



Ensuring Market Focussed Seafood Value Adding in SA to 2030

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Project 2022-137 *Ensuring market-focused value adding capabilities are available to SA Seafood companies today and through to 2030* is supported by funding from the FRDC on behalf of the Australian Government



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This project was undertaken by a team from Food South Australia Inc, and Ridge Partners with funding from the Fisheries Research and Development Corporation. Logifish Consulting undertook an independent industry survey.

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Glossary and Abbreviations

ABS	Australian Bureau of Statistics
AMFA	Australian Maritime and Fisheries Academy
APRA	Australian Prudential Regulatory Authority
B2B	Business-to-Business seafood transactions
BDO EconSearch	An SA based national analyst of seafood industry and economic impacts
Cool	Country of Origin Labelling
Credence	Product attributes unobservable through search or experience. Some consumers will pay a premium for their provision e.g., organic certification
Cwth	Commonwealth
D2C	Direct-to-Consumer seafood transactions by a processor, value-adder, or manufacturer typically online
ESG	Many global food markets and regulators, including Australia's, are planning introduction of auditable Environmental, Social and Governance standards for supply chain enterprises.
DNA	DNA testing of food products and ingredients is the most accurate way to identify and authenticate species, detect contaminants, and verify labels.
FRDC	Fisheries Research and Development Corporation
FTE	Full time equivalent employee or contractor
GDP	Gross Domestic Product
GSP	Contribution to Gross State Contribution is measured as value of output less cost of goods and services (incl. imports) used to produce that output.
G&G	Gilled and gutted
HOGG	Head on gilled and gutted finfish
ICT	Information and communication technology
MAP	Modified Atmosphere Packaging creates an optimal environment for fresh food by reducing oxygen and controlling carbon dioxide. MAP can extend shelf life, preserve the quality, and prevent food waste of seafood products.
MSC	Marine Stewardship Council, a global fishery and seafood supply chain certification organisation
NA	Not applicable
NPD	New product development
PCR	A polymerase chain reaction (PCR) test detects genetic material from a pathogen or abnormal cell sample.
PIRSA	Department of Primary Industries and Regions SA

Processing

This review broadly distinguishes between seafood:

- processing which involves minimal product transformation of the seafood at sea or onshore, and
- value-adding (see value-adding reference below) transforms (e.g., taste texture, shelf life) or enhances (e.g., flavour, mouthfeel, convenience packaging), or assures (e.g., food safety, 3rd party certification of source integrity and sustainability) a product, and
- manufacturing where processing and value-adding activity is economically scaled up to enable economic production and distribution to retail and food service markets.

ROI

Return on investment

RD&E

Research Development and Extension

RTE

Ready-to-eat meals

SARDI

SA R&D Institute

SASPEC

SA Seafood Processors and Exporters Council, submission to SA Productivity Commission re Reform of SA Regulatory Framework 2021

SBT

Southern Bluefin Tuna

TPA

Tonnes per annum

Value Adding

Seafood value adding enhances the quality, convenience, or appeal of products. It can involve different methods such as breeding, marinating, filleting, smoking, peeling, or packaging. Value-added seafood can help increase sales, reduce waste, and attract customers who are looking for restaurant-quality meals or easy-to-prepare options



Executive Summary

Context

Fresh premium seafood has long been the best pathway to a viable consumer. That remains true for premium SA wildcatch species (e.g., rock lobster, prawn, abalone) that are, and will continue to be, prosperous. But processing and value adding have never been more critical to attract retail consumers than they are today. Modern seafood consumers (retail, food service, or online) are informed and agile, and increasingly choosing retail offers that are consumer meals ready-to-eat. Fishers, farmers, and chain partners must engage in this reality if they are to remain competitive and viable.

The rising frequency of product recalls by SA seafood manufacturers prompted this review. A Preferred Investment Pathway offers direction to resolve gaps by 2030.

Globally and nationally, aquaculture is the largest seafood supplier, setting baseline prices for retail and online product formats. Its easy access, scalable supply, chain efficiency, and species control over yield and product format, can more easily attract investment. SA aquafarms and a few wildcatch fisheries (e.g., Jackets, Pipi) are approaching economic scale in supply and along integrated supply chains. Both are seeking to integrate or access technology and capability to value-add to tight national retail and food service client specifications. Efficient market-focused seafood value adding will build SAs capability and retain investment and employment, particularly in regional communities.

Consultation

This review consulted widely (fishers, farmers, processors, value adders, investors, regulators) regarding processing and value adding capacity and capability that exists and is required to ensure SAs successful market focused value adding by 2030. Unsurprisingly capacity gaps already exist and will grow (without clear heads) as supply increases 25,000 tonnes (32%) by 2030. Eighteen core issues and risks are identified.

Human capacity (skills, collaboration, leadership), Technology transfer (NPD, batch trials), and Markets (intelligence, unique selling points) are the most critical and challenging. Most new investment is by industry's private account, but indirectly coinvestment by government will enable and leverage community outcomes.

Issues

High Priority Value-Adding Issues



- Lack of specialised freezer, chiller and dry goods storage space
- Alternatives to MAP processing using plastics
- Access to new environmentally sustainable product technologies
- Lack of Chain-of-Custody and Cool chain logistics capacity
- Low recovery of and poor returns from seafood waste
- Lack of skilled people and labour, including housing, in regions
- Excessive and costly compliance (SA & Cwth)
- Low industry collaboration and investment in development

Ten additional lower priority issues have been identified in this report. Some core issues flag capacity gaps to be filled (e.g., -60°C freezer space), while others need complex capabilities developed (sustainable packaging, 3rd party certification) or created (industry collaboration and governance, toll processing, NPD, and innovation). These are complex choices industry must make with government support. Some are urgent to ensure SAs landed production does not transfer to interstate processors.

Outcomes to 2030

SISA, Food SA, and SA Government need to work together to drive the 2031 Strategy. Jointly they need to lead enterprises, employees, agencies, and regions to assess priorities, verify feasibilities, and map optimum investment and milestones to 2030.

Better data and market intelligence are high priorities. EconSearch/BDO and PIRSA have long been and remain national data exemplars. But as investors and regulators rebalance value chains and product formats, and integrate new volume by 2030, they need better whole-of-chain economic data to track risks, performance, and returns.

For three decades SA Seafood has been doing two things well: Reinvesting in core seafood capabilities built on comparative and competitive advantage. The new challenge is to implement market-focused strategies that value-add seafood optimally.

Seafood Value Adding Development Options

This project was framed in late 2022 with a focus on pre and post competitive assessment of an infrastructure Business Case, that would enable SA's 2030 seafood development pathway. However, two subsequent events changed the project context for industry – a new SA Government was elected, and a new industry peak body was established. These changes resulted, appropriately, in a mid-process reset for the project to focus on the precompetitive development and investment opportunities. By mid-2023 it was evident in consultations with investors, agencies, and stakeholders that industry needed to review and update the 2031 Strategy (developed by previous government). Industry were also seeking to understand SISA's emerging role in the post competitive seafood industry before they committed to new downstream precompetitive investment.

Fishers, farmers, processors, and manufacturers add value to the seafood harvest and production in many ways. The range of value adding options identified in this review is summarised under two headings below – Governance Development Options; and Processing and Value Adding Development Options. We do know that leadership and related structural change must come first. The welcome creation of SISA jointly by industry and government is now underway. But project consultation has confirmed that Industry will only buy-in to precompetitive options if they offer known investment risks, and commercial incentives to drive downstream outcomes to 2030.

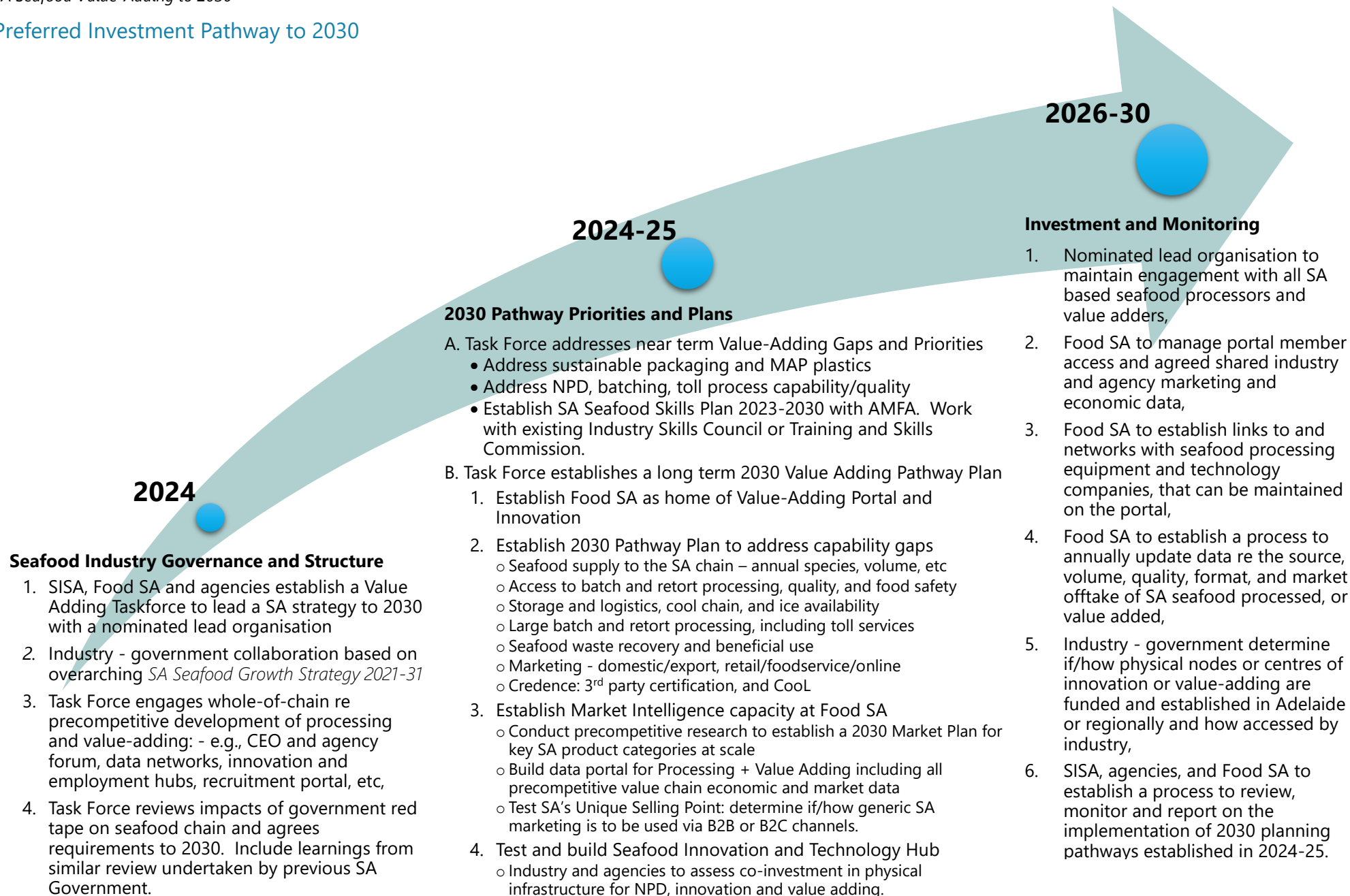
Business-as-usual is listed as an option under each heading below, as this is a possible pathway for SA Seafood Industry. The analysis in this review has identified considerable risks, ongoing capability gaps, adverse product and market outcomes, and poor commercial outcomes from maintaining Business-as-Usual approaches.

GOVERNANCE DEVELOPMENT OPTIONS

1. Business as usual – existing governance and structure. New SA Seafood Industry Peak Body formed across whole seafood chain
2. Industry and government to raise priority of seafood industry to SA Economy on back of SA *Seafood Growth Strategy 2021-31*
3. Industry to review and update the *2031 Strategy* where appropriate to suit current environment including barriers to industry production and value chain efficiency
4. Industry and government to create and support structures and initiatives to deliver *2031 Strategy*
5. Review, manage, and report Strategy to 2030

PROCESSING and VALUE ADDING DEVELOPMENT OPTIONS

1. Business as usual – existing supply chain gaps and capabilities
2. To boost seafood precompetitive process and add value capability in SA
 - Data portal - seafood supply species by volume for wildcatch/farmed
 - Chain and market intelligence - along chain, retail, food service, B2B, B2C, etc
 - Human skills & AI - access to processing and value adding skills along chain
 - Innovation, NPD & Market development - what technology is required now/by 2030? – Test regional hub concept.
3. To boost seafood capacity to process and add value in SA
 - Access to batch (large, small, toll) retort processing, quality, and food safety
 - Storage and logistics, specialised cool chain, and ice availability
 - Seafood waste recovery and beneficial use
 - Market leverage – SA unique selling point, credence: 3rd party certification, CoolL.
4. To resolve near term gaps and priorities
 - Address sustainable packaging and MAP plastics
 - Address NPD, batching, toll process capability/quality
 - Establish Seafood Skills Plan 2023-2030 with AMFA, Skills Council.



1.Objectives



Seafood processors work with fresh, chilled, or frozen seafood, prepared or preserved seafood, smoked, dried or salted seafood, and related products.

South Australia has the highest concentration of seafood processing businesses in the nation with 22% of the 261 establishments (IBIS World 2023¹). But south-eastern states are where the largest seafood processors are based – Tassal, Simplot, and Huon Aquaculture, Petuna. The top four command more than 70% of processed seafood market share (IBISWorld).

At first glance this appears to be an anomaly, but deeper analysis reveals several reasons why SA has been the leader in seafood and seafood processing. Since the 1990s SA initiatives included, for example, SBT aquaculture development and related Sardine fishery leverage, and development of industry-wide economic impact indicators for seafood that have since been adopted in other jurisdictions. The state's primary position is under threat.

This review assesses the seafood processing drivers, risks, and options to a viable future for the SA seafood processing industry to 2030.

Methodology

Stage 1

Consult stakeholders

The first stage consulted industry and stakeholders to document value adding capabilities and gaps to 2030. Target stakeholders included seafood producers, value adders (both commercial and Not-for-Profit), industry, experts and researchers, government agencies, and relevant third parties. Early in the project based on discussion with NT Seafood Council, it was confirmed that NT seafood product would not be included in this 2030 seafood value adding project for SA.

Stage 2

Identify development options

The second stage identified seafood value adding development options and was tasked to develop a preferred Business Case. The options were assessed against issues, risks, opportunities and objectives to quantify the scale and scope of existing and forecast operational, technical, financial and market-facing variables. The project focus was on intentional outcomes for assessing a range of viable and preferred pre and post competitive options to resolve the value adding capacity gap. The development of financial governance, and investment scenarios was considered in discussion. In the light of recent change of government and creation of the new industry peak body, industry determined to limit the investment pathways to precompetitive options.

Stage 3

Report preferred investment pathway

The final stage reported to stakeholders regarding the project process, value adding development options and the preferred investment pathway.

¹ Seafood Processing in Australia, IBISWorld, Jun 2023.

2. Why Now?

This review of the SA seafood processing sector is timely. Is the sector fit-for-purpose to meet the needs of producers, consumers, investors, and the community, as seafood production expands, and consumer preferences (domestic and export) shift toward value added products?

The state's seafood growth strategy to 2031 has been launched jointly by industry and government (*SA Seafood Growth Strategy 2021-31*). The industry Vision is to be a leader in premium sustainable seafood production and experiences, delivered under seven strategic pillars, as illustrated.

In May 2023 the Premier announced \$300,000 to establish a new peak body “to strengthen the industry and provide a cohesive and united voice for the extensive range of industry sectors.” The formation of this body Seafood Industry SA is central to Pillar 1.

Now is the right time to consider the capacity and capability of the processing sector to jointly enable that vision.

The 2031 Seafood Growth Strategy presents a broader approach than this project brief requires. The attached Pillars and initiatives are a summary of those 2031 growth strategies that are directly relevant to this project.

Pillar 1. Support, Unity and Resources

- Establish a seafood peak body in SA. (SISA established in 2023).
- Foster industry investment including understanding the value proposition for and to attract global market investment

Pillar 2. Seafood Products and Production

- Assess customer demand and review future market opportunities
- Establish strategic opportunities for growing seafood industry volume and value
- Value-add to seafood and waste products, to meet consumer demand for sustainable protein
- Support industry to adopt food innovation: a). packaging, RTE meals, b). create an innovation hub to trial product, technology, c). reduce and reuse waste
- Drive aquaculture development

Pillar 3. Security of Access and Investment

- Logistics/transport to support better movement of product for industry and tourism access
- Review the regulatory framework for fish processor registrations – to ensure human health standards are maintained and innovation is fostered

Pillar 4. Industry Promotion and Communication

- Develop and deliver innovative marketing campaigns to promote South Australian seafood

Pillar 5. Capacity Building: Education and Training

- Workforce training needs to be prioritised and addressed so the industry is forward-thinking and prepared
- Attracting and retaining staff

Pillar 6. Strategic RD&E

- Initiatives not directly relevant to this processing review project, including SA research priorities, R&D levy investment, and stock assessments.

Pillar 7. Technology Adoption and Innovation

- Review and implement new technologies to drive efficiencies in seafood businesses
- Develop a state-based traceability program to ensure ease and compliance, and meet market expectations
- Build confidence, skills, and knowledge of fishers to use and adopt e-solutions – a statewide industry training program to support adoption of digital programs, including those able to support performance of value-added supply chains in selected markets
- Scope a new phone app or program that can provide dashboard information to the industry

3. Strategic Overview

Last 20 years - production tonnes and prices

Seafood is the most globally traded animal protein. It is not surprising then that Australia's (and SAs) small industry of openly traded seafood enterprises and processors are highly exposed to the \$A relative to trading partners, per the Trade Weighted Index.

The TWI impacts A\$ prices received by producers, exporters, and domestic buyers of products in import-competing markets. It also impacts prices paid for imported inputs used by industry (e.g., processing equipment, aquafeed). Seafood demand (and production) is the other key viability driver for enterprises, expected at an economic scale to enable a positive sales margin.

Multidecadal SA seafood production, price and growth data is presented below.

Summary	1999	2010	2022	1999-10 Multiple	2011-22 Multiple
Source: ABARES, SA Govt, Industry					
EXCHANGE RATE \$US/\$A	0.6538	1.0163	0.6775	1.6	0.7
SA SEAFOOD tns	26,431	66,707	75,298	2.5	1.1
SA Seafood \$GVP m (nom.)	\$345.3	\$392.9	\$444.6	1.1	1.1
\$A/kg Avg. SA	\$13.06	\$5.89	\$5.90	na	na
WILDCATCH SA tns	18,243	46,158	54,561	2.5	1.2
Finfish tns	9,353	39,462	49,287	4.2	1.2
Crustacean tns	6,161	4,905	3,842	0.8	0.8
Molluscs tns	2,729	1,791	1,432	0.7	0.8
\$GVP m (nominal)	165.1	199.5	206.7	1.2	1.0
Finfish \$GVP m	16.7	41.0	68.0	2.5	1.7
Crustacean \$GVP m	117.4	122.0	121.0	1.0	1.0
Mollusc \$GVP m	31.0	36.4	18.0	1.2	0.5
\$A/kg Avg. SA wildcatch	\$9.10	\$4.30	\$3.80	na	na
\$A/kg Avg. Finfish	\$1.80	\$1.00	\$1.40	na	na
\$A/kg Avg. Crustacean	\$19.10	\$24.90	\$31.40	na	na
\$A/kg Avg. Mollusc	\$11.40	\$20.30	\$12.60	na	na
AQUACULTURE SA tns	8,188	20,549	20,737	2.5	10
Farmed \$GVP m (nominal).	180.2	193.5	237.9	1.1	1.2
\$A/kg Avg. SA Aquaculture	\$22.00	\$9.40	\$11.50	na	na

Six trends stand out from the data:

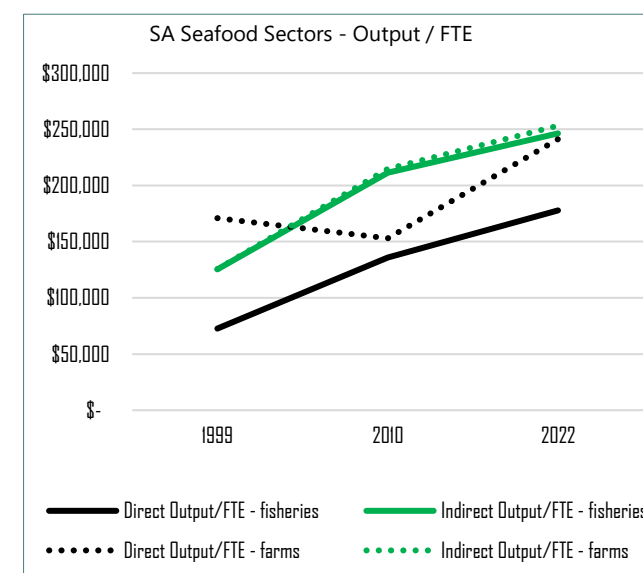
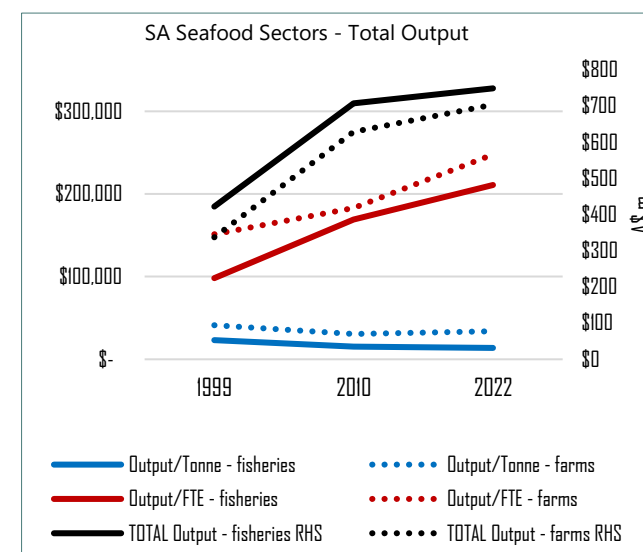
1. **The A\$ in 2010** had risen strongly in relative TWI value by 55% to US\$1.02. While this depressed export sales contracted in A\$ prices, it provided added investment leverage for capital development of Australian producers and processors importing equipment, inputs etc. The A\$ has since retreated enabling a refocus on seafood exports.
2. **SA production volume expanded 2.5 times to 2010**, driven by wildcatch (4.2) (subject to marine scale fishery review) and aquaculture (2.5). In the last decade wildcatch finfish and aquaculture both grew 1.0-1.2 times for both tonnage and GVP, albeit subject to Covid impacts in 2022. Crustacean and Mollusc production has been consistently falling over 20 years (0.8 times), with variable GVP declines.
3. **SA \$GVP nominal** (not inflation adjusted) has seen steady growth (1.1 times) over both decades, aquaculture growing faster (1.2 compared to 1.0) since 2010. For wildcatch seafood, average nominal prices have fallen reflecting the downward pressure of rising seafood imports to Australia – up from now 57.3% in 2010 to 67.7% today (IBISWorld 2023). Since 1999 this is most evident for finfish (\$1.80 to \$1.00 to \$1.40 nominal). Crustacean and mollusc average nominal prices grew, as they are typically premium species with declining harvest volumes. Some species (Pipi) shifted from bait to seafood.
4. For **average landed prices (A\$/kg nom.)** this topline data suggests seafood fell from \$13.06 to \$5.89 in 2010 and has kept steady (\$5.90) over the last decade. A strong TWI in 2010 made local producers less competitive against imports. Critically since 2010 GVP's and prices for both wildcatch finfish and aquaculture have achieved good growth.
5. Since 1999 the **share of seafood volume** from aquaculture (supported from the wildcatch Sardine Fishery) has fallen marginally from 31% to 28%, while its contribution to nominal SA seafood GVP has risen from 52% to 54%.
6. **This data does not show us** the efficiency and viability of seafood producers (average sales margins, ROI, etc), nor the impacts of changes to the downstream seafood processing and value adding sectors in SA.

SA Seafood Value-Adding to 2030

Last 20 years – production, employment, and economic impact

Analysis of the available economic performance data (Econsearch, BDO, ABARES) for SA seafood since 1999 to 2022 is presented below and in Appendix 1. It is a story of two halves - 1999-2010 was significantly different to 2011-2022 for SA Seafood producers, downstream operators, other indirect sectors, and industry employees.

Summary	1999	2010	2022	1999-10 % p.a.	2010-22 % p.a.	1999-22 % p.a.	Comment
Nominal \$							
Landed Tns	26,431	66,707	75,298	8.7%	0.1%	4.7%	Since 1999 seafood tonnage grew 85% (avg 4.7% p.a.). Fishery tonnage grew (4.9%) faster than farms (4.1%). Since 2010 growth has slowed to 1.0% p.a. (fisheries 1.4% p.a., farms at 0.1% p.a.)
Fisheries	18,243	46,158	54,561	8.8%	1.4%	4.9%	
Farms	8,188	20,549	20,737	8.7%	0.1%	4.1%	
Jobs FTEs	6,532	7,631	6,395	1.4%	-1.5%	-0.1%	Fisheries have lost 749 jobs, mostly since 2010. Most (612) of these jobs shifted to aquaculture, but many left the industry. Over 23 years, there was only 0.1% p.a. loss of FTEs from seafood.
Fisheries	4,302	4,190	3,553	-0.2%	-1.4%	-0.8%	
Farms	2,230	3,441	2,842	4.0%	-1.6%	1.1%	
Tonnes/FTE	4.0	8.7	11.8	7.3%	2.5%	4.8%	Since 1999 Tns/FTE has risen 4.8% p.a. Tuna farms boosted both fishery (Sardine) and farm Tns/FTE strongly. Since 2010 Tns/FTE has slowed for fisheries (2.8% p.a.), and farms (1.7% p.a.)
Fisheries	4.2	11.0	15.4	9.1%	2.8%	5.8%	
Farms	3.7	6.0	7.3	4.5%	1.7%	3.0%	
Output \$m	760	1,337	1,453	5.3%	0.7%	2.9%	Output grew strongly (2.9% p.a.) for 23 years (farms 3.3% p.a.; fisheries 2.5% p.a.). But the large fall since 2010 to 0.7% p.a. is a key concern. Since 2010 farm direct output/FTE rose sharply to 3.9% p.a. while fisheries fell sharply to 2.3% p.a. Indirect output/FTE has fallen for fisheries to 1.3% and farms to 1.4%. Catch-limited fisheries are focussed on minimal processed fresh seafood customers, while farms scale-up and integrate chains to value add, primarily to retail markets.
Fisheries \$m	422	708	749	4.8%	0.5%	2.5%	
Direct \$/FTE	72,645	135,755	177,826	5.8%	2.3%	4.0%	
Indirect \$/FTE	125,348	211,333	246,351	4.9%	1.3%	3.0%	
Farms \$m	337	629	704	5.8%	0.9%	3.3%	
Direct \$/FTE	170,975	152,984	241,236	-1.0%	3.9%	1.5%	
Indirect \$/FTE	125,593	214,775	253,135	5.0%	1.4%	3.1%	
GSP \$m Contribution	442	652	800	3.6%	1.7%	2.6%	From 1999-2022 Gross State Product/FTE grew 2.6% p.a. But the second decade since 2010 has been at half the initial rate achieved before 2010.
Fisheries \$m	249	374	432	3.8%	1.2%	2.4%	Since 2011 farms have been contributing more growth to both direct and indirect GSP/FTE than fisheries – direct (6.3% V 3.3%) and indirect GSP/FTE (2.4% V 1.8%). These trends reflect the output/FTE trends above driven by the rising economic scale and supply chain integration of aquaculture enterprises and related products created for specific processed/value added consumer markets.
Direct \$/FTE	53,402	76,809	113,424	3.4%	3.3%	3.3%	
Indirect \$/FTE	62,650	105,014	130,531	4.8%	1.8%	3.2%	
Farms \$m	193	278	368	3.4%	2.4%	2.9%	
Direct \$/FTE	103,886	50,000	104,170	-6.4%	6.3%	0.0%	
Indirect \$/FTE	63,571	113,754	150,549	5.4%	2.4%	3.8%	



SA Seafood Value-Adding to 2030

Changing industry structure and products

Over the long-term consumers' choices re accessible healthy food and lifestyles drive industry structure. Seafood offers these benefits, more than other proteins. As income rises, consumers will pay for (Pascoe et al ²) origin and sustainability, driving up scrutiny on suppliers. Analysts (IBISWorld 2023) and industry see domestic consumers moving toward fresh or value-added seafood; Asian markets to fresh chilled away from frozen.

The IBISWorld 2023 study finds that variable farmed supply has a large impact on processing. Seafood processors source much seafood from farms, including salmon, prawns, tuna, and oysters. As farmed supply rises, processors can expand production. But seafood costs comprise ~66% of processor revenues, so many processors integrate to grow seafood or are located near both farms and ports to ensure input volume.

SA's farmed seafood sector is restructuring (economic scale, capability, capacity) to optimise supply control, and capture productivity and margin gains from technology, human capital, and chain integration toward markets. Australia's (including for SA) small capture fisheries do not enable such growth opportunities as readily.

For decades import competition has dominated most segments of the domestic seafood market. With scale and low cost, processors in China and SE Asia are very attractive suppliers to Australian supermarkets. The resulting high imports (74% prepandemic) have increased market competition, crowded out local processors, and constrained both their growth and profits, particularly for low value product lines. Import penetration fell during the pandemic as outlets closed but is expected to remain high (>65%), smothering producers and processors for the near term.

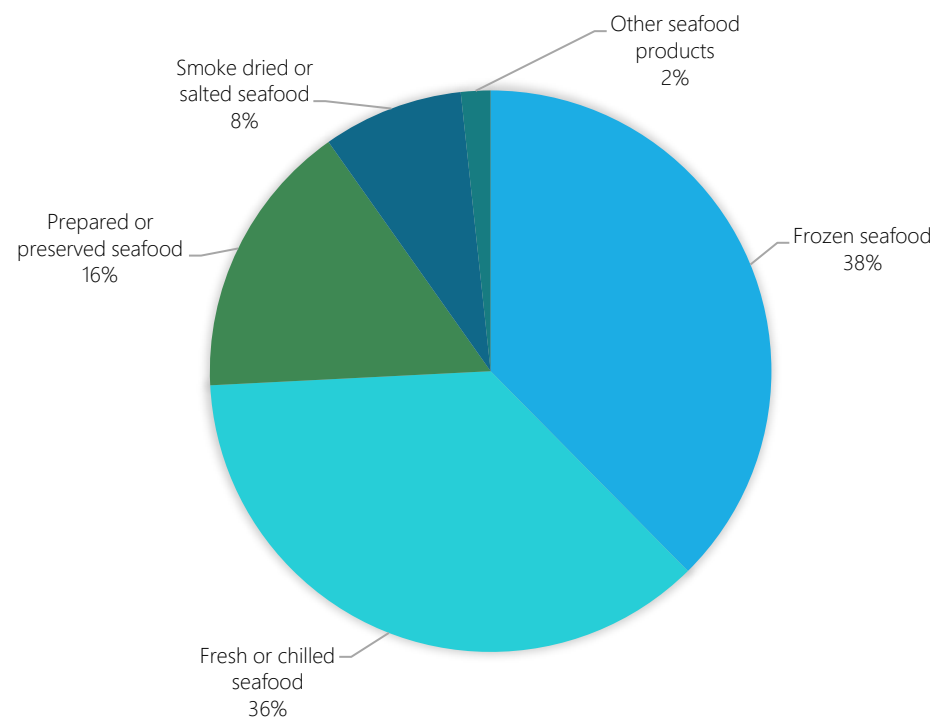
In 2009, 439 seafood processors value added or manufactured seafood in Australia. Today 261 sites (down 41%) for 213 enterprises employ 2,036 people. IBISWorld forecasts further sites will decline to 239 in 2029. They identify three broad categories of seafood processors: **Large processors** (by volume, turnover, and degree of vertical integration) align with and invest near seafood supply, increasingly from aquaculture. Secure access to supply is a major risk for processor investors. It also drives firms to scale up and integrate along supply chains. **Medium processors** including SA Safcol and A. Raptis & Sons, (combined 6% national market share and \$70 m turnover) focus on niche products (sustainable seafood, value-added farmed salmon, and trout products, etc.). **Small processors** (more than 80% of sites) are typically sole proprietors

with less than 20 employees. They lack the economic scale and incentive to compete with large processors, and target niche products (smoked, dried or preserved seafood).

What products do successful processors offer?

Frozen seafood (cheap, easy to cook) has fallen as a share of domestic revenue in recent years (IBISWorld 2023). Fresh or chilled (whole fish, portions, fillets) and value-added products (composite Ready-to-Eat meals) are increasing in market share.

Australian Seafood Processor Revenue by product type

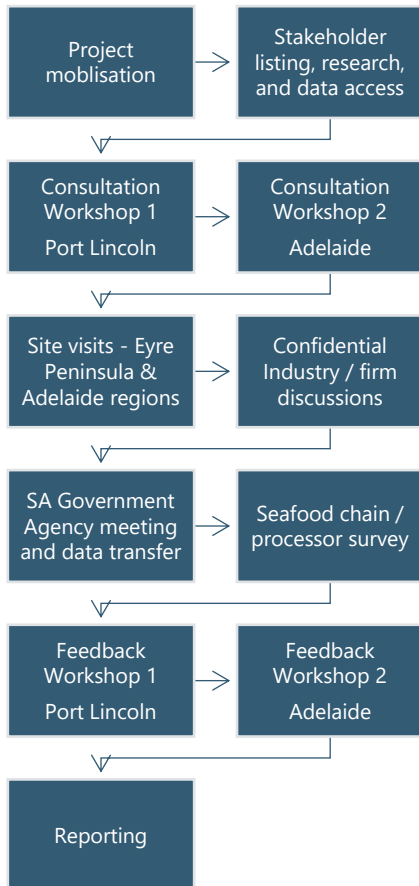


Processors also make some revenue from by-products (e.g., scrap meat, fish oil, organs), predominantly as pet food and various industrial products (e.g., fish meal, refined fish oils, fertilisers, oyster shell products, pearl essence). Fish oil is sold to manufacturers for pharmaceutical production.

² Do "local" markets offer new opportunities to Australian seafood producers? Pascoe S, Paredes S, Coglán L, *Fisheries Research*, 263 (2023) 106691

4. Stakeholders Consulted

The project team implemented a comprehensive consultation program with the SA seafood industry, agencies, and stakeholders, across a 10-week timeframe, as summarised below.



SA State Government stakeholders and agencies with responsibility for fishery and aquaculture access and use, regulation, seafood safety, export, and with an interest in seafood industry supply chain and market development and efficiency.

Businesses that operate seafood manufacturing facilities, receiving SA landed seafood and producing value added seafood products for wholesale, retail, food service markets. These include small local operations (smoke houses), through to large export multinational operators.

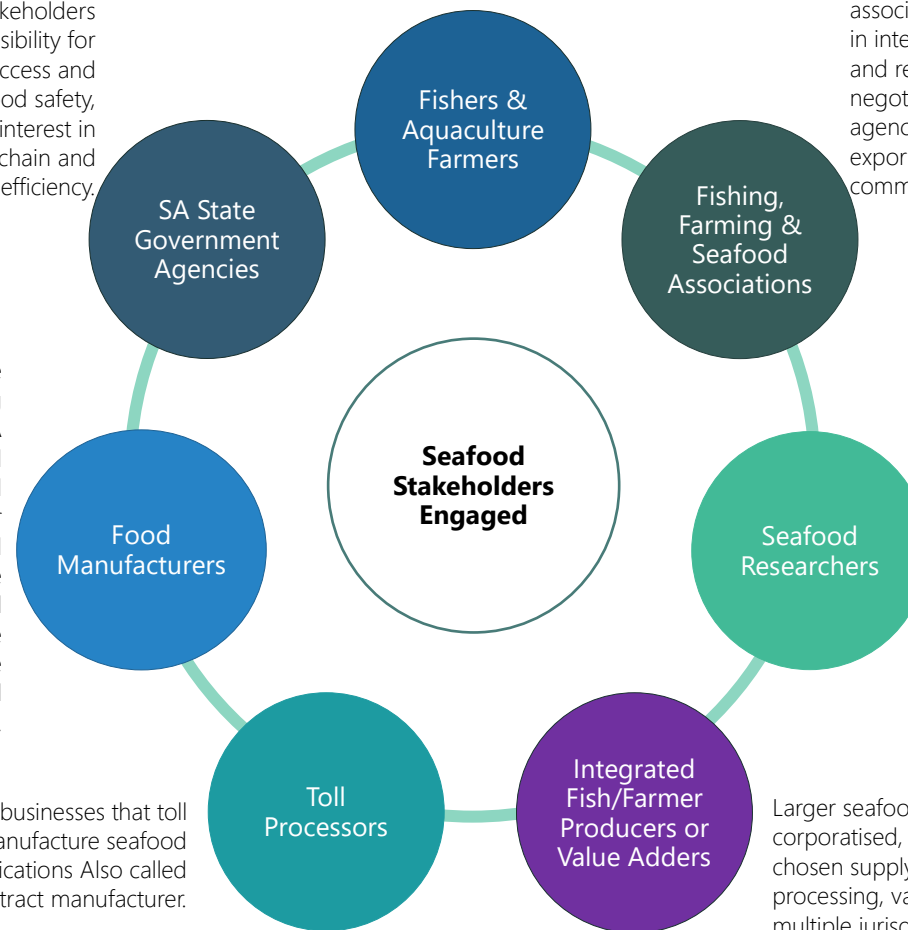
Private or corporate businesses that toll process, value add or manufacture seafood to a customer's specifications Also called contract manufacturer.

Enterprises that capture, farm or ranch commercial seafood species from SA state or Commonwealth waters for supply to SA based onvessel or onshore processors, value adders, exporters, or freight forwarders.

SA Food, Fishing, Aquaculture or Seafood industry or regional associations, that lead their members in internal discussion and planning, and represent them in discussions and negotiations with government agencies, supply chain partners, exporters, resource managers, local communities, and third parties.

Private, corporate, or government stakeholders that service industry, consumers, or government with data and advice regarding the scale, scope, efficiency, viability, or sustainability of past, current, or future industry activities and transactions.

Larger seafood enterprises, typically corporatised, that are integrated along their chosen supply chains (fishing, farming, processing, value adding) possibly in multiple jurisdictions across few key species.

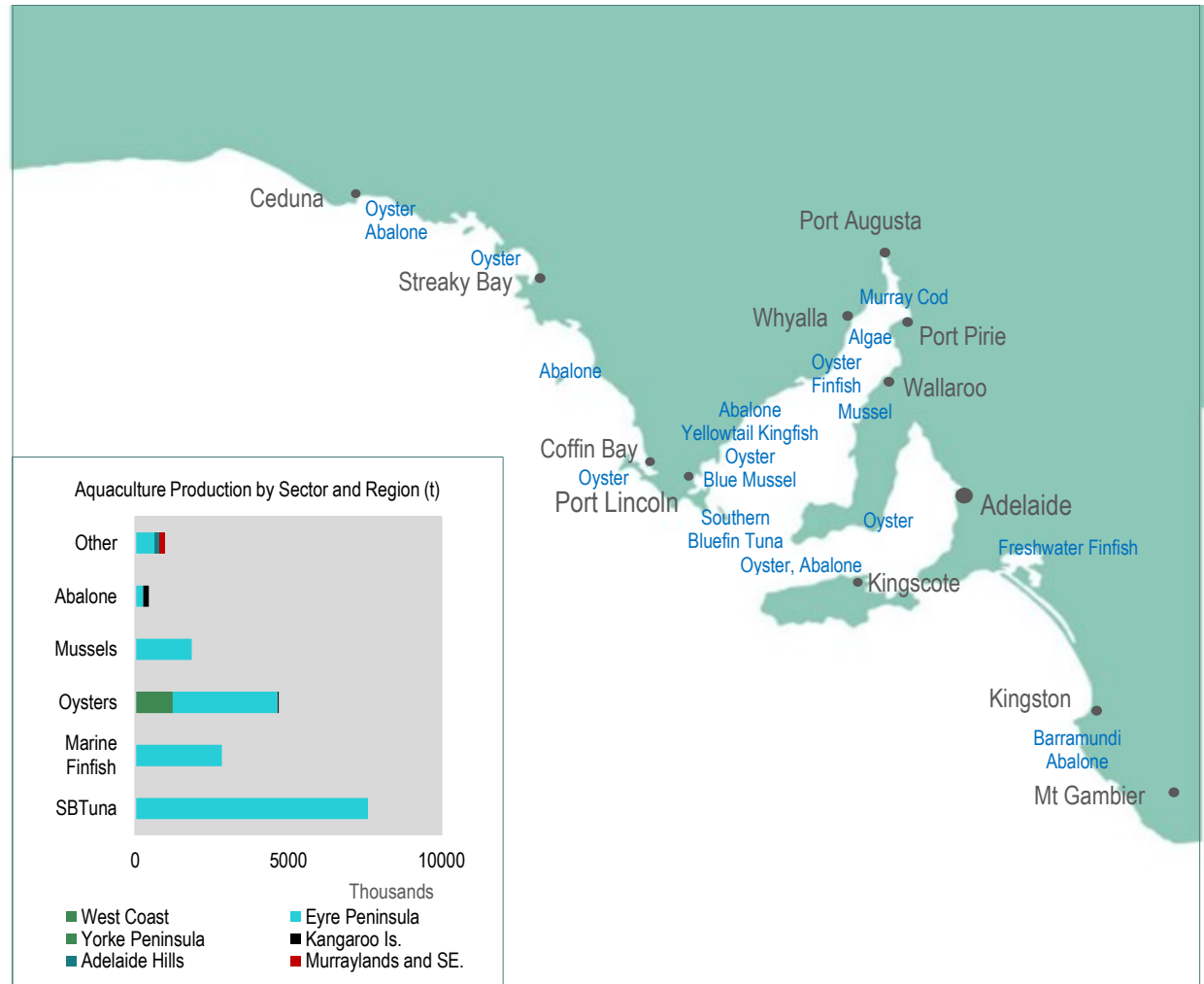


5. Seafood Species and Regions

SA's seafood supply draws from wildcatch (SA and commonwealth) and aquaculture. State wildcatch grew 18% since 2010 and is forecast to grow 20% to 2030, mostly due to Sardine fishery expansion for SBTuna feed. Aquaculture grew 1% since 2010 but is forecast to grow by 63% by 2030. Overall SA landings are forecast to grow 32% by 2030 (p18). Of the top 18 species, the top seven contributed \$383m (91%) of GVP in 2021; \$219 m (65%) of which came from value added aquaculture. Eyre Peninsula contributed 90% of the farmed harvest.

SA Seafood Landed	SA Wild	Cwth Wild	SA Farmed
Key Species GVP 2021 \$m (Descending order)			
1. Southern Bluefin Tuna	-	-	91.0
2. Southern Rock Lobster	82.9	-	-
3. Yellowtail Kingfish	-	-	66.0
4. Oysters	-	-	43.7
5. Prawn (Western King)	39.0	-	-
6. Abalone	18.3	-	18.5
7. Sardine	29	-	-
8. Squid	6.8	-	-
9. Southern Calamari	6.7	-	-
10. Goolwa Cockle (Pipi)	5.5	-	-
11. Blue Crab	5.4	-	-
12. Blue Mussel	-	-	3.7
13. King George Whiting	3.4	-	-
14. Garfish	2.2	-	-
15. Yellow Eye Mullet	2.0	-	-
16. Giant Crab	1.3	-	-
17. Ocean Leather Jacket	0.6	-	-
18. Snapper	0.5	-	-
Production Tonnes from SA fisheries and farms			
2000	16,791	-	10,314
2010	46,158	-	20,549
2020	48,477	-	17,472
2022	54,561	1,634	20,737
2030 forecast	65,357	2,300	33,796
GVP \$'000 (nominal) from SA fisheries and farms			
2000	183.0	-	220.2
2010	199.5	-	193.5
2020	247.0	-	229.0
2022	206.7	unknown	237.9
2030 forecast	unknown	unknown	464 - 485

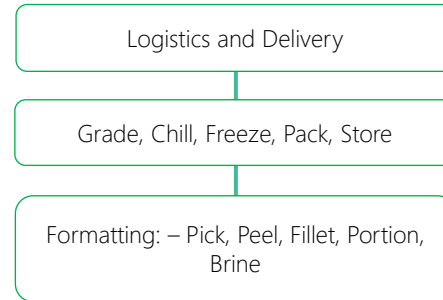
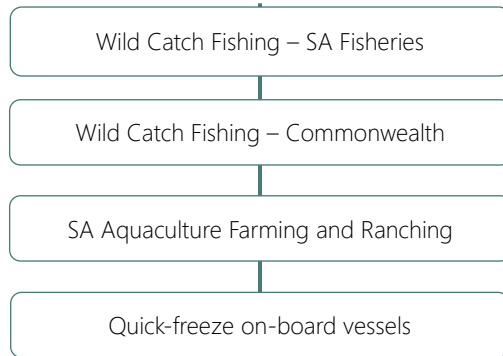
wildcatch from both SA and Commonwealth Fisheries. Sources: BDO, ABARES, and industry



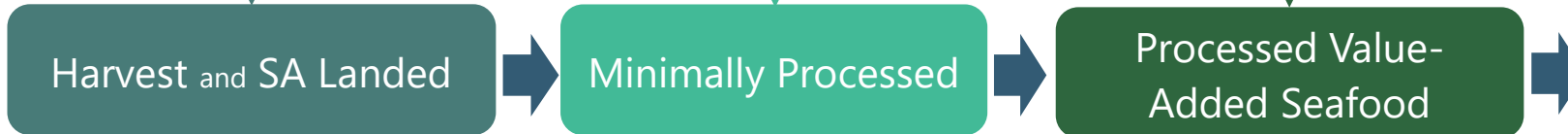
6. SA Seafood Supply Chain Map

SA Seafood Supply serves local SA, domestic, and export consumers. Opportunity exists to add value to existing species and add new species for target consumers.

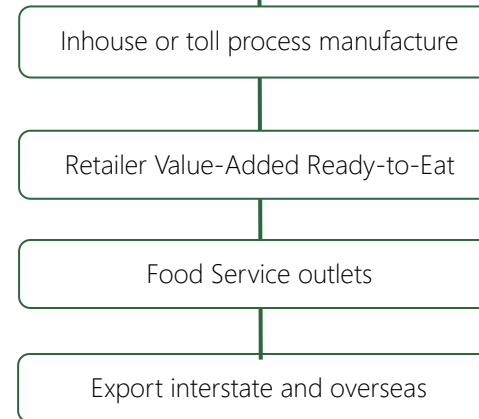
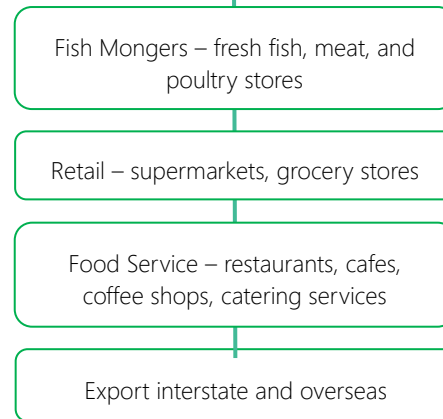
Chain Activities



Chain Stages



Chain Partners



CONSUMER OFFER

Must-Have attributes:

- PRICE - critical need
- Available in volume
- Safe food
- Nutritious - omega 3, etc
- Quality of product
- Freshness - real or apparent
- Convenience - size, Ready-to-eat, format, etc
- Flavour - cuisine specific
- Unique SA selling point

Increasingly aware of:

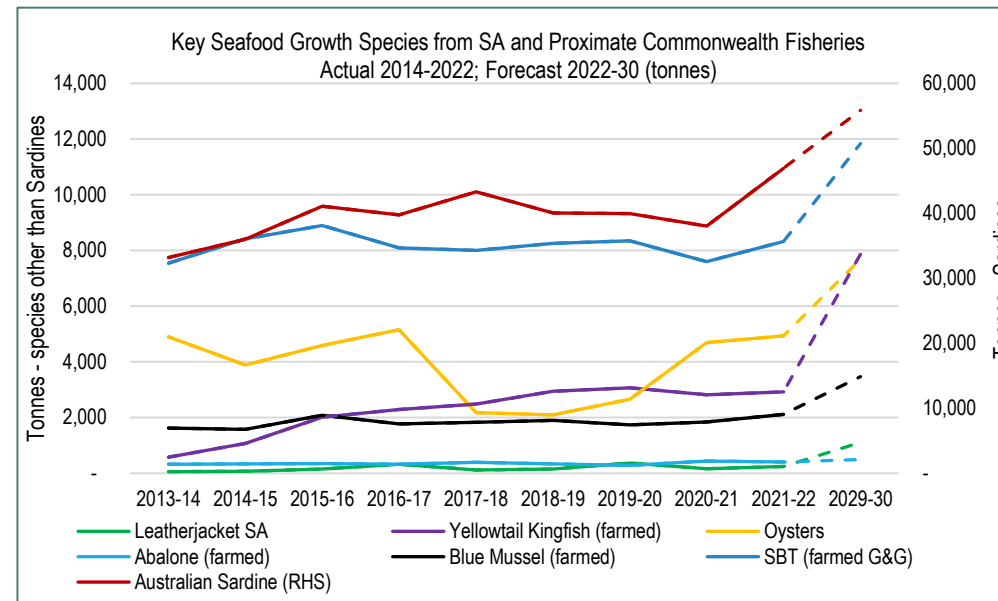
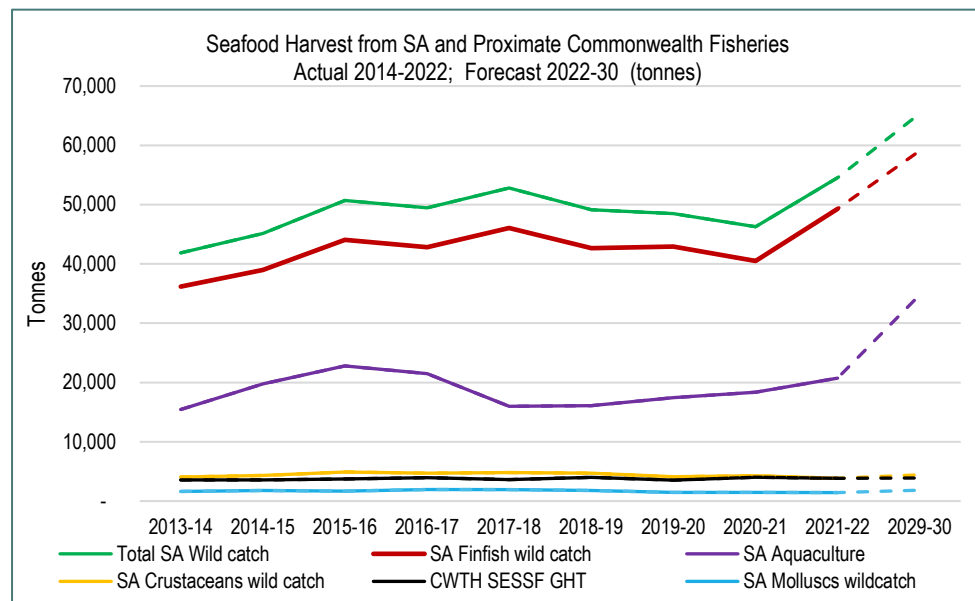
- Authentic seafood - Cool
- Traceable - Chain-of-custody, Provenance
- Credence, Integrity
- Shelf life & shelf stable
- Reduced waste streams
- Reduced packaging
- Sustainable - 3rd party accreditation
- Social licence for seafood

Via Chain-to-market models

- Traditional supply chain
- D2C Direct to consumer
- E-commerce online

7. Growth in existing Seafood Species

Which species work now, and which need support to commercialise? More than 50 species land in SA from state and commonwealth fisheries and farms. Industry plans to increase production for selected wild species, and aquaculture species that will grow strongly. This page summarises the forecasts for the state and for key species identified by industry.



Selected growth species	Growth Multiple# 2014-2022	Forecast Multiple## 2022-2030	Summary Comment
Leatherjackets (SA)	1.5	4.1	Small but rising harvest for value added consumer seafood markets. Underutilised with high discard rates at sea.
Yellowtail Kingfish (farmed)	2.0	2.2	YTK fishery contributes 18% of SA farmed seafood GVP. A listed company now offers premium products. Volume to double by 2030.
Oyster (farmed)	0.8	1.9	Oysters contribute 16% of SA farmed GVP. Declining production has been arrested with forecast ongoing recovery; 25% production growth by 2030.
Blue Mussel (farmed)	1.1	1.5	Mussel farming consolidation (2007) boosted enterprise scale and retail branding. Production forecast to increase 54% to 3,200 tpa by 2030.
Southern Bluefin Tuna (farmed)	1.0	1.5	SBT fishery contributes ~50% of SAs farmed seafood GVP (G&G) using Sardines as input feed. A premium export product with domestic potential.
Australian Sardine	1.1	1.4	More than 90% of the harvest was used as Tuna farm feed. Minor uses include pet food, bait, and seafood. 30% growth forecast to 2030.
Abalone (farmed)	1.1	1.3	Farms Greenlip Abalone species; also sells abalone and oyster spat locally and interstate. New water acreage being developed.
Pipi	1.1	1.1	From a 1,100 tpa bait fishery (Nom. GVP \$1.4m at \$1.60/kg) in 2005, fishers now harvest 440 tpa as food service seafood at \$12.40/kg (Nom. GVP \$5.5m)
Mullet	2.1	1.1	A staple fresh local seafood, mullet harvest has recently doubled from 200tpa to 350-400 tpa (GVP >\$2 m) as Snapper fisheries are closed by regulators.
Crab	1.1	1.0	The Crab harvest has been stable since 2001 and expected to stay so through to 2030. Nominal average market prices increased 30% in last five years.

Average annual harvest tonnes 2019-22 as a multiple of Average annual harvest tonnes 2014-17 (ABARES, SARDI, EconSearch and Industry advice). ## Forecast annual tonnes 2030 as a multiple of Average annual harvest tonnes 2017-21 (ABARES, SARDI, EconSearch and Industry advice) SBT =Southern Bluefin Tuna. SESSF = Southeast Scale and Shark Fishery (GHT Gill Hook and Trap and GAB Great Australian Bight sectors) RHS = right hand side axis.

8. SA Sardine Fishery

The SA Australian Sardine fishery is large, unique, and critical to seafood value adding in SA. Established in 1991, Australia’s largest fishery (100% landed in SA) plays a unique role. Since SBTuna farms began (1992), local Australian Sardines have been their key feed source, taking 93-100% of the Sardine harvest. Tuna farmers have long owned, and value added (via ranching) quota from this MSC certified fishery, and funded studies to test sardines as seafood, while also importing 10,000-17,000 t. of feed (e.g., sardine, herring) annually.

Today, factories based in Port Lincoln (Australian Southern Exporters, Dinko Tuna, Marnikol Fisheries) process sardine volumes for recreational fisher bait (2 kg and larger boxes), pet food, filleted and whole sardines for human consumption, and fresh or value-added seafood as products in human consumption condiments. Many WA firms (Mendolia, Catalano, Bevans, and Albany Seafoods) also value add small catches for food service seafood (packs, jars, cans). Growing consumer health awareness (especially Omega-3 and polyunsaturated fatty acids) and demand for healthy and delicious diets underpin small but persistent consumer demand in the sardine seafood market.

Tuna farmers advise there is not yet a viable business case at scale to value-add sardines for human consumption. Export marketers and agencies note the rising consumer interest in MSC certified niche value-add high-quality sardines. Analysis (BDO, June 2023) confirms local SA Australian sardines as an efficient tuna-driven feed commodity, with average real prices falling from a peak in 2003.

Opportunity exists to segment SA’s Sardine supply – larger fish as feed, small fish as niche premium seafood. The related metrics (scale, processing costs) are challenging, and markets (local, export) are small, but the social license value of MSC wild fisheries is rising as a bankable asset for fishers. The question is what product mix (feed, pet food, seafood) at scale, will optimise long run Sardine Fishery returns. Forecast growth to 55,853 t. by 2030 presents opportunity and imperative to review this critical precompetitive fishery business case.

Australian Sardines	Year end June	2006	2009	2012	2015	2018	2021	Estimate 2022	Forecast 2030
HARVEST	Tonnes	28,626	27,850	36,962	36,020	43,293	38,024	46,935	55,853
A. Tuna Feed	%	97.6%	93.7%	100%	100%	99.5%	99.9%	98.0%	94.0%
Share of harvest	Tonnes	27,939	26,095	36,962	36,020	43,077	37,986	45,527	53,060
Fresh sales	%	55.2%	85.7%	74.1%	83.9%	90.2%	85.7%	unknown	-
Frozen sales	%	42.4%	8.0%	25.9%	16.1%	9.3%	14.2%	unknown	-
B. Seafood Value added	%	2.4%	6.3%	0%	0%	0.5%	0.1%	1.0%	5.0%
Share of harvest	Tonnes	687	1,755	0	0	216	38	1,408	2,750
Fresh sales	%	0.6%	0.8%	0.0%	0.0%	0.5%	0.0%	0.25%	1.0%
Frozen sales	%	1.8%	5.5%	0.0%	0.0%	0.0%	0.1%	0.25%-	4.0%
C. Other uses	%	na	na	na	na	na	na	1.0%	1.0%
AVG.PRICE (nominal)	\$/kg								
Fresh Feed	\$/kg	\$0.53	\$0.67	\$0.57	\$0.54	\$0.70	\$0.59	unknown	-
Value Added	\$/kg	\$1.04	\$2.50	n.a.	n.a.	n.a.	\$3.50	unknown	-

Source: BDO and industry advice

9. Emerging and Growth Species

Are there other seafood species available that offer viable market pathways? The identification of and potential for, underutilised seafood species is a topic that has been extensively researched across Australia (see FRDC 2017-185) for decades. The Great Australia Bight Trawl Fishery recently reviewed (April 2021) five species for commercial value, noted below. PIRSA has confirmed that several other species are being evaluated in SA for potential seafood production or allied purposes (seaweed as aquaculture feed). However, there is limited confidence in any new species.

Species	SA Fisheries	Cwth Fisheries (landed in SA)	Comment
Jackets (Ocean / Leather)	1992	1,147 tns dominated (88%) by Ocean Jackets	Jackets are currently harvested in SA and proximate Cwth waters by fisher /processors. Traditionally high discard rates at sea. Identified by Great Australian Bight Industry Association (GABIA) as an attractive underutilised target seafood species.
	2007-2016	nil	
	2022	254 tns	
Bight Redfish	Not a legal commercial species	1999	Key seafood species selected by Great Australian Bight Industry Association to target in Cwth waters as attractive seafood development candidates, offering viable landing prices and processing outcomes that minimise waste streams and meet consumer needs.
		2005	
		2020	
Latchet	Not a legal commercial species	Estimate 600 tpa	
Yellow Spotted Boarfish	Not a legal commercial species	1999	
		2005	
		2020	
Ornate Angel Shark	Not a legal commercial species	1999	
		2005	
		2020	
Sea Urchin	Wildcatch - Miscellaneous Fishery harvested for roe Aquaculture - 1 land-based license - no data available	No production	Low-production low-value SA fishery.
Razor Fish	Wildcatch - Not a legal commercial species; only harvested in restricted quantities for bait due to sustainability concerns. Aquaculture – 1 marine-based license in Smoky Bay.	No production	No commercial data available.
Sea Cucumber	Wildcatch – several parties have expressed interest in harvesting the species, if licensed, within the Miscellaneous Fishery. SA Government has not approved any licences due to that species' vulnerability to overfishing as evidenced overseas Aquaculture – no licences issued yet	No production	There are several Sea cucumber (also called Beche de mer, Sandfish, Trepang) ventures underway in Australia especially in northern tropical waters. In addition, a few new ranching/reef reseeding ventures are being assessed.
Seaweed	Aquaculture - 53 farm licences issued (5 land based), including for creating broodstock, research, bioremediation, biofouling, and aquaculture feed supplements. No data available. SARDI Seaweed project investment to date of \$1.5m.	No production	Rising global demand as: food, feed, fertiliser, biofuels, pharmaceuticals, cosmetics, carbon sequestration, nutrient offset, bioremediation, and methane reduction.
Sturgeon	No farming - declared noxious species.	No production	Current import risk assessment underway at Commonwealth Department of Agriculture, Fisheries and Forestry (Due in mid-2024).

Sources: PIRSA–Fact Sheet *Opportunities for South Australia in caviar*, accessed June 2023; Canadean Inc, *ForeSights: Edible Seaweed, Could seaweed become a mainstream food ingredient?*, accessed June 2023; ABARES; FRDC; GABIA; Industry advice

10. Which key species will drive growth to 2030?

Consultation with industry forecasts that seafood volume landed in SA will increase by 32% over the next eight years to 2030. This additional 24,520 wet tonnes will come from wild fisheries (11,461 tonnes, up 20%) and aquaculture farms (13,059 t., up 63%). **The SA seafood industry is effectively going to add more supply over the next eight years than its current annual aquaculture production.**

A small number of key species are driving seafood supply growth. For wildcatch species, 36% of total seafood growth will come from Australian Sardines (value added on Tuna farms as input feed), and 4% from Leatherjackets. For aquaculture species, 20% of total seafood growth will come from Yellowtail Kingfish, 14% from Southern Bluefin Tuna, 11% from Oysters and 6% from Blue Mussels. At current average nominal prices this implies the seafood GVP in SA will rise from \$445 m in 2022 to more than \$700 m in 2030 in nominal terms.

The challenge for industry is to ensure the supply chain capacity and capability is fit-for-purpose to optimise the seafood harvest in an increasingly competitive seafood market. Key issues are the need to attract the people, technology, and financial capital to SA to create and invest in the processing and value adding pathways that will maximise returns.

Seafood Landed in SA		Transition			2030	
Key species only	2022	2030	% Change	Growth %/yr	Additional tonnage	Key Species
Total	76,932	101,453	32%	3.5%	24,520	100%
Wildcatch	56,195	67,657	20%	2.3%	11,461	47%
Finfish	50,922	61,380	21%	2.4%	10,459	43%
SA Fisheries	49,287	59,080	20%	2.3%	9,793	40%
Australian Sardines	46,935	55,853	19%	2.2%	8,918	36%
Leatherjackets	249	1,108	345%	20.5%	859	4%
Other Finfish	2,103	2,120	1%	0.1%	17	0%
CWTH SESSF GHT	1,147	1,500	31%	3.4%	353	1%
CWTH SESSF GAB	487	800	64%	6.4%	313	1%
Crustaceans	3,842	4,450	16%	1.9%	608	2%
Molluscs	1,432	1,826	28%	3.1%	395	2%
Aquaculture	20,737	33,796	63%	6.3%	13,059	53%
Southern Bluefin Tuna	8,322	11,839	42%	4.5%	3,517	14%
Marine Finfish (YTK)	2,919	7,868	170%	13.2%	4,949	20%
Oysters	4,929	7,689	56%	5.7%	2,760	11%
Blue Mussels	2,113	3,471	64%	6.4%	1,358	6%
Abalone	402	495	23%	2.6%	93	0%
Freshwater Finfish	295	423	43%	4.6%	128	1%
Marron & Yabbies	4	20	393%	22.1%	16	0%
Other	1,753	1,992	14%	1.6%	239	1%

11. SA Seafood Employment

Labour shortage is the new normal for many food industries. In 2022 Seafood Industry Australia (SIA) joined other agrifood national sectors to form the Food Supply Chain Alliance. SIA uses to Alliance to better monitor labour issues in supply chains. SIA estimates 48% of its businesses lack skilled employees and crews, impacts that will persist for many years. In SA, lack of skilled labour is one of eight core issues identified. SA needs a fundamental relook at attracting people to seafood careers for both traditional and e-commerce chains.

State seafood trends since 1999 (see Appendix 1) confirm FTEs have been stable for 23 years (1999 - 6,532 FTEs; 2022 - 6,395 FTEs, a negligible fall of 0.1% p.a.). However, this masks a net shift of seafood jobs (610-750 FTEs) from fisheries (-17%) to aquaculture (+27%) since 1999. Strong FTE growth of 17% in 1999-2010, was followed by a 16% fall in 2011-2022. The trends since 2010 also show aquaculture seafood has delivered higher output/FTE (both direct and indirect) and GSP/FTE (both direct and indirect) than wild fisheries. The big change since 2010 is strong growth in farm direct output/FTE (to 3.9% p.a.) and direct GSP/FTE (to 6.3% p.a.) reflecting ongoing corporate activity to integrate downstream value adding and market-based outcomes into aquaculture enterprises. Farm jobs are forecast to rise 29% by 2030, and nominal GVP per direct employee by 59%, a challenge in tight labour markets.

SA Seafood Employment	Year End June	2017	2018	2019	2020	2021	2022	2025 Forecast	2030 Forecast
WILDCATCH									
Total Direct employees - fishing	FTEs	1,332	1,319	1,187	1,072	1,064	1,010	No basis for forecast	
Total Direct employees - downstream	FTEs	808	914	1,238	1,013	876	830		
Total Direct Employees	FTEs	2,140	2,233	2,425	2,085	1,940	1,840		
SA Fisheries Production tonnes (excluding Cwth fisheries)	Tonnes	49,491	52,782	49,169	48,448	46,215	54,561	65,357	
Tonnes per direct employee – fishing	T/FTE	37	40	41	45	43	54	No basis for forecast	
Nominal GVP	\$/m	\$281	\$287	\$295	\$247	\$209	\$207		
Nominal GVP \$ per direct employee - fishing	\$/FTE	\$211,000	\$218,000	\$249,000	\$230,000	\$196,000	\$205,000		
AQUACULTURE									
								<i>Based on BDO 2023 Data</i>	
Southern Bluefin Tuna	FTEs	223	264	278	234	222	306	302	296
Marine Finfish	FTEs	69	101	78	81	87	91	128	227
Oysters	FTEs	206	199	212	299	335	298	325	377
Mussels	FTEs	20	26	32	29	29	15	18	24
Freshwater Finfish	FTEs	38	42	53	45	41	35	40	49
Marron & Yabbies	FTEs	26	26	14	26	59	52	52	53
Other	FTEs	5	7	6	5	6	10	11	12
Total Direct Employees	FTEs	594	670	678	724	784	816	886	1,049
SA Aquaculture Production tonnes	Tonnes	21,580	15,986	16,070	17,472	18,353	20,737	24,726	33,796
Tonnes per direct employee	T/FTE	36	24	24	24	23	25	28	32
Nominal GVP	\$/m	\$232	\$205	\$212	\$229	\$200	\$238	\$306	\$464
Nominal GVP per direct employee (BDO forecast high case)	\$/FTE	\$389,764	\$305,672	\$312,242	\$316,271	\$255,217	\$291,217	\$350,564	\$461,913
TOTAL SA Seafood (excl. Cwth landings)									
Seafood Direct Employees	FTEs	2,734	2,903	3,103	2,809	2,724	2,656	No basis for forecast	
Seafood Production Tonnes per direct employee	T/FTE	26	24	21	23	24	28		
Seafood Nominal GVP \$ per direct employee	\$/FTE	\$187,462	\$169,411	\$163,294	\$169,448	\$150,180	\$167,395		

Sources: B Jeffriess. BDO/Econsearch 2022 – except tuna (updated by www.frdc.com.au/tradedata) and Yellowtail Kingfish (updated by www.asx.com.au/CSS Annual Report FY22). For 2025/26 – taken from: For tuna (see www.ccsbt.org/ESC 2022 outcome); for Yellowtail Kingfish (derived by Jeffriess from ASX reports); for oysters, abalone, and mussels (sourced from company information).

12. What influences markets? How can value-adders respond?

The following drivers are drawn from project team consultation and experience, and include review of recent research by IBISWorld 2023, and Pascoe et al 2023.

Influence	Driver	Response	Strategies to manage risk and viability?
Consumers prefer local sustainable seafood	Three in four seafood meals are imported. Local consumers now prefer locally processed seafood due to perceived and real quality and provenance. Technology enables processing close to production.	1. Secure seafood supply	Secure long term seafood supply to specification before investment of value-adding capital. Aquaculture is preferred.
Information empowers consumers	Online consumers want informed, low risk purchase choices. Supply chains that are short, transparent, traceable, and demonstrate high sustainability and low waste scores will generate higher sales margins.	2. Target retailer needs	Retailers increasingly control most processor revenues. Seek direct supply agreements with selected seafood retailers.
Supermarkets going direct to processors	Supermarket competition in meat and seafood is increasing due to new entrants. They seek direct-supply differentiation options and to directly control format and quality. D2C chain development.	3. Invest in technology	Invest in R&D and technology to boost freshness, quality, yields, efficiency, and shelf life.
Pandemic impacts favoured retail over food service	Food-service establishments (restaurants, fish and chip shops, cafes, hotels, caterers, and fast-food outlets) were adversely impacted by the pandemic and will be recovering in near term ³ .	4. Value add in target markets	The highest sales growth rates will come from premium processed products in export consumer markets.
Declining role for wholesalers	Wholesalers are important to some small processors. They aggregate product from multiple processors to on-sell to retail or food service. But their role is declining for value added or manufactured seafood.	5. Extend by-product range	Expand by-product offers using less popular species, to boost revenue through economies of scope (i.e., underutilised species).
Seafood processors target export sales	Australian exports have fallen 6.4% p.a. since 2018. To avoid low margins and intense local competition, processors are targeting export sales. But a rising A\$ and intense competition in premium global markets will bring new competitive challenges.	6. Increase economic scale	Increase economic scale via mergers, acquisitions, and joint ventures to reduce fixed unit costs and boost sales margins.
		7. Manage TWI risk	Use financing tools to mitigate \$A/TWI (Trade weighted index) risks where possible, including joint ventures with market partners.
		8. Boost automation and AI	Seek out and adopt automated seafood production and processing systems, including artificial intelligence.
		9. Build chain infrastructure	Collaborate to deliver joint precompetitive investment in key infrastructure-physical, ICT, data networks, human capacity, market infrastructure.
		10. Assure supply sustainability	Consumer demand is driving sustainability concerns and ESG regulation. Implement global verifiable sustainability production and supply chains.
		11. Bypass wholesale/D2C model	Create D2C processed seafood products that sell directly to supermarkets and fish mongers, and bypass wholesalers.
		12. Exit low margin products	Add value to down-market goods (e.g., low value canned fish) via new flavours and textures to entice new sales and build margins.
		13. Repitch premium products	Augment higher value products (e.g., smoked salmon) with different flavour profiles that attract mainstream seafood consumers.

³ The impact of Covid-19 on seafood consumption is yet to be fully documented, but recent European research concludes there will be an increased strategic focus on managing seafood specifically as it contains highly bioactive compounds and is globally traded across complex multi-partner chains. Refer to *The impact of Covid-19 pandemic on seafood safety and human health*, Frontiers in Microbiology, 2022; 13: 875164.

13. SA Seafood Industry status re Big Trends

The rate of change in consumer markets has never been greater, largely driven by online marketing, social media, and increased consumer awareness. In response, the SA seafood industry is continuously evolving, adapting to the changing tastes of consumers, regulatory environments, and local and global supply chains. What are the key issues for SA industry?

SA Seafood Issues to 2030		SA Status 2022
1. Sustainable aquaculture	Consumers are increasingly interested in sustainable fishing and aquaculture – this is shaping the seafood industry. SA Seafood is farmed or ranched in a clean environment supported by world leading local R&D managed by a strong policy environment. The 2022 FoodSA product category snapshot notes “NPD trends within the Fish & Seafood sector globally include Fresh & Sustainable, Wellbeing, Premiumisation and Flavour Experimentation.	Advanced
2. Innovation in harvest technology	Advanced technologies and tools (e.g., drone technology, precision fishing, and big data analytics) boost efficiency and quality, and allow industry to reduce waste. But consultation with industry and chain partners reveals occasional lack of technology and capability among local processors.	Underway
3. Climate change adaptation	Seafood producers seek to mitigate and adapt to climate change. This drives investment in resilient species, sustainable methods, and alternate inputs and feeds. The emerging aquaculture sector has greater capacity to control production and thereby adapt to climate change impacts.	Underway
4. Plant based and cellular seafood	Seafood producers face threats from substitutes in consumer markets. Understanding of consumers’ changing preferences, and product differentiation options, in a new global synthetic seafood market is a current regulatory challenge.	Competitor
5. Traceability and transparency	Modern consumers expect advice re seafood sources and how it has been produced, processed, transported and presented. Traceability, transparency, and integrity are accessible and mandated technologies.	Advanced
6. Growth of online seafood sales	E-commerce is increasingly used to source, purchase, deliver food (accelerated by the Covid -19 pandemic). This trend will continue, with new online food and seafood platforms and markets challenging existing pathways to markets.	Early days
7. Personalised nutrition	Advanced nutrition and genomics drive personalisation of food. Consumers choose seafood for health benefits - omega-3 fatty acids, vitamin D, etc.	Early days
8. Functional seafood products	Seafood producers, processors and manufacturers face increased consumer demand for functional products – foods enhanced with health-promoting ingredients (e.g., probiotics).	Early days
9. Automation and robotics	Adoption of automation, robotics and artificial intelligence in seafood production and processing plants is enhancing efficiency, reducing labour costs, and improving food safety and quality.	Early days
10. Culinary styles and fusion cuisine	Consumers value innovative culinary techniques (preparation and presentation) like sous-vide cooking, poke bowls, and seafood charcuterie platters. Social media and online marketing have reduced the marketing costs for niche foods and related experiential and seafood tourism activities.	Underway
11. Circular economy	Markets and supply chains are focussed on waste reduction and responsible resourcing. Practices (e.g., no plastics) are aligning to principles of the circular economy.	Underway
12. Microbial and algae-based feed	Excess wild capture of low value trash fisheries and non-sustainable feed sources is driving investment to microbial and algae-based inputs, feeds, fish meal, and fish oil.	Emerging - in Aquaculture
13. “Free-from” foods	Trends to personalise nutrition, and a broader market resistance to antibiotics are forcing seafood producers to develop antibiotic-free and chemical-free seafood. Synthetic and cellular seafood manufacturers are tuning and promoting their products as pathways to personal therapeutic consumption.	Emerging
14. Offshore fish farming	Increased investor interest in developing offshore technologies and systems, with smaller carbon footprints, and less impact on coastal environments.	Advanced
15. Integrated Multi-trophic Aquaculture	IMTA systems of fish, plants, and other marine species enable efficient use of resources while minimising waste. Adoption of aquaponics and IMTA systems are expected to increase as a sustainable seafood production method.	Inactive

Source: FoodSA 3 May 2023 from Gitnux, and Ridge Partners analysis

14. SA Seafood Industry Capacity and Capability

Capacity refers to the total seafood amount that can be produced under existing laws. This review finds the SA Seafood Industry can and should increase by ~32% sustainably and viably to more than 101,000 tonnes by 2030. The **capability** of Industry to absorb this change and also create and leverage commercial outcomes requires proactive leadership and collaboration with investors, chain partners, regulators and consumers. The transition, already evident, to an increased market focus must be built on a new value proposition for SA, better skills and technologies, and fit-for-purpose precompetitive industry networks that optimise returns. Joint commitment to a unique SA Seafood selling point is desirable.

The 20-year review (see p18-19) finds that the SA seafood industry continues to mature - initial high growth rates are moderating, and annual performance has declined for each of three key decadal criteria: Tonnes/FTE (7.3% to 2.5%), Nominal output (5.3% to 0.7%), and Contribution to GSP (3.6% to 1.7%). None has yet turned negative but the rate of decline since 2010 is concerning. More granular recent data may refine this trend for recent years although the impact of the Covid 19 pandemic will be difficult to separate.

The decadal metrics also confirm an increasing share of economic impacts is generated both a). downstream towards the market, and b). indirectly in related sectors. There is also ample corporate evidence of businesses already driving the transition - existing supply and processing businesses are investing in their own transition capacity and capability toward their customers. This is predominantly (but not only) evident in aquaculture businesses where seafood production and supply seek scale, and to derisk their supply chains.

Industry Survey

To look broader and deeper the project sought advice re capabilities from a confidential online survey of SA based seafood processors at three levels, as illustrated. Key findings were:

Level 1 - Species:

- Finfish
- Mollusc
- Crustacean
- All seafood types
- Seafood toll-process

- Most of the 20 processors who responded do a wide range of primary (i.e., minimal process) or secondary (value add) processing; most want to do more if viable,
- Key limitations on primary minimal processing are: 1. Lack of skilled staff, and 2. Lack of capacity regarding equipment – lack capacity at scale,
- Key limitations on secondary processing/value adding are: 1. Lack of equipment (including NPD) to create consumer products, and 2. Lack of skilled staff,
- Three seafood processing facilities offer advanced processing technology (retorts + MAP); but do not use them every day. These technologies are also often operated by toll processors that service food clients other than seafood. They are not seafood specialists and often lack requisite skills and technical understanding.

Level 2 - Primary Processes:

- Gill & gut
- Pack chilled HOGG fish
- Prepare HOGG fish
- IQF freeze

The survey and related consultation also identified several hurdles or opportunities in the SA Seafood Processing Industry:

- New development (processes and products) is costly and takes time to achieve to market specifications,
- The cost of labour in the SA seafood processing industry is high compared to overseas processors,
- Access to investment capital for maintenance and development by SA seafood processors is difficult for many processors, especially those that lack economic scale,
- The dual focus (wildcatch + aquaculture) is based on unique species with minimal overlap, but this limits scale economies (production + processing) for investors,
- Competitive advantage has developed and concentrated geographically (e.g., Port Lincoln) for some seafood industry capabilities (e.g. -60°C freezing),
- Industry has not created attractive products and educated consumers to “eat the whole fish” in a ready-to-eat format, thereby optimising harvest yield and returns,
- Industry has long-neglected investment in seafood market intelligence. As the focus shifts to markets, industry needs a means to jointly invest in market data.
- Seafood producer/processor accreditation in SA is high. But consumers do not trust Government accreditation. Industry wants 3rd party programs including ESG.
- Pursue automation at scale as the emerging pathway to overcome equipment gaps, and effectively offset the expected long-term lack of skilled processing people,
- Gather whole-of-chain data and respond as a single industry voice regarding the economic and social returns generated by seafood relative to other marine users,
- Collaborate as an industry from CEOs down in selected precompetitive investments and capabilities that offer mutual advantages to investors and the SA economy.

Level 3 - Value Adding:

- Filleting, portioning, loins
- Vacuum packing fillets, loins
- Freezing packed portions
- Pickling, smoking, crumbing
- MAP
- Skin packing
- Fish sauces / Fish burgers

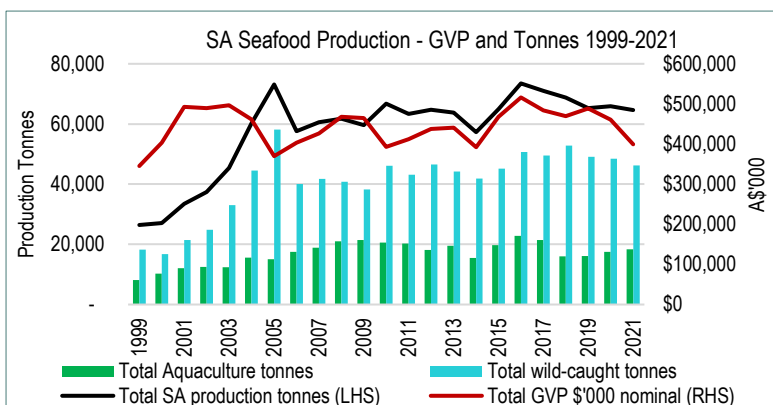
The confidential survey reveals SA's processors as fragmented, and somewhat aspirational, reflecting a desire to grow but lacking the human, financial and technical capability to do so.

SA Seafood Value-Adding to 2030

Processing Capacity and Capability

Several factors influence the availability and capability of seafood processors in SA.

Seafood supply to SA has been quite variable since 1999, for both fisheries and farms.



Many SA capture species require dedicated processors and value-adders enroute to markets. Few species overlap and can share pathways to boost scale.

Since 2000

sardine supply, value added via SBT farms has been SA's most efficient and viable pathway. Rising volume and farm investment has built significant infrastructure and in-house onsite processing factories on Eyre Peninsula. But as sardine/tuna supply growth stalled several purpose-built processing/value-adding facilities were closed and remain mothballed. Supply shortage and volatility (including seasonality) have been major barriers to seafood value adding investment, including in advanced processing technologies. The project survey shows many processors currently have plants with low utilisation rates.

Low factory utilisation, and low and variable volume has compounded investment risks faced by SA processors. The large SBT processing task is outsourced to proximate Japanese vessels. Understandably processors in other sectors have been cautious, derisking their investments, and allocating capital away from seafood processing. At a smaller scale they have rightly focused on seafood quality and innovation (e.g., larger prawns processed on-board, pipi de-sanding).

Looking beyond sardines/SBT, the **emerging SA aquaculture** sector has attracted increasing corporate investment in key species (kingfish, abalone, oyster, mussel, pipi). Their focus is on economic scale, quality, and direct supply to retail and food service.

The number and type of **seafood jobs** has been driven by seafood supply, capital availability, and the broader emergence of aquaculture. For 23 years seafood job numbers have been very stable. A jobs boom up to 2011, was followed by a bust as skilled and unskilled people left the industry. Hidden in this data, jobs shifted away from fisheries to farm supply, and from onboard/onfarm jobs to downstream indirect jobs in value adding. These are positive signs of increased scale and maturity in the SA

seafood industry. One negative sign is frequent comment to the project that industry is no longer a secure career for workers - a challenge that needs to be addressed.

Since 2011 **toll food processors** have filled a capacity gap arising from low factory utilisation and variable low seafood supply. Toll processors often service multiple industries (e.g., dairy, beef, grains, horticulture, seafood), thereby driving up factory utilisation, lowering costs, and boosting their ROI's. Adelaide based, they can also access pools of skilled and semi-skilled workers. But consultation reveals the trade-off between processors' "capacity need" for high utilisation clients and a clients' "capability need" to deliver foods product to tight retail specifications. Not all toll processors are the same, but most offer generalist processing services – they lack seafood specific technology and skills to add value, to specification, at scale or in small batches. In SA, seafood process capability has become a weak point, adding risk for seafood clients.

Seafood businesses who contract toll processing services face disadvantages including:

- The stop/start and seasonal nature of seafood supply means seafood clients are less attractive than say, a dairy industry client with product every month,
- Seafood is highly perishable, demanding cool storage to maintain best quality,
- Seafood is often harvested and delivered to toll processors on a just-in-time basis to maximise freshness and quality - delayed delivery poses risks,
- Perishable, high-cost seafood means spoilage and waste are at a high cost,
- Potential for IP from NPD trials and small batch processes is abused or lost,
- Few people in generalist processing businesses have trained in or had experience with seafood, so will be at risk of devaluing their clients' product.

Clear toll-contract terms and onsite client representatives will reduce this mutual risk.

Conclusions

The capacity and capability of the SA seafood industry to undertake primary and secondary processing of a wide variety of local species is fair but can be much better.

National seafood demand is rising but shifting to RTE products dominated by large retailers or online. In this context wildcatch fisheries (both premium and commodity) face harvest limits and are difficult to derisk. High quality diverse wildcatch seafood is central to fresh and export trades but lacks the volume and long-term supply control to be a low-cost value-added option. Aquaculture at scale is more able to secure, proven supply to be value-added at high yields into RTE meals and higher margins.

New investment will be in existing seafood species, and probably by existing or emerging SA firms, led by aquaculture. Scaling up will reduce unit costs and boost utilisation. Since 1999 the tonnage has risen from 26,000t. to 77,000t., but there is little evidence of SA consolidation of soft capital (human capability, industry networks, market loyalty to SA products), NPD technology, or rising market penetration. Industry will need this intelligence to be competitive and to reconfigure existing production (77,000t) and optimises new supply (25,000t).

15. Other initiatives to note

Current Processing and Value adding Initiatives

The SA Government has advised a number of seafood processing and value adding initiatives are underway regarding existing and emerging commercial species.

Initiative	PIRSA Advice
1. Garfish	The SA Marine Fishers Association and Marine Scale Net Fishers Association are exploring mechanical filleting machines to reduce the processing costs associated with Garfish
2. Eyre Peninsula Seafoods (owned by Yumbah Aquaculture)	The SA Government awarded a \$500,000 grant to help build a wet store holding facility allowing higher production value and supply throughout the year. The new facility means the company can pursue new export markets and damaged stock will no longer go to waste.
3. Prawn	The sector is currently investigating automated weighing and packaging equipment to enable on-board processing and packaging for the domestic market. This would support the emerging demand for smaller format consumer packaging to meet the 'eat or freeze' consumption market.
4. Tuna aquaculture	Tuna companies have implemented value adding to tuna product through improved cold storage technologies and entry to local markets. KIN Premium Australian Seafood, established in 2021, is a collaboration of three prominent SBT farmers to create and retail premium tuna to domestic markets. The group works closely with SARDI, leading scientists from the CSIRO, plus the FRDC, a partnership between the Australian Government and the fishing and aquaculture industries.
Portion and pack sizes	Smaller meal size packaging across many aquatic species represents opportunities to meet domestic and international supermarket and domestic consumption markets and improve price and profitability.
5. Value added collaboration	PIRSA recommends that any state initiative to boost downstream seafood outputs and performance should incorporate processors from many locations, economic scales, and sectors across both wildcatch and aquaculture sectors. Meal portion packaging across many aquatic species represents opportunities to meet domestic and export, and retail and food service markets, and improve profitability.

Seafood Waste

The Australian fishing industry produces around 20,000 tonnes of waste per year. Seafood waste streams arise in four ways:

Waste Tier	Value Adding Processes and Products
1. Legal waste	Disposal at sea, incineration
2. Simple	Fish waste is declared and certified, therefore incurring landfill costs. Fish waste rendering to create fertiliser, fish meal, hydrolysate, feed ingredients, soil conditioners. Fish waste, including oils and omega 3 extracts, are increasing in value.
3. Complex	Bone treatment, hydrolysate processes, drying, tanning, to create high quality oil, hydrolysed adjuvants, pet food, leather
4. Premium	Transform, mince, extract to create seafood (soup, stock, sauce), pharmaceutical (additives, powders, gelatine, enzymes, squalene (diabetes and cancer treatment), chitin for industrial use

SA agencies advise that the SA seafood industry currently beneficially uses seafood waste in several ways, including:

1. Tuna waste for garden fertiliser,
2. Tuna waste for liquid farming fertiliser,
3. Abalone Shells for the costume jewellery market,
4. Oyster Shells as road base and artificial reef bases,
5. Abalone blood for glazing abalone meat for freezing,
6. Fish frames as crab bait (latchet and whiting frames),

SARDI Food Sciences is currently managing two seafood waste projects, related to mussels and abalone.

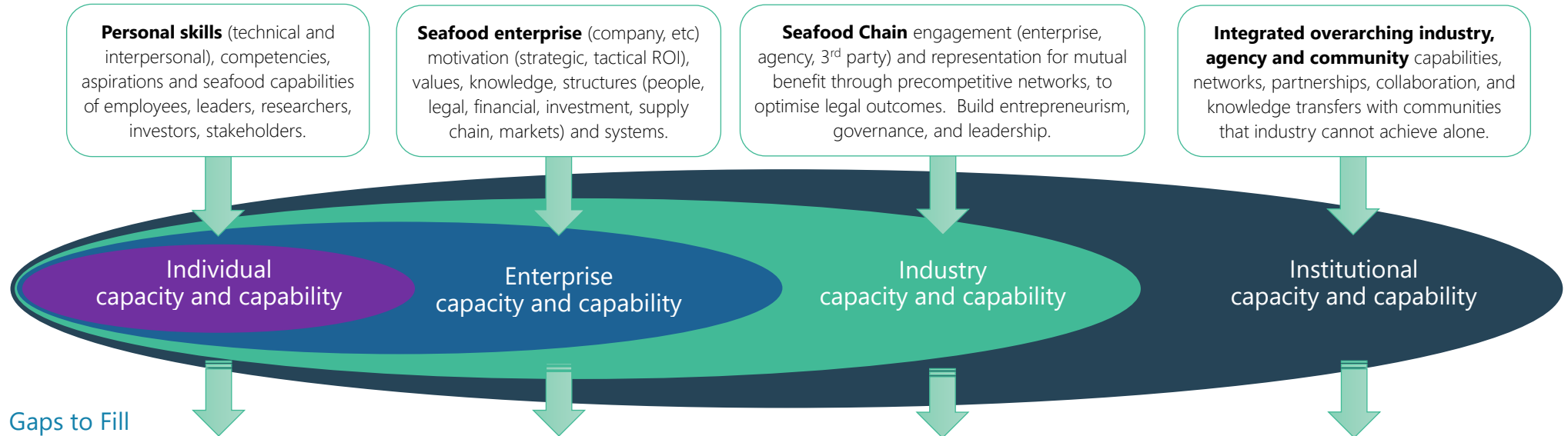
16. Key Issues and Gaps identified by Industry

SA Seafood Industry fishers, farmers, processors, agencies, and stakeholders were consulted in four workshops (in Port Lincoln and Adelaide) and via an online independent survey, regarding the current key issues and processing and value adding capabilities of their industry. Responses presented below highlight the seafood processing and value adding constraints and risks identified across industry. Responses from the Adelaide and Port Lincoln consultations reflect similar supply chain priorities, with some local and regional nuances.

<p>High Priority</p>	<p>Lack of Storage Space: Insufficient specialised freezer, chiller, dry goods storage capacity across all seafood species landed in SA.</p>	<p>Seafood Waste: Low recovery and poor returns from seafood biproduct and waste streams across all species.</p>
	<p>MAP: Impact of bans on plastics used in Modified Atmosphere Packaging across all seafood species.</p>	<p>Skilled Labour: Lack of skilled people and processing labour (filleting, shucking), and related housing across all species.</p>
	<p>Sustainable Packaging: New product technology to meet new environmental regulations across all seafood species.</p>	<p>Government Red Tape: At state and federal levels (especially export) compliance-heavy and costly approvals, audits, and regulations do not support innovation or investment (SASPEC 2021).</p>
	<p>Logistics: Lack of SA capacity in cool chain, and Chain-of-Custody across all seafood species.</p>	<p>Industry Collaboration: Low industry collaboration and investment to drive mutual efficiencies and industry development priorities.</p>
<p>Medium Priority</p>	<p>Large Batch Processing: Lack of SA capability in high-quality large batch processing for many species</p>	<p>Quality Testing: Low capability available and priority given to food quality testing (QA, Xray, metal) across all SA seafood species.</p>
	<p>Retort Processing: Lack of SA capability in high-quality seafood retorting for mussels and pipis.</p>	<p>New Product Development: Lack of SA capability and capacity for high-quality small batch trials for SME producers.</p>
	<p>-60°C Freezing: Lack of SA capacity in processing and freezer storage for SBTuna (-60°C) and Yellowtail Kingfish (-40°C)</p>	<p>Food Safety: Low capability available and priority given to food quality safety testing across all SA seafood species.</p>
<p>Low Priority</p>	<p>Meat Picking: Lack of access in SA to skilled seafood meat picking employees to support crab processors.</p>	<p>Marketing & Branding: Low Investment in and promotion of advanced processing capabilities. No unique selling point for SA seafood.</p>
	<p>Ice Availability: Lack of access in SA to experienced ice pack manufacturers tuned to service seafood processing.</p>	<p>3rd Party Certification: Consumers and customers increasingly demand seafood certification – low priority in SA seafood chains.</p>

17. Capabilities Required and Gaps to Fill

Capabilities required to support Seafood Processing



Gaps to Fill

Skilled Labour: Lack of skilled people and labour (filleting, shucking) and related access to regional housing

Meat Picking: Lack of access in SA to skilled meat picking employees to support Crab processors

Leadership: to bring industry and government agencies together in precompetitive collaboration and mutually beneficial investment

Large Batch Processing: Lack of SA capacity in high-quality large batch processing

Retort Processing: Lack of SA capacity in high-quality seafood retorting

-60°C Freezing: Lack of SA capacity in processing and freezer storage

New Product Development: Lack of SA capacity and capability for high-quality small batch trials for SME producers

Ice Availability: Lack of access in SA to ice pack manufacturers tuned to service seafood processing requirements

Storage Space: Insufficient freezer, chiller, dry goods storage capacity

MAP: Impact of bans on plastics used in Modified Atmosphere Packaging

Seafood Waste: Low recovery and poor returns from seafood biproduct and waste streams across all species

Food Safety: Low capability/priority given to food quality safety testing across all species

Toll Processor Capability: Seafood training, client-nominated monitoring of outputs, dedicated seafood contract processing facility

Chain & Market Intelligence: Lack of shared data regarding precompetitive seafood chain

Sustainable Packaging: Meet new environmental regulations across all species

Logistics: Lack of capacity in cool chain, and Chain-of-Custody across all seafood species

Government Red Tape: Compliance heavy, and costly approvals, audits, and compliance

Industry Collaboration: Low collaboration is a barrier to efficiencies /development priorities

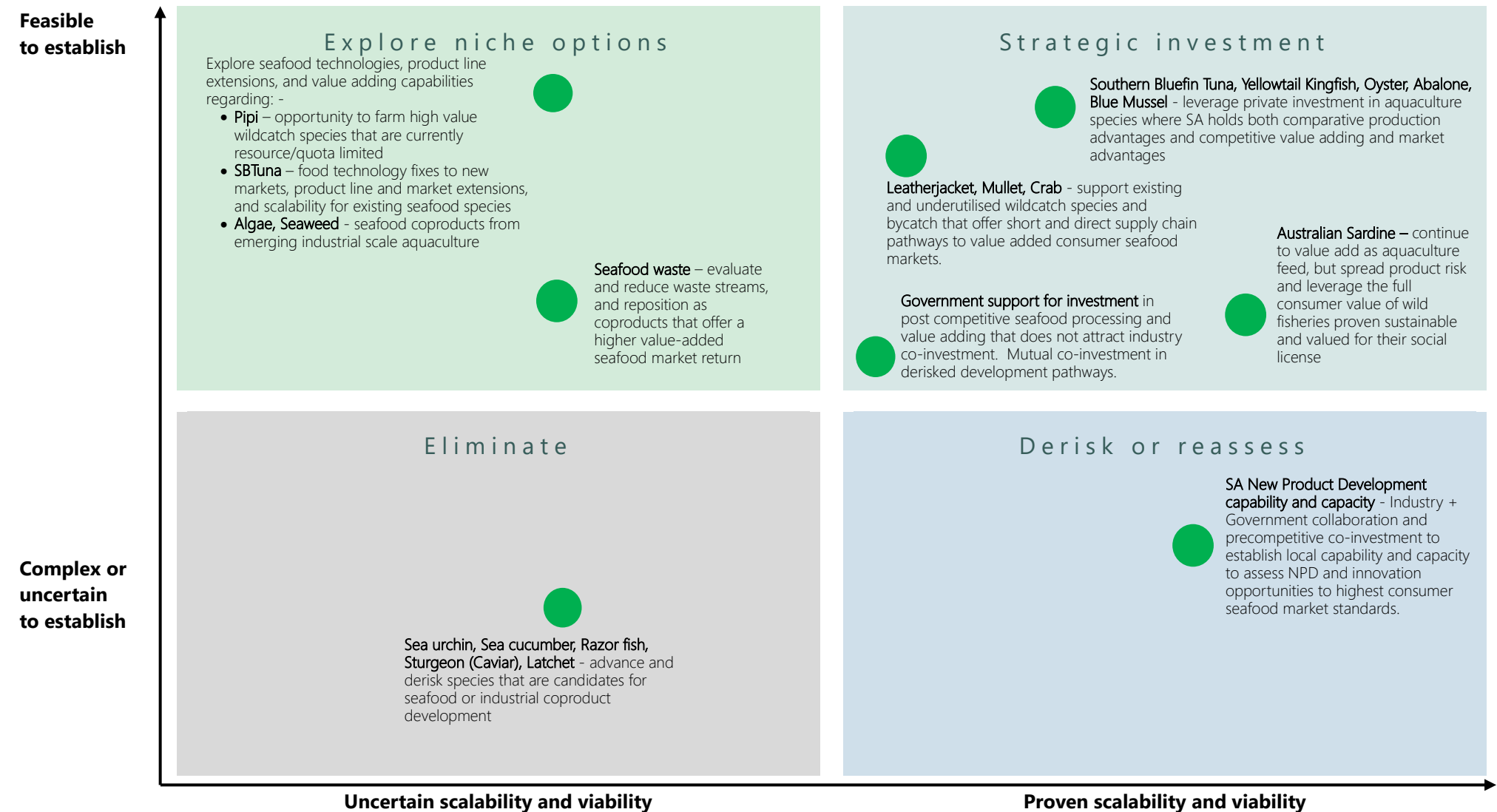
Quality Testing: Low capability/priority given to food quality testing (QA, Xray, metal) in some cases in SA

Marketing & Branding: Advanced processing capabilities need leverage of SA selling point

3rd Party Certification: Consumers demand certification – given low priority in SA

18. Seafood Product Opportunity Matrix

This review has identified a range of SA seafood product options that require further analysis to confirm possible sustainable and viable investment.



19. Seafood Innovation Network

Consultation with industry in Adelaide, Port Lincoln and regions considered the value to industry from investment in a collaborative precompetitive "Innovation Hub". Four drivers were identified for this precompetitive concept: Sustainable resource access and use, Entrepreneurial risk management, Seafood innovation, and Access to human and financial capital.

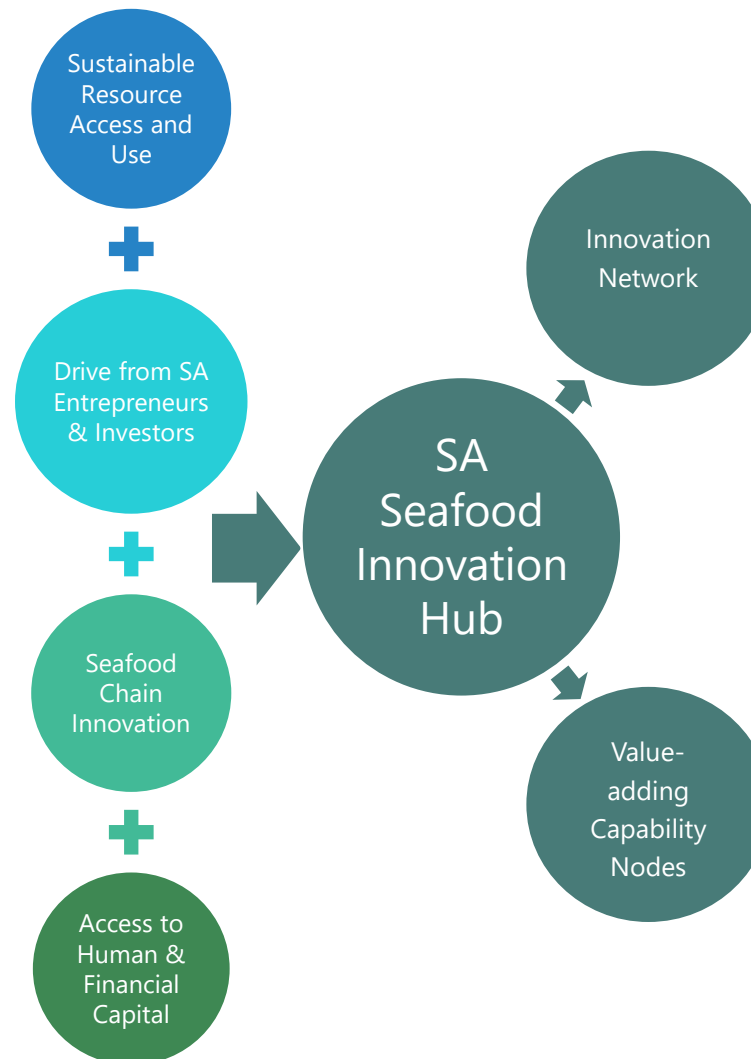
This approach recognises that the state's value proposition to create seafood value has and is changing. Will this work? Industry collaboration is the key to identifying innovation gaps and co-investing for mutual commercial benefit.

A couple of thoughts came forward:

- Every FTE hour of work and litre of diesel must enable attractive seafood more efficiently to boost outcomes (economic, social, environmental) for target consumers, producers, employees, and South Australians.
- Every dollar of investment must seek the optimum pathway to create a fresh or value-added RTE seafood product that appeals to a customer who will value it ahead of its competitors.

The hub (or whatever structure is determined) will aim to bring industry people together along supply chains in a precompetitive commercial approach where common operational or market issues can be prioritised and invested.

The aim is to create more and better SA seafood that sells at higher margins.



SA Seafood Innovation Network
 Based in Adelaide and supported by new Seafood Industry SA body.
Aim: Raise awareness, lead industry, facilitate and derisk joint innovation and investment – Do what individuals can't!

1. Owned by SA seafood industry, processors and value adders,
2. Governance – industry collaboration by processors, value adders, and sponsors (technology, training, waste, plastics, environment, etc). Potentially determined by new SISA body.
3. Upgrade R&D and innovation capability - NPD, batch, waste, increased automation, etc,
4. Seafood consumer education, seafood marketing intelligence (export and domestic), and promotion of SA seafood,
5. Seafood careers, training, skills and entrepreneurship,
6. Engagement and Planning with Government – formal and informal. Certification of all SA fisheries under a PIRSA banner.
7. Funded by industry with 3-year Gov't support based on milestones.

SA Multisite Infrastructure Nodes
 Based on nodes set by industry - Adelaide, Pt Lincoln, and regions.
Aim: Bring critical mass to seafood supply, processing capabilities, and returns

1. Owned privately by existing seafood investors, fishers, etc,
2. Primary species: Australian Sardines, SBTuna, Yellowtail Kingfish, Oysters, Abalone, Mussels, Ocean Jackets,
3. Fresh + value added seafood – overcome seasonality,
4. Domestic + export accreditation: Toll/Own process + Toll/Own brand
5. Focus on market demand as driver for suppliers and investors,
6. Use existing underutilised facilities for cold storage – derisked,
7. Core skills training centre: Not-for-Profit seafood food service and hospitality training school + Seafood tourism experience for Eyre Peninsula Seafood Industry.

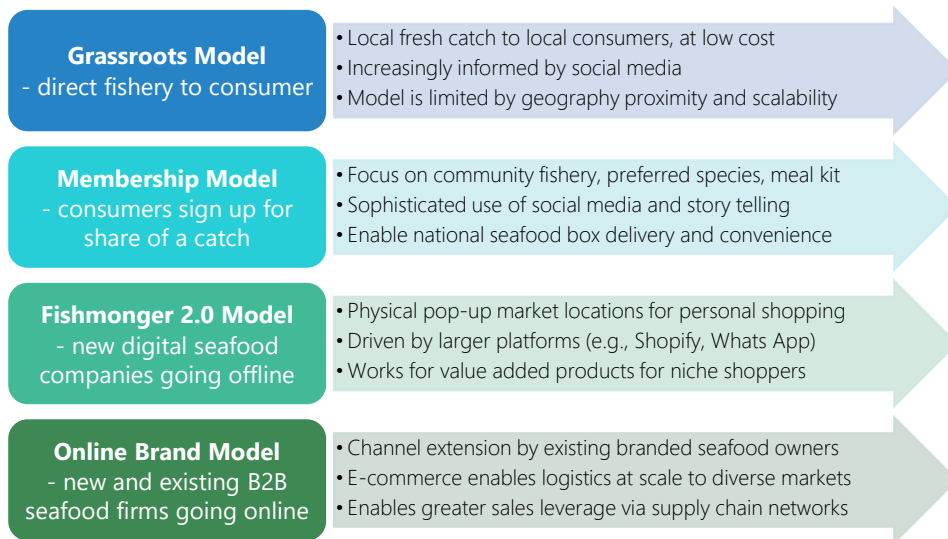
20. Pathways to Consumers

D2C – Direct to Consumer

The Covid-19 pandemic created a “range of experiences from positive to catastrophic and everything in between” according to the FRDC (Project 2016-128). The pandemic accelerated a supply chain trend that was already evident - the rise of seafood chain e-commerce and D2C model sales reducing traditional B2B (business to business) sales.

In a D2C model the brand owner (typically a manufacturer) sells its product directly to end customers without third-party wholesalers or retailers. The Future-of-Fish global review (2022) found that D2C models in seafood range from small companies servicing local markets to large e-commerce enterprises with international reach. Emerging D2C models engage every node in the seafood supply chain domestically and overseas.

This emerging e-commerce disruption is very relevant to the strategic evolution of the SA seafood industry. Four categories of D2C have been identified:



The **Fishmonger 2.0** and **Online Brand** models, in particular, offer SA seafood attractive industry development options.

ESG (Environmental, Social and Governance)

The Securities Exchange Commission (SEC) is the independent US federal agency charged with enforcing the law against market manipulation. In March 2022 the SEC proposed to mandate a sweeping law forcing supply chains and related companies to track and report all greenhouse-gas emissions. This proposed mandate has the support of the European Union, and some Australian legislators.

Yet to be legislated in the US or Australia, the proposed ESG standard is already voluntarily reported by many Australia's ASX200 largest publicly listed companies, with ultimate carriage of the issues held by the regulator APRA. Globally the International Financial Reporting Standard (IFRS) has moved to integrate mandatory reporting of ESG outcomes for larger enterprises (www.ifrs.org). They propose the new global reporting ESG standard will be managed by a new sister body International Sustainability Standards Board (ISSB)

In the event these two large northern hemisphere regulators achieve their legislative aims, Australian seafood companies undertaking sales in these markets may be required to observe this reporting standard soon thereafter. Recent research ([ESG reporting in Australia - the full story, or just the good story? \(pwc.com.au\)](https://www.pwc.com/au/en/issues-and-ideas/industry-topics/food-and-beverage/2023/esg-reporting-in-australia-the-full-story-or-just-the-good-story.aspx)) found more than 80% of the ASX200 companies don't identify and disclose material ESG risks for the organisation, but variously link these risks to the financial statements.

The Australian Institute of Company Directors noted in September 2023 ([Mandatory climate and sustainability reporting developments \(aicd.com.au\)](https://www.aicd.com.au/news/mandatory-climate-and-sustainability-reporting-developments)) that “Federal Treasury is working on a mandatory climate reporting regime. The likely result will be the required disclosure of how boards monitor progress towards climate targets, including how climate performance metrics are factored into remuneration policies.”

What are the implications for SA Seafood processing?

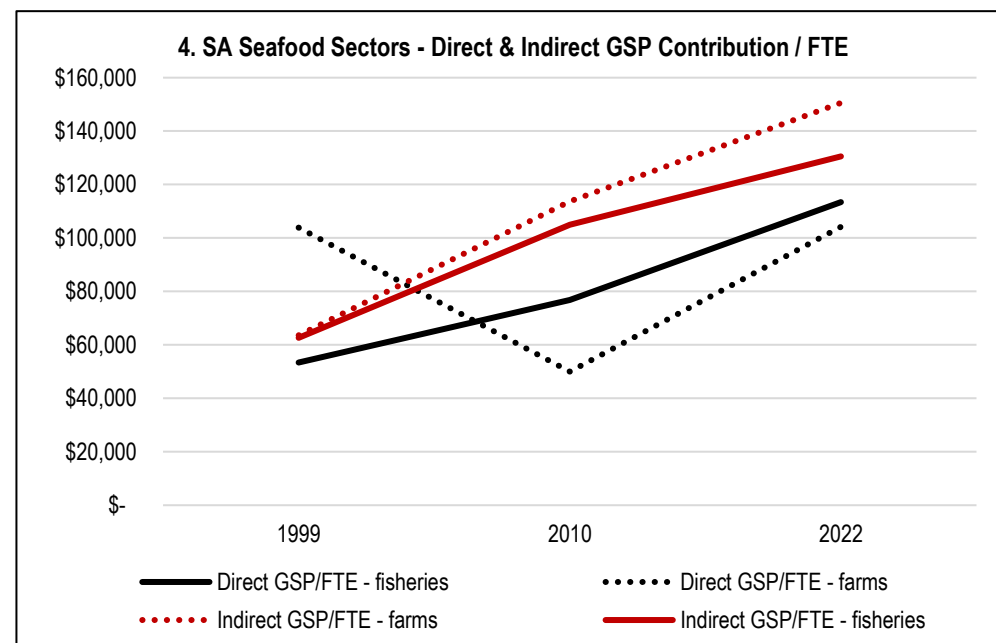
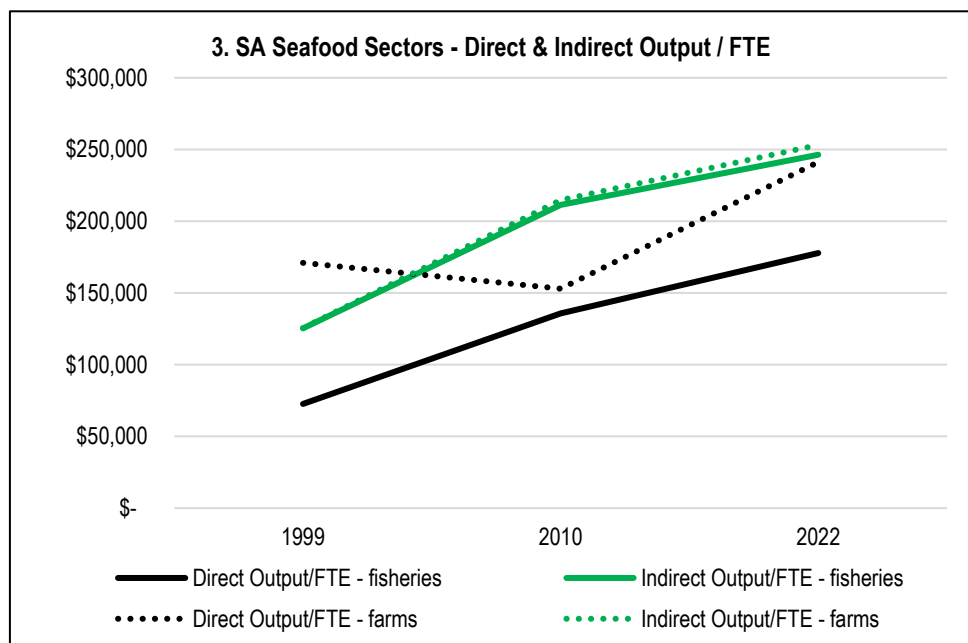
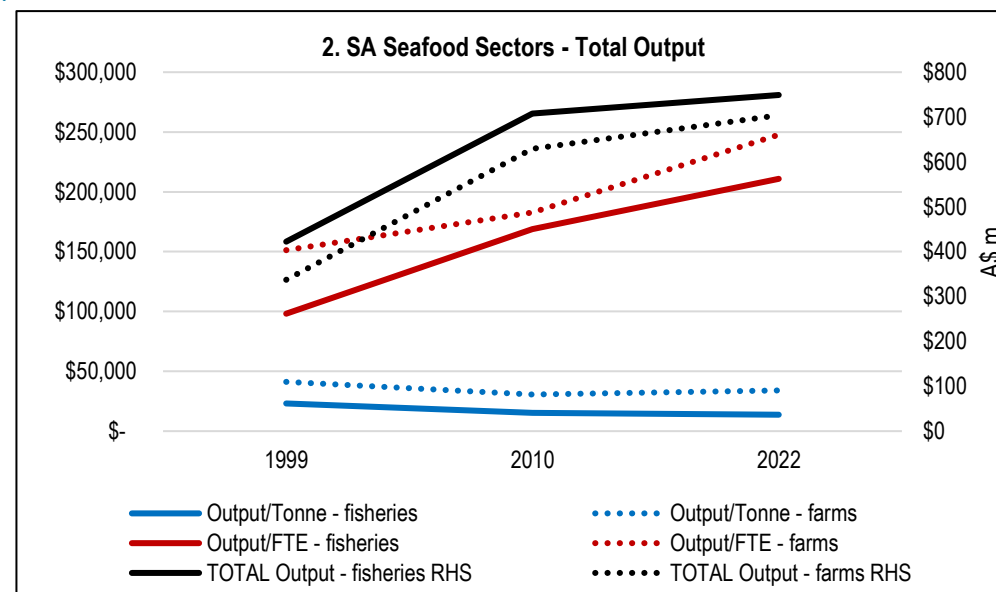
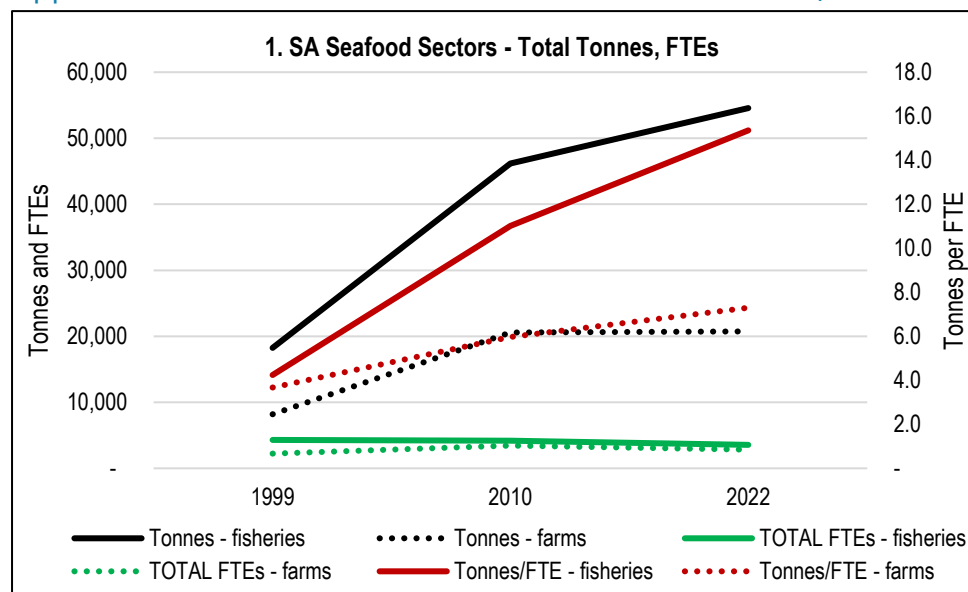
This review finds that mandatory ESG reporting requirements are on the horizon for larger Australian seafood companies. Companies that do not consider ESG reporting risks may face shareholder and employee activism, investor divestment and future regulatory action.

21. What should be the response to SA Seafood Industry Issues?

This table records and references the SA Seafood Growth Strategy 2021-31 Pillars and Scenarios, and the recommended respective investments and responses from this project.

STRATEGIC PILLAR	Investment Scenario	Investment and Response from Industry	Investment and Response from Agencies and Other Stakeholders
1. Support, Unity and Resources	a. Establish a seafood advocacy body in SA	This analysis shows the SA economy increasingly benefits from creating seafood meals for specific customers and consumers. This is achieved off the back of a large efficient traditional high quality quota managed seafood sector. Both supply sources are critical to a viable seafood future. But the fact is that aggregate returns will only be optimised when SAs competitive advantages are fully leveraged down chains to customers who value SAs offer. All three sectors (fresh, minimal processed, value adding) must be part of the state's industry future to 2030. Engaging consumers directly in a unique SA selling point is the optimal step to capture margins that create value for producers and processors. Industry collaboration and co-investment is the core issue identified. Industry is still managing itself under an old production-based governance model. A better approach will <u>integrate whole-of-chain leadership and advocacy</u> from production to consumer. Processing and value-added meal creation must be formally embedded into industry, not <i>ad hoc</i> participants. SISA's launch (2023) as a joint co-investment and commitment from industry and SA Government is a welcome first step. SISA can lead industry to joint review and analysis of preferred pathways to market. This could be implemented internally (e.g., via industry task force), or externally (via arms-length downstream precompetitive initiatives) to a 2030 value-adding vision.	
	b. Foster industry investment and the value proposition for global market investment	Lead industry and agencies to jointly identify and derisk high priority precompetitive seafood value adding and supply chain cases that leverage the forthcoming increased scale of the SA seafood production to 101,000 tonnes p.a. Undertake analysis and facilitate financial investment feasibility models of preferred precompetitive seafood value adding pathways	
2. Seafood Products and Production	a. Assess market opportunities	Guided product development is fundamental to 2030 viability, for existing and new supply. Industry must lead re forecast capacity needs, innovation gaps (batch and toll processing, NPD, MAP, retorting, -60°C freezing, ice, and other opportunities identified in this review. Industry must raise the profit priority of value-added seafood.	Recent investment transactions confirm that SAs aquaculture sector is strategically positioned, has identified premium species, derisked its production systems, has access to technology and financial capital, and is motivated to grow its value to target consumers. The opportunity for wildcatch species is less obvious but exists for some select fisheries (e.g., Ocean Jackets). This is the major role of government in the emerging supply mix. Government has a central role to provide planning support, and co-investment for regional and urban innovation initiatives, public infrastructure (e.g., technology hubs, industry data networks, etc), marketing data and online network initiatives, and ESG issues (waste, packaging, quality and safety, certification), once they are described, tested, and prioritised jointly with industry. Creation of a targeted fee-for-access NPD centre for industry should be considered.
	b. Grow volume and value		
	c. Value-add seafood product		
	d. Support industry innovation: <ul style="list-style-type: none"> • packaging, RTE meals, • hub for product, tech. • reduce and reuse waste 		
	e. Drive aquaculture sector		
3. Security of Access and Investment	a. Logistics/transport	Storage, logistics and Government red tape are high priority concerns and capability gaps for industry.	Issues for SISA and agencies to address jointly
	b. Review regulation re processor registrations		
4. Promotion & Communications	a. Drive innovative SA seafood marketing	Unity Industry voice and purpose will enable a unique selling point (and possibly underpin generic branding) for SA Seafood to national fish retail and online markets. This is a long-term strategic investment that Industry (producers, processors, and value adders), SISA, and Government may consider worthwhile.	
5. Human Capacity	a. Workforce training for jobs to 2030	Lack of skilled people is a major risk. Engage existing training institutions and align to emerging needs. Include Toll process sector.	Regional seafood initiatives and hubs cannot succeed without agency support and planning for skills development and transfer, housing, and ICT programs. Regional seafood industry has placed high priority on the current and forecast lack of skilled people available to meet existing production as well as forecast increased production by 2030.
	b. Attract and retain staff		
6. Strategic RD&E	a. Not directly relevant to this review	Industry to determine its RD&E priorities to 2030. The SA Government supports "investment in aquaculture in our state. Our Case Management approach (including designated derisked zones) facilitates potential projects across government." Downstream food/seafood processing should also be integrated as per this review.	
7. Technology Adoption and Innovation	a. Scan and adopt best technologies	Industry must determine and lead investment in priority technologies. The SA Seafood Growth Strategy 2021-31 identified traceability and dashboard apps as priority. This review finds the priority technologies to be batch processing, retorting, -60°C freezing, MAP, food safety, toll processing, packaging, ICT and quality testing.	A technology advanced and innovation seafood industry value chain benefits all South Australians, directly or indirectly. The optimal approach therefore is for joint collaborative precompetitive industry and government investment in the agreed technology and innovation creation and knowledge transfer activities, at efficient scaler and across regions, aligned with comparative and competitive advantage for the investors. The technologies identified in this review that are of particular indirect relevance to the seafood industry include sustainable packaging, cool chain logistics and Chain-of-Custody, and quality testing.
	b. Develop SA-based traceability program		
	c. Build confidence, skills re e-solutions		
	d. Scope a new phone dashboard app		

Appendix 1. SA Seafood Economic Indicators 1999-2022 (BDO, ABARES)



SA Seafood Value-Adding to 2030

Findings re SA Economic Indicator Trends 1999-2022

The following discussion considers the SA seafood trends in the four charts above (drawn from project team analysis), assessed over 23 years in two periods: 1999-2010 and 2011-2022. The criteria assessed are seafood production by sector (fisheries and aquaculture farms) for tonnage, FTEs, and contributions to state product. All A\$ figures are nominal.

Chart 1.

- Since 1999 seafood production has grown 185% (4.7% p.a. compound). Fishery tonnage grew faster than farms – fisheries 199% (4.9% p.a.) and farms 153% (4.1% p.a.)
- For the most recent period (2011-2022) state production grew slower, at an average annual rate of 1.0% p.a. compared to 8.8% p.a. for 1999-2010.
- Seafood FTEs (direct and indirect) shifted to aquaculture across 1999-2022 with minimal FTE change over the 23-year period (decline of 0.1% p.a.). **The net shift of jobs from fisheries to aquaculture was around 610-750 FTEs over the 23-year period** – a 17% fall in fishery FTEs offset by an additional 27% of new jobs in aquaculture. Across the period FTE growth of 17% in 1999-2010 was offset by **a concerning 16% fall in 2011-2022**.
- Landed seafood tonnes/FTE grew strongly across the SA seafood industry, at 4.8% p.a. for 1999-2022. The emergence of the SBT aquaculture sector in 1999-2010 (7.3% p.a.) created much stronger tonnage/FTE growth than for 2011-2022 (2.5% p.a.).

Chart 2.

- Total seafood output rose 91% since 1999 at an average of 2.9% p.a. Fisheries' output grew slower (2.5% p.a.) than farms (3.3% p.a.) **But a key issue is the large decline in the last decade** - 1999-2010 (5.3% p.a.) and 2011-2022 (0.7% p.a.). In the last 12 years fisheries averaged just 0.5% p.a., while farms were a little better at 0.7% p.a.
- On a per tonne basis, since 1999, farm output fell 18% (-0.8% p.a.) while fisheries fell dramatically by 41% (-2.2% p.a.), reflecting the rising tonnage, particularly of sardines as feed. Since 2011, it is pleasing **to see farm outputs are now growing** at an average 0.9% p.a., while fisheries are still falling (-0.9% p.a.)
- On a per FTE basis since 1999, farm output grew strongly by 64% (2.2% p.a.) while fisheries more than doubled by 115% (3.4% p.a.). **Since 2011, it is pleasing to see both farm output/FTE (2.6% p.a.) and fishery output/FTE (1.9% p.a.) are now growing** strongly.
- The trends indicate that aquaculture delivers a higher output per tonne and per FTE for SA than wild fisheries. However, the impact of the large SA Sardine fishery that feeds the SBT farms has a significant dual impact on both sectors and needs to be considered in more depth in the analysis.

Chart 3.

- This chart compares seafood output per FTE trends (direct and indirect) by sector. The trend for farmed Output /FTE is more volatile than that for fisheries and may, given the lack of data points, mask any analysis.
- Since 1999, farms created higher direct output/FTE (fishing or on-farm, + downstream) per FTE than fisheries. In 2022 farms were at \$241,236 and fisheries were at \$177, 826. Since 2011, direct output/FTE have grown 3.9% p.a. on farms, and 2.3% p.a. in fisheries. Seafood **Direct output/FTE is rising - 1.6% p.a. (1999-2010) to 3.2% p.a. (2011-2022)**.
- Since 1999 indirect output/FTE has been rising at 3.0% p.a. but has been slower since 2011 (1.3% p.a.). The current rate of growth is similar for both sectors at 1.30%-1.38% p.a.
- Comparing Direct output/FTEs with Indirect output/FTEs, since 2011 the trend in direct output/FTE has increased (1.6% to 3.2% p.a.) while Indirect output/FTE has fallen (4.9% to 1.3% p.a.). **The big change since 2010 has been in farm direct output/FTE rising 3.9% p.a. reflecting integration of downstream process/value adding into farms.**

Chart 4.

- This chart compares seafood's contribution to Gross State Product per FTE trends (direct and indirect) by sector. The trend for farmed GSP/FTE is more volatile than that for fisheries and may, given the lack of data points, mask any analysis.
- Since 2011 **farms have been contributing more growth to both direct and indirect GSP/FTE than fisheries** – direct (6.3% V 3.3% p.a.) and indirect GSP/FTE (2.4% V 1.8% p.a.).