SEA CHANGE AUSTRALIA

Working with Change: Climate Risks, Opportunities and Adaptation Options for Tasmania's Rock Lobster Fishery

A Sea Change Australia Case Study Report

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The Tasmanian Rock Lobster case study was developed in collaboration with the Department of Natural Resources and Environment Tasmania (NRE), with contributions from research partners including CSIRO, IMAS, CMS and stakeholders from industry and management.

Stand-alone versions of the summary infographics presented in this report (Figures 2, 3, 5, 6, 7, 8 and 9) will be available via the Sea Change Australia website: https://seachangeaustralia.org/.

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Executive Summary

Climate change has already impacted Tasmania's Rock Lobster Fishery through increased air and water temperatures and marine heatwaves, which increases risk of heat stress on lobsters *in situ* or as live product in transit to overseas markets. As a positive effect of long-term warming, lobsters appear to be growing more quickly and maturing earlier and catch rates are good. However, careful monitoring of recruitment and coordinated management actions across state jurisdictions will be required to ensure the stock remains sustainable.

The quality of captured lobster is a bigger issue for the fishery now than it has been in the past. Handling throughout the supply chain is important to monitor and optimise, including reducing lobster stress by keeping them cool and well aerated. Although increasingly accepted as the norm, implementing requirements for best practice lobster storage and transport would encourage all operators to improve quality.

There are many opportunities to build on recent research in this fishery to better understand larval recruitment dynamics (e.g. to develop collaborative management agreements across boundaries), as well as to explore new options for supporting recruitment (i.e. trialling aquaculture). Improving access to up-to-date weather forecasts will also assist in operations and optimising harvest windows. In addition, options for habitat improvement, lobster ranching, and increasing catches of Eastern Rock Lobster are also of interest. Additionally, installation of more temperature loggers at different sites (e.g. on boats, on pots, or on jetties), could help inform management actions (if water temperatures are too high) and help direct optimum times and locations for activities (e.g. unloading catch).

This case study brings together evidence from a stakeholder workshop, desktop policy and regulatory analysis, and local knowledge to examine how the Tasmanian Rock Lobster Fishery is responding to climate change impacts, and how this intersects with future management plans and current industry pressures, (e.g. markets). It forms part of Sea Change Australia; a national initiative focused on supporting fisheries and aquaculture sectors to prepare for and adapt to climate change impacts.

What is changing

Climate change poses a significant threat to the long-term viability of the Tasmanian Rock Lobster Fishery, primarily through the impact of warmer temperatures on lobster recruitment, habitat loss and lobster quality. Marine heatwaves, ocean acidification, and altered current systems can disrupt lobster recruitment, habitat, and growth. A warmer, low-nutrient East Australian Current can lead to the loss of kelp forests, and the establishment of urchin barrens, thereby reducing lobster recruitment and growth. Larval dispersal is highly connected across Southeast Australia, so careful cross jurisdictional monitoring and collaboration is required. The potential for increased heat

stress during marine heatwaves or along the supply chain could negatively impact lobster quality (and therefore catch value and economic returns).

Industry is adapting - systems are not keeping pace

A clear message from the workshop was that commercial fishers are agile and have already been adapting, but there are changes needed to support further adaptation that are out of their control. Proactive fisher actions include on-vessel water temperature monitoring, aerating water, managing stocking density and modifying unloading times and locations to reduce exposure to higher temperatures. These adaptation actions are considered best practice and working well but are not yet uniform across the fishery. Workshop participants noted that minimising stress to lobster along the supply chain is the best outcome for economic return, but that there still needs to be awareness raising with fishers and buyers to achieve full adoption of best practices.

Key barriers identified in the workshop include industry needs for climate change adaptation to be more flexible and responsive. Regulatory change is a barrier to industry adaptation, especially regarding the time taken to update policy; limitations of taking Eastern Rock Lobster as bycatch; the conflict between rules and advice; and the demands of compliance and policing. In addition, the costs of adaptation, including upgrading boats and equipment, up-skilling and accessing labour and the time taken responding to other changes (not just climate change) were identified as barriers to adaptation. These pressures also compound others outside the climate frame, notably growing competition for ocean space from offshore energy development and marine protected area expansion, which fishers see as reducing access to productive grounds.

Adaptation requires improved collaboration

The case study highlights that because of high larval connectivity across jurisdictions a multijurisdictional response is required to maximise adaptive success. In addition to cross-jurisdictional communication and collaboration within government, supporting collaboration among fishers - to encourage peer-to-peer learning and raising awareness of best practice - and among fishers and managers, could improve relationships and information sharing. Currently, high turnover in government departments, an aging industry workforce, and a lack of trust between fishers and government, are all key barriers to adaptation.

Opportunities for improving climate readiness

In terms of managing the resource, there are many opportunities to improve the outlook for the fishery by better understanding larval dispersal, puerulus development under changing temperatures, lobster recruitment and distribution, potential for habitat

restoration, exploration of ranching and aquaculture, and improved understanding of the impact of the increasing occurrence of Eastern Rock Lobster.

For industry to meet the challenges of climate change they need:

- Improved awareness and adoption of existing best practices for optimising lobster quality.
- More industry participation in research, so that results are more readily applied.
- More temperature data (from coastal waters and on vessel) to inform fishing and business decisions.
- More flexibility to retain Eastern Rock Lobster as bycatch.
- Flexibility in compliance and policing rules that reflect the changing conditions, allowing fishers to maximise operational safety and product quality.

Why this matters

The Tasmanian Southern Rock Lobster Fishery is economically and socially valuable to Tasmania and regional communities. Fishers are naturally adaptive as evidenced in their responses to the many challenges that they face, however a multistakeholder response is necessary that permits regulatory flexibility and agility that ensures resource sustainability and supports industry to change with the changing climate.

1 Introduction

1.1. Sea Change Australia

Sea Change Australia is working with Australian fisheries and aquaculture sectors to develop ways to prepare for and respond to climate change impacts. The project is creating a nationwide two-way knowledge exchange between researchers and sector stakeholders. The main goals are to understand how sectors are already adapting to climate change, identify barriers to further adaptation, and co-develop practical, sector-specific options for building climate resilience.

A key concept informing the project's design is knowledge brokerage, which is a science-impact approach that involves facilitating the exchange of information and knowledge between researchers, policymakers, managers, industry members and other stakeholders to enhance decision-making and promote sustainable marine management (e.g. Cvitanovic et al 2025; Karcher et al 2024).

The project is undertaking national-scale knowledge brokerage using a range of digital platforms and media, and stakeholder and community of practice networks. It is also undertaking 12 case studies of fisheries and aquaculture operations, working with industry members, managers and scientists for each case study to understand climate change impacts and the factors influencing industry and management's capacity to adapt to these impacts.

1.2. Case study aims

The case studies (see Figure 1) are engaging with stakeholders to explore how well their sectors could potentially respond and adapt to climate change and extreme weather events. While a consistent framework is used to support cross-learning across case studies, individual case studies are co-developed and tailored to the needs and interests of their stakeholders. Key aspects are (i) understanding how fishers and aquaculture operators are already adapting to climate change impacts, (ii) exploring options and visions for the future in the context of climate change projections, and (iii) identifying barriers and opportunities for climate change adaptation.

The case studies involve:

- Stakeholder engagement on climate change and adaptation
- Workshop (Industry, Managers, Researchers)
- Policy and Regulatory analysis
- Short report (this document) also formatted to share with stakeholders as a short presentation or fact sheets on request.
- Cross-case study synthesis and learnings.

This report provides a synthesis of climate knowledge and information about the Tasmanian Rock Lobster Fishery, including workshop findings, key policy and regulatory

details, barriers and opportunities for adaptation, and cross-learning with other case studies as these develop.

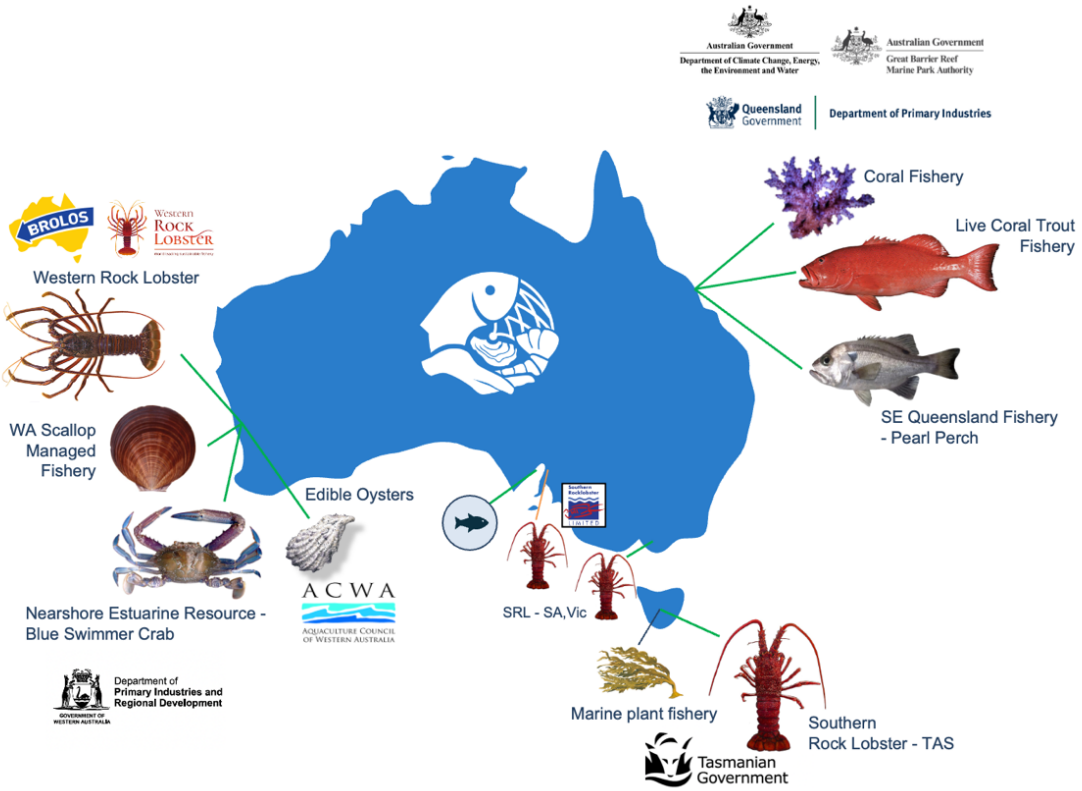


Figure 1. The Sea Change Australia case studies (at time of writing).

1.3. Case study overview: Tasmanian Southern Rock Lobster

In Tasmania there is one fishery – the Tasmanian Rock Lobster Fishery – and it is managed on a statewide basis under the Offshore Constitutional Settlement (effort extends beyond state waters) and is distributed around the west, south and east coasts of Tasmania, and around King and Flinders Islands. A high proportion of fishing effort occurs in waters less than 50m deep, although specific rules apply in some specific regions. Recreational activity is significant and traditional fishing is also undertaken.

Tasmania's Rock Lobster Fishery (Figure 2) catches around 1000 tonnes per year from about 150 vessels, and the annual value of the commercial harvest is $50-100 M annually (IMAS 2025; Rust & Ogier 2021). It targets Southern Rock Lobster (*Jasus edwardsii*), with a small amount (<1%) of Eastern Rock Lobster (*Sagmariasus verreauxi)*) as byproduct. Live Southern Rock Lobster is a high-value commodity exported to predominantly China and Hong Kong.

The Southern Rock Lobster has four distinct life stages, takes 5-10 years to grow to mature adults, and can live for 20 years. This means climate -related impacts can affect the lobster at each stage and in different ways. Some impacts may be negative (e.g., thermal shock associated with a marine heatwave) while others positive (e.g., improved

growth rates in some locations and life stages). Southern Rock Lobster populations are highly connected with larvae dispersed around southern Australia. The complexity of the lifecycle means that recruitment numbers and settlement areas can fluctuate, often influenced by significant environmental variability.

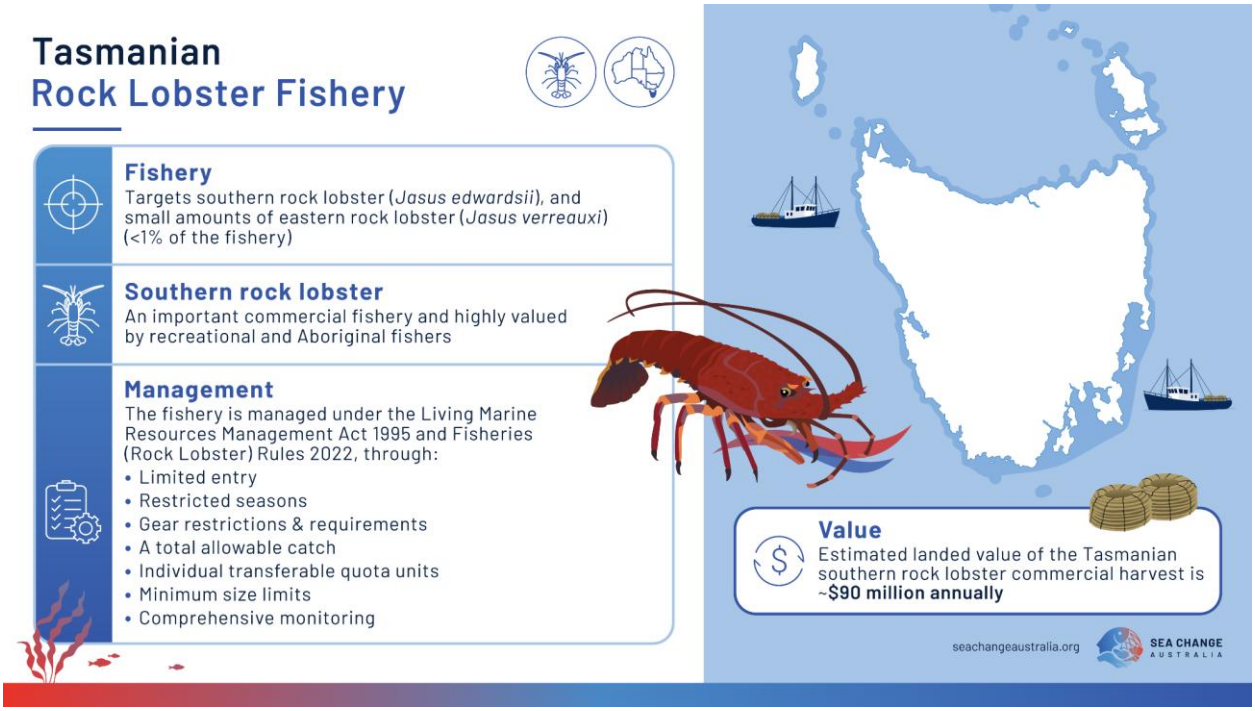


Figure 2. An overview of the Tasmanian Southern Rock Lobster Fishery.

Climate change impacts

Climate impacts on the Tasmanian Southern Rock Lobster include warming waters, changing ocean currents and upwellings shifting nutrient and puerulus dispersal as well as changes to ocean acidification potentially impacting lobster development. Other changes related to climate include changes to other species, such as increasing populations of urchins and octopus and changes to lobster habitat and food sources, such as kelp. For more details see Figure 3.

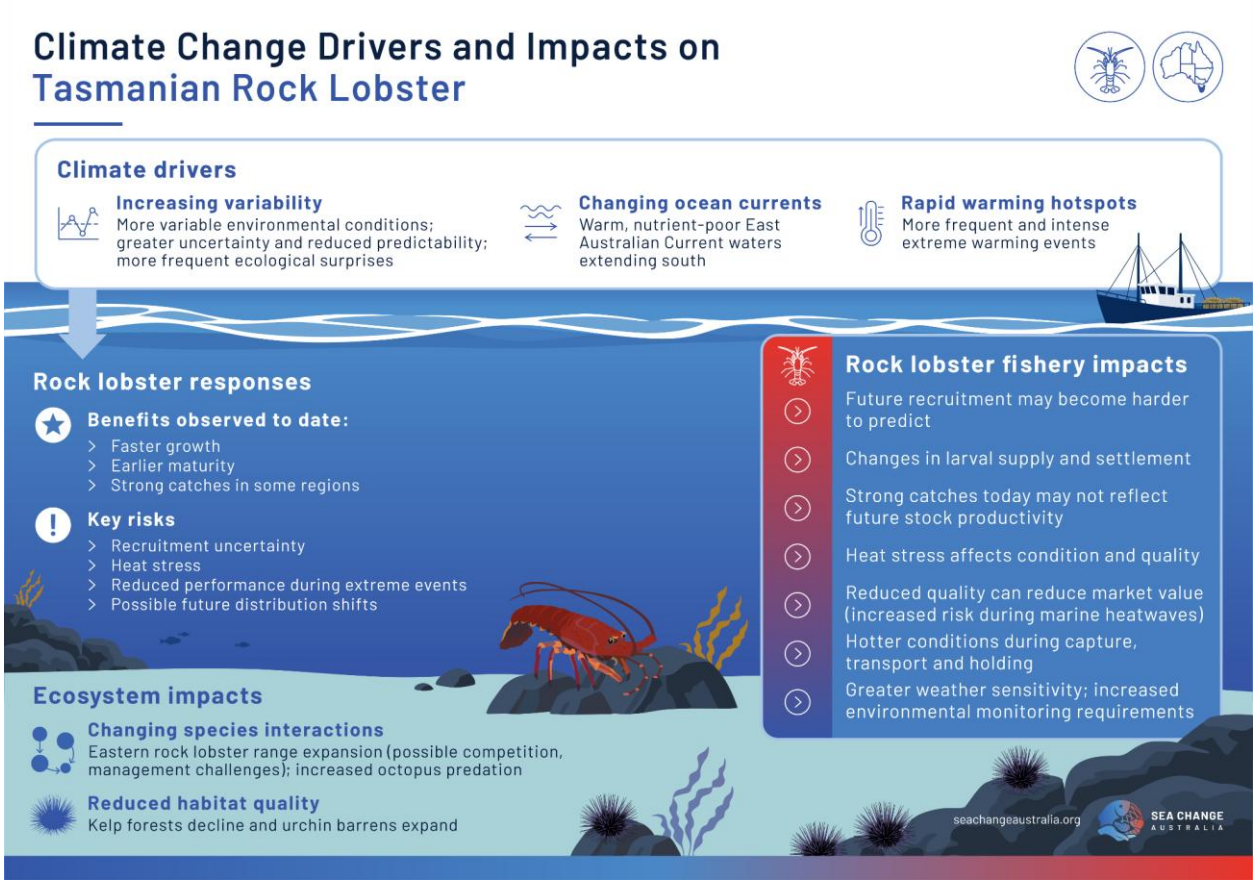


Figure 3. Climate change impacts on the Tasmanian Rock Lobster. EAC is the East Australia Current, and SE is South-East.

1.4. Case study approach

The Sea Change Australia case study approach involves consultation and stakeholder engagement in the lead-up to a workshop organised in collaboration with industry contacts to facilitate participation and help determine the most suitable locations, participants, timing, and duration (Figure 4). These pre-workshop consultations also help to establish a shared understanding of the climate-related concerns and needs for the case study, broader context of other pressures and opportunities for the case study fishery/fisheries/operation, and the kinds of outputs from the case study that might be useful for participants and end-users.

In addition to addressing the primary workshop aims (detailed below), the case study workshop is also an opportunity for participants to become aware and engaged in other parts of the project, like sharing success stories, asking and getting answers for any key climate or other change-related questions, and connecting with peers. Each case study is supported by a policy and regulatory analysis, which combines insights from the workshop with a desktop analysis of the legislative and governance landscape (see below for further details).

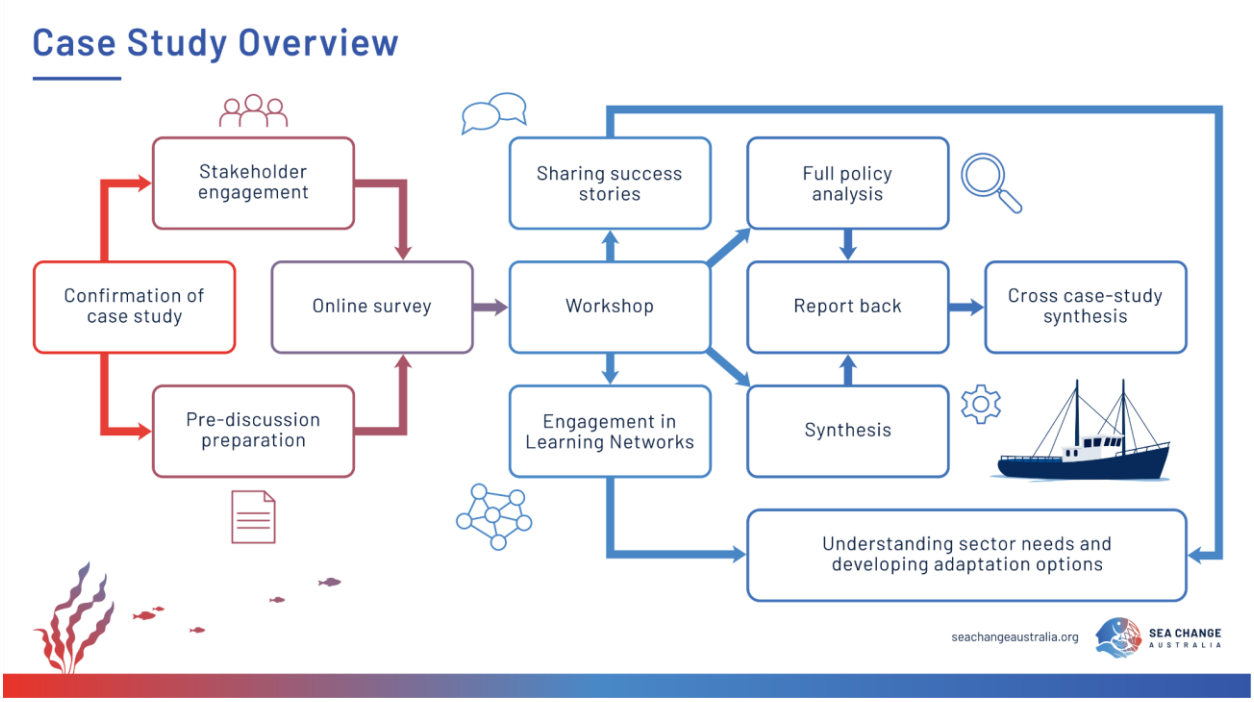


Figure 4. Case study approach overview.

For the Tasmanian Southern Rock Lobster case study, one face-to-face workshop was conducted, in October 2025 at CSIRO in Hobart.

The aims were:

- Listen to stakeholders about the effects of climate change they are already experiencing in their fishery/operation;
- Understand how they are already responding to these changes; and to
- Identify key factors that will affect industry's capacity to adapt to climate change in the future.

The workshop included a presentation on summary impacts of climate change on the fishery and discussion of the policy and regulatory context.

1.5. Participants

The workshop was well attended. There were 15 participants: Sea Change Australia (7), Tasmanian Rock Lobster Council Ltd. representatives (2), commercial fisher (1), processor (1), Department of Natural Resources and Environment (1), Fisheries Research and Development Corporation (1) and Seafood Industry Tasmania (1). Some participants had multiple representative roles, with just the primary role noted here. There was a good balance of gender (8 men and 7 women).

1.6. Workshop agenda

8.30– 8.45: Welcome and Introductions

8.45 – 10am: Sea Change and case study overview

- Brief project overview
- Workshop objectives
- Discussion about what people are seeing, doing and barriers to action (including non-climate related concerns/threats)

10 – 10.15am: Break

10.15am – 11.25am: Environmental changes and responses

- Presentation and questions
- Discussion: What are longer-term adaptations? What limits your ability to respond?

11.25-11.30pm: Break

1.15 – 2.15pm: Climate change adaptation

- What would you like to do but can't because of a barrier?
- What other info do you need and how do you need that?
- What are longer-term adaptation options for industry and management?
-

11.30 – 12pm: Next steps

- Other information needs
- Opportunities to be involved in other Sea Change Australia activities
- Output format and reporting back

Reflection (team)

2 Summary of discussion

The workshop elicited discussion across a wide range of topics. At a high level, the topics discussed included:

- **Lobster quality is increasingly important.** For continued market access and best prices, lobster quality is more important now than it has been in the past. To maintain quality, it is important to minimise or avoid thermal stress. Existing research provides a good understanding of how to minimise post-capture stress (Fitzgibbon 2022). This includes avoiding thermal shock, monitoring and managing dissolved oxygen, managing stocking densities and avoiding vessel

movements through warm waters, and minimising exposure to the air during unloading.

- **Improved understanding of lobster recruitment and growth is needed.** Further research is needed to build on recent understanding of how recruitment and population growth might be impacted and managed under climate change scenarios (Cresswell 2023). Potential options to explore include shared agreements across jurisdictions for egg harvest strategies. In addition, trials of new innovations in aquaculture interventions such as ranching to grow out lobster were also of interest. While faster lobster growth has been observed by fishers, there was some concern from workshop participants that future recruitment might be negatively impacted by climate change. There is an ongoing need to monitor both recruitment and growth.
- **Collaboration is essential.** Due to high larval connectivity across regions resulting in different lobster recruitment patterns, fishers noted that collaboration across state jurisdictions was important. The lack of knowledge about increasing observations of the Eastern Rock Lobster further south; how that interacts with Southern Rock Lobster and the inability to retain Eastern Rock Lobster as bycatch was noted as a barrier to adaptation.
- **Adaptation is occurring in industry but not in government**. It takes a long time to update policy, but changes are happening now. Fishers feel like they are adapting alone rather than being supported and included in adaptation changes across industry. Some future options, like electrification of boats, require more support and access to information (e.g. how to manage fire safety).
- **Lack of trust and transparency.** Fishers noted the high staff turnover in government has resulted in a loss of trusted relationships between fishers and managers. Conflicting rules across departments also create confusion and distrust. For example, fishers noted their inability to anchor in fishing-restricted locations even if the weather was unsafe and the requirement for police and compliance officers to have evidence that fishing is not occurring. Cameras on boats might be one way to address this, but it involves additional cost and may not always be effective.
- **Lack of ongoing extension and reduction in research funding**. Fishers noted that research was often not taken through to industry adoption and that there needed to be more industry collaboration to clarify the ‘so what’ questions. At the same time, participants all noted that they often lacked time for engagement. Fishers pointed out that they would like to see more industry directed research to make sure it is industry relevant and adoption ready, to enable better innovation.

- **Climate adaptation is one pressure among many**. Fishing costs are increasing, including updating boats and equipment, managing compliance and reporting, and increasing costs of labour and fuel. The workforce is aging and there needs to be skill development and a drive to show the innovative potential of the industry as a career pathway. Participants also emphasised spatial squeeze, from the offshore energy sector and MPA expansion (including the national 30%-by-2030 commitment), as a significant and under-recognised pressure, with fishers citing exclusion from productive, low-impact reef grounds through recent marine park planning processes.

More examples of the discussion are indicated in indicative quotes from the workshop participants (see Figure 5).

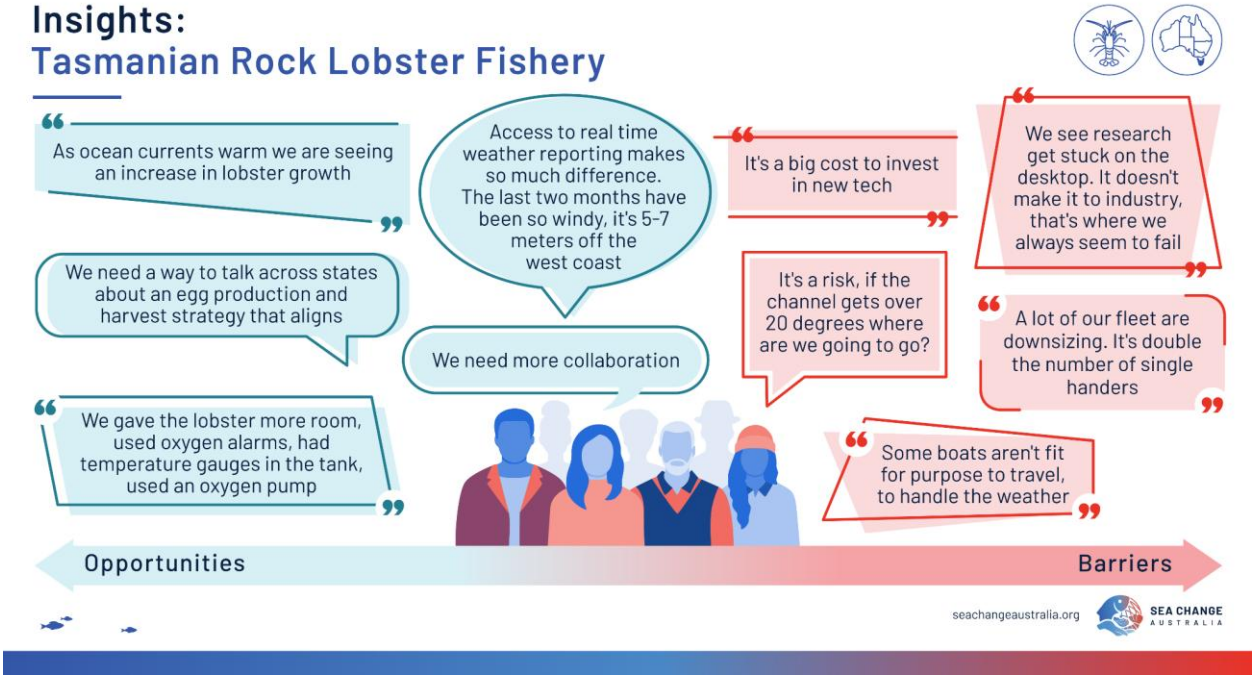


Figure 5. Selection of indicative quotes from workshop participants.

3 Policy and Regulatory Analysis

The policy and regulatory context of fisheries was identified early in project scoping and stakeholder discussions as both a key barrier and an opportunity for climate adaptation. This section summarises the legislative and governance landscape, the network of agencies and stakeholders involved, and the systemic barriers to effective adaptation identified through workshops.

3.1. Legislative, Policy, and Management Framework

Fisheries management for Tasmania's Southern Rock Lobster (*Jasus edwardsii*) is based on a state-led framework under the *Living Marine Resources Management Act 1995*

(LMRMA). The *Fisheries (Rock Lobster) Rules 2022* are the main instrument used to implement day-to-day management. The LMRMA provides the legal basis for licensing, quota management, setting catch limits, and recognising peak industry bodies and advisory groups. The Rules came into effect in November 2022 after extensive public consultation and will remain in place for ten years. They give effect to management arrangements across both commercial and non-commercial sectors, including the Individual Transferable Quota (ITQ) system, regional and sex-based minimum size limits, seasonal closures, and the East Coast Stock Rebuilding Zone arrangements.

At the federal level, the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* provides the overarching environmental framework. To export product, the fishery must maintain Wildlife Trade Operation accreditation, which is contingent on demonstrating ecologically sustainable management. The Department of Agriculture, Fisheries and Forestry (DAFF) also oversees export controls and international market access arrangements. These federal responsibilities have a direct impact on the fishery's commercial performance. For example, the suspension of live rock lobster exports to China between 2020 and 2024 reduced the fishery's gross value of production from around $100 million to $51 million.

A key feature of the fishery is that it supports two main user sectors, commercial and non-commercial, which share the same resource under different management arrangements. The non-commercial sector includes both recreational and Aboriginal fishers. Aboriginal fishing activity is largely managed under recreational rules, as most Aboriginal fishers reportedly exercise their fishing rights within that framework. Separate permits for Aboriginal fishing activities may also be issued under the LMRMA. The commercial sector operates under a wmature ITQ system with 10,506 transferable quota units distributed across a maximum of 311 entitlements. The non-commercial sector is managed mainly through input controls applied to around 17,000 recreational licence holders, of whom about 13,000 actively fish for lobster in a given year. The sector also has a notional 170-tonne TARC, although this is not monitored or enforced in real time. This two-sector structure influences all aspects of governance, resource sharing, and the fishery's ability to respond to climate change.

Two existing instruments are well established. The East Coast Stock Rebuilding Strategy (ECSRS) operated from 2013 to 2023 and established the East Coast Stock Rebuilding Zone (ECSRZ). It introduced regional catch caps for both commercial and recreational fishers and supported a translocation program focused on depleted east coast reefs. Translocation has also been carried out in other parts of the state, including the north-west. These measures continue to inform management while a harvest strategy is being developed. The Rock Lobster Biotoxin Management Plan 2023 provides a statutory framework for managing recurring Paralytic Shellfish Toxin (PST) closures on the east coast, which are driven by climate-amplified *Alexandrium catenella* blooms.

Two additional instruments remain under development and are central to improving the fishery's climate readiness. A new Tasmanian Rock Lobster Harvest Strategy is expected to formalise reference points and harvest control rules for both sectors and is widely

expected to include climate scenario planning. The LMRMA is also under review following a 2021 assessment undertaken as part of the Seafood Industry Growth and Recovery Plan. A Tasmanian Fisheries White Paper has outlined the policy direction for a modernised fisheries management framework, although legislative reform is not expected to take effect before the current ten-year management period under the 2022 Rules concludes.

3.2. Governance and Decision-Making Network

The decision-making network for Tasmania's Rock Lobster is characterised by mature institutional architecture and well-established formal channels for representation and scientific input, distinguishing it from many comparable fisheries (Figure 6).

Minister and NRE Tas.

The Department of Natural Resources and Environment Tasmania (NRE Tas) is the lead state agency responsible for regulation, compliance, and strategic management under the LMRMA.

The Minister responsible for administering the Act (currently the Minister for Primary Industries and Water) holds final decision-making authority. This includes setting the annual Total Allowable Commercial Catch (TACC). These decisions are informed by scientific advice from the Institute for Marine and Antarctic Studies (IMAS) and input from the Crustacean Fisheries Consultative Group (CFCG). These arrangements are described in the *Marine Resources Public Engagement and Consultation Policy (2025).*

NRE Tas serves as the technical and administrative body that implements these decisions. Its responsibilities include administering the LMRMA and the *Fisheries (Rock Lobster) Rules 2022*, managing licensing and compliance, overseeing the ECSRS and translocation program, and coordinating development of the new harvest strategy and LMRMA reforms. Scientific advice and harvest strategy recommendations only take effect once accepted and gazetted by the Minister. As a result, NRE Tas is the central point through which IMAS science, industry advocacy, and CFCG advice pass before decisions are made.

Compliance and Enforcement.

NRE Tas's Fisheries Licensing and Compliance Branch is responsible for maintaining the day-to-day integrity of the fishery. It issues commercial licences and oversees the collection and entry of catch and effort data used in IMAS stock assessments. NRE Tas also manages key compliance functions, including vessel monitoring systems, catch reporting, and enforcement of seasonal and spatial closures.

Tasmania Police provides the fishery's primary on-water enforcement capability and undertakes most compliance activities at sea, particularly those relating to illegal fishing, black-market product, and quota fraud.

Cross-Agency

Marine protected areas (MPAs) are managed separately from fisheries under the *National Parks and Reserves Management Act 2002*. NRE Tas retains a role in reviewing and providing input on proposals that affect commercial fishing. The Environmental Protection Authority (EPA) administers marine environmental standards under the *Environmental Management and Pollution Control Act 1994*. While its role is indirect, it influences the habitat quality that supports the fishery's productive capacity.

Industry Peak Bodies and Consultative Groups.

The Tasmanian Rock Lobster Council Ltd (TRLC) and Seafood Industry Tasmania (SIT) are the statutorily recognised peak bodies for the commercial sector. They represent licence and quota unit holders and are represented on the CFCG. TRLC played a key role in designing both the ECSRS and the translocation program, which is largely delivered by industry. Together, TRLC and SIT also influence annual TACC and catch cap discussions.

The Tasmanian Association for Recreational Fishing (TARFish) is the recognised peak body for the recreational sector and is similarly represented on the CFCG. TARFish has been actively involved in development of the harvest strategy, advocating for ambitious stock rebuilding timeframes and formal recognition of the recreational sector's economic and social value.

The CFCG is a non-statutory advisory group that replaced the former Fishery Advisory Committees (FACs). Its membership includes two industry representatives (SIT and TRLC executives), two representatives from TARFish (the CEO and one board member), two IMAS representatives, Tasmania police representative, and several NRE Tas staff. The CFCG does not produce formal minutes or recommendations. Instead, members provide written feedback after meetings, which NRE Tas considers alongside its own departmental advice when preparing briefings for the Minister or delegate. This process is similar to the previous FAC system, where FAC input was also provided alongside NRE Tas advice. Because peak bodies do not see the Department's final advice before it is provided to the Minister, the Department's position may differ from that of industry and research representatives. This occurred in the previous year, when a publicly announced Ministerial decision was later revoked by the Minister's Office, see *Marine Resources Public Engagement and Consultation Policy (2025).*

Scientific and Research.

IMAS is the fishery's principal scientific institution. Through the Sustainable Marine Research Collaboration Agreement (SMRCA) with NRE Tas, it undertakes annual stock assessments, fixed-site fishery-independent surveys, observer programs on commercial vessels, recreational catch surveys, and applied research on ecosystem dynamics, *Centrostephanus* (sea urchin) impacts, and climate-driven change. This arrangement is an established science-management partnership in which IMAS research directly informs CFCG discussions and Ministerial decisions. IMAS and NRE Tas also jointly lead initiatives such as development of the harvest strategy.

The Fisheries Research and Development Corporation (FRDC) provides complementary co-funding for national research priorities, linking Tasmania's management arrangements with the broader national fisheries framework.

Federal Government.

The Commonwealth's role complements state management rather than providing direct operational control. DCCEEW administers the *EPBC Act* Wildlife Trade Operation accreditation process. This accreditation requires demonstration of sustainable management and includes reporting requirements for interactions with listed species. DCCEEW also manages Australia's Commonwealth marine parks under the EPBC Act, including the South-East Marine Parks Network (SEMP). Spatial closures within Commonwealth waters can limit access to some fishing grounds.

Separately, DAFF administers export controls and bilateral market access arrangements that affect the industry's ability to trade internationally. Figure 6 shows a summary overview of some of the institutional and governance arrangements.

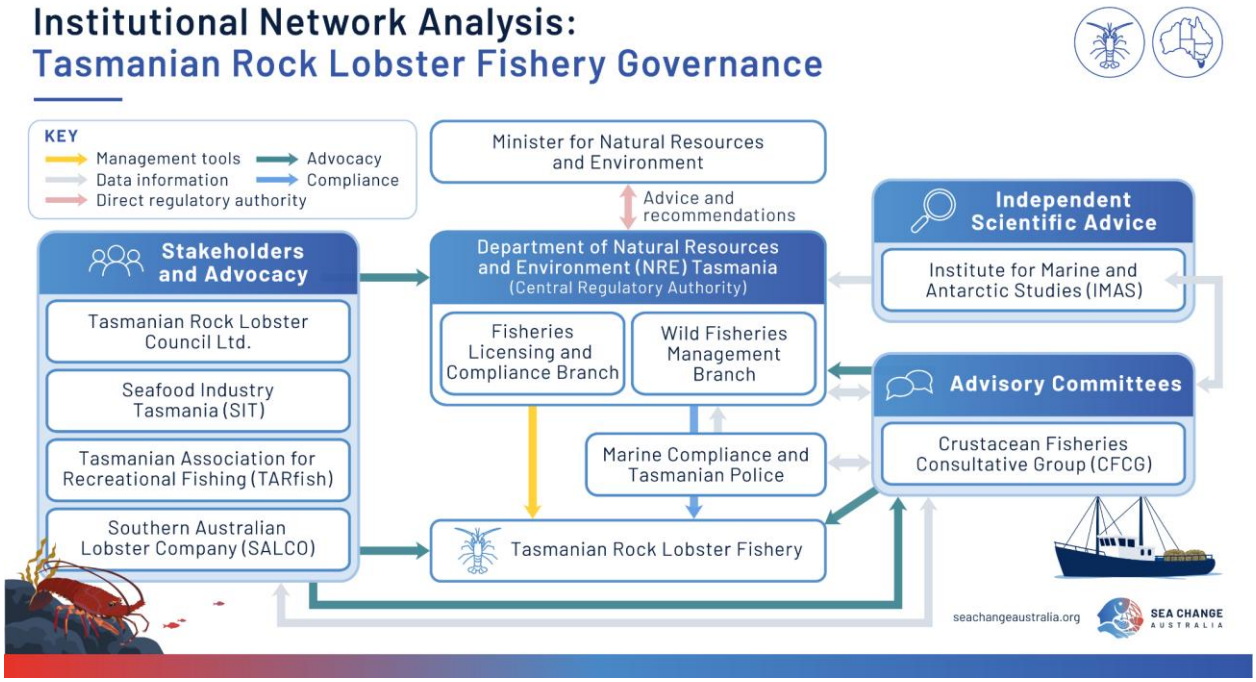


Figure 6. Summary overview of institutional networks for Tasmanian Rock Lobster.

3.3. Barriers and Bottlenecks to Climate Adaptation

Workshop discussions and the policy analysis identified a set of systemic barriers that limit the Tasmanian Rock Lobster fishery's capacity to respond with agility to accelerating climate-driven change.

Legislative and Policy Gaps

Climate Change and the Legislative Framework

The fishery has shown it can respond decisively when stock decline is clearly established, as occurred on the east coast in 2011-12. However, it is less well equipped to act before impacts become evident. A key limitation is that the LMRMA, the primary legislation governing the fishery, does not contain an explicit precautionary principle and does not directly address climate change. This means scientific uncertainty about emerging climate-related risks cannot easily be used as the basis for protective management action before harm has been demonstrated.

At the same time, legislating specific climate responses carries its own risks. Embedding particular climate mechanisms or triggers in the LMRMA could reduce flexibility, making it harder to adapt management approaches as scientific understanding and environmental conditions change. However, the extent to which management can respond remains influenced by the legislative tools available and the processes required to amend management settings.

Decision-making flexibility

A new Rock Lobster Harvest Strategy is currently being developed to guide when management actions should be considered. When approved, it will provide non-legislative guidance on management responses, including potential changes to TACC, TARC, and other management settings. The strategy is intended to guide decision-making towards defined targets, timeframes, and objectives while providing greater transparency for stakeholders. However, it is intentionally non-binding, with final decisions remaining the responsibility of the Minister or delegate.

There is broad agreement that the harvest strategy should incorporate climate scenario planning. The details of how this will occur, including how climate-related objectives interact with existing resource-sharing arrangements, have not yet been settled. Resource-sharing arrangements remain an important consideration in management decision-making. Current arrangements allocate a fixed 170-tonne TARC whenever the TAC is below 1,700 tonnes, with the remainder allocated to the TACC. The East Coast Stock Rebuilding Strategy 2013-2023 included a catch sharing arrangement of 79% commercial and 21% recreational, which was used to calculate the notional catch share in East Coast Stock Rebuilding Zone for each sector each year. The commercial catch share was applied as the commercial east coast catch cap, while the recreational share became a notional recreational allowance. These arrangements may be reviewed and the catch sharing arrangements renewed.

Legislative rigidity (Rules, reviews, amendment processes).

Management settings are governed through a combination of annual decision-making processes and longer-term regulatory instruments.

Some management settings can be adjusted annually, including:

- TACC and TARC
- Open and closed areas
- Season dates

Of these, TACC and TARC are generally set once each year, while area closures and season dates can be modified during the year if required.

Other management settings are established through the Fisheries (Rock Lobster) Rules 2022, including:

- Total pot numbers
- Size limits
- Boat limits
- Possession limits

These settings can only be changed through a review of the Rules.

The *Fisheries (Rock Lobster) Rules 2022* create an additional source of rigidity because they operate on a 10-year cycle. The LMRMA does provide mechanisms for changes within this period:

- Section 48A allows correction of errors.
- Section 49 allows emergency changes, although this provision has rarely, if ever, been used.
- Section 53 allows a Minister-directed review.

In practice, operational capacity, available resources, and departmental priorities limit how often these mechanisms are used.

As a general guide, a management plan such as the Rock Lobster Rules may undergo two or three reviews during its 10-year life, although this varies between fisheries and circumstances. Each review typically takes 10 to 18 months because of consultation, parliamentary tabling, and other regulatory requirements.

As a result, smaller changes are often deferred until the full review at the end of the 10-year period. Larger changes are more likely to trigger a review between cycles, although this still depends on priorities and resources. Together, these arrangements create a system that can respond relatively quickly through annual catch-setting processes, but more slowly where changes require amendments to the *Fisheries (Rock Lobster) Rules 2022*.

The current Rules remain in force until 2032.

Governance, Access and Resource-Sharing Challenges

Commercial and Recreational Management Differences

One of the fishery's main governance challenges is that the commercial and non-commercial sectors are managed using fundamentally different approaches.

The commercial sector operates under a hard catch cap supported by near real-time electronic reporting, quota management, and associated reporting requirements such as unload reports. This gives the Department detailed information on actual catch and enables direct control over removals. The recreational sector is managed primarily through input controls, including:

- Bag limits
- Season dates
- Minimum legal-size limits
- Boat limits
- Possession limits
- Pot limits

These measures manage fishing effort rather than directly limiting catch. Recreational catch is estimated retrospectively through annual IMAS surveys.

The two sectors also measure catch differently. Commercial catch is reported in tonnes, whereas recreational catch is recorded as numbers of lobster and then converted to tonnage by IMAS. As a result, trends can appear different between sectors. TARFish reports that recreational catch numbers have remained broadly stable over time, while estimated recreational tonnage has increased as CPUE has increased. As lobster become larger or easier to catch, the same number of recreationally caught lobster can translate into a higher tonnage figure. Conversely, the same commercial tonnage can represent fewer lobster.

These differences in management and measurement contribute to ongoing discussions about resource sharing and certainty of access. The issue is most apparent in the East Coast Stock Rebuilding Zone (ECSRZ), where recreational catch for 2024-25 is estimated at 77.5 tonnes compared with a 35-tonne notional share established under the East Coast Stock Rebuilding Strategy and last updated in 2022.

At the statewide level, however, the TARC remains substantially under-caught and has never been exceeded. The challenge is therefore concentrated on the east coast, where fishing effort and catch remain relatively high while stock rebuilding continues.

Resource sharing is often presented as the fishery's central governance issue. However, both sectors currently have access to the resource, and the statewide stock is improving and generally at sustainable levels. The issue arises largely from the different management systems used for each sector and a shared desire for greater

certainty of access. A renewed resource-sharing arrangement would not, by itself, resolve these underlying structural differences.

These issues are primarily discussed through the CFCG, which is the main forum where sector representatives, managers, and researchers consider resource-sharing and access concerns. The CFCG does not have decision-making authority, with its role limited to providing advice to NRE Tas and the Minister. Final decisions remain the responsibility of the Minister or delegate.

Resource-sharing issues have also been considered through other mechanisms, including a now-disbanded Working Group established specifically for the issue and ongoing direct engagement between stakeholders and the Minister.

Commonwealth-State Intersections

The Commonwealth layer of management is becoming an increasingly important source of operational pressure on the fishery.

A key concern raised by industry relates to access to fishing grounds. Industry stakeholders identified the South-East Marine Parks Network (SEMP) process as an example of spatial management they considered poorly aligned with the fishery. The process excluded fishers from one of the fishery's most productive areas in order to protect deep-water golden kelp (*sp. Ecklonia radiata*).

Industry argues that this outcome is difficult to reconcile with the low-impact nature of rock lobster fishing gear, which operates on reefs and rocky outcrops with limited bottom disturbance. Some stakeholders also question the rationale for excluding a fishery that has operated in these areas for more than 150 years.

These spatial pressures may increase in the future. The Australian Government's commitment to protect 30% of Commonwealth waters by 2030 may result in further expansion of marine protected areas. At the same time, competition for ocean space from offshore energy developments, including offshore wind projects, is emerging as an additional source of pressure on access to fishing grounds.

Beyond spatial management, Commonwealth decisions can also affect the fishery through trade and market access arrangements. DAFF's administration of export controls and bilateral market access arrangements creates an additional source of risk for the industry. The 2020-24 China trade tensions demonstrated that Commonwealth trade decisions can affect industry viability independently of, and at times more significantly than, state fisheries management decisions.

Operational and Structural Constraints

Compliance and Regulatory Challenges

Workshop participants consistently raised concerns that compliance arrangements have not kept pace with climate-driven changes in fishing operations.

Fishers reported difficulties anchoring safely in some locations during extreme weather and marine heat events because of existing spatial restrictions. They also described the compliance approach as adversarial rather than collaborative and felt the regulatory system was not adapting quickly enough as conditions changed. The relationship between compliance personnel and industry was repeatedly identified as a source of tension, which can reduce trust between industry and regulators, undermine adaptive management, and discourage voluntary uptake of reporting tools such as the Fishing Tas app.

Biological and Industry Pressures

Other operational pressures identified during workshops included:

- Continued range expansion of *Centrostephanus* (sea urchin).
- Recurring PST closures.
- An ageing fishing fleet (both boats and fishers).
- Consolidation of processing capacity into fewer, larger facilities.

Rebuilding specialised workforce capacity is also difficult once skills and experience are lost. As climate-driven changes alter where fishing effort occurs, the ability of processing and transport infrastructure to adjust will influence whether biological adaptation can be translated into commercial adaptation

Spatial and Economic Constraints

The ITQ system does not directly restrict where quota can be fished, apart from the east coast catch cap and the northeast catch cap, which applies across the commercial fleet. Outside this area, spatial decisions are largely driven by economics. Fishers need to operate profitably, which can discourage fishing in lower-value areas such as some deep-water grounds that industry considers underused.

Marine protected areas create additional spatial constraints by limiting access to some fishing grounds. Tasmania's MPA network covers approximately **2.66%** of marine waters, with **1.1%** designated as no-take areas. Despite this relatively small footprint, the impact on the fishery has been significant.

Poor consultation and limited understanding of the fishery and its reporting requirements resulted in fishing access being lost to an estimated:

- 0.5% of TACC according to MPA figures, or
- Up to 2.5% of TACC according to fishers' estimates.

Whether the actual impact is closer to 5 tonnes or 25 tonnes, the displaced effort remains within the TACC and must occur elsewhere, increasing pressure on other rock lobster stocks.

The fishery also faces a structural vulnerability through its strong reliance on China as the premium live export market. This reliance was exposed during the 2020-24 trade tensions, highlighting the risks associated with dependence on a single export destination.

Data and Knowledge Gaps

Commercial and Recreational Catch Reporting

Despite recent improvements, data gaps remain relating to recreational catch reporting.

Commercial reporting remains paper-based, although pre-fishing reports, unload reports, and geospatial data are submitted electronically. These systems support near real-time decision-making, but delays in receiving and validating data remain a source of frustration for fishers and limit management responsiveness.

Recreational reporting presents a more substantial challenge. Mandatory catch reporting, including through the Fishing Tas app, is now in its third season but remains at an early stage of uptake. NRE Tas still relies primarily on retrospective IMAS surveys to estimate recreational catch while the data series from mandatory reporting is being established. As a result, recreational catch is generally not fully understood until after the season has ended which can pose limitations given the speed at which climate-driven shifts in effort and stock distribution can occur.

Real-time reporting through app-based systems could improve the ability to manage both sectors during the season rather than assessing catch only after the fact.

NRE Tas continues to validate app data against IMAS survey estimates and has not yet determined what level of participation or compliance would be considered sufficient. Concerns about mandatory reporting also remain among some recreational fishers.

Biotoxin Forecasting

Predictive capability for biotoxin events remains limited. As a result, closures are often applied on a precautionary basis and can affect some of the fishery's most economically important fishing grounds during peak market periods.

Research Uptake

A final challenge identified during workshops is the limited translation of research into operational practice. Research findings are often described as becoming "stuck on the desktop", with insufficient extension pathways to support implementation on the water. This limits the practical uptake of climate adaptation measures identified through research.

4 Recommendations to build capacity for adaptation

The recommendations to build capacity for climate adaptation in this fishery build on the responsive adaptations that fishers have already made. These include enabling fishers to continue to improve best practices around lobster quality through careful temperature management (see Figure 7).

Other recommendations include further research and development of:

- Understanding changes to ocean currents and lobster recruitment, including options to enhance habitat, or enhance recruitment and growth through aquaculture interventions (e.g. ranching).
- Improved collaboration across state jurisdictions.
- Improved understanding of the impact of Eastern Rock Lobster and flexibility to retain as bycatch.
- More industry-led or championed research that is targeted to adoption and innovation to overcome research being 'stuck on the shelf'.

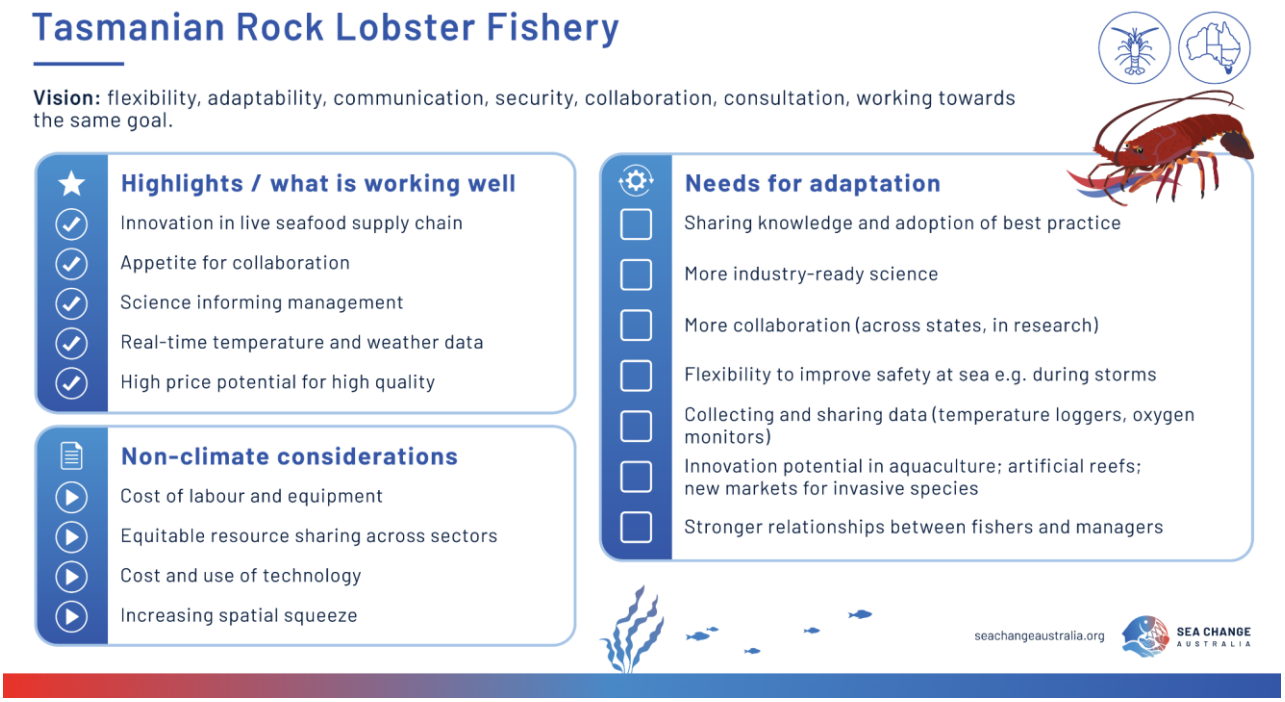


Figure 7. Summary of highlights, non-climate drivers and recommendations for adaptation.

5 Potential adaptation pathways

The workshop for this case study highlighted that best practice is a good way to start adaptation to climate change, but there needs to be more support for encouraging everyone in industry to adopt changes. This involves raising awareness but also incentivising and rewarding change. Market drivers are moving in this direction (rewarding better quality) but are not at the point where poorer quality is unsalable (this may happen in the future), so some fishers lack the motivation to implement best practice.

Research and development and more flexibility in regulation is needed to support further adaptation. To enable this, the potential adaptation pathways in Figure 8 show how adaptation requires alignment across industry, research and management to be most effective. Enabling fishers to respond to changing circumstances due to climate change requires a system perspective and a collaborative approach across science, policy and industry. This builds on many existing features and processes in the management system which already work to adjust management in response to stock conditions; amend legislation or update Harvest Strategies (for example). Continuing to build in more opportunity for transparency and collaboration, data collection and research into these existing processes will strengthen and improve them further. See Figure 8 for some of the potential adaptation pathways.

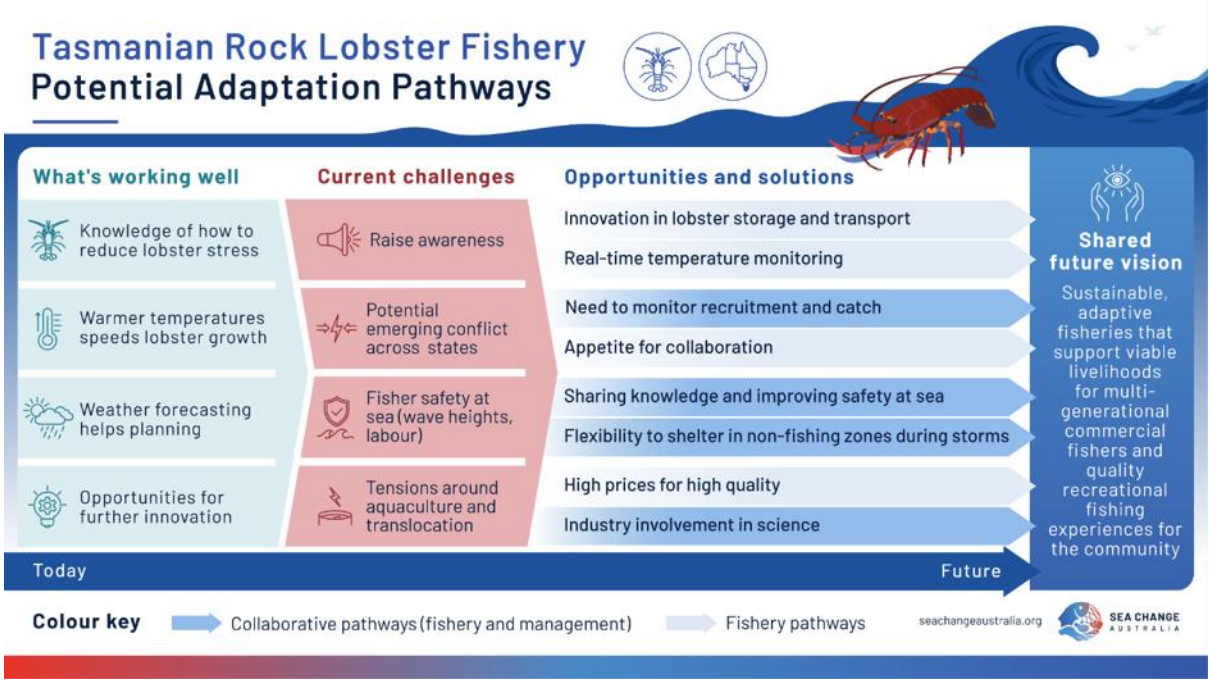


Figure 8. Summary of potential adaptation pathways for industry, managers and research.

This case study also identified specific implications for management of climate-driven shifts in cold-chain storage and transport, summarised in Figure 9.

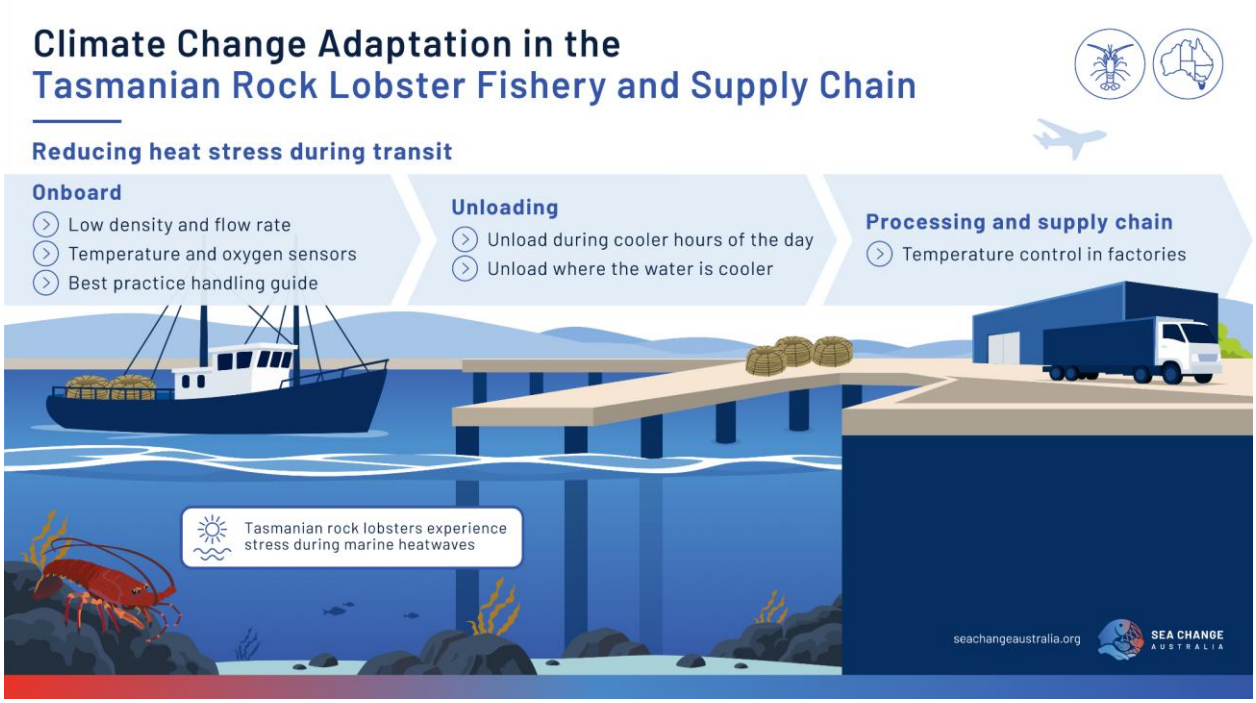


Figure 9. Climate adaptations occurring in the Tasmanian Southern Rock Lobster Fishery.

6 Conclusion and next steps

This case study highlights successful climate change adaptations have already been achieved, but often fishers feel like they are acting alone and more collaboration is required to support further adaptation. The Tasmanian Rock Lobster fishery has already experienced climate impacts such as higher temperatures, marine heatwaves and altered currents. Faster lobster growth has been observed and is welcomed, but other changes to future recruitment and habitat condition are less certain.

Following completion of the other case studies, cross-case analysis will look at similarities and differences, opportunities and shared barriers, to consider insights for a national scale approach to adaptation plans and pathways for fisheries and aquaculture in Australia.

Themes already emerging across case studies include:

- Past management decisions, put in place for good reasons and well intentioned, are now constraining flexibility to respond to climate change. This includes the separation of management across states making shared decision making and planning difficult.
- Regulatory change is not keeping pace with industry needs for climate change adaptation. Fishers recognise that changing regulation is a slow process, but there could be more provisions made to increase flexibility (e.g. regarding bycatch, or anchoring rules).

- Recognition that actively listening to, and involving, industry is critical for successful research and that research should include a specific focus on adoption.
- It can be very challenging to build and maintain long-term trusted relationships across industry, management and research. Opportunities to build more trust (such as collaborative research or building networks) should be encouraged.
- There are evidently high levels of stewardship, ingenuity, flexibility and willingness to make changes and adapt within industry, but more could be achieved with greater support and collaboration.

Other next steps include reporting back to industry (within the case study and more broadly) and highlighting the results on the Sea Change Australia website to support further knowledge exchange.

Looking ahead

This case study has relevance well beyond Tasmania. The challenges identified – climate driven extremes and variability, regulatory rigidity, limits to adaptation, and the importance of trust and responsive decision making - are shared across many Australian fisheries. As climate impacts intensify, management systems designed for stability are increasingly tested by rapid and uneven change. Lessons from the Tasmanian Rock Lobster Fishery provide early insight into where fisheries governance is well placed to adapt, and where reform is needed.

If adaptation stalls, the risks extend beyond reduced fishing opportunity. Inflexible systems may accelerate business exit, erode generational knowledge, weaken stewardship, and undermine confidence in fisheries management and social licence. These outcomes are difficult and costly to reverse.

Sea Change Australia offers a practical pathway forward by supporting structured knowledge exchange across industry, management and research. By enabling shared learning, testing flexible responses, and strengthening relationships, the project can help ensure fisheries management remains effective, credible and resilient under ongoing climate change, in Tasmania and nationally.

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