<p>WRLC</p> <p>PFAs</p> <p>External experts</p>

<p>7.3 To investigate and promote understanding regarding the health and presentation of live lobster in export markets</p>	<p>Research has been undertaken (largely by Geraldton Cooperative) to identify methods of potting which cause least damage to lobster legs and feelers. These methods were adopted across the fleet.</p>	<p>WRLC Processors</p>	<p>WRLC PFAs</p>	<p>Mid Term</p>	<p>WRLC PFAs External experts</p>
	<p>An ongoing process has been implemented by WRL Processors and Fishers to continually review catch and handling processes so as to minimise damage and maximise quality. A number of outcomes have been achieved in the last 3 years:</p>				
	<ul style="list-style-type: none"> • new catch methods are being researched and developed to help reduce catch damage, • best methods of on-board measuring and handling were identified and standardised across our fleet, • new equipment for zero-handling grading of live lobsters was introduced, • a bar-coding system was introduced so as to be able to track lobsters throughout the processing and distribution system, • best practice methods for packing and cooling of live lobsters for transporting were implemented, • catch logging methods were changed so fishers could trace any lobster back to the boat it came from. 				
	<p>Document the market outturn and value of these initiatives to ensure they are valued by markets and are meeting their point-of-sale preferences.</p>				

Investment Area 8 – Other RD&E Matters

RD&E Investment Objective	Risks and Rationale	Co-Investment	Responsibility	Horizon	Resource
8.1 To develop and maintain appropriate leadership skills and human capacity in WRLC	<p>The WRLC is an incorporated peak organisation, with a charter to lead and represent the interests of license holders and members. Council decisions impact (directly and indirectly) all stakeholders - fishers, processors, community members, agencies consumers, and the general public. Effective and transparent governance is essential for optimum outcomes.</p> <p>The WRLC's human resources comprise current Board members, license holders, staff, and fishery supporters.</p> <p>Implement a targeted program to increase WRLF human capacity in three core areas:</p> <ul style="list-style-type: none"> • Governance capacity – potentially via courses offered by Australian Institute of Company Directors, • Leadership development – potentially through the Australian Rural Leadership Foundation, • Media Training – via external professional training and expert advice. 	<p>WRLC</p> <p>Processors</p> <p>WAFIC</p> <p>WA Fisheries</p> <p>FRDC</p>	<p>WRLC</p> <p>PFAs</p>	Mid Term	<p>WRLC</p> <p>PFAs</p> <p>External experts</p> <p>WAFIC</p>
8.2 To develop performance measures and reporting networks that promote WRLF's social licence to operate	<p>Capture fishers (in particular) must secure and maintain the ongoing endorsement of the community to permit harvest from the public resource. This "social license to operate" is increasingly tested under a triple bottom line (environmental sustainability, social outcomes, and economic viability) and related legislation (eg CITES, EPBC Act, etc). Agencies, NGOs and the media increasingly focus on qualitative and quantitative measures of fishery performance.</p> <p>WRLC should proactively protect its MSC accreditation by working with communities, fishers, NGOs and experts to identify and report performance outcomes to selected audiences.</p>	<p>WRLC</p> <p>Processors</p> <p>WAFIC</p> <p>FRDC</p>	<p>WRLC</p> <p>PFAs</p> <p>NGOs</p>	Mid - Long Term	<p>WRLC</p> <p>PFAs</p> <p>External experts</p> <p>WAFIC</p>
8.3 To confirm the current and future participation in MSC and recertification – assess who	<p>The Marine Stewardship Council is the world's leading certification and ecolabelling program for sustainable seafood. As the first wild capture fishery certified by MSC, WRLF has since</p>	<p>WRLC</p> <p>Processors</p>	<p>WRLC</p> <p>NGOs</p>	Mid - Long Term	<p>WRLC</p> <p>External experts</p>

<p>pays the merits of continuing</p>	<p>been reaccredited twice, most recently in 2012.</p> <p>The financial cost of MSC certification to WRLF fishers is \$120,000-\$140,000 over 5 years. The benefits from this WRLF investment flow (directly and through spinoffs) to the WRLF fishery, consumers, the State of WA, and the broader Australian seafood industry.</p> <p>Conduct an independent review of the direct and indirect outcomes from MSC investment and consider who should share the costs. Consider the level of chain-of-custody accreditation that is best for WRLF and whether MSC is the best pathway to achieve this.</p>	<p>WAFIC</p> <p>FRDC</p>		<p>WAFIC</p>	
<p>8.4 To engage with and extend knowledge to community</p>	<p>As a large and geographically disparate fishery, the WRLF is primarily a regional fishery dominated by WA regional communities. For a number of mutually beneficial reasons (eg social license to fish, availability of employment skills) WRLF must engage with all regional communities regarding mutual issues and outcomes.</p> <p>Establish and implement a plan to advocate and promote WRLF and industry benefits to regional communities.</p>	<p>WRLC</p> <p>Processors</p> <p>WAFIC</p> <p>WA Fisheries</p>	<p>WRLC</p> <p>PFAs</p>	<p>Mid - Long Term</p>	<p>WRLC</p> <p>PFAs</p> <p>WAFIC</p>
<p>8.5 To conduct a Biennial Conference/festival</p>	<p>For many years the WRLF has led wild fishery development and innovation in Australia. Recent feedback from stakeholders, agencies and third parties indicates that this leading role is being overtaken by other Australian fisheries (wild and aquaculture) that are better led, more innovative and better engaged with license holders and consumers.</p> <p>Reestablish a leadership role with internal (fishers, PFAs, processors, researchers, regulators, etc) and external stakeholders (agencies, communities, NGOs) by undertaking Industry conferences/events to promote WRLF's research outcomes, identify future needs, etc.</p>	<p>WRLC</p> <p>Processors</p> <p>WAFIC</p> <p>WA Fisheries</p>	<p>WRLC</p> <p>PFAs</p>	<p>Mid - Long Term</p>	<p>WRLC</p> <p>PFAs</p> <p>WAFIC</p>

Glossary

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences, an agency within the federal Department of Agriculture, Fisheries and Forestry
AFGC	Australian Food and Grocery Council
CITES	The Convention on International Trade in Endangered Species of Wild Fauna and Flora, is a multilateral treaty that came into force in July 1975 to protect endangered plants and animals
EPBC Act	The Environment Protection and Biodiversity Conservation Act 1999 is the Australian Government's key piece of environmental legislation which commenced 16 July 2000
FAO	Food and Agricultural Organisation of the United Nations
GVP	Gross Value of Production
ITQ	Individual Transferable Quota
MFL	A Managed Fishery License in Western Australia
MSC	Marine Stewardship Council
NGOs	Non-Government Organisations
SOTF	Annual WA Fisheries "State of the Fisheries" Report
Value Adding	Any process (eg grading, manufacturing) or activity (e.g. packaging and Just-in-Time logistics management) that enhances the harvest value of fish, to meet end-user requirements.

Appendix 1. Extract from 2011/12 RMAD Plan

This table highlights (in red) the relevant WRLF RD&E Projects managed under the WA Fisheries RMAD Plan.

Key to symbols in the matrix/summary tables:

- Indicates that the activity is funded and planned to occur
- Indicates that the activity is part of a proposal but is not yet funded

West Coast Western Rock Lobster Fishery Research Projects	Research Status	2011/12	2012/13	2013/14	2014/15	2015/16	Comments
1. Retained Species Stock Analysis							
1.1 Basic Biology of indicator species (Growth, Reproduction, Diet, Natural mortality)	Ongoing	■	■	■	■	■	Still some work required
1.2 Other Biology							
Recruitment Dynamics	Underway	■	■				Investigating 2008/09 recruitment failure
Migration	Underway	■	■				
Lobster spawning rates	Underway	■	■				
Lobster mating behaviour	Underway	■	■				UWA PhD student
Ageing of lobsters	Underway			■			Project with Curtin University - proposal for FRDC under development
By-product Octopus basic biology	Underway	■	■				The basic life history studied / recruitment
1.3 Stock Assessment							
Annual Assessment	Ongoing	■	■	■	■	■	
Develop New Model	Underway	■	■				Models updated as new data developed
Shallow Water Depletion Assess.	Underway	■					
Deep Water Depletion Assessment	Underway	■					Initial trials underway
Estimating harvest rates by tagging	Proposed			■	■	■	FRDC funding Approval
Change in Ratio and Index Removal	Proposed						Funded by the FRDC
1.4 Fishery Monitoring							
Ongoing	Ongoing	■	■	■	■	■	
Commercial Catch & Effort	Ongoing	■	■	■	■	■	
Processor Returns	Ongoing	■	■	■	■	■	
Commercial Monitoring	Ongoing	■	■	■	■	■	
Puerulus Monitoring	Ongoing	■	■	■	■	■	
Research Logbooks	Ongoing	■	■	■	■	■	
Spawning Stock Survey	Ongoing	■	■	■	■	■	
Fishing Power	Ongoing	■	■	■	■	■	
Recreational Catch and Effort	Ongoing	■	■	■	■	■	
Stock & recruitment	Ongoing	■	■	■	■	■	
Meshed Pot monitoring	Ongoing	■	■	■	■	■	
2. Habitat & Ecosystem							
2.1 Bycatch	Ongoing	■	■	■	■	■	Monitoring
2.2 Listed Species	Ongoing	■	■	■	■	■	Monitoring of all interactions
Mitigation of whale interactions	Underway			■	●	●	FRDC funded another proposal submitted.
Sea Lion Interactions and behaviour	Completed						Pot design to stop juvenile sea lions entering pots has been developed and implemented
2.3 Habitat							
Ongoing	Ongoing	■	■	■	■	■	
Seagrass and Limestone reef effects	Completed						Sufficient for management
Coral Reef effects	Underway	■	■				Study at the Abrolhos Islands
Habitat Mapping	Underway	■	■				FRDC funded
Habitat - recruitment relationships	Proposal						FRDC proposal to understand relationship between habitat and puerulus recruitment requirements
2.4 Ecosystem/Environment							
Ongoing	Ongoing	■	■	■	■	■	
Deep water ecosystem study	Underway	■	■	■			Closed area monitoring
Jurien Bay inshore	Completed						SRFME/WAMSI study
Dongara inshore	Completed						CSIRO studies in the 1980s
Rottneest Sanctuary zones	Underway	■	■	■	■	■	Comparing fished vs. unfished
2.5 Oceanography							
Ongoing	Underway	■	■				
Leeuwin Current monitoring	Ongoing	■	■	■			
Oceanographic Modelling	Underway	■					FRDC funded

West Coast Western Rock Lobster Fishery Research Projects	Research Status	2011/12	2012/13	2013/14	2014/15	2015/16	Comments
Impacts of ocean conditions on catch rates	Underway	■	■				
Climate Change effects	Ongoing		■	■	■		FRDC funded
Ocean acidification - puerulus	Proposed				●	●	ECU proposal
2.6 Other impacts on fishery							Nothing identified
3. Management Analysis							
3.1 Socio-economic							
Bio-Economic modelling	Underway	■					In principle CRC funding
Economic Analysis (MEY)	Underway	■					Examination of Maximum Economic Yield
3.2 Resource Access (Shares)							
Determination of access shares	Periodic		■				Needed for IFM / ITQ
Monitoring of shares	Ongoing	■	■	■	■		Needed for IFM ITQ
3.3 Compliance							
Enforcement efficiency	Underway	■	■				
3.4 Management Systems							
Input vs output controls	Completed						Industry moving to Quota In 2010/11
4. Industry Development							
4.1 Production Technology							
Puerulus growout	First Stage Completed						Awaiting outcomes of policy on ownership of puerulus
More Efficient Lobster Pot Design	Underway						Fisher testing of pots
4.2 Post Harvest							
							Completed by industry
4.3 Marketing							
							Completed by Industry
5. Priority Review							
WRLC/WAFIC		■	■				Annual review of R&D plan
6 Science Review							
Stock Assessment	Ongoing	■	■	■	■	■	Last completed in detail in 2010
MSC audits	Ongoing	■	■	■	■	■	Yearly audits