Cost-recovery Benchmarking for Fisheries and Aquaculture

Governing authority: Cost-recovery Implementation Committee (CRIC)

Agency: Department of Primary Industries and Regions (PIRSA)

Final Report

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I. Cartwright
K. Sainsbury

Executive Summary

South Australia has operated a cost-recovery system for commercial fisheries since the 1990s and aquaculture since 2009, requiring industry to fund relevant government services delivered by PIRSA. Although reviewed periodically, earlier reviews focused mainly on administrative processes rather than assessing whether the model remained appropriate, efficient, risk-based, or aligned with best practice.

In 2023, an Independent Cost-recovery Review supported cost-recovery in principle but found significant operational weaknesses and declining stakeholder confidence, calling for a "revise and reset" including independent benchmarking of science and compliance activities. PIRSA subsequently commissioned three independent benchmarking studies, overseen by the Cost-recovery Implementation Committee (CRIC). This Final Report synthesises those studies, highlighting common themes, assessing legislative alignment, and identifying priority reforms needed to improve the effectiveness and credibility of South Australia's cost-recovery framework and the services provided by it.

The benchmarking process was thorough, multi-layered and consultative, exceeding typical standards for cost-recovery reviews. It incorporated surveys, structured interviews, regional engagement, document review, and extensive interaction with PIRSA and SARDI staff. This approach built a shared evidence base and legitimacy across government and industry. The principal risk now lies not in consultation quality, but in whether findings are translated into tangible reform and thus improvement.

Across fisheries and aquaculture, the central weakness of the current system is generally a poor correlation between costs recovered from industry and some industry's ecological and compliance risk, industry value or production, and the costs recovered from industry. In practice, historical budgets and legacy issues or practices continue to drive cost allocation in many fisheries. This has resulted in:

- Over-servicing and high costs in some low-risk, highly compliant fisheries and aquaculture sectors.
- Insufficient differentiation between high- and low-risk activities.
- Weak incentives for industry investment in risk-reducing technologies and practices.

South Australia is among the most advanced Australian jurisdictions in activity-based compliance cost-recovery. However, stakeholders perceive unit costs to be high as well. This assertion is difficult to quantify, as different jurisdictions provide different services using different assets. The compliance report benchmarked the compliance effort (contacts per vessel per annum) against environmental status and compliance risks. This benchmarking shows inspection rates (compliance effort) to be broadly significantly higher than their peers. The work also showed that compliance effort did not relate to indicators of potential compliance risk, exploitation uncertainty or ecological risk. An adapted Risk–Catch–Cost-Compliance (ARCCC) framework was developed, showing a nil or very weak relationship between compliance risk and stock status versus compliance resourcing in most of the fisheries studied.

South Australia has a strong fisheries science capability, with extensive monitoring, assessments and ecological risk analyses. However, science costs per unit of industry value are high in several fisheries compared with other jurisdictions, and monitoring intensity is often driven by legacy practices rather than harvest strategy needs. Increased expenditure does not always translate into reduced risk or improved outcomes.

South Australia's aquaculture cost-recovery framework is more comprehensive and transparent than in other jurisdictions, but linkages between Ecologically Sustainable Development (ESD) risk ratings, management responses and cost allocation are weak. Some low-risk sectors continue to fund science and compliance activities disproportionate to current risk, while broader public-good science (e.g., climate and cumulative impact assessment) is partly funded by industry.

Cost-Recovery Implementation Statements (CRIS') are transparent compared to other jurisdictions with AFMA being the only other jurisdiction with a similar level of transparency. Despite this, stakeholders struggle to understand how costs relate to specific activities, staff effort, overhead allocation, and risk-reduction outcomes, which limits informed negotiation, accountability, and confidence in value for money.

South Australia's fisheries compliance and science costs are high in some cases, unevenly allocated, and more intensive than in comparable jurisdictions, with resources often misaligned to actual risk, stock uncertainty, and economic scale. While staff costs themselves do not appear excessive, some fisheries are over-serviced relative to their risk and value, indicating strong potential for cost reductions through targeted, risk-based reforms without undermining sustainability or regulatory integrity. Aquaculture compliance and science costs are transparent, proportionate, and low relative to production value, with differences from other jurisdictions largely driven by cost-recovery policy rather than regulatory burden.

Across fisheries and aquaculture, this report and the underlying benchmark studies identify a consistent reform direction:

- Adopt Risk–Catch–Cost (RCC) as the organising principle for science and compliance application and cost-recovery, resetting budgets from first principles rather than rolling forward historical arrangements. The compliance stream has gone as far as proposing budgets by fishery that are aligned with RCC.
- Reduce overall fisheries compliance effort substantially (by more than one-third but less than two-thirds) to improve ESD outcomes by reallocating compliance resources toward higher-risk and higher-exploitation-uncertainty fisheries. Several operational efficiencies are put forward to assist in achieving this.
- Leverage digital transformation as a substitute for some existing measures and practices, not an addition, to reduce compliance and monitoring costs where risk is demonstrably low. Be consistent in the application of technologies across fisheries.
- Align fisheries science investment with explicit risk-reduction and harvest strategy needs, using Management Strategy Evaluation to justify monitoring intensity and cost.
- Strengthen aquaculture risk-based prioritisation, explicitly linking ESD risk assessments to compliance and science effort, and using biomass and production metrics rather than licence counts alone.
- Improve cost transparency, including clearer reporting of specific activities, staff effort, overhead (including asset depreciation) allocation and the distinction between public-good and private-benefit services.
- Clarify the distinction between public and private benefits, ensuring that activities that deliver broad community or environmental monitoring or benefits are not inappropriately recovered from industry.

Although beyond the scope of this Report, there are other sectors such as recreational fishing and boating, along with other environmental and conservation sectors, which incur significant compliance, research, administrative and general management costs. These are currently met by the SA State Government via core funding, and this Report makes no recommendations in relation to

these costs. However, it is reasonable to suggest that the implementation of several of the recommendations relating to commercial fisheries and aquaculture in this Report will have application and therefore efficiencies and benefits for these sectors.

Conclusion

The benchmarking studies confirm that South Australia's fisheries and aquaculture are generally well managed and supported by strong institutional capability. However, the cost-recovery system has drifted away from its original rationale and legislative intent. A reset toward a more transparent, risk-based, and outcome-focused cost-recovery framework for compliance and science services is required to restore industry confidence, ensure value for money, ensure equitable treatment of fisheries, and align cost-recovery with the ESD objectives of the *Fisheries Management Act 2007* and the *Aquaculture Act 2001*.

Albeit central to achieving the goals of the cost-recovery 'revise and reset' programme, the benchmarking studies and associated recommendations are only part of the work needed to address the issues identified in the 2023 review. For example, the increasing cost of management in recent years combined with variable financial profitability mean that some industry sectors, including developing sectors and sectors with recently low profitability, are limited in their ability to meet cost-recovery. Cost-recovery in SA has already been applied across different sectors, but not through clear, transparent processes. There is scope to develop and apply better and more similar processes for cost-recovery across industry sectors.

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1. Introduction

In Australia, cost-recovery mechanisms for marine and terrestrial agriculture began in the 1980s. It was part of the 1992 Australian Inter-Governmental Agreement on the Environment to which all States and Territories were signatories, and it was included in the relevant legislation of all Australian jurisdictions. Australian jurisdictions implemented cost-recovery differently, including differences in its implementation within and between fisheries and aquaculture.

The South Australian fisheries cost-recovery process has been in place since the introduction of the state's Cost-recovery Policy in the 1990s, which requires commercial fisheries to contribute to the costs of government services provided by the Department of Primary Industries and Regions (PIRSA), including management, policy, research, compliance, and licensing. While the process was reviewed in 2009, 2015, and 2018, these reviews primarily examined administrative processes rather than the suitability or effectiveness of the cost-recovery model itself.

In 2023, the Minister commissioned an Independent Cost-recovery Review, which was conducted by the Independent Cost-recovery Review Panel (ICRRP). The Panel supported the principle of cost-recovery for both commercial fisheries and aquaculture but identified significant weaknesses in the system's operation. It recommended a "revise and reset" approach, including benchmarking PIRSA's compliance, research, and monitoring programs and costs.

In response, PIRSA commissioned benchmarking studies for fisheries and aquaculture. These studies form part of broader reforms recommended by the ICRRP. To oversee implementation, the Cost-recovery Implementation Committee (CRIC) was established, comprising representatives from PIRSA and Seafood Industry South Australia (SISA). Working with project leads, the committee initiated and funded three benchmarking studies covering commercial fisheries science, fisheries compliance, and aquaculture science and compliance.

In this report we summarise our view of the key processes, findings and recommendations of the three benchmarking studies. The individual benchmarking reports provide a wider and more detailed range of findings and recommendations than is summarised here, and these reports should be examined to obtain that detail. We considered how well these activities aligned with the South Australian fishery and aquaculture legislation, and make several broad recommendations based on that consideration.

2. Objectives of the overall benchmarking process

The primary objectives of the overall benchmarking process, drawn from the respective Terms of Reference (TOR) provided to the consultants, were to:

1. Evaluate current fisheries and aquaculture science and compliance frameworks and cost structures to determine if these are appropriate, risk-based and effective.
2. Ensure current fisheries and aquaculture science and compliance costs are transparent and aligned with best practice.
3. Identify efficiencies in current activities and future opportunities for modernisation, particularly through i) digital transformation (fisheries and aquaculture compliance), ii) innovation and new approaches to aquaculture and monitoring (aquaculture science), and iii) innovation and new approaches to stock assessment and monitoring (fisheries science).
4. Ensure compliance with legislation, confirming that science and compliance service provision aligns with the requirements of i) the *Fisheries Management Act 2007*, where the aquatic resources of the State are to be managed in an efficient and cost-effective manner and ii) the *Aquaculture Act 2001*, where the aquatic resources of the State are to be managed in an efficient and cost-effective manner.

This Final Report is structured around these primary objectives.

3. Purpose and structure of the final report

This report provides a high-level independent overview of the findings from the three benchmarking studies. It also provides observations and recommendations regarding the actions necessary to give effect to the recommendations therein. It does not seek to summarise in detail the findings and recommendations made by the authors of these studies.

The report is divided into the following sections:

- Consultation process for the benchmarking studies
- Context for cost-recovery in South Australia
- Assessment against the study objectives
- Other issues
- Implementing the recommendations of the studies
- Other matters
- Conclusions

4. Consultation Process

The three benchmarking studies drew on multiple lines of evidence, with this approach adapted to the services under review. These included literature reviews, including reports relating to previous cost-recovery reviews, service level agreements, Cost Recovery Implementation Statements (CRIS'), stock assessment reports, ecological risk assessments, BDO / EconSearch economic assessments and other relevant documentation.

Online surveys were distributed to licence holders and businesses across the fisheries and aquaculture sectors to identify issues, perceived value for money and priorities for further investigation. These survey findings were explicitly referenced in diagnostics and conclusions rather than treated as contextual background.

Structured interviews were held with individual fishers and aquaculture operators, industry peak bodies, PIRSA operational staff, and South Australian Research and Development Institute (SARDI) scientists and managers. The interviews included in-person regional visits, often with follow-up discussions. This process improved candour and practical insight.

In compiling the studies, the teams engaged extensively with PIRSA and SARDI staff to access operational data, understand historical policy settings and operational circumstances and test the feasibility of reform options. This engagement went beyond document review and included walkthroughs of systems and costing approaches.

Industry peak bodies and the CRIC provided valuable feedback on initial findings by the consultants, which were presented both at the fishery level and statewide. A similar process was followed by the aquaculture team.

Draft reports for each benchmark study were shared with the authors of this report for comment and suggestions. The final benchmark study reports were then provided to the CRIC.

5. Consultant teams

Ten consultants worked in three teams to produce the benchmarking studies. Team members represent decades of experience in their respective areas of expertise, and all have contemporary

experience in applying cost-recovery. Project leads Prof. Keith Sainsbury and Ian Cartwright worked with the three teams and the CRIC during the process of compiling the three benchmarking studies and prepared this Final Report

Table 1: Membership of benchmarking study teams. The leader of each team is underlined.

Benchmarking study	Team Members
Fisheries research, monitoring and assessment	Dr Ian Knuckey, Dr Tony Smith and Dr Paul McShane
Commercial fisheries compliance	Simon Boag, Dr Chantel Ford, Richard Wells (NZ) and Dean Baigent (NZ)
Aquaculture science and compliance	Dr Ian Dutton, Dr John Carragher and Dr Bess Ruff

The Project Leads reviewed drafts and provided feedback to consultants. An emphasis was placed on i) ensuring an adequate treatment of risk in determining an appropriate level and nature of science and compliance services through the application of a risk-catch-cost approach and ii) the application of Ecologically Sustainable Development (ESD) principles in the analysis.

The fisheries science and compliance studies covered all South Australian commercial fisheries for which SARDI provides monitoring and assessment and PIRSA compliance services: Abalone (Southern, Central and Western Zones), Blue Crab, Lakes and Coorong (finfish and pipi sectors), Marine Scalefish, Prawn (Gulf St. Vincent, Spencer Gulf, West Coast), Rock Lobster (Northern and Southern Zones), Sardine, Giant Crab, Vongole and Charter Boat[1]. The aquaculture study covered the oyster, mussel, finfish, southern bluefin tuna, and marine abalone sectors.

6. Context for cost-recovery

6.1 Rationale

The South Australian government imposes cost-recovery regimes for fisheries and aquaculture to ensure these industries are regulated fairly, sustainably, and efficiently—without placing the full financial burden on the general taxpayer. Specifically, the cost-recovery process seeks to achieve:

- Stable funding for core fisheries management, science and compliance.
- Drive for efficiency, which has seen the industry (and to some extent PIRSA and SARDI) incentivised to push harder for innovation when charges are visible and the services directly impact fishing and aquaculture businesses.
- Fairness, by creating a scheme based on a user-pays principle that transparently identifies industry sources of risk and beneficiaries from the use of a community resource (fisheries or lease area in the case of aquaculture).

Industry

The gross value of production (GVP) of the commercial industry has declined significantly since the introduction of cost-recovery; the GVP of South Australian commercial fisheries, expressed in 2024 values, has fallen by more than 50%, from $574 million in 2004/05 to $227 million in 2023/24[2]. With

[1] The availability of data and other constraints mean there was limited consideration of the Charter Sector and no meaningful recommendations on amending current cost-recovery arrangements were made.

[2] Economic indicators for the Commercial Fisheries of South Australia Summary Report 2023/24. A report for Department of Primary Industries and Regions 27 June 2025.

growing amounts of imported and aquaculture seafood available for Australian consumers, the commercial fishery has also been subject to a cost-price squeeze. These economic conditions have implications for cost-recovery, including the industry's ability to pay.

While the GVP of aquaculture production has fallen by 21% between 2022/23 and 2023/24 it is anticipated to grow by 28% in 2026/27 from $210 million to $293 million[3].

Although concerns have been expressed about the current cost-recovery regime, relationships between industry, scientists and managers in South Australia are relatively well-developed. There are continued efforts to improve stakeholder engagement with management decisions and to move up the co-management continuum towards industry-based decision making. Examples include delegation of some management responsibilities in the Spencer Gulf Prawn Fishery, and the creation of self-funding and management advisory committees in other sectors.

Benchmarking with other jurisdictions

The individual studies provide, where possible, detailed benchmarking of compliance and science cost-recovered services in fisheries and aquaculture against other jurisdictions. These details will not be repeated here, but across Australia cost-recovery in wild catch fisheries is partial, uneven, and highly jurisdiction-specific. Most jurisdictions recover some costs (licensing, access, limited compliance), but few recover the full costs of compliance and science, and fewer still do so in a transparent, activity-based manner. Other than the Commonwealth, there is more use by most jurisdictions of simpler licence or levy structures, including recovering a fixed % of GVP, rather than fishery-specific activity costing. Several jurisdictions (including Victoria, Northern Territory, and Tasmania) are currently reviewing existing or developing new cost-recovery regimes.

Overall, aquaculture cost-recovery in Australia is less developed and less consistent than for commercial fisheries, with South Australia having a well-developed system in terms of scope and maturity. Other jurisdictions tend to rely more heavily on lease and licence fees that have minimal direct recovery of compliance or science costs, resulting in heavy public funding of environmental monitoring and research.

Fisheries Compliance

South Australia is one of the most advanced jurisdictions in applying activity-based cost-recovery. It has nearly full cost-recovery for fisheries compliance and a cost-recovery intensity that is high relative to peers**.** Comparable Australian jurisdictions (e.g. NSW, WA, QLD) generally recover compliance costs only partially, they fund significant compliance effort from consolidated revenue, and they use simpler licence or levy structures rather than fishery-specific activity costing. The Commonwealth does not recover most of their compliance services from industry.

Inspection rates and compliance contacts in South Australia are materially higher (per vessel) than most Australian and NZ comparators. Cost-recovery is decoupled from, or has a weak relationship to, demonstrated compliance risk and stock exploitation uncertainty in three quarters of the fisheries considered. This has resulted in general over-servicing in low-risk fisheries given the weak or non-existent correlation between compliance fees, risk and exploitation uncertainty.

Several recommendations for efficiencies with regard to technology, use of inspection vessels, threatened, endangered and protected species (TEPS) reporting and compliance tolerances were put forward to assist in the significant overall reduction in compliance services recommended.

[3] Economic Indicators for the Commercial Fisheries of South Australia Summary Report 2023/24. A report for Department of Primary Industries and Regions 27 June 2025.

Fisheries Science

South Australia recovers a substantial share of fisheries science costs directly from industry through CRIS arrangements. Relative recovered costs in South Australia exceed those in most other Australian jurisdictions, which rely more heavily on general government funding and use Fisheries Research and Development Corporation (FRDC) levies as the primary industry contribution to research, but not for core monitoring and assessment. South Australian fisheries are generally well monitored, often exceeding national norms in the frequency of fishery-independent surveys and the breadth of ecological risk assessment. However, costs per unit of GVP are high in several South Australian fisheries compared with interstate equivalents, and some fisheries (e.g. rock lobster, sardine) are serviced at a higher cost relative to comparable jurisdictions without a commensurate risk reduction. In summary, South Australia sits at the upper end of the national spectrum for fisheries science cost-recovery, with strong transparency but mixed cost-effectiveness across fisheries when benchmarked.

Aquaculture Compliance

Other states (NSW, QLD, WA) recover little or none of aquaculture compliance costs beyond basic permitting. While South Australian costs are reasonably transparent and activity-based, compliance costs are relatively low, albeit not consistently risk-weighted across the aquaculture sectors. There is considerable scope for SA to improve and apply transparent, risk-based compliance approaches across all aquaculture sectors. This would help to achieve several of the issues identified by the consultants' reports, including costs not being directly linked to risk, the need to reflect risk adequately in developing sectors that may have high or low risk, the persistence of high compliance costs in sectors that have decreased their risk, and the apparent cross-subsidy of costs between different aquaculture sectors. The combination in South Australia of many developing aquaculture sectors alongside many well-established sectors makes this an important issue to address.

Aquaculture Science

South Australia's cost-recovery for aquaculture science is in place for some mature, high-value sectors (tuna, finfish), which are the only two sectors from which science costs are recovered. The issues to address in aquaculture science are similar to those described above for aquaculture compliance, with the need to link the science to the risk while also accounting for the sector's development. In addition, the science work for each sector needs to be recognised, transparently analysed and addressed in a manner that is adequately balanced across the sectors. There are situations in which some science needed across several aquaculture sectors (e.g., carrying capacity, spatial zoning, biophysical models) is funded primarily by a small group of sectors, and the models' results are not publicly available. These challenges can be better addressed through transparent and balanced decision processes, and cost-recovery may be differentially applied to different sectors if that is necessary to encourage development (e.g. oysters) or obtain benefits from more developed aquaculture sectors (e.g. finfish). A key point is the use of transparent, balanced decision-making processes based on the goals of aquaculture production in South Australia. National benchmarking shows no other state approaches South Australia's transparency or scope, though Tasmania is moving in this direction for salmon.

7. Overarching themes and recommendations

7.1 Risk catch cost framework

To determine whether fisheries and aquaculture science and compliance frameworks and cost structures are appropriate, risk-based, and effective, the three studies were required to use a risk-catch-cost (RCC) framework. In simple terms, the framework is based on the principle:

If risk or uncertainty is high, managers must either accept lower catch/production or invest more in compliance/science. If risk is demonstrably low, costs should fall.

RCC is usually applied to the full fishery or aquaculture sector, so that the full cost of management, financial return to the industry and the combined risk can be evaluated. This combined approach to RCC supports decision making for the full fishery or aquaculture operations, even if there are differences in the detail of how the risk, return and cost are calculated for these operations. The current benchmarking studies required that the RCC be applied separately to the compliance and science aspects of commercial fisheries and aquaculture. This approach is valid because each of these aspects can be examined separately, but it does not encompass all the aspects of RCC that would be included if the full operation was evaluated. For example, it does not include all aspects of management in either fisheries or aquaculture.

The results of the RCC conducted by the benchmarking teams are reported here. The key failure identified in South Australia is weak correlation between these three variables in practice, particularly for compliance and for some science programs.

Fisheries Compliance

The compliance study adapted the RCC model into the innovative "Assessment of Risk-Catch-Cost of Compliance" **(ARCCC**) that redefines the parameters as i) the relative compliance **risk**, ii) **catch** as measured (scored) by the stock exploitation level and uncertainty and iii) **cost** per active licence. Applying the ARCCC identified those fisheries (outliers) that did not conform to the above principle, and helped to inform further consideration of why they were outliers.

Overall, RCC principles are not being applied consistently in South Australia. There is a lack of a transparent and risk-based foundation, resulting in compliance resources being allocated in ways that often contradict risk-based and ESD-aligned logic. This has led to overservicing in several fisheries that have persisted, despite high industry professionalism, very low serious non-compliance, widespread stewardship and some third-party sustainability certification.

Fisheries that invest in VMS, electronic reporting, and monitoring have not received commensurate reductions in compliance cost, undermining incentives. Continued misalignment with the ARCCC model weakens trust and system integrity, frustrates the industry, damages inter-fishery equity, and erodes confidence in South Australia's fisheries management system.

Key recommendations are:

- Rebuild compliance budgets from first principles using the ARCCC model, across all fisheries; the report provides potential budgets by fishery, which can be adopted or adapted.
- Reduce overall compliance effort by more than one-third but less than 61%.
- Achieve efficiencies by applying technologies across all fisheries (not some), using TEPS investigations.
- Reallocate compliance resources toward higher-risk, higher-uncertainty fisheries, not to historically over-serviced fisheries. Doing so addresses ESD weaknesses in some fisheries.
- Use RCC as a guiding dynamic incentive mechanism, rewarding with lower long-term compliance costs those fisheries with lower compliance risk and improved stock certainty.

Fisheries Science

The study adopted RCC as an evaluative framework to test whether i) **risk** to stock sustainability and ecosystems, ii) **catch** outcomes expressed in biological and economic returns, and iii) **costs** of monitoring, assessment, and research recovered from industry are proportionate, efficient, and aligned with the risks faced by individual fisheries and the benefits derived from them**.** The framework supports decision-making under cost-recovery by explicitly linking scientific effort to sustainability risk, harvest outcomes and economic value. This approach tested whether science investment is justified and whether equivalent or lower risk could be achieved at lower cost or with different monitoring designs.

Application of the RCC framework indicated that science investment is not consistently scaled to risk or value across fisheries. This results in some fisheries with relatively low or moderate biological risk incurring levels of monitoring and assessment expenditure comparable to those applied to higher-risk fisheries. Conversely, in some fisheries with elevated risk or depleted stocks, higher research costs made little difference in reducing risk. Increased monitoring and assessment expenditure has not automatically translated into improved stock outcomes**,** indicating that better outcomes could be achieved with lower cost and lower assessment frequency or different data monitoring and assessment regimes. The RCC framework does not support uniform or across-the-board cost reductions, and in some fisheries (e.g. high-risk or short-lived stocks), reductions in monitoring effort would likely increase the probability of adverse outcomes beyond acceptable limits. In other fisheries, changing monitoring frequency, assessment intensity or survey design could be modified without materially increasing risk, provided harvest strategies are adjusted accordingly.

Monitoring and assessment costs are often driven by legacy practices rather than the explicit needs of harvest strategies**.** Management Strategy Evaluation (MSE), can clarify acceptable levels of risk, define information requirements more precisely, and enable cost-effective trade-offs between monitoring intensity and harvest outcomes. The concept of 'acceptable risk' will most likely vary between industry and government.

Consideration should be given to replacing bespoke stock assessment models with widely used and supported model frameworks such as Stock Synthesis (SS)3.

Key recommendations are:

- Risk–Catch–Cost analysis should become a core principle in determining science investment under cost-recovery.
- Science programs should be demonstrably linked to risk reduction and harvest strategy performance, rather than historical practice or uniform service levels.
- Management Strategy Evaluation should be routinely applied to test RCC trade-offs and to justify the scope and cost of monitoring and assessment programs.
- Greater transparency is required in explaining how recovered costs relate to risk management objectives and expected benefits.
- In some cases, reduced catch or acceptance of higher short-term risk may be preferable to unsustainably high costs, particularly where economic viability is threatened.

Aquaculture

The study adopted RCC as a guiding lens rather than a formal calculation rule. The RCC principle is used to argue for dynamic, evidence-based reprioritisation of cost-recovered activities over time. It defines risk as the primary driver of management effort, using an Ecological Sustainable Development (ESD) risk assessment as the foundation for deciding where to focus science and compliance efforts. Higher-risk sectors, zones, or practices should attract greater regulatory attention and higher cost-recovered effort, while low-risk, mature, and compliant sectors should

attract less. **Catch** (production) is used as a proxy for impact, recognising that biomass, stocking density, and intensity of farming activity (rather than licence numbers alone) are more accurate indicators of environmental risk and compliance burden. **Cost** is framed as a function of **risk** and the required management response, and not simply as a function of historical budgets or a sector's ability to pay.

The study identifies several structural gaps between principle and practice. There is a weak linkage between ESD risk ratings and the applied management and cost-recovery. So, while PIRSA has an ESD risk framework, its translation into cost and effort allocation in the aquaculture sector is weak and inconsistent. Although PIRSA undertakes detailed ESD risk assessments, the "Likely Management Response" statements for High and Extreme risks are vague and non-binding, making it unclear how risk ratings translate into additional effort or cost. Conversely, some low-risk sectors continue to fund science and compliance activities at levels that appear disconnected from their current risk profile. That said, the overall compliance program for the entire aquaculture program is very low and the science programme applies only to the tuna and kingfish sectors.

Compliance resources are thinly spread and historically patterned, rather than being actively reallocated toward higher-risk sectors or emerging issues. Production metrics (biomass, feed input, intensity) are not consistently used to trigger changes in management cost or oversight. This weakens the economic logic of cost-recovery and undermines industry confidence in fairness.

Key recommendations are:

- Make greater use of risk-based management to drive cost-recovery by explicitly determining which sectors should receive more science effort, where compliance resources are to be concentrated, and to reset cost-recovered budgets each CRIS cycle.
- Avoid rolling over static or historically derived costs, particularly in mature sectors with stable or declining risk.
- Reset base budgets using risk-weighted logic rather than historical precedent.
- Ensure biomass/production metrics play a stronger role in cost logic and shift management triggers towards biomass density and production forecasts, which better reflect real environmental and compliance risk.

7.2 Cost transparency and alignment with best practice

Annual Cost-Recovery Implementation Statements (CRIS') provide a formal mechanism for disclosing recovered costs and planned work programs and, relative to other jurisdictions except for the Australian Fisheries Management Authority (AFMA), provide a high level of transparency. That said, there are some useful recommendations made in the three studies that would improve transparency, including listing staff FTE by function, providing clarity on overhead allocation methodology and cost by fisheries science activity (assessment, surveys, ERA, reporting).

Fisheries compliance

The fisheries compliance report identifies the drivers of compliance costs as inspection rates, asset depreciation and cost-of-capital charges, overhead recovery and fishery officer pay rates (and days worked per annum). Attributions to individual fisheries are on the basis of fully-loaded 'FTE' officer days per annum. Compliance levies were analysed by the project at the fishery level via a wide variety of metrics including; per active licence, per vessel, and alternative metrics such as per unloading. This provided insight into the relativity of fees by fishery. Using the ARCCC model described above, compliance costs were compared against their expected relationship with compliance risk and stock exploitation uncertainty, with the assumption being that riskier fisheries

should receive more compliance focus. There are resultant “conforming” and “outlier” fisheries, highlighting where current cost-recovery arrangements depart from rational expectations.

Overall, implementing the study's recommendations regarding alignment of compliance effort with risk and exploitation uncertainty (i.e. compliance management working with fisheries management) will strengthen cost-recovery arrangements by making compliance costs visible, explainable and contestable, while aligning future cost allocation with risk-based, proportionate and internationally recognised best practice. Implementation will move the application of cost-recovery away from historical precedent towards an evidence-based framework that incentivises compliance. Ultimately, fisheries that can lower risk, develop better data, uptake digital technologies, improve compliance performance and increase exploitation certainty can lower compliance cost. This is in line with the South Australian Act’s main objective of ecologically sustainable development.

The study explicitly draws on recognised models such as Braithwaite’s responsive regulation and harm-based compliance principles. Reinforcing proportionality but also encouraging PIRSA’s current behaviours of escalation and behavioural change rather than purely enforcement-driven activity. Adopting a risk-based, proportional framework as recommended under the adapted RCC model above (the RCCC model), reflects contemporary regulatory best practice by aligning compliance effort and cost with compliance risk and stock-exploitation uncertainty, rather than applying uniform or historically fixed levies.

Efficiencies, including consistent digital transformation across fisheries, development of appropriate compliance tolerances and an alternate approach to TEPS investigations (such as electronic monitoring), are covered elsewhere in this final report. These efficiencies will contribute to significant changes in compliance focus and a reduction in recovered costs.

Fisheries science

Fishery science costs in South Australia are more transparent than other jurisdictions but in several fisheries exceed what industry considers reasonable, affordable, or expects under an activity-based cost-recovery model. Transparency is considered relative rather than absolute: the mechanisms exist, but they do not yet provide clarity at a level that supports trust, scrutiny, or informed negotiation.

Because science costs are reported in aggregate, the reviewers found it challenging to conduct a detailed analysis at the fishery level to determine how much is spent on specific activities (e.g., fishery-independent surveys vs. stock assessment vs. logbook management) and which costs are core monitoring requirements versus discretionary or legacy activities. In addition, the inability to link explicit FTE and overhead reporting to specific functions and activities, or to individual scientists, prevented an independent assessment of whether costs are efficient or excessive, even when total costs are disclosed.

South Australia’s fisheries science cost-recovery system is transparent in form, but not yet transparent enough in substance**.** Closing that gap—by making science costs traceable, intelligible, and defensible at the activity level—is necessary as a prerequisite to restoring industry confidence and aligning practice with best-practice cost-recovery principles.

Aquaculture

Industry cost-recovery in South Australia is well documented relative to other jurisdictions. It is activity-based, with costs clearly allocated across defined programs (science, compliance, licensing/business services, management and legislation). Stakeholders struggle to understand the full funding picture, particularly the scale and role of government appropriations and co-investment. and although data are available, budget and finance material is difficult for non-specialists to interpret.

Best practice would be achieved by "resetting" cost-recovery as industries mature, technologies change, and risk profiles shift. Explicit policy guidance on partial or deferred cost-recovery for new or emerging aquaculture sectors is recommended, as it is common in leading international systems. Best practice also requires clear communication of how review recommendations are actioned over time.

7.3 Efficiencies in current activities and future opportunities for modernisation

Fisheries compliance

Benchmarking indicates that significant efficiency gains are available through reducing: i) routine physical compliance activities, particularly at-sea inspections where effective digital monitoring is already in place, ii) duplicate or low-value compliance interactions in consistently compliant fisheries, and iii) uniform application of compliance intensity across fisheries with very different risk profiles. Overall compliance effort directed at the commercial sector could be reduced by between 30% to 61%, while still maintaining a compliance presence above peer benchmarks. This approach aligns with the concept of "optimal compliance", where resources are directed to maintain non-compliance at acceptable levels rather than attempting to achieve perfect compliance at high and disproportionate cost given diminishing marginal returns on effort expended.

As discussed in section 7.1 above, applying the ARCC (risk-catch-cost-approach) allows Monitoring, Control, and Surveillance (MCS) services to be more precisely targeted. Under such an approach, fisheries with higher uncertainty or higher ecological and compliance risk would attract proportionally greater MCS effort, while low-risk, high-compliance fisheries would benefit from streamlined oversight and reduced costs.

The introduction of digital transformation offers the single largest opportunity to improve MCS efficiency. These include:

- Use of a Vessel Monitoring System (VMS) which would significantly reduce the need for hail-in/hail-out reporting, enable spatial compliance verification, and support intelligence-led compliance. Full implementation across fisheries would materially lower compliance risk and physical inspection requirements. VMS data can also be used for research and assessment purposes relating to fine scale spatial fishery dynamics.
- Full implementation of Electronic Logbooks (eLogs) and Electronic Catch Disposal Records (eCDRs) to improve data timeliness, accuracy, and auditability while reducing administrative burden and manual verification costs. Partial implementation has already occurred.
- Camera-based electronic monitoring (EM) already provides scalable oversight of fishing and unloading activities, particularly in one high-volume or high-risk fishery. Where cost-effective, EM can substitute for human observers such as in the Sardine Fishery and reduce at-sea enforcement activity.
- Digital Unloading Verification (e.g. RFID and camera systems) technologies are already in place to some extent. They improve traceability and reduce the need for on-site inspections, particularly in fisheries with frequent unloading events.

While these digital tools have been increasingly adopted, the expected downstream reductions in MCS cost as compliance risk decreases, have not consistently occurred. To realise efficiency gains, digital adoption must be explicitly linked to reduced inspection frequencies and simplified reporting requirements. These, in turn, will lead to lower compliance levies. Without these linkages, digital systems risk becoming additive rather than substitutive, increasing costs and layers of regulations rather than reducing them.

The benchmarking review demonstrates that South Australia's fisheries are well managed and generally compliant, but that MCS services are delivered at a higher intensity and cost in other jurisdictions and as necessary in many fisheries. Significant efficiencies can be achieved by:

- Reducing routine physical compliance effort.
- Embedding genuine risk-based allocation of MCS resources.
- Fully leveraging digital technologies as substitutes, not supplements.
- Aligning cost-recovery outcomes with demonstrated reductions in risk and uncertainty.

Modernising MCS through digital innovation is not primarily a technology challenge, but a governance and implementation challenge. When paired with clear incentives and transparent cost-recovery, digital MCS systems offer a pathway to lower costs, stronger compliance outcomes, and enhanced confidence for industry, regulators, and the broader community.

Fisheries science

A central efficiency issue is the mismatch between the scale of science investment and the risk and value profile of individual fisheries. Despite low potential risk, some small or low-value fisheries incur monitoring and assessment costs comparable to those applied to larger, higher-value fisheries. This has led to perceptions of over-provision and reduced value for money, particularly where research costs represent a high proportion of gross value of production (GVP).

Fishery-independent surveys are a major strength of South Australian fisheries science, but they are also a major cost driver. Conducting annual surveys may not always be necessary, particularly for stable stocks, and their design is not always well aligned with harvest strategy requirements. For some fisheries, efficiencies could be obtained by adjusting survey frequency, improving design efficiency, and adopting risk-based approaches without materially increasing stock risk.

Monitoring programs are heavily weighted toward biological data, with weaker integration of environmental, economic and social information. In addition, limited access by industry to underlying datasets reduces opportunities for co-management and industry-led efficiency gains.

While maintaining core capability within SARDI is important, selective use of alternative providers for non-core assessment and monitoring or specialist services may introduce competitive pressure and innovation. Mixed-provider models, used in other jurisdictions, can improve efficiency where governance and quality assurance are strong, although transaction and continuity costs must be carefully managed.

Programs such as the Fishing Vessels as Ships of Opportunity (FishSOOP) demonstrate how commercial vessels can collect environmental data (e.g. temperature, salinity) at relatively low cost. Expanding such initiatives would improve understanding of climate and environmental drivers while avoiding the need for dedicated research platforms.

Efficiency gains can also be realised through modernising assessment approaches including:

- Wider use of integrated models (e.g. Stock Synthesis) can reduce duplication across fisheries and improve consistency.
- Application of simpler assessment models (e.g. surplus production, length-based models) can provide adequate assessments for data-limited fisheries at lower cost.
- Management Strategy Evaluation (MSE) can be used to explicitly test the cost-effectiveness of alternative monitoring and assessment regimes.

These changes will allow science effort to be better matched to management need and risk.

Changes to the industry-perceived monopoly provider model using a limited mixed provider, e.g. by enabling a process for external providers to bid for some science services, could offer some

efficiencies, particularly where capability or capacity in SARDI is limited, or research is outside core monitoring and assessment functions, which are retained

There is substantial scope to modernise fisheries science delivery through digital innovation and new technologies, with the potential to improve both efficiency and effectiveness. These technologies can be deployed in a risk-based manner, targeting fisheries or sectors where uncertainty is greatest, thereby optimising cost-effectiveness.

These include:

- The transition from paper to electronic logbooks (i.e. electronic reporting or ER) is already improving efficiency but it remains incomplete. Full adoption across all fisheries would: reduce data processing costs; *i*mprove spatial and temporal resolution of catch and effort data; and enable near-real-time access to information for industry and managers.
- Electronic logbooks also provide a platform for better recording bycatch, discards and interactions with endangered, threatened and protected species at a lower marginal cost than traditional observer programs.
- VMS and remote electronic monitoring (REM), combined with AI-based image recognition is already well developed in other fisheries and jurisdictions. It offers significant efficiency gains by reducing reliance on human observers; providing more comprehensive coverage of fishing activity; and improving the quality of bycatch and compliance data.

Digital access to data and clearer feedback loops between monitoring, assessment and management decisions would support stronger co-management arrangements. Industry participation in data collection and interpretation can improve both efficiency and legitimacy of cost-recovered services.

Aquaculture

As noted above, compliance efforts in the aquaculture sector are relatively low but not consistently allocated in proportion to sector-specific or spatial risk. Increased science and compliance is needed in some sectors. Focusing compliance in areas of higher risk would increase efficiency and reinforce the principle that cost-recovered services should be commensurate with risk and regulatory need. Science investments in some sectors (notably oysters) are constrained by legacy approaches rather than contemporary data needs.

Compliance and science service delivery efficiency is impacted by fragmented data and information systems. Multiple internal databases limit the visibility of licence holder interactions across PIRSA units and so compliance officers lack real-time access to integrated licence, biomass, and environmental data. Reporting obligations for industry are often duplicative and manually intensive. These inefficiencies increase administrative costs for both government and industry without improving regulatory outcomes. There is also a need for innovation in other areas of aquaculture science, including emerging sectors such as integrated multi trophic aquaculture (IMTA) and greater collaboration with interstate and global peers to develop projects that would use the limited industry funds, leveraged with FRDC and state contributions to address common research questions

Compliance activities remain heavily oriented towards periodic inspections and audits, and the manual verification of licence conditions. There is limited use of predictive or preventative compliance tools that could reduce costs by identifying emerging risks before non-compliance occurs.

There is scope for improved efficiencies. For example, a single source of information for licence, compliance, science and engagement interactions would (i) reduce duplication and deliver efficiency gains across PIRSA business units, (ii) improve transparency and responsiveness in government–industry engagement and (iii) enable better tracking of service delivery against cost-recovered expenditure.

Opportunities exist to leverage existing science investments more efficiently by:

- Integrating environmental monitoring, oceanographic models and operational data to inform dynamic risk assessment.
- Using digital dashboards to prioritise compliance efforts spatially and temporally.
- Applying remote sensing and automated monitoring technologies where appropriate to reduce reliance on manual sampling.

Targeted use of such tools would improve both the effectiveness and cost-efficiency of science programs.

Improved Aquaculture Risk Assessment and Prioritisation Planning would explicitly link risk assessment to service delivery planning, enabling PIRSA to better align costs and the allocation of compliance and science resources with regulatory needs and avoid over-servicing low-risk activities.

Digital transformation tools provide significant potential to modernise compliance delivery and achieve efficiencies Such tools would shift compliance from a labour-intensive inspection model toward a more automated, risk-based approach.

Compliance activities are limited, with generally high industry adherence to regulations. Resource allocation is not based on systematic risk assessment, especially for the oyster sector, and compliance staff lack adequate training in aquaculture generally. There is a need for more emphasis on staff capacity building and improved grower engagement as well as more targeted risk-based and sector-specific compliance planning, and improved digital tools for monitoring and reporting.

Key opportunities include:

- Digital compliance reporting portals enabling real-time submission of biomass, stock movements and operational plans.
- Mobile tools for Fisheries Officers to access licence conditions, risk profiles and historical compliance data in the field.
- Standardised digital SOPs, particularly for oyster biomass estimation, to improve consistency and reduce officer training costs

7.4 Compliance with legislation

Fisheries are legislated through the South Australian *Fisheries Management Act 2007* and aquaculture operations are legislated through the South Australian *Aquaculture Act 2001*. The alignment between the benchmarking studies and the two acts was examined and is summarised here. The benchmarking reports for fisheries and aquaculture showed that the two industries are at different stages of development, and while there are similarities in the two governing Acts there are also differences between them. It should be noted that while fisheries are harvested by the commercial, recreational, and indigenous sectors, cost-recovery is applied only to the commercial sector, with government providing funding for other sectors.

Fisheries Management Act

Risk-based proportionality is an appropriate organising principle for cost recovery, noting that Section 7(1) of the Act gives primacy to ecologically sustainable development (ESD) as the overarching objective of fisheries management and a risk-based approach to science and compliance expenditure ensures that resources are targeted to where sustainability risks are greatest. Section 7(3) explicitly requires value for money and accountability, which is satisfied when costs recovered from industry are demonstrably proportionate to biological, ecological and exploitation risk.

The Act (Sections Section 7(1)(a)–(c) and Section 7(3)) supports separating public-benefit activities from private cost recovery to ensure ESD is pursued equitably. Recovering the former costs from

industry conflicts with Section 7(1)(d), which requires fisheries to benefit the whole community, and risks undermining economic sustainability, contrary to ESD principles. Clarifying public-good versus private-benefit activities and funding public goods outside cost recovery should address this issue.

This Final Report and the reports of the benchmarking studies address other key aspects of the Fisheries Management Act, including:

- Incentivising the adoption of technologies (e.g. electronic logbooks, VMS, EM) that reduce compliance and sustainability risk supports ESD by improving certainty and reducing unnecessary regulatory burden.
- Transparent attribution of costs enables licence holders to understand how recovered funds support sustainability outcomes, reinforcing accountability and informing participatory management
- Incorporating economic sustainability into cost-recovery decisions aligns with the provision of economic, social and physical well-being and the creation of viable fisheries and thriving coastal communities.
- Adaptive and, where appropriate, contestable service delivery can support statutory objectives of efficiency, accountability and sustainability.

A table summarising the above is provided below:

Table 1: Mapping Cost Recovery Benchmarking topics with sections of the Fisheries Management Act 2007[4]

Benchmarking topic	**Relevant Act Sections**	**Core Statutory Objective Supported**
Risk-based proportionality	s7(1), s7(3)	ESD; value for money
Public vs private benefit	s7(1), s7(3)	Community benefit; equity
Incentivise risk reduction	s7(1), s7(3), s7(5)	ESD; participation
Transparency and stakeholder engagement	s7(1), s7(3), s7(4), s7(5), s20	Accountability
Economic & social sustainability	s7(1), s7(3), s7(5)	Viable fisheries & communities
Adaptive/contestable delivery	s7(3), s7(5), s12, s20	Efficiency & responsiveness

Science

South Australia has generally strong ecological information, supported by long-term monitoring, fishery-independent surveys (FIS), stock assessments and ecological risk assessments (ERAs). However, there are several ESD weaknesses in science delivered under the current cost-recovery model. These include:

[4] Tables 1 and 2 provide a general indication of how cost recovery and the issues and recommendations of the benchmarking study align with the fisheries and aquaculture legislation. There is considerable interaction between different parts of the legislation, a comprehensive alignment of the linkage between the legislation and cost recovery is beyond the scope of the current comparisons, and so the mapping in Tables 1 and 2 is not exhaustive.

- As noted in the RCC section of this report (Section 7.1 above), there is a mismatch between risk and expenditure: some fisheries incur high monitoring and assessment costs despite low or stable ecological risk, while others face high biological or environmental risk without commensurate investment.
- Several fisheries continue to rely on catch per unit effort (CPUE) as an index of abundance despite evidence of CPUE hyperstability in all fisheries where hyperstability was examined (most South Australian fisheries). This undermines confidence in stock status estimates and harvest strategy outcomes for those fisheries that rely primarily on CPUE.
- There is insufficient integration of climate and environmental drivers, despite growing evidence that climate variability and extreme events are affecting productivity.
- Under-investment in TEPS, bycatch and ecosystem monitoring relative to their public-good nature, noting the need for careful consideration of cost-recovering such investment.
- While economic sustainability is explicitly analysed through the BDO reports[5] , it is not adequately reflected in cost-recovery decisions**.**

A further weakness identified in the Science report was poor monitoring of recreational fishing. While this monitoring is not subject to cost-recovery from commercial fishers, its weakness does undermine management of many shared resources.

While the means to address these weaknesses are reflected in the detailed sector studies, it will be necessary to demonstrate that costs recovered i) reflect intensity and frequency of monitoring and assessment, and ii) are demonstrably proportionate to ecological risk and management need. Periodic risk–cost–catch review will allow for reductions in monitoring frequency where stocks are stable and risk is low, with corresponding harvest strategy safeguards. It would also prevent the default continuation of high-cost programs.

As noted above, carefully designed contestability can support, rather than undermine, statutory objectives of efficiency, accountability and sustainability

Fisheries compliance

Current compliance cost-recovery arrangements do not consistently reflect ESD as a risk or aim and are generally operationalised through somewhat blunt effort measures, resulting in several fisheries with relatively low ESD risk and high compliance performance facing disproportionately high compliance levies. Conversely, while some higher-risk fisheries pay less than expected. This misalignment undermines the credibility and legitimacy of cost-recovery as being risk-based and reduces incentives for industry to invest in ESD-enhancing measures (e.g. digital or mitigation technologies, training).

To better reflect ESD, **f**uture fisheries compliance cost-recovery arrangements should be explicitly based on a risk-weighted framework, such as the proposed ARCCC model. This framework should include the following actions:

- Compliance budgets to be reset periodically from first principles and revisited, not simply rolled forward.
- Clear linkage established between stock exploitation and uncertainty, Compliance risk (including TEPS exposure) and compliance levies charged.
- Transparent publication of how ESD risk informs cost allocation at the fishery level.

[5] Noting that South Australia has the most detailed and comprehensive (coverage and time series) economic data set for fisheries and aquaculture in Australia.

- This reform would align cost-recovery with the Act's priority ESD objective, while preserving proportionality and fairness.
- There is a need to shift from the activity-based cost-recovery of inputs (officer days, patrol vessels, inspections) to outcome-based compliance funding. Such a shift would
    - Recover costs based on ESD outcomes required**,** not routine effort.
    - Recognise that in low-risk, high-certainty fisheries, fewer interventions may be sufficient to meet ESD obligations.
    - Explicitly adopt the concept of "optimal compliance" via the introduction of tolerances**,** rather than implicit expectations of near-perfect compliance.
    - Materially reduce the risk of over-servicing compliant fisheries without compromising sustainability

Aquaculture Act

Under the South Australian *Aquaculture Act 2001,* ESD is a core object and fundamental framework guiding how fisheries and aquatic resources are managed in the State. The Act expressly states that one of its primary objects is to protect, manage, use and develop the aquatic resources of South Australia in a manner consistent with ESD, explicitly in terms of sustainability, safeguarding ecological processes and balancing economic and community needs. Additionally, the Act requires maximising benefits to the South Australian community and ensuring aquaculture is managed in an efficient and effective regulatory framework.

There have been a number of weaknesses in the current aquaculture cost-recovery framework identified, namely:

- The translation of ESD risk ratings into management responses is often weak, particularly for risks rated "High" or "Extreme", creating a gap between legislative intent and cost-recovered regulatory effort.
- Cost-recovery levels do not consistently reflect differential ESD risk between sectors or changing environmental pressures.
- Activities addressing broader environmental risks (e.g. climate change, harmful algal blooms, cumulative impacts) are partly cost-recovered despite delivering benefits beyond licence holders, raising questions of alignment with cost-recovery principles under the Act.
- Industry cannot readily distinguish between industry-funded and government-funded activities nor clearly link fees paid to regulatory outcomes.
- There are significant science deficiencies in the oyster sector where habitat and disease effects are high, contrasting with stronger science investment in tuna and finfish sectors
- Lack of explicit mechanisms to moderate cost-recovery charges for emerging or transitional industries, potentially discouraging innovation, contrary to the Act's objects

The broad recommendations in this Final Report and those in the studies will address these key aspects of the Aquaculture Act, including:

Table 2: Mapping Cost-recovery Benchmarking topics with sections of the Aquaculture Act 2001

Benchmarking topic	Relevant Act Sections	Core Statutory Objective Supported
Risk-based proportionality	s.7(1); s7(3); Part 4; s.59 Part 8	ESD; effective and effective regulation
Public vs private benefit	s.3(b); s.3(c); Part 5; s.59	Community benefit; equity
Incentivise risk reduction	s.3(a); s.3(c); Part 4; Part 8	ESD; effective and effective regulation
Transparency and stakeholder engagement	s.3(b); Part 6); s.59; s.3(c)	Community benefit; effective and effective regulation
Economic & social sustainability	s.3(a); s.3(b); Part 4; Part 5	ESD; community benefit

Aquaculture management

Science and compliance recommendations on aquaculture benchmarking study, similar to those in fisheries, are framed around ESD-based assessment, with sector-specific risk profiles (tuna, finfish, oysters, mussels, abalone) are analysed to identify material environmental risks**,** including habitat effects, disease management, water quality, and biosecurity. Implementing these recommendations should result in risk-based allocation of science and compliance effort, ensuring management intensity is proportional to environmental risk

The aquaculture cost-recovery regime should be recalibrated to ensure it more explicitly, transparently and defensibly supports the ESD objects of the *Aquaculture Act 2001*. This recalibration should explicitly link ESD risk profiles to compliance and science effort. The recalibration should include any expected or past changes in industry behaviour and in environmental/sustainability outcomes.

Targeted, peer-reviewed science programs are required to reduce uncertainty and inform precautionary production limits, particularly where risks are ranked High or Extreme. For compliance, Risk-based compliance prioritisation through an annual Aquaculture Risk Assessment and Prioritisation Plan (ARAPP)**,** emphasises efficiency gains through better targeting**,** not increased regulatory intensity.

Adopting these reforms would strengthen the legal defensibility, environmental credibility and social licence of South Australia's aquaculture cost-recovery framework. They would ensure that cost-recovery operates not only as a budget mechanism, but as a direct and transparent instrument for delivering the ESD intent of the Aquaculture Act, consistent with the recommendations of the benchmarking study.

8. Recovered costs

Fisheries compliance

PIRSA recovers compliance costs from commercial fisheries through activity-based costing of fully costed compliance officer days (FTE days). These costs are substantial in absolute terms and have remained largely stable (CPI increases excluded) over the last six years for most fisheries, despite consistently high compliance rates and very low prosecution levels.

Compliance levies represent between 6% and 76% of total levies paid by individual fisheries, indicating very uneven burden-sharing across the sector. A small number of fisheries account for a disproportionately large share of total compliance expenditure, notably: Northern Zone Rock Lobster, Southern Zone Rock Lobster and Western Zone Abalone.

Statistical testing found no meaningful correlation between compliance cost per licence and revenue, catch and risk per licence. This suggests that compliance costs are not being allocated in proportion to economic scale, exploitation pressure, or risk, contrary to best-practice principles.

Compliance services in South Australia were benchmarked against those in New Zealand, Western Australia, and the Commonwealth. The key findings were:

- PIRSA conducts significantly more compliance contacts per active licence than any comparator jurisdiction.
- South Australia's average compliance contact rate is higher than all NZ, WA, and AFMA benchmarks and while exact dollar-for-dollar comparisons are constrained by different cost-recovery systems, higher compliance contact rates directly translate into higher compliance costs.

If PIRSA halved compliance contacts, South Australia would still sit slightly above the Australasian peer average, implying current service levels are well beyond what peers consider necessary.

To align more closely with peer jurisdictions, PIRSA would need to reduce compliance effort by up to 61%. Such a reduction would deliver immediate and material reductions in compliance levies, require fewer vessels, fewer inspections, and lower overhead allocation. The result would be that South Australia would still be left with higher-than-peer compliance intensity, while preserving regulatory credibility. As noted in the compliance report, these reductions would depend on other recommendations being embraced, such as VMS and EM.

Fisheries science

Science services recovered from industry include stock assessment and monitoring, fishery-independent surveys, catch sampling and ecological monitoring, economic assessments, and information services. Total annual science costs per fishery range from ~$14,000 to >$1 million, depending on scale and complexity, with staff inputs for stock assessment and monitoring typically ranging from 0.5–4.2 FTE per fishery. Cost per FTE are considered comparable to other government and university research agencies.

Science costs as a percentage of Gross Value of Production (GVP) are very high for some fisheries and some smaller or economically stressed fisheries are disproportionately burdened, even when biological risk is not exceptional. The percentage of GVP is a poor measure of capacity to pay as it is not a reliable indicator of net returns, particularly as some fisheries are already showing negative or marginal net economic return (NER). Given that BDO information allows for explicit consideration of NER for many SA fisheries, it should be more widely used to measure the capacity to pay. Declining export prices (e.g. abalone, prawns) place increasing pressure on capacity to pay, even as science costs remain fixed or increase.

South Australia is not uniformly high-cost**,** but several fisheries are materially more expensive than comparable programs elsewhere**.** For instance, without clear evidence of proportionally higher risk, rock lobster science in SA is significantly more expensive than in NZ and Victoria. Similarly, South Australian sardine science is substantially more expensive than Commonwealth small pelagic equivalents, with little evidence of differential risks. Conversely, in the case of the prawn fisheries, South Australia delivers high-quality science at a competitive cost.

The cost-recovery system for fisheries science in SA is more transparent than elsewhere, but still insufficiently detailed to enable clear attribution of resources and FTEs to different monitoring,

survey and assessment projects. This is confounded by science involvement in externally-funded (e.g. FRDC) projects, that although generally related to relevant fisheries, may not reflect the core requirements expected through service agreements. This hampers further in-depth analysis of cost structures, but also and potentially more importantly, reduces industry confidence in the science cost-recovery process. Overall science costs are not well aligned with risk, stock status, or economic capacity both within SA fisheries and compared to other fishery jurisdictions.

Aquaculture science

Total aquaculture cost-recovery in South Australia is approximately $2.24 million per year, representing around 12% of total fisheries and aquaculture cost-recovery income and 0.8% of aquaculture GVP. Science costs comprise 20% of aquaculture recovered costs, with the largest share of aquaculture cost-recovery (57%) relating to licensing, business services, data systems, and management/legislation. Science is not fully industry-funded, with significant State government and FRDC co-investment underpinning core capability.

Cost-recovery of aquaculture science costs is largely limited to South Australia and Tasmania, and in most jurisdictions, science is largely funded through government budgets, FRDC levies, and bespoke co-investment arrangements. This makes South Australia's aquaculture science costs, which apply only to tuna and kingfish, appear higher in relative terms, reflecting transparency rather than higher real system costs.

Aquaculture compliance

Aquaculture compliance costs include inspections, audits, investigations, vessel operations, and compliance data management. Expenditure is relatively limited, reflecting high industry compliance and historically low-to-moderate risk profiles across most sectors, as well as a legacy issue from when aquaculture was considered an emerging industry, which is no longer the case. Issues to be addressed relate to efficiency rather than excessive cost levels, notably a lack of systematic risk-based prioritisation. Most states, other than the Tasmanian salmon sector, do not directly recover aquaculture compliance costs, treating compliance as a public-good service.

9. Other matters

There have been many changes in the context of cost-recovery since it was introduced, and these have a significant impact on the feasibility of recovering the full costs of management. There is value in continuing cost-recovery mechanisms, but the scope of the cost recoveries requires careful consideration in the context of current management and industry profitability. There are several major changes that should be considered:

1. The requirements of managing marine resources have greatly expanded. In the 1980s the main responsibility of fishery management was to achieve sustainable populations of the target fish species. Subsequently, the responsibilities of fishery management have substantially increased. Management now includes significant focus on the sustainability of non-target species, habitats, depleted species, and other aspects of the ecosystem. Management is now also increasingly required to consider economic performance and social outcomes. This increases the monitoring required, scientific analysis, management strategy development, stakeholder engagement, and reporting. There is also increasing use of third-party assessment and certification systems that cost time, money and often require additional management actions. The situation is similar in aquaculture, where there is increasing focus on the impacts of production on ecosystems and social outcomes. Overall, the increased focus on the broader aspects of these industries is welcome, but it comes with significant implications and costs.

2. Industry profitability. The profitability of Australian fisheries is variable, but profitability is decreasing or very unstable in many fisheries. The situation is similar for aquaculture. Some aquaculture operations are in their early stages of development and so have low or uncertain profitability, though profitability in some aquaculture industries is already large and is likely to increase. The consequence is that different parts of the industry have very different abilities to meet full cost-recovery.

Given these factors, it is increasingly difficult for many in the industry to meet the management cost-recovery levy. There is a need for practical, transparent mechanisms to determine and apply appropriate cost-recovery for these sectors of industry. For some sectors of industry, a high cost-recovery level may be appropriate and affordable. But other sectors, such as new fisheries, recovering overfished fisheries, and establishing new aquaculture operations, may need lower or no cost-recovery. The current South Australian cost-recovery system does provide different cost-recovery requirements for different sectors of industry (e.g. low cost for developing aquaculture sectors, high cost for well-established aquaculture sectors, low cost for some fisheries), but there is no clear basis for these decisions. Different applications of cost-recovery across different parts of the industry will require clear, transparent guidelines and mechanisms for dispute resolution. It is suggested that these be developed and applied.

10. Conclusions

The benchmarking studies confirm that South Australia's fisheries and aquaculture are generally well managed and supported by strong institutional capability. However, the cost-recovery system has drifted away from its original rationale and the legislative intent. A reset toward a transparent, risk-based, and outcome-focused cost-recovery framework is required to restore industry confidence, ensure value for money, and align cost-recovery with the Ecologically Sustainable Development objectives of the *Fisheries Management Act 2007* and the *Aquaculture Act 2001*. The benchmarking studies and associated recommendations reported here are only part of the work needed to address the issues identified in the 2023 review and to achieve the goals of the cost-recovery 'revise and reset' programme. Consequently, the wider PIRSA initiatives to revise and reset the cost-recovery programme should be continued and they should include the findings of the benchmarking studies.