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The feasibility of a financial safety-net: Investigating financial mechanisms to protect NSW oyster growers from disease outbreaks

NSW Farmers Association

January 2025

Deloitte Access Economics

Acknowledgement

Project 2023-070 - The feasibility of a financial safety-net: Investigating financial mechanisms to protect oyster growers from disease outbreaks, is supported by funding from Oysters Australia and the Fisheries Research and Development Corporation on behalf of the Australian Government.

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Abbreviations

Acronym	Full name
AHA	Animal Health Australia
AMSA	Australian Maritime Safety Authority
APFA	Australian Prawn Farmers Association
APRA	Australian Prudential Regulation Authority
ARAC	Aquaculture Research Advisory Committee
ASIC	Australian Securities and Investments Commission
BOM	Bureau of Meteorology
BRMP	Biosecurity Risk Management Plan
DAFF	Department of Agriculture, Fisheries and Forestry
DPIRD	Department of Primary Industries and Regional Development
EADRA	Emergency Animal Disease Response Agreement
ETFG	Enhanced Taskforce Green
EPPR	Emergency Plant Pest Response
EPPRD	Emergency Plant Pest Response Deed
FHA	Farm Household Allowance
FMD	Farm Management Deposit scheme
FRDC	Fisheries Research and Development Corporation
GSP	Gross State Product
GVP	Gross Value of Production
HAB	Harmful Algal Bloom
MCA	Multi-Criteria Analysis
NSW	New South Wales
NSWFA	New South Wales (NSW) Farmers Association
OISAS	Oyster Industry Sustainable Aquaculture Strategy
Qx	Queensland unknown
PHA	Plant Health Australia
POMS	Pacific Oyster Mortality Syndrome
PSP	Paralytic Shellfish Poisoning
RIC	Regional Investment Corporation
RFCS	Rural Financial Counselling Service

Executive summary

The New South Wales (NSW) oyster industry is the state's largest aquacultural sector, yet disease risks pose threats to the long-term sustainability and growth of the sector. Over the past two decades, oyster production has been particularly impacted by two biosecurity risks – the Queensland unknown (Qx) disease and Pacific Oyster Mortality Syndrome (POMS). Outbreaks of both diseases across various NSW estuaries has caused significant loss of stock, in addition to other financial consequences for oyster producers including restocking and clean-up costs.

There are currently no formal financial support arrangements available to oyster producers impacted by disease incursions. During prior outbreaks, producers have primarily relied on their own financial buffers, although a small amount of ad-hoc funding has been made available on occasions. For many producers, the costs of disease response are borne amid a period of no income, unless they have diversified their oyster stock by species and/or location.

It is in this context that the NSW Farmers Association (NSWFA) is investigating financial support mechanisms to bolster the long-term viability of oyster production, particularly as a changing environment increases the risk of disease outbreaks and non-disease supply shocks in the future. Deloitte Access Economics was engaged to investigate the feasibility of various financial support mechanisms and develop a shortlist of options that could potentially support NSW oyster growers.

A long list of potential financial support options was developed based on relevant financial support schemes available to terrestrial agricultural and other aquaculture industries. Various stakeholders from the Australian oyster industry and insurance sector were engaged in the development of the long list.

The long list was subsequently refined to three shortlisted options based on the merit of each option against a set of criteria. Suitability criteria spanned considerations such as long-term sustainability, cost effectiveness, flexibility, fairness, and practicality. The performance and design considerations of each option were assessed in conjunction with NSW oyster growers to ensure fitness-for-purpose. The three shortlisted options comprise of:

1. A tiered support, shared cost mechanism: similar in design to the Emergency Animal Disease Response Agreement (EADRA), this mechanism would provide financial assistance in response to estuary-level disruptions to supply. It would be co-funded by both industry and state government, but the share of government support would increase progressively based on the magnitude of financial loss caused by the disruption. A compulsory and estuary-wide initiative is recommended to ensure stable funding that is sustainable over the long term, whereby beneficiaries can observe its impact in their local estuary.
2. An industry-led common fund: this option would involve establishing a funding pool managed by industry, for the benefit of industry. The fund would enable the cost of responding to a supply disruption to be shared across members, geographies, and over time. This option would provide the greatest flexibility to adapt the fund to cover costs where funding support is most needed. It is recommended that this option is implemented on a voluntary basis and at an estuary level to maximise support for the fund and to enable local communities to determine the terms of the fund based on their needs.
3. Oyster industry insurance: this option would involve designing a parametric insurance product which covers certain costs that arise following a supply disruption. While insurance products of this nature are not currently available for NSW oyster farmers, with sufficient industry interest and engagement, a suitable product could be successfully designed. However, establishing a new, bespoke product would be relatively costly for the insurance industry – necessitating a coordinated, collaborative effort across the NSW oyster industry to appropriately signal market interest to insurers.

While this report presents pathways through which industry could establish mechanisms to better prepare for, and respond to, supply-side disruption, further design work and additional steps are required for the shortlisted options to be established. As the primary beneficiaries, industry collaboration and coordination is critical to ensuring the long-term success of any financial support mechanism.

1 Project overview

1.1 Scope of works

Deloitte Access Economics (Deloitte) was engaged by the NSW Farmers Association to investigate financial mechanisms that could support NSW oyster producers to endure major supply shocks. Recent events, such as the outbreak of Qx disease in Port Stephens in 2021, have highlighted the vulnerability of the oyster industry to supply-side disruptions. However, no measures of last resort currently exist to support producers impacted by disease outbreaks and other non-biosecurity disruptors such as Harmful Algal Blooms (HABs) or food-borne illness.

In this report, Deloitte researched and developed a list of potential financial mechanisms and evaluated each option using a pre-defined framework. The initial list was developed in consultation with representatives from various shellfish industries and government departments in several Australian jurisdictions. Desktop research of mechanisms available to other agriculture and aquaculture industries also informed the initial suite of options. The three best performing options from the initial list were explored in detail to enable industry committees and stakeholders to further develop these options and consider potential implementation opportunities.

1.2 Structure of this report

Deloitte recognises the significant burden that supply-side disruption places on the NSW oyster industry, and the ad-hoc nature of government support to date. It is timely to consider how the industry can leverage financial support measures to create greater certainty for producers and ultimately improve industry outcomes into the future.

In this context, this report articulates the key issues that exist under the status quo and presents three options which could be utilised to achieve better outcomes for industry, government and the broader Australian public.

This paper is structured as follows:

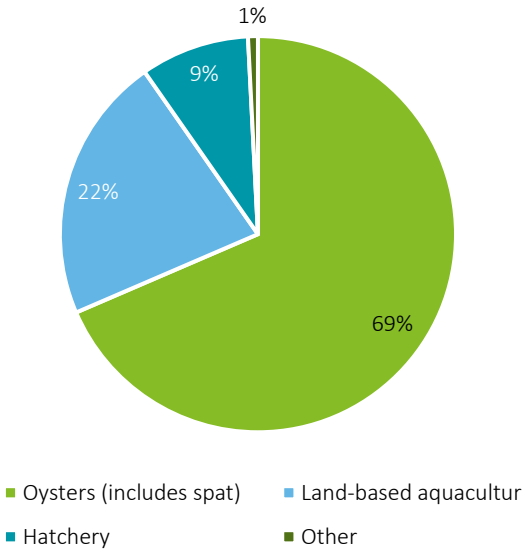
- Chapter 2 provides an overview of the NSW oyster industry, in terms of its geographic footprint, production and market value, ownership structure and governance.
- Chapter 3 describes the supply-side risks facing the NSW oyster industry, and the possible consequences of inaction.
- Chapter 4 discusses how other aquaculture and agriculture industries respond to supply-side disruption risk, and the financial support mechanisms they utilise.
- Chapter 5 presents a long list of possible options that could support NSW oyster producers, as well as the methodology applied to shortlist three options most suitable for further consideration.
- Chapter 6 examines the three shortlisted options in further detail. This includes how they might work in practice, design characteristics including geographic coverage and funding, as well as challenges and preconditions for success.
- Chapter 7 summarises the next steps that industry could take in order to progress the options presented in Chapter 6.

2 Overview of the NSW Oyster Industry

Aquaculture in NSW is a thriving industry that plays a vital role to the state economy and culinary landscape. In 2021-22, the NSW aquaculture industry had a Gross Value of Production (GVP) of $105 million and employed an estimated 2,329 full-time equivalent workers.[1] When factoring in flow-on benefits, the contribution of NSW aquaculture to Gross State Product (GSP) was estimated to be over $219 million.[2] While the industry is significant, the NSW Government's Aquaculture Vision Statement outlines a commitment to work with industry to grow its farmgate value to $300 million by 2030.[3]

The NSW oyster industry is the most valuable fishery in the state's aquaculture sector (Chart 2.1), and is Australia's largest producer of edible oysters.[4] In 2022-23, there were approximately 250 oyster cultivation permit holders in NSW. Oyster production is spread across approximately 30 estuaries, ranging from the Tweed River (on the Queensland border) to Wonboyn Lake in the far south of NSW (Figure 2.1).

Chart 2.1 Share of NSW aquaculture value by production type, 2022-23



Source: NSW Department of Primary Industries and Regional Development

Figure 2.1 Location of major oyster producing estuaries in NSW

Source: NSW DPI Aquaculture Facts & Figures

There are three species of oysters commercially grown in NSW - the Sydney Rock oyster (*Saccostrea glomerata*), Pacific oyster (*Magallana gigas*) and the Native oyster (*Ostrea angasi*).[5] Whilst all three species of oysters are cultivated in NSW, the Sydney Rock oyster has always been the primary focus of oyster production due to its endemic status, and reputation as a gourmet delicacy.[6] Since the late '90s, Sydney Rock oysters have consistently accounted for around 90 per cent of NSW oyster production (Chart 2.2).

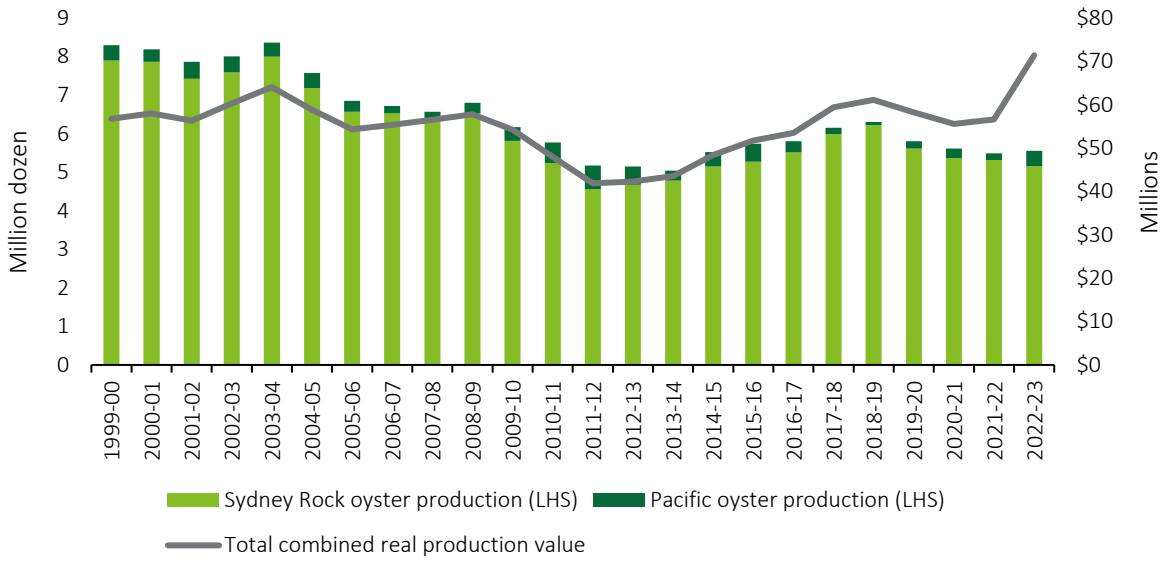
Sydney Rock oysters are endemic to NSW and southeast Queensland. The species has been known to reach approximately 60g in three years and live for up to 10 years.[7] Sydney Rock oyster cultivation in NSW has been historically dependent on natural spatfall, although the use of hatchery-produced spat is increasing.[8] Spat are usually collected on plastic slats and farmers use different systems such as floating longline baskets, tumblers and trays affixed to rails to grow-out their product.

The Pacific oyster is endemic to Japan and was introduced to Australia in the mid-20th Century. The species is now found throughout most of the range of the Sydney Rock oyster in NSW.[9] The Pacific oyster has a high

growth and reproduction rate, reaching a marketable size of 50g between 10 months to two years. In 1990, permission was granted for aquaculture permit holders in Port Stephens to cultivate Pacific oysters due to the large population of wild Pacific oysters. In all other estuaries, only reproductively sterile triploid Pacific oysters (produced in hatcheries) are allowed for cultivation, following approval by the NSW Department of Primary Industries and Regional Development (NSW DPIRD).[10]

Estuaries are a common property resource, managed by the state government on behalf of the community. It is the role of the government to manage these ecosystems to maintain and enhance their environmental, cultural, social and commercial values. NSW DPIRD estimates the sustainable production level for oysters in NSW to be approximately 7,500 tonnes annually.[11]

Chart 2.2 NSW oyster production by species, and total real production value



Source: NSW Department of Primary Industries and Regional Development

2.2 Oyster producers

The ownership structure of the NSW oyster industry is characterised by many small, family-owned producers, akin to land-based agriculture in Australia, although the industry has undergone some consolidation in recent years. The number of permit holders has declined from 308 in 2012-13 to 250 in 2022-23.[12] The consolidation of family-owned operations by corporates has contributed to this trend.[13] Consolidation has also occurred in Tasmania, particularly within hatchery operations.[14]

The barriers to entry for new oyster producers are significant. New entrants face high initial costs, including access to waterfront land sites, specialised equipment, cultivation infrastructure, as well as lease and lease-related fees. The Tasmanian oyster industry, for example, collectively pays more than $1,000,000 in fees annually.[15] Compliance with biosecurity protocols further adds to the costs that producers face.

2.3 Historical production and market value

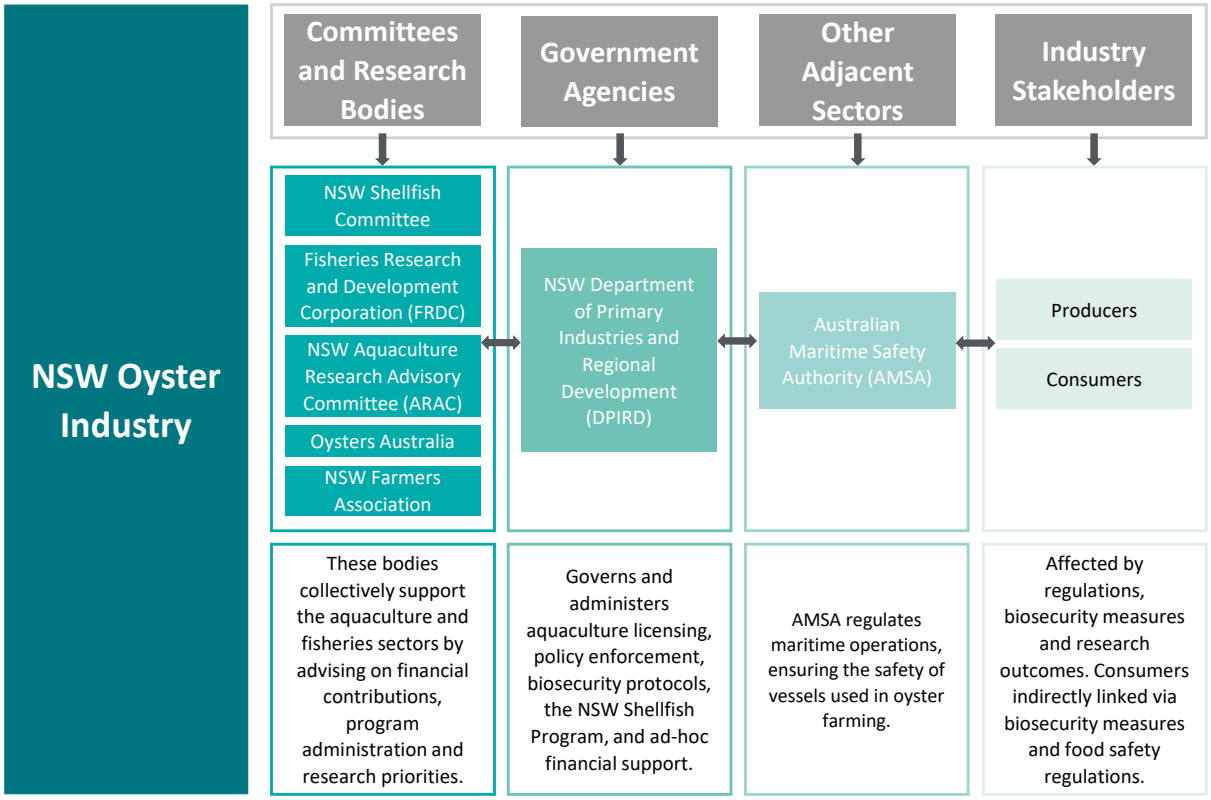
Oyster production increased significantly from the early 1940s until it reached its peak in the 1976-77 financial year.[16] At its peak, annual production neared 9,375 tonnes (17 million dozen oysters). This was predominantly driven by production in Port Stephens and in the Georges River. After the mid-1970s, oyster production has been declining. Part of this decline was due to changes in cultivation methods and a trend towards quality over quantity, however oyster disease and other non-biosecurity risks have also significantly impacted production.

In 2022-23, the nominal value of Sydney Rock oyster and Pacific oyster production combined was $71.4 million, with Sydney Rock oyster production value accounting for 92 per cent (around $66 million).[17] Between 1999-00 and 2022-23, while the total value of oyster production increased by 26 per cent, production declined by 33 per cent (Chart 2.2). Sydney Rock oyster production declined most notably, falling on average 1.8 per cent per annum in volume terms, while its real value increased on average by 0.9 per cent each year.

2.4 NSW oyster industry governance

The NSW oyster industry is governed and supported by several committees, industry stakeholders and research bodies, as well as regulatory bodies such as the NSW Government, and the Australian Maritime Safety Authority (AMSA). These entities work to ensure the industry's sustainability, biosecurity and safety standards are met.

Figure 2.2 NSW Oyster industry governance structure



Source: Deloitte Access Economics

3 Supply-side risks to the oyster industry

The NSW oyster industry is a cornerstone of the state's aquacultural landscape. Not only does the oyster industry contribute significantly to the economic and social prosperity of the state's coastal regions, but there are strong ambitions for it to grow. While the industry has expanded significantly since the early 1940s, the impact of supply-side disruptions such as disease outbreaks, food-borne illness outbreaks, and poor water quality pose a significant risk to its future growth prospects.

There are several drivers of supply-side disruption in the oyster industry, including disease, food-borne illness and persistent harmful algal blooms. Disease outbreaks are the most significant risk faced by oyster growers due to the substantial mortality caused by disease. Oysters are prone to multiple diseases, but Qx disease affecting Sydney Rock oysters and POMS impacting Pacific oysters cause the most severe disruption to the industry.

Despite research into Qx and POMS diseases, alongside investment in breeding programs to improve disease resistance, outbreaks still cause significant oyster mortality. For example, Qx outbreaks in the Hawkesbury in 2004 and Port Stephens in 2022 wiped out almost entire populations of oysters. The outbreaks had devastating financial implications for oyster growers, particularly those without a diversified oyster supply, such as production spread across multiple estuaries.

While the industry bears the brunt of these events, farmers have, at times, received support from government. Support from the Commonwealth and state governments has typically been provided on a one-off basis to producers affected by major outbreaks. Given that oysters are extensively farmed in public waterways, they are uniquely vulnerable to supply disruptions compared to other aquaculture and fisheries industries. This provides a strong case for formalising financial support mechanisms to strengthen industry resilience.

3.1 Disease risks

3.1.1 Qx disease

First identified in 1976, Qx is a seasonally occurring disease which infects Sydney Rock oysters, typically in the summer months.[18] The disease is transmitted to oysters by the parasite *Marteilia sydney*i. The disease has a delayed onset of mortality – as the seasons transition from autumn to winter, the mortality associated with the disease becomes increasingly evident.[19] There are many gaps in the knowledge and understanding of Qx due to the complex multi-host lifecycle nature of the parasite. However, research indicates that the prevalence of Qx is associated with changes in various environmental factors, including salinity and water temperature. Climate change has the potential to increase Qx prevalence, particularly via increases in water temperature. Notably, the presence of *Marteilia sydney*i alone does not always cause outbreaks of Qx. This uncertainty, combined with the lack of scientific understanding of Qx, means preventing and managing devastating outbreaks is challenging.

The gradual onset of Qx disease makes early detection and response difficult, and mortality rates of up to 98% have been recorded in some outbreaks.[20] The three-year growth cycle of the Sydney Rock oyster means that losses closer to harvest can be more costly.

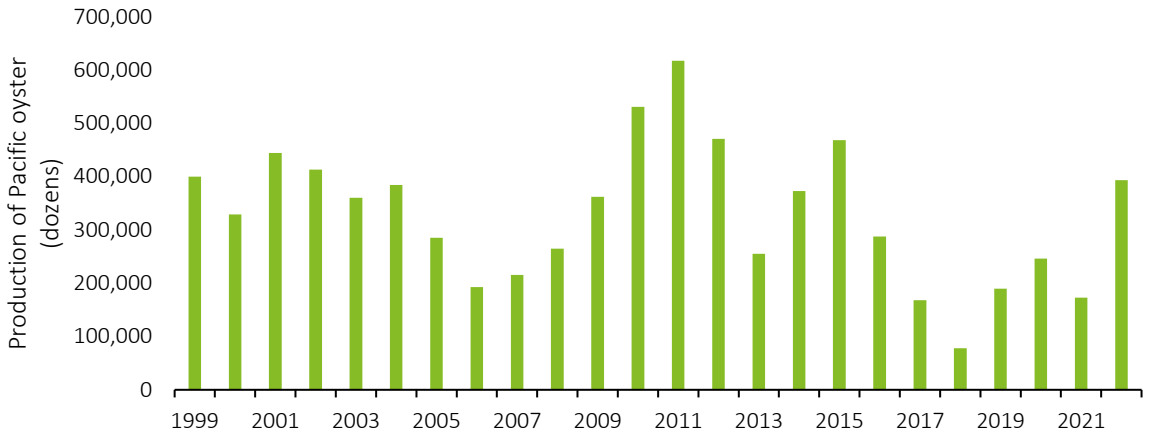
Qx disease is a factor contributing to the ongoing decline of Sydney Rock oyster production since the 1970s. For example, the 2022 Port Stephens outbreak decimated the region's entire stock of Sydney Rock oysters which represented 16 per cent of NSW annual supply.

3.1.2 Pacific Oyster Mortality Syndrome (POMS)

POMS affects Pacific oysters and was first identified in France in 2008. Like Qx, POMS is also a seasonally occurring disease where infection and mortality is most prevalent in the summer months. Once introduced into an estuary, the impacts of POMS persist annually.[21] The first Australian case of POMS was confirmed in November 2010 in NSW and it has since been detected in other states including Tasmania and South Australia. More is known about the virus that causes POMS, than the parasite that causes Qx. In NSW estuaries that suffer from POMS, mortalities occur when water temperature consistently reaches 21°C and above.[22]

POMS can cause significant mortality of up to 100 per cent in Pacific oyster stocks within days of infection.[23] Juvenile oysters aged three to six months experience higher mortality rates, though all life stages are susceptible. The 2013 POMS outbreak in the Hawkesbury River killed 10 million oysters, representing 98 per cent of the region's oyster stock.[24] Despite the immediacy of POMS' impact on Pacific oysters, recovery is relatively faster than in Sydney Rock oysters due to the shorter grow-out period from spat to market (6-18 months versus 2.5 – 3.5 years).

Chart 3.1 Total NSW production of the Pacific oyster (dozens) from 1999 to 2022



Source: NSW Department of Primary Industries and Regional Development

Since first identified in France, POMS has been detected globally in many different countries including the United Kingdom, Ireland, Netherlands, Spain, Italy, New Zealand, Australia and throughout Asia. POMS has been confirmed in three NSW Pacific oyster producing estuaries including Botany Bay/George's River, the Hawkesbury River and Brisbane Water. The disease was first confirmed through testing in Botany Bay/George's River following a large mortality event in Pacific oysters in 2010.[25] Then in 2013, POMS struck oyster farmers in the Hawkesbury River and Brisbane Water, leading to the total collapse of the Pacific oyster sector in that region over the following 12 months.

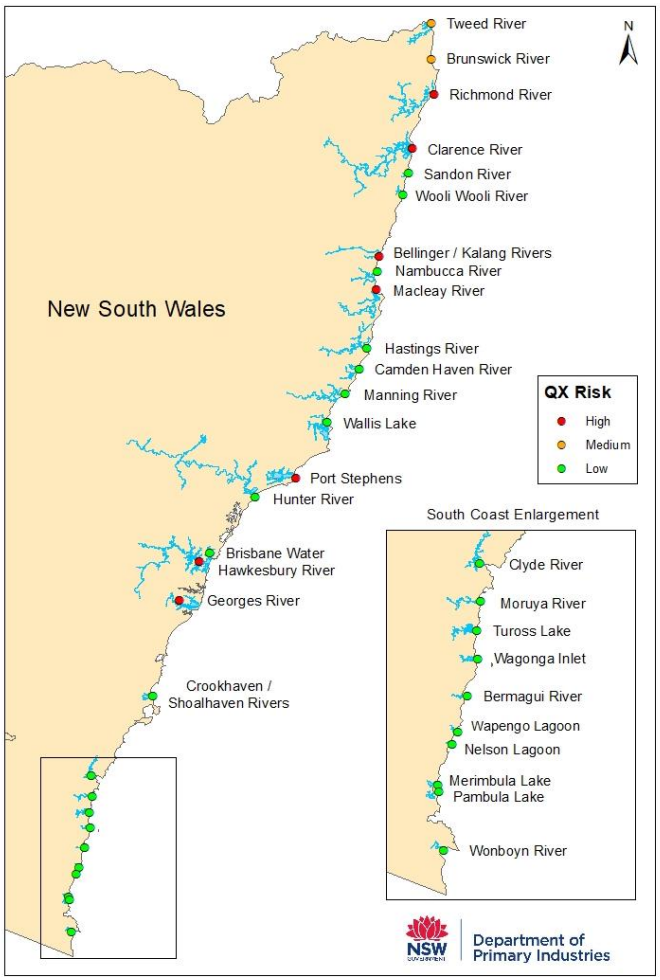
3.1.3 Disease management

Biosecurity controls are in place in NSW to minimise the risks associated with both Qx disease and POMS. Controls are governed by the NSW Government Department of Primary Industries and Regional Development (NSW DPIRD). A similar disease management approach is used for POMS and Qx diseases.

To reduce the risk of disease spread, the NSW DPIRD has established biosecurity zones for both POMS and Qx under the NSW Biosecurity Regulation Act 2017 which limits the movement of oysters and equipment from affected areas. [26] The Qx Biosecurity Zone uses a risk-based approach that categorises all NSW estuaries as either low, medium or high risk of Qx infection (Figure 3.1). The regulation prohibits movement of all oysters from high risk Qx estuaries to low or medium Qx risk estuaries. Movement of oyster farming equipment from high and medium Qx disease risk areas is only allowed if the equipment has been treated in line with the provisions of the specific Qx disease biosecurity requirements. Similarly, for POMS, oysters and equipment may only be moved between affected areas described by the POMS Biosecurity Zone.

Further, the NSW DPIRD requires that all Class A Aquaculture Permit applications include a farm-based Biosecurity Risk Management Plan (BRMP).[27] The BRMP should address the identification and assessment of potential biosecurity risks, mitigation measures to manage potential biosecurity risks, staff biosecurity training, record keeping procedures, cleaning procedures, and an emergency disease action plan.

Figure 3.1 Declared Qx risk areas under Part 3 of the NSW Biosecurity Regulation 2017



Source: NSW Department of Primary Industries and Regional Development

3.2 Non-biosecurity risks

Although Qx disease and POMS are recognised as the primary driver of large-scale oyster supply interruptions, there are several other non-biosecurity risks which can also affect supply. The potential impact of these risks is secondary compared to disease, but this could change in the future.

3.2.1 Harmful Algal Blooms

Microalgae are vital to aquatic ecosystems, but certain species can proliferate into Harmful Algal Blooms. Some species of algae produce toxins which can accumulate in oysters. If these shellfish are consumed by humans, this can cause Paralytic Shellfish Poisoning (PSP). To protect consumers, the oyster industry undertakes a rigorous quality assurance program, which involves the regular testing of water and meat samples, and if toxins are detected at dangerous levels, the harvesting of oysters is prohibited. Climate change and nutrient loading have intensified the frequency and severity of these blooms.[28] Consequently, harmful algal blooms pose increasing challenges for the industry, leading to closures, stock losses, financial impacts, and potential public health risks.

3.2.2 Food-borne illness outbreaks

Vibrio bacteria, which thrive in warm, moderately saline estuarine waters, can cause gastrointestinal infections in humans when raw or undercooked seafood is consumed.[29] Prior to 2022, food-borne outbreaks were rare in Australia, with only four reported outbreaks between 2002 and 2019 affecting a total of 24 people.[30] However, in 2021, following the winter season, health officials observed a rise in locally acquired Vibrio cases in South Australia, a trend later seen in other states. With climate change driving warmer water temperatures, the likelihood of elevated Vibrio levels—and consequently, food-borne illness outbreaks—is expected to increase, presenting a growing risk to the oyster industry.

3.2.3 Poor estuary conditions

Poor estuary conditions represent another risk for the oyster industry. Factors such as pollution, invasive species, poor water quality, and flooding—all of which are expected to worsen with climate change—pose ongoing challenges. The 2022 flooding and storm events in NSW, for example, was estimated to cost $18.7 million in damages and losses to the oyster industry, affecting equipment, stock, and water quality.[31] Where natural disasters are declared, financial assistance may be available to primary producers by Commonwealth and state governments through the Natural Disaster Relief and Recovery Arrangements. Different levels or tiers of support are activated depending on the level of impact within a Local Government Area (LGA).

3.3 Existing support provided to the NSW oyster industry

Various stakeholders in NSW oyster industry governance (illustrated in Figure 2.2) have played roles in supporting oyster producers prepare for and response to supply disruptions. However, consistent financial support remains limited and primarily reactive, rather than a sustained mechanism to manage long-term risks.

3.3.1 Preventative support

Government agencies, committees, research bodies and supporting groups all undertake activities to try and decrease the likelihood of supply disruptions, and to increase industry's preparedness and resilience to these events when they do occur. Some of the key organisations and activities are described below:

- The NSW Shellfish Committee is a statutory advisory body established under the Food Regulation 2015, which includes five representatives from the shellfish industry.[32] The Committee provides advice to the Minister and the Food Authority on the administration of the NSW Shellfish Program.
- Similarly, the ARAC advises the Minister on contribution levels to and from trust accounts (established from lease research levies) and prioritises the research needs of the NSW aquaculture industry.[33]
- NSW DPIRD manages the Sydney Rock oyster breeding program, established in the 1990s. The program aims to boost industry productivity through the generation of elite family lines, and to create a platform to address future challenge of climate change.[34] Its initial goal was to develop commercial oysters with over 70 per cent survival during a Qx disease outbreak and 30 per cent faster growth.
- As the industry's representative body, NSW Farmers Association works to support the oyster industry in various ways. The association convenes an Oyster Committee and looks to enhance industry productivity and reduce risk through advocacy and project activity.

3.3.2 Support during and after supply disruptions

Government has occasionally provided financial support to oyster producers during a major supply disruption. Assistance has historically comprised of a one-off financial package delivered in the wake of a disease outbreak. Support packages have generally assisted producers with the costs of clean-up activities, and have also provided fee waivers and grants to ease financial stress. Despite the ongoing risk to oyster production posed by Qx, POMS, Harmful Algal Blooms and other threats, there are no formal and consistent financial support mechanisms available to oyster producers in NSW (or across Australia) following a severe supply disruption.

Examples of one-off recent support packages delivered by the NSW Government include:

- A $3.1 million package following the 2004 Qx outbreak in the Hawkesbury River, which allocated $2.7 million for clean-up costs of existing infrastructure, $100,000 for lease fee waivers, and $200,000 in grants to affected farmers.[35]
- A 12-month waiver of the Fisheries and Food Authority State Levy Fees for the financial year 2023-24, issued to Port Stephens oyster farmers impacted by Qx disease, totalling $240,000.[36]

Following the 2004 Hawkesbury Qx outbreak, the NSW Government announced it would not provide financial support to growers following future disease outbreaks. While these and other ad-hoc support packages in the past have assisted oyster producers to continue operations, they are not a guaranteed measure, nor are they financially sustainable. Fisheries levies and fees for example act as a cost recovery mechanism for DPIRD personnel, biosecurity activities and breeding programs.

In addition to the ad-hoc nature of government support delivered during supply disruptions, NSW oyster producers do not currently have access to insurance products that provide financial support during outbreaks. As a result, oyster farmers must bear the financial burden associated with potential disease and loss of stock, as well as the costs associated with restocking or rebuilding their businesses. Preparing financially for a major

disease outbreak is particularly challenging when the timing of an outbreak is unpredictable and can occur over consecutive years.

The lack of ongoing and reliable financial support available to oyster growers is not unique to NSW. Commonwealth funding is not available to the oyster industry, and other state and territory governments have not established ongoing programs that can financially support oyster growers in the event of a supply disruption. The Tasmanian and South Australian Governments both introduced short-term support measures in response to a POMS outbreak in 2016. However, neither this outbreak, nor the ongoing disruption caused by COVID-19, led to the introduction of a formal long-term support mechanism.

Long-term and reliable financial mechanisms to support producers affected by supply disruptions are a feature in other aquaculture and agriculture industries. Case studies demonstrating how support mechanisms have assisted farmers in various industries are presented in Chapter 4. These case studies have informed the list of options potentially available to the NSW oyster industry, presented in Chapter 5.

3.4 Consequences of inaction

Without reliable and established financial support, NSW oyster growers face an uncertain future. The lack of support and financial aid is a vulnerability that undermines confidence in the sector and impedes investment. With risks to oyster production set to increase with climate change, it is important to understand the possible consequences of not supporting oyster growers through major supply disruptions.

3.4.1 Risk of failing to achieve aquaculture production targets

In 2024, the NSW Government launched its NSW Aquaculture Vision Statement, outlining the government's commitment to support the growth of the sector to reach $300 million by 2030. This includes a target to double oyster production to 7,500 tonnes per annum. Without a longer term and stable financial support system for oyster growers to combat the effects of supply disruptions, the NSW Government target is unlikely to be achieved. Oyster farming is fundamentally about managing risk, and supply disruptions erode farmers confidence to invest in and expand their operations. Prospective entrants are also becoming more aware of the risks associated with oyster farming and are discouraged by the lack of support available in the event of a major disruption.

3.4.2 Industry exits

Producers are faced with limited options to maintain the financial viability of their businesses amidst the risk of supply disruptions. These include spreading production (and therefore risk) across multiple estuaries, diversifying into other oyster species (e.g., growing Pacific oysters and Sydney Rock oysters), or building a financial buffer from earnings in bumper years when conditions were good. For some growers, none of these options are viable. This has resulted in some oyster growers seeking secondary employment or exiting the industry altogether.

3.4.3 Financial impact of ongoing liabilities

For growers who intend on leaving the industry, financial liabilities associated with infrastructure cleanup and lease obligations remain significant burdens. If the grower is unable to sell the lease to another permit holder, before a lease can be surrendered to NSW DPIRD, the area must be remediated to vacant water. This involves the expensive and time-consuming process of removing and disposing of cultivation material. If growers fail to fulfill their cleanup obligations, responsibility passes to the state as landowner. The state may pursue clean-up costs through state debt recovery processes, before drawing on funds from the Lease Security Trust Account.

4 Existing financial support frameworks for primary industries

Chapter 3 outlined the case for establishing mechanisms to support NSW oyster growers facing real financial risks from disease and other environmental threats. In fact, most aquaculture and agriculture industries face unique biosecurity or climate-related threats that can inflict severe economic, social and environmental harm. The key difference is that many other industries have access to financial support measures that compensate for stock loss, fund biosecurity response activities, or provide income support for farming households. The purpose of this chapter is to explore existing measures and frameworks available in Australia and overseas, the industries they apply to and the threats that are protected against. Case studies demonstrating the application of specific support measures are included where relevant.

The information presented in this chapter demonstrates that there are an established set of approaches to responding to biosecurity (and other supply disruption) events which involve common elements. These typically include specified industry coverage; support provisions provided to industry; and a mechanism of cost recovery. However, existing frameworks contain a range of customisable features and settings, such as geographical coverage and membership rules. These have been combined in Chapter 5 to create customised options suitable for the NSW oyster industry.

4.1 Commonwealth levy and charge rates system

The statutory levy and charge rates system is a system for biosecurity preparedness, designed to ensure that industries contribute fairly to the costs associated with managing biosecurity risk.[41] This system applies levies and charges to various agricultural goods to fund biosecurity measures aimed at preventing and responding to pest and disease threats. Farmed prawns is the only aquaculture segment which has invested in a levy system. A levy was introduced in 2020 to recover the industry's share of costs incurred in responding to a White Spot Disease outbreak in Queensland's Logan River in 2016 (see Box 4.1).

Box 4.1: Prawns - White Spot Disease

White spot disease is a highly contagious disease that affects decapod crustaceans, including prawns, crabs, yabbies and lobsters. Caused by the white spot syndrome virus, it results in up to 100 per cent mortality in farmed prawns. While the disease is considered exotic to Australia, it has been declared endemic in Queensland's Moreton Bay region.[37] No formal arrangements exist to support prawn producers and fishers affected by white spot disease or other aquatic diseases.

The first major outbreak of white spot disease affected farmed prawns in the Logan River in October 2016. Prawns from seven prawn farms were destroyed, resulting in an estimated loss of $43 million to producers.[38] The Commonwealth initially provided $1.7 million to assist farmers with the costs of the emergency biosecurity response, which was not recovered from industry. Six months following the outbreak, the Commonwealth and the Australian Prawn Farmers Association (APFA) reached agreement on a $20 million compensation package, of which 20 per cent would be repaid by industry. The package reimbursed producers for destroyed stock and other costs associated with the biosecurity response.[39]

Utilising the federal levy and charge rates system, a levy charge was set at 3.01 cents per kilogram of whole farmed to prawns from the 1st of January 2020 to recover industry's 20 per cent contribution. Prawn producers nationwide are liable to pay the levy each quarter by submitting a levy return to the Department of Agriculture, Fisheries and Forestry (DAFF).

White spot disease outbreaks also affected northern NSW prawn farmers in 2022/2023. While the Commonwealth did not provide financial support, the NSW Government allocated $21.4 million to help the industry respond and recover.[40] The package was funded via the state's general biosecurity allocation, and did not involve co-funding from industry.

The primary industry that decides to participate in the levies system determine the levy or charge applied to a commodity under legislation. Levy and charge revenue can be directed towards biosecurity emergency response (detailed further below) or other supporting activities such as marketing, research and development and residue survey activities.

4.2 Emergency Animal Disease Response Agreement (EADRA)

The EADRA applies to terrestrial livestock affected by emergency animal diseases, and includes diseases that are exotic to Australia, as well as endemic diseases where they could lead to an epidemic.[42] The EADRA is administered by Animal Health Australia (AHA), an independent, national, not-for-profit organisation that brings together government and industry to deliver animal health and biosecurity. The EADRA covers all industries whose representative bodies are signatories to the agreement.

A core feature of the EADRA is the sharing of costs incurred in responding to a pest or disease outbreak between the Commonwealth, state government and affected industries. An example of a cost incurred in responding to an outbreak is the compensation that producers receive for destroying their livestock or contaminated products, following direction from state or territory authorities. A share of biosecurity response costs is recovered from industry via mandatory levies applied to agricultural goods. The cost sharing arrangement is tiered, where the share of government funding changes depending on the categorisation of the disease (Table 4.1). The categorisation of disease is based on the extent of damages, such as loss of supply, socio-economic consequence, human health risks and environmental impacts.

Table 4.1 EADRA Cost sharing arrangement between government and industry

Category of Disease	Government Funding	Industry Funding
Category 1	100%	0%
Category 2	80%	20%
Category 3	50%	50%
Category 4	20%	80%

Source: Animal Health Australia

The emergency biosecurity response to the avian influenza outbreak in Australia in 2024 has been coordinated under the EADRA. Duck meat, chicken meat and egg farmers have received compensation for stock destroyed to contain the outbreak, as their respective industry bodies are signatories to the EADRA. Box 4.2 contains further details on the financial support received by Australian poultry producers.

Box 4.2: Chickens - Avian Influenza

Avian influenza, commonly referred to as 'bird flu' is a highly contagious viral disease of birds found globally.[43] The disease has commercial consequences when outbreaks occur in the poultry industry, typically causing up to 90-100 per cent mortality in chicks, often within 48 hours.[44]

The poultry industry is most heavily concentrated in Queensland, NSW and the ACT, and Victoria. The value of poultry production (meat and eggs) was estimated to be valued at $4.3 billion in 2022-23, which included 6.7 billion tonnes of egg production and 1.4 million tonnes of meat.[45,46]

The impact of avian influenza on such a high value industry can have devastating impacts for the financial viability of poultry producers and have wider consequences for the poultry supply chain and end prices to consumers. To soften the impact on avian influenza on poultry producers and consumers, state and Commonwealth level government supports are accessible to the poultry sector in the event on an outbreak.

Most notably, outbreaks of avian influenza in the poultry sector qualify for EADRA. Access to EADRA means that farmers have access to compensation for loss of stock as a result of an outbreak and are therefore financially protected.

In addition to EADRA support, qualifying farmers can apply for the Farm Household Allowance (FHA) if an avian influenza outbreak causes farmers to experience financial hardship. This provides financial support to cover household expenses following an avian influenza outbreak that may cause a reduction in household income.

These financial support mechanisms help to reduce financial hardship experienced by the poultry sector in the event of an avian influenza outbreak and will ultimately reduce the number of producers who cease operations due to financial hardship.

4.3 Enhanced Taskforce Green (ETFG) – New Zealand

Like Australia, New Zealand is an island that faces unique biosecurity challenges, and therefore is a good comparison in terms of biosecurity-related financial support frameworks. The Enhanced Taskforce Green (ETFG) is a government program, led by the New Zealand Department of Work and Income focused on assistance for disaster clean up.[47] The ETFG is a labour assistance scheme, providing funding to councils or other authorised agencies to employ workers to assist with clean-up activities following an adverse event. The ETFG workers provide support to farmers and growers in clean-up activities such as fence clearance, repair and the removal of tree and debris. However, this scheme is limited to events usually defined as a natural disaster.

Box 4.3 describes an additional support scheme in New Zealand similar to the EADRA which has been leveraged to support Bluff oyster producers respond to the ***Bonamia ostreae*** parasite.

Box 4.3: Bluff Oysters - *Bonamia ostreae*

Bonamia ostreae is a parasite that was first detected in New Zealand in 2015 and the cause of entry remains unknown.[48] The parasite is transferred through the water column and enters the bloodstream of an oyster through the gills, mantle and gut. The parasite causes significant mortality in Bluff oysters, with a mortality rate of up to 90 per cent in infected stock.

The oyster industry affected by the parasite is concentrated in the southern parts of New Zealand, with outbreaks occurring in multiple locations around Stewart Island. The value of the oyster, mussels and salmon industry in New Zealand was estimated to be $685 million in 2022, including 1,980 tonnes of oysters.

The Bluff oyster fishery is an integral part of Southland's economy and cultural identity, and the impact of the parasite has been devastating to the livelihoods of producers. The New Zealand government recognises the economic, social and cultural significance of the industry and identifies biosecurity incursions as an adverse event, similar to natural disasters. Accordingly, the New Zealand government expands the range of financial responses available.

Under the New Zealand Biosecurity Act 1993, compensation may be payable if farmers incur a loss as a result of the Ministry for Primary Industries actions. The Act requires claims of losses to be submitted within a 12-month period. This compensation is provided from money that has been specifically allocated by Parliament for that purpose. In response to the 2017 outbreak in Big Glory Bay in Stewart Island, assessments revealed compensation payments of $5.2m.[49] As of 2019, $2.4m had been paid out to Stewart Island oyster farmers.[50]

4.4 Emergency Plant Pest Response Deed (EPPRD)

The EPPRD is essentially the same as the EADRA but is focussed on responding to and eradicating emergency plant pests.[51] The EPPRD is administered by Plant Health Australia (PHA), a not-for-profit organisation that works to protect Australia from plant biosecurity risks like pests and diseases. The EPPRD also contains a provision to compensate crop producers who are directed to destroy infected plants or contaminated products. Cost-sharing arrangements between government and industry are detailed for a range of biosecurity threats and agricultural industries.

4.5 Farm Household Allowance

The Farm Household Allowance (FHA) is a payment for farming families experiencing financial hardship and is issued by Services Australia. Farmers can apply for an allowance if they meet several eligibility criteria and can demonstrate financial hardship.[52] Oyster farmers were previously excluded from the scheme on the basis that they did not have rights or interest in land used for the purpose of a farming enterprise. However, the eligibility criteria changed in 2023, and oyster farmers are now eligible to apply for FHA payments.

The FHA payment is the same as the maximum rate of JobSeeker Payment or Youth Allowance. Recipients can also receive 'activity supplements' of up to $10,000 to help improve the financial position of their farming enterprise. This includes professional advice related to a range of business topics including business planning or performance, diversifying and value-adding, and managing risk. The supplement also covers the costs of formal training and study to help farmers upskill and better manage future disruptions.

4.6 Financial counselling services

The Commonwealth Government, along with some state governments, and other jurisdictions like New Zealand, offer financial counselling services to help farmers at times of financial hardship. These services include the Rural Financial Counselling Service (Commonwealth) and Rural Support Trusts (New Zealand).[53,54]

4.7 One-off industry funded incentive payments

One-off industry funded incentive payments are available in Victoria to producers of cattle, sheep and goats as a risk minimising incentive scheme.[55] The payments encourage early detection of disease by providing producers a payment of $1,000 for cattle or $500 for sheep or goats following a positive diagnosis of anthrax.

4.8 Income-smoothing mechanisms

The Farm Management Deposit Scheme and the Income Equalization Scheme are similar programs administered in Australia and New Zealand, respectively.[56,57] These schemes are a way for businesses to even out income fluctuations in their industry by spreading income between years. Income deposited into a Farm Management Deposit account is tax deductible in the financial year the deposit is made. If an adverse event were to occur, producers who have deposited income into the schemes may be able to withdraw funds from their account. The funds are recorded as taxable income in the financial year they are withdrawn.

Although the Farm Management Deposit Scheme is available to all primary producers, a barrier for oyster producers is the 12-month rule. If participants withdraw any portion of a deposit within 12 months, they are ineligible to claim a tax deduction for that amount.[58] Oyster producers may be deterred from participating in the scheme due to the potential impact of a disease outbreak. In 2019, Dairy News Australia indicated that the Australian National Audit Office reported that the administration of the Farm Management Deposit Scheme has not been fully effective, with compliance arrangements and risk assessment processes not fully capturing elements of the design of the scheme.[59] Additionally, there has been minimal adoption of the policy changes introduced in 2016.

5 Long list of options to support NSW oyster producers

The remainder of this report considers how financial mechanisms could be adopted by the NSW oyster industry to lessen the financial consequences of a significant supply disruption. This chapter explores the process undertaken to identify and assess an initial long list of financial support options available to industry. The key steps taken were:

1. Develop a long list of six possible options, drawing on case studies of mechanisms used in other aquaculture and terrestrial agriculture industries, as well as feedback from stakeholders.
2. Develop a set of criteria against which to assess each of the options through a multi-criteria analysis (MCA). The criteria draws upon cost recovery principle guidelines provided by the Commonwealth and the Productivity Commission (see Section 5.2 for more detail).
3. Assess each long listed option against the criteria, drawing on Deloitte judgements along with judgements from an industry working group.

Section 5.1 below outlines the long listing process and provides a brief description of each long listed option. Section 5.2 details the shortlisting approach and the high-level rationale underpinning the MCA outcomes. Detailed scoring and accompanying logic against each criterion for all six long listed options is given in Table B.5 in the Appendix.

5.1 Identifying and defining a long list of options

A long list of six financial support options was developed by researching existing support mechanisms identified in case studies of other aquaculture and terrestrial agriculture industries. The six options and their basic features are provided in Table 5.1.

While the options are fundamentally unique, they can be configured in multiple ways by changing core features, including geographical coverage, nature of participation (voluntary or compulsory), and funding arrangements. Feedback from growers and other stakeholders helped to determine which configurations would be most suitable for the NSW oyster industry. Further detail on each long listed option is provided in Sections 5.1.2 to 5.1.7 below, and a summary table is contained in Table B.1 in the Appendix.

Table 5.1 Long list of financial support options

	Option	Co-funding from government	Geographic level of implementation[1]	Eliminates ad-hoc government funding
1	Tiered support, shared cost	Yes	State-wide; Estuary-wide	Yes
2	Uniform support, shared cost	Yes	State-wide; Estuary-wide	Yes
3	Common industry fund	No	State-wide; Estuary-wide	Possibly
4	Insurance	No	State-wide; Estuary-wide; Individual	Possibly
5	Incentive payments and penalties	No	Individual	Unlikely
6	No intervention	No	N/A	No

[1] Geographic level of implementation refers to the level at which the scheme can be customised or adapted. Under a state-wide scheme, rules are consistent across all estuaries within the state. Conversely, an estuary-wide scheme implies that rules can be customised within each estuary. A scheme that is adopted at the individual level means that businesses sign up to the scheme independently and negotiate their own unique terms of agreement.

Source: Deloitte Access Economics

5.1.2 Option 1: Tiered support, shared cost

Option 1 would be modelled on the existing EADRA and EPPRD biosecurity emergency response schemes administrated by Animal Health Australia and Plant Health Australia respectively.

While the EADRA and EPPRD are national instruments, involving three parties (the Commonwealth, state government and industry), option 1 would operate at a state or estuary level, and therefore involve two parties (state government and industry). The differences between these geographic levels of implementation are summarised as follows:

- A **state-wide scheme** would be compulsory for all oyster producers in NSW, regardless of the risk status of the producers' estuary. The signatory parties would be the NSW Government and NSW oyster industry. Cost recovery levies would be collected solely from NSW oyster farmers, not the national industry.
- An **estuary-wide scheme** would be compulsory for all oyster producers that operate in the nominated estuary. An estuary-based scheme would more likely be implemented in the waterways classified by the NSW DPIRD as high or medium disease risk.

Under option 1, in the event of a major supply disruption, certain biosecurity response costs (such as testing and stock disposal) would be initially underwritten by state government to enable a more rapid response. Part of the costs of the biosecurity response would subsequently be recovered from industry via a levy on production. The respective share of costs paid by the government and industry would be tiered, meaning that the government's share would increase as the extent of damage increases.

Option 1 is the most common emergency biosecurity response model. The emergency response initiated under option 1 would be similar to that delivered during the current avian influenza outbreak, as well as witchweed in sugar cane and Varroa mite affecting European honey bees.

5.1.3 Option 2: Uniform support, shared cost

Option 2 would be broadly similar to option 1, except that the proportion of costs paid by government and industry remains fixed, regardless of the magnitude of costs incurred in an emergency response. Option 2 therefore places a greater degree of liability onto industry for the costs of responding to a disease outbreak or other disruption.

Similar to option 1, option 2 could be implemented at a state-wide or estuary level. A state-wide scheme would likely be compulsory for oyster producers, regardless of the risk status of the producers' estuary, whereas an estuary-level scheme could be opt-in.

A levy applied to oysters at the point of sale would similarly be used to recover industry's share of costs. The scope of activities funded by the levy would be similar to option 1.

There are no flat cost-shared agreements under the EADRA or EPPRD. The cost split is determined by the classification of diseases based on the severity of potential impact to human, animal and environmental health, as well as the economy.

5.1.4 Option 3: Common industry fund

A common industry fund would be a system in which fund members contribute to a shared funding pool. When supply disruptions occur due to disease outbreaks or other non-biosecurity risks, affected oyster producers can access these funds to provide support.

This type of fund allows industry members, as the sole stakeholders, the flexibility to establish terms that maximise benefits for the industry. Members could decide on contribution levels, specify qualifying events for financial support, and determine what expenses are eligible for coverage. Few other options offer the same degree of flexibility, as they often involve multiple stakeholders with varied interests.

A common industry fund could be implemented either at a state-wide or estuary level. Each option has its merits:

- State-wide fund: A state-wide fund allows for broader risk-sharing as disease outbreaks typically occur at the estuary level. This model could provide greater long-term sustainability for the fund. However, it may lead to perceptions that lower-risk estuaries are subsidising disease outbreaks in higher-risk areas.
- Estuary-wide fund: An estuary-wide fund on the other hand could promote stronger buy-in and acceptance, as growers may see the fund as directly benefiting their own community. However, an estuary-based scheme offers less risk-sharing, as all members are likely to rely on the fund simultaneously if an outbreak affects the entire estuary.

Similarly, the common industry fund could be structured as either compulsory or voluntary.

- Voluntary fund: This option would offer more flexibility and potentially higher acceptance among oyster growers. However, it may result in fewer members, which could limit the fund's capacity.
- Compulsory fund: Compulsory payments into a common fund would generate greater funding availability than optional payments. However, no legislation currently exists to enforce compulsory industry payments.

Common fund models have been adopted in other industries to pay for emergency biosecurity responses and other industry priorities. For example, the duck meat industry established a Voluntary Reserve Fund (VRF) in 2015-16, which is drawn down in the first instance when a biosecurity outbreak occurs, but may also be used to fund research and development activities. A trust account also exists in the NSW oyster industry to cover lease clean-up costs in certain instances (see Box 6.4 in Chapter 6 for further detail on both examples).

5.1.5 Option 4: Insurance

Insurance provides financial protection against potential risks and losses that businesses or individuals may face. In the context of the oyster industry, insurance may help farmers manage the financial impact from supply disruptions. By paying regular premiums, farmers can secure compensation in the event of a disease outbreak or other non-biosecurity disruption.

The two main types of insurance currently available in other agricultural and aquaculture industries include traditional insurance and parametric insurance. Traditional insurance covers producers for actual loss, and is widely available in broadacre cropping and livestock industries. Parametric insurance is a relatively new product that compensates producers for a pre-determined loss if a certain trigger or threshold eventuates. Triggers are commonly based on measurable environmental variables such as temperature and rainfall.

An insurance product could be made voluntary or compulsory for oyster producers. However, the financial viability of a product is partly determined by the number of participating businesses.

Insurance products are used in the farmed tuna industry in Australia, whereby ranchers can purchase stock insurance that enables them to be compensated when certain events lead to stock mortality. While parametric insurance is not currently available to oyster producers in Australia (or the wider aquaculture industry), products could be custom-designed to support producers when mortality events are induced by a set of known environmental triggers.

5.1.6 Option 5: Incentive payments and penalties

Incentive payments and penalties involve providing incentives for behaviours that minimise the risk of disease spread, and penalties for actions that are contrary to this aim. Under this approach, financial support would not be guaranteed but contingent upon participants actively engaging in risk-reducing practices.

Risk creation levy

A risk creation levy aims to financially penalise individuals or businesses whose actions contribute to heightened disease risk. Funds collected through this levy could be used to support oyster producers during supply shocks, while simultaneously deterring risky behaviours. This initiative mirrors the quarantine fees charged to incoming tourists during the COVID-19 pandemic. For this levy to be effective, it must be compulsory. For example, penalties could be imposed for the movement of oysters from high-disease-risk estuaries to low-disease-risk estuaries during periods when movement restrictions are in place.

Risk minimiser incentive

A risk minimiser incentive rewards individuals or entities that actively reduce the risk of a disease outbreak and its spread. For example, incentives could be rewarded to whistleblowers who notify authorities about early signs of a Qx or POMS disease outbreak. This initiative follows a similar incentive for risk minimising farmers and their

livestock subject to an anthrax outbreak in Victoria. Incentives could be used in conjunction with other financial support mechanisms explored in this report. Conversely to a risk creation levy, self-reporting and receival of an incentive payment would be voluntary by nature.

5.1.7 Option 6: No intervention

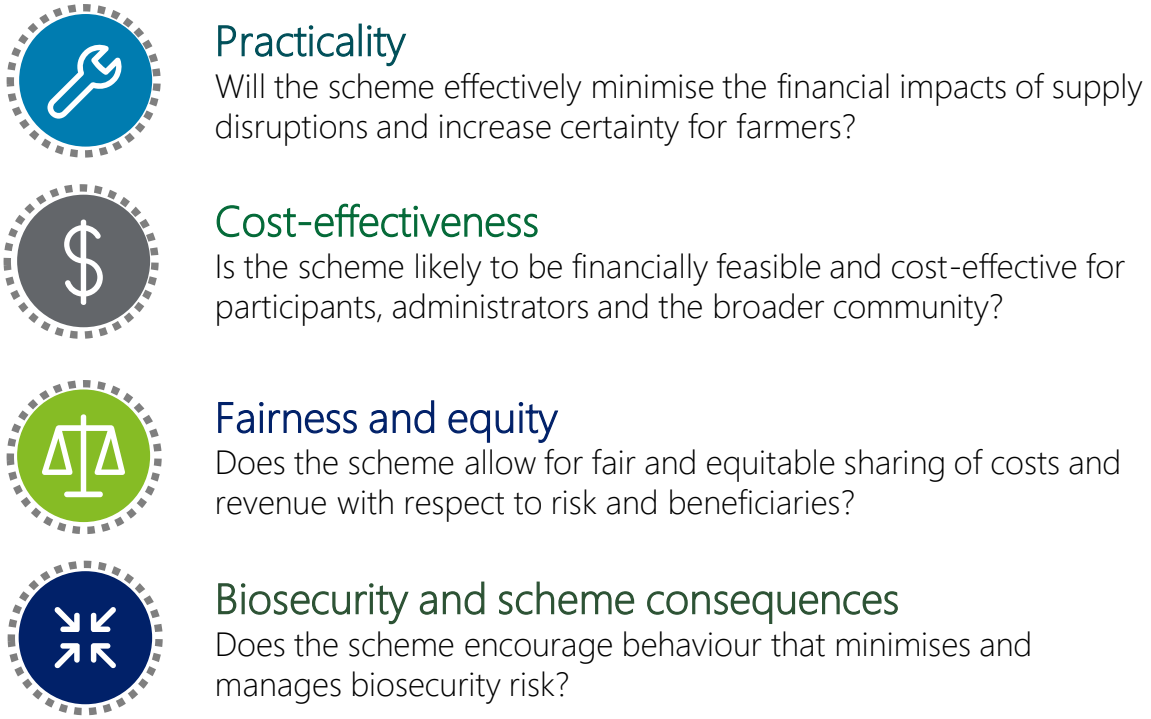
This option reflects the current scenario where oyster producers must support themselves financially during major supply disruptions. While the status quo gives oyster producers the freedom to manage their finances in a manner that suits their business structure (e.g., depositing funds in profitable years, or seeking additional payments from investors), producers aren't protected from financial devastation caused by major disruptions, particularly in higher risk estuaries. While ad-hoc support might be allocated by government when disruptions hit, it is not guaranteed.

5.2 Multi Criteria Analysis (MCA) and shortlisted options

To identify the options most suited to address the needs of oyster producers, the six long listed options were assessed using MCA. MCA is a framework used to systematically rank a group of options against a common set of criteria.

The criteria were developed by combining input from stakeholders on characteristics of support mechanisms that are important to industry, along with cost recovery guidelines from the Commonwealth and the Productivity Commission.[60] The guidelines contain economic principles such as practicality and cost-effectiveness which underpin effective policy. The core principles contained in the guidelines are illustrated in Figure 5.1 below. The criteria were then weighted based on their relative importance to industry. The weightings assigned to each criteria are detailed in Table B.2 in the Appendix, while accompanying rationale is provided in Table B.5.

Figure 5.1 Economic principles underpinning cost-recovery mechanisms



Source: Deloitte Access Economics

These criteria, and their respective weightings, were workshopped by several industry stakeholders, including a group of NSW oyster growers. Once agreed, the long list of options was assessed using the MCA framework by 1) industry stakeholders as well as 2) independent project stakeholders, which produced the same three priority options. This process was undertaken to ensure that the MCA findings were robust to alternative points of view.

The total scores awarded to each option through the MCA are given in Table 5.2. Full results tables containing rankings against each criteria are contained in Table B.3 (independent project stakeholders) and Table B.4 (industry stakeholders). The top three highest performing options were option 1 (tiered support, shared cost mechanism), option 3 (common industry fund), and option 4 (insurance). In considering the case for change, it is also important to note that no intervention (the status quo) was rated last out of all the long listed options.

Table 5.2 Summary of MCA results – oyster industry stakeholders

Criteria	Option 1: Tiered support, shared cost	Option 2: Uniform support, shared cost	Option 3: Common industry fund	Option 4: Insurance	Option 5: Incentive payments and penalties	Option 6: No intervention
NSW oyster growers scoring	4.0 (1)	3.1	3.9 (2)	3.6 (3)	3.2	2.9

Source: Deloitte Access Economics

Note: The three highest ranked options are numbered.

The MCA was used to select the top three most suitable support mechanisms for further exploration. As such, the ranking within the top three options does not reflect a definitive order of preference amongst the options, but rather that they collectively warrant further investigation.

5.2.2 MCA outcomes for Option 1: Tiered support, shared cost

The tiered support, shared cost, option offers the highest financial protection certainty of all options, due to the cost-sharing nature of the arrangement with state government. Combined, the financial contributions of oyster producers and the government are expected to provide a high degree of certainty for NSW oyster producers.

The tiered support, shared cost option also scored well in terms of practicality, long term sustainability, fairness, adaptability, and appropriateness of government funding. The option would be modelled on the EADRA scheme which has enabled rapid responses to emergency animal and plant disease incidents, and minimised uncertainty over management and funding arrangements since its inception in 2002. The scheme has been modified over time to accommodate a variety of terrestrial agricultural industries which have become signatories. As a result, the scheme offers practical support without overreliance on government funding and the need for ad-hoc support packages when disease outbreaks do occur.

5.2.3 MCA outcomes for Option 3: Common industry fund

An industry common fund offers high adaptability and flexibility relative to the other shortlisted options, since the design and implementation of the scheme falls principally on industry. Since growers are the principal stakeholders, the process of designing and adapting the fund may be more straightforward than if government were also involved. This could be particularly true when determining the levy mechanism and the nature of payments. In addition, a scheme governed at the estuary level could offer even greater flexibility, since it could be shaped by local growers according to their unique needs and preferences.

The common fund scored lower on several criteria. The long-term sustainability of an industry common fund was questioned, as its existence relies on continued participation from oyster growers, and a long-term commitment by an identified fund administrator. Loss of confidence in the scheme's ability to support growers to endure supply disruptions could undermine the long-term viability of the scheme. The option also has a medium level of fairness and equity, particularly if it is a voluntary and estuary-based scheme, since risk-sharing only occurs across a proportion of growers.

Additionally, the ability for a common fund to incentivise good biosecurity behaviour was debated; on the one hand, an industry fund could increase the risk of poorer practice by some individuals because they are protected regardless. This is notwithstanding potential penalties for actions which contribute to increased disease risk, discussed earlier in 5.1.6. On the other hand, the knowledge that costs are borne entirely by industry (given the absence of government co-contribution) could encourage producers to adhere to best-practice biosecurity protocol.

Overall, a fund designed and led by industry was determined to be a viable and appropriate last-resort option to support oyster producers through severe supply disruptions.

5.2.4 MCA outcomes for Option 4: Insurance

Insurance scored third highest amongst the shortlisted options. Insurance was determined to be relatively flexible and adaptable since it is a direct arrangement between growers and an insurance provider, and does not involve government. Insurance was also thought to incentivise risk-reducing behaviour given the positive relationship between claims and insurance premiums paid by growers.

Similar to the industry-led common fund, the long-term sustainability and cost-effectiveness of insurance was rated medium since affordable premiums are contingent on high levels of take-up (and therefore greater risk-sharing) among oyster growers. The certainty of financial protection under insurance was considered lower than the other shortlisted options, as the decision whether to pay a claim lies with the insurance provider, rather than with industry and government.

Oyster growers broadly accepted insurance as a feasible financial support option, but noted uncertainty around how it would be designed, including triggers for making a claim, the data required to calculate risk premiums, and the product value that could be insured.

Summary

This chapter described the process used to identify an initial list of financial support options available to industry. It also described the method applied to assess each option against key criteria developed in conjunction with industry and drawing on government guidelines. Three options were shortlisted for further consideration, and are developed in greater detail in the next chapter.

6 Detailed description of shortlisted options

Chapter 5 outlined the process and information used to generate the long list (and subsequently shortlist) of financial support options. This chapter explores the three shortlisted options, detailing their practical implementation, design considerations (including coverage and membership), challenges to address and preconditions for success, as well as examples of similar mechanisms adopted in other primary industries. The three options are:

- Option 1: Tiered support, shared cost mechanism
- Option 3: Common industry fund
- Option 4: Insurance

Section 6.1 below defines the design elements which allow the options to be configured in different ways. Sections 6.2 to 6.4 explore each of the three shortlisted options and identify potential actions in more detail. Chapter 7 ties together these actions and recommends next steps for industry.

6.1 Overview of design considerations

The shortlisted options provide financial support in unique ways. However, the options can also be configured in multiple ways by varying common design elements, which are summarised in Table 6.1. These include:

- **geographic coverage**, where payments to growers and funding raised can be structured at either a state or estuary level, reflecting the scale and scope of the affected area.
- **membership**, which can be established as either compulsory for all participants or voluntary.
- **scheme governance**, which refers to the organisation responsible for the establishment, decision-making and oversight of the scheme. Governance could be undertaken at the state level (either by the state government or an oyster industry administrative body), estuary level (by representatives at each estuary), or a mix of both.
- **legal structure**, which could involve the design of new legislation potentially based on existing legal frameworks, or amendment of existing legislation.

The merits and drawbacks of particular design settings are discussed for each option, as well as recommendations of specific design settings. A hypothetical example of a disease outbreak demonstrates how the recommended settings for each option would work in practice.

Table 6.1 Summary of design considerations and possible settings

Geographic coverage		Is membership voluntary or compulsory?	Who is responsible for governing the scheme?	What is the legal structure of the scheme?
What geographical level are payments to growers made?	What geographical level is funding pooled?			
State level Estuary level Producer level	State level Estuary level	Compulsory Voluntary	Oyster industry State government	New legislation based on existing framework Amendment of existing legislation

Source: Deloitte Access Economics

6.2 Tiered support, shared cost mechanism

6.2.1 Option summary

This option describes a support system that would be co-funded by both industry and state government. The tiered nature of the system means that the share of government support increases progressively based on the

extent of damage caused by the incident. The extent of damage would be defined by the impact on production and socio-economic consequence. This framework ensures that as the impact of estuary-wide disruptions to supply intensify, government contributions cover a larger proportion of the costs. Conversely, for smaller events, industry takes on a relatively larger share of costs.

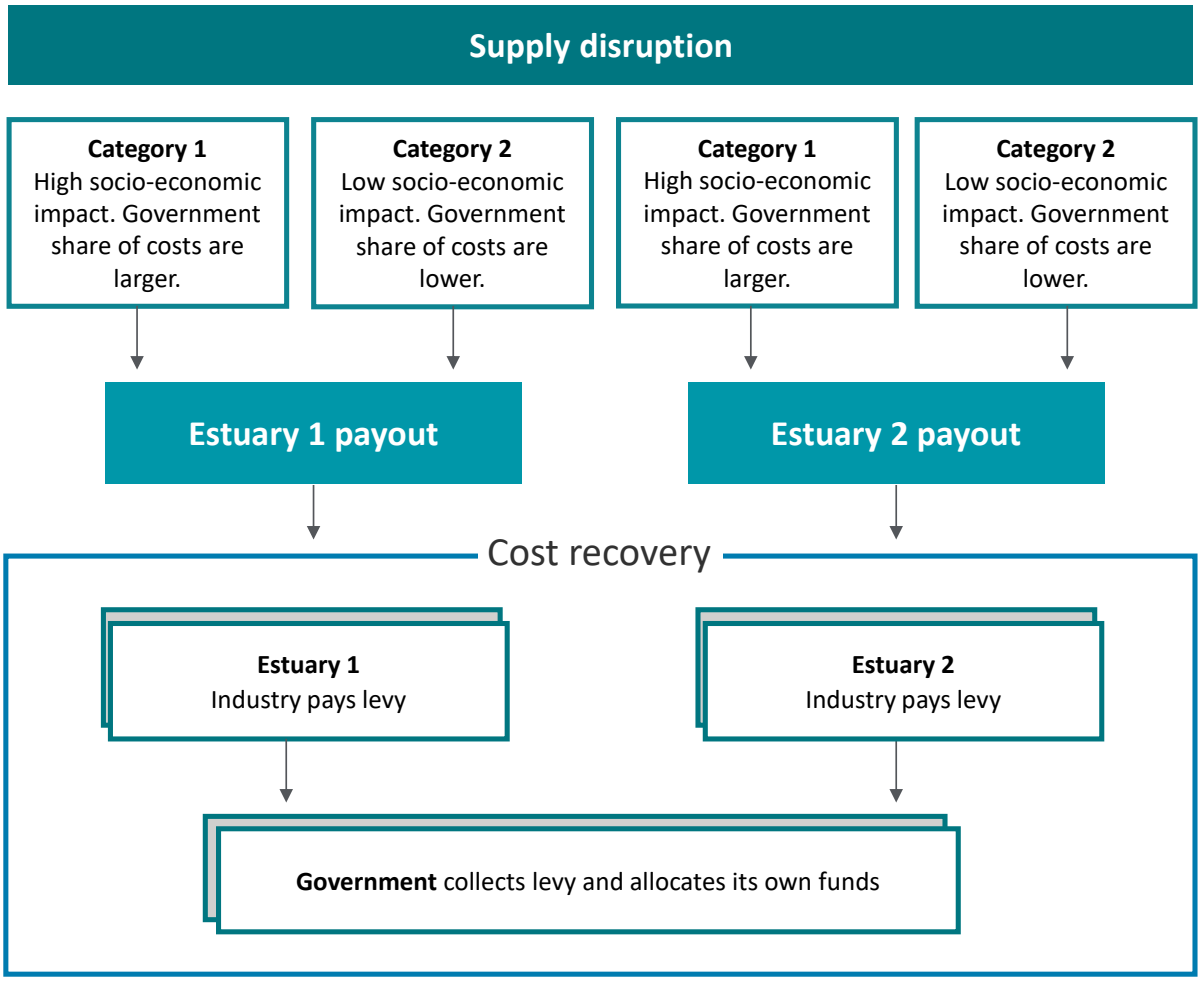
6.2.2 Practical implementation

In establishing a tiered, shared-cost mechanism, government and industry would negotiate the terms of cost-sharing; principally, the thresholds (in terms of impacts to production and socio-economic outcomes) in which government's share of costs would increase. A compulsory industry-wide levy would also be established to recover industry's share of costs after an incident occurs, and would be set to zero by default.

The specific incidents that would constitute a disruption to oyster supply (e.g. disease outbreak, HAB) and their threholds or 'trigger levels' would be pre-determined in the scheme agreement. In the event of a declared disruption, government would underwrite the cost of responding to the disruption by making payments to affected estuaries (Figure 6.1). Oyster producers would not be burdened by out-of-pocket costs during the disruption, unlike in options 2 and 3. Following the disruption, the estuary-wide levy would be activated. The levy rate would be determined by the magnitude of costs to be recovered from industry, which in turn would be a function of the share covered by government according to the total costs caused by the supply disruption.

Option 1 would be based on the EADRA and the EPPRD, which outline government's role in underwriting initial costs incurred in responding to emergency animal and plant pests and diseases. Both agreements also contain the relative proportion of costs paid by government and industry according to the category of the pest or disease in question (as outlined in 4.2 and 4.4). Cost recovery from industry would be achieved by establishing levies under the statutory levy and charge rates system.

Figure 6.1 Tiered support, cost shared mechanism structure



Source: Deloitte Access Economics

6.2.3 Design considerations

A cost shared financial support mechanism involves several design considerations, including distinctions between state and estuary levels for payouts and cost recovery, and compulsory compared to voluntary participation. Since a scheme with government involvement might be difficult to vary once in place, it is important to ensure that the design of the scheme is carefully considered from the outset.

Table 6.2 Tiered support shared cost mechanism proposed design settings

Geographic coverage		Is membership compulsory or voluntary?	Who is responsible for governing the scheme?	What is the legal structure of the scheme?
What geographical level are payments to growers made?	What geographical level is funding pooled?			
Estuary level (only estuaries affected by a supply disruption)	Estuary level (separate pools of funding for each estuary if disruption affects multiple estuaries)	Compulsory	Oyster industry with general oversight from state government	New legislation or amendment of existing legislation

Source: Deloitte Access Economics

6.2.3.2 Geographic coverage

Geographic coverage encompasses two components: the areas covered by levy collection and the areas where support would be delivered. State level coverage of levy collection would consist of an industry-wide levy, whereas estuary level coverage would entail an estuary-wide levy, meaning those who receive a payout are sharing cost recovery. While a state level coverage would distribute the burden more broadly, simplifying administration, an **estuary level** coverage of levy collection ensures that those who benefit from compensation are directly involved in the cost recovery process and allows for variation in the levy fee.

State level coverage of support provided would consist of a single pool of funds, while an estuary level approach would have separate funding pools for each estuary. While a **state level** support system could be simple and fast to implement and ensure consistent support and standards across the entire state, **estuary level** support could allow for a more targeted allocation of funds to those that need more support. A support system targeted at the estuary level is recommended as it could offer greater transparency around funded activities, key contributors and beneficiaries.

Box 6.1: Hypothetical example of a tiered shared cost mechanism working in practice

A hypothetical example of a support system targeted at the estuary level for collection and payout in the event of a Qx outbreak could involve the following process. If an outbreak occurred, the industry operating within the estuary could initially receive a payout to mitigate immediate impacts. Following this, a cost recovery mechanism could be initiated, whereby an estuary-wide levy could be applied to recover a percentage of the funds distributed during the payout phase. Depending on the extent of damages, the government's share of funding would vary in the cost recovery phase.

6.2.3.3 Membership and eligibility criteria

A compulsory membership model is recommended to maximise the practicality and fairness of the scheme. Under a voluntary scheme, it would be challenging for the government to justify withholding support from an oyster producer who opted out, while providing funding to neighbouring producers who participated. This would create inconsistencies and undermine the scheme's effectiveness.

Some stakeholders expressed a preference for a **voluntary** scheme, highlighting the potential to reduce resistance and avoid opposition from industry. Given that the oyster industry is already subject to high fees, with some producers struggling to meet existing financial obligations, imposing a compulsory levy could lead to pushback. However, other stakeholders acknowledged that a voluntary scheme with minimal participation would likely fail to address the issues posed by the status quo. These stakeholders were more inclined to support a compulsory scheme, recognising its potential to provide a stable and predictable funding pool, which could ensure the scheme's viability and effectiveness.

While a voluntary approach may initially be less contentious, it risks insufficient participation, undermining the scheme's ability to address supply disruptions effectively. Conversely, a compulsory system offers a more practical and equitable solution, ensuring stable funding and achieving the scheme's objectives. To navigate these considerations, careful consideration of industry buy-in is crucial. This includes assessing the minimum participation threshold required to make a voluntary scheme viable, and determining whether compulsory membership is essential for achieving the scheme's objective.

6.2.3.4 Payments to growers

Payments to growers would be made by government, and would be proportional to the estimated costs incurred by growers. Larger producers would therefore receive more financial support, and smaller producers less, given differences in the quantity of oyster stock affected by disease or other threats. The type of costs to be covered by payments would need to be pre-specified with government in the scheme agreement. This may include assistance with the costs associated with the loss of stock, lease clean up and restocking.

It is assumed in this report that payouts would be made at an estuary level; i.e. all producers in estuaries declared affected by a disruption would be eligible for support. This is because in many cases, incidents affect whole estuaries. However, there is a limitation to using the estuary as the spatial unit in relation to payments. In large estuaries like Port Stephens, risk profiles and disease manifestation differ across growing areas. There are also differences in genetics being used by farmers, as well as growing techniques, so not all farmers in an estuary are impacted in the same way. Paying out at an estuary level for damages that might only affect a proportion of farms within the estuary would be problematic. Further analysis is needed to investigate how payouts could be made to smaller spatial units (e.g. regions in an estuary or individual producers) that can demonstrate impacts to supply, should an incident only affect part of an estuary.

6.2.3.5 Funding

The costs associated with the emergency response would be shared between the oyster industry and government. This cost-sharing model introduces a component of cost recovery from industry, which has been absent from previous ad-hoc government support packages. By implementing cost recovery, the financial burden of addressing supply disruptions would be distributed more equitably, ensuring that oyster growers who benefit from the system also contribute to its long-term sustainability.

Cost recovery would occur after the event, based on the realised cost of the event and the agreed cost-sharing arrangement. A mechanism such as a levy applied per lease or per unit of production would be required to collect these funds.

A **lease-based levy** would involve imposing an additional fee to producers who hold leases. This type of levy offers the advantage of predictable, fixed costs, giving producers greater certainty in their financial planning. However, the fixed nature of the levy does not account for variations in production, which could disproportionately burden producers experiencing declines in output.

A **production-based levy** would charge producers for each unit of oysters produced. This system would result in a more equitable outcome, as larger producers would contribute more while smaller producers pay less. However, the variable nature of the levy introduces uncertainty for producers, making it more difficult to predict future production costs. Additionally, this approach may create an incentive for farmers to under-report production, as they currently self-report their output at the end of the financial year to NSW DPIRD. Despite this risk, production-based levies are commonly used in other industries, particularly under the Commonwealth Government's levy and charge system for commodities, which often includes biosecurity and emergency response levies scheduled on a per-unit of production basis.

To encourage new entrance and limit barriers to entry, a grace period could be introduced to exempt new entrants from paying the levy during their initial operations. In addition, industry consultation suggested incorporating incentives to reduce levy fees for growers who adopt risk-minimising behaviours, such as adopting disease-resistant oyster lines.

6.2.3.6 Governance

Governance would be led by a coordinated body with a prior agreement between representatives from both the NSW Government and the oyster industry. The government would be responsible for the verification of costs, fraud prevention and covering administrative costs. Other parties, such as Animal Health Australia (AHA) could

be involved in processes such as the establishment of the levy. Both industry and government representatives would undertake the review and oversight of the process.

6.2.3.7 Legal structure

The Biosecurity Act 2015 was established to provide for the prevention, elimination, minimisation and management of biosecurity risks.[61] Under this Act, the government is not required to provide financial support for endemic diseases, so any support would need to exist outside the Act. However, under Section 156 1D of the Fisheries Management Act 1994, the Minister can collect additional fees (with legislation amendment) to be kept in a trust account.[62]

Box 6.2: Examples of tiered support shared cost mechanisms used in other agriculture industries

Poultry industries

Several poultry industries, including the chicken meat, duck meat and egg industries benefit from a similar financial support model to the one proposed. The industries are signatory to the EADRA, which means that in the event of an emergency animal disease outbreak (such as avian influenza), producers are eligible to receive payments to assist with response costs, such as stock destruction and decontamination of facilities.

The EADRA outlines how emergency response costs are to be shared between the Commonwealth, state governments and poultry industries. This cost-sharing arrangement functions similarly to the tiered support system described in this chapter. In the case of avian influenza, various strains are categorised based on the extent of potential damages, such as loss of supply, socio-economic consequence, human health risks and environmental impacts. Depending on the category in which the disease falls, cost-sharing split differs:

- **Category 2** emergency animal diseases can cause large national socio-economic consequences through severe international trade losses, market disruptions and significant production losses in affected livestock industries. High pathogenic strains of avian influenza (of subtypes H5 and H7) are classified as a Category 2 emergency animal disease, where the cost sharing arrangement is **80 per cent by government** and **20 per cent by industry**.
- **Category 3** emergency animal diseases also have significant impacts, but to a lesser degree than Category 2. Low pathogenic avian influenza strains fall into Category 3, where the cost sharing arrangement is **50 per cent by government** and **50 per cent by industry.**

6.2.4 Challenges to address and preconditions for success

While a cost-shared financial support mechanism has its advantages, there are several limitations that must be addressed. The first limitation is that unlike a system that is fully funded by industry, government involvement may limit the ability to adapt the scheme to evolving industry needs. While the scheme could be implemented as a policy change, rather than requiring new legislation, this approach presents a greater risk of it being reversed over time. In either case, designing a scheme with co-involvement from government would be more costly to establish and less flexible than option 2.

In addition, a compulsory system by nature may lead to resistance amongst oyster producers who would be subject to paying an additional industry levy. Transparent fund management would be crucial to gain producer support. Government may also be resistant to signing an agreement which obligates funding following a supply disruption, especially in the case of an endemic disease outbreak. This would represent a significant deviation from the current arrangement, where there is no financial obligation on government after such an event.

Thirdly, establishing a levy administered as per DAFF's Levy Principles and Guidelines can be costly and time consuming, adding another layer of complexity to the system's implementation.[63] While any entity may submit a proposal for a levy, it must adhere to several principles and be submitted through the levy proposal process.

Lastly, a limitation of this option is its financial sustainability with respect to repeated supply disruptions, particularly in the context of climate change. As temperatures rise, environmental impacts may become more frequent, elevating the potential financial losses incurred by growers. While government would share part of these costs, financial collapse would still be a real risk for many producers faced with an increasing levy burden. This limitation is not explored in detail in this report but could be addressed in the next design phase.

6.3 Industry-led common fund

6.3.1 Option summary

An industry-led common fund refers to a pool of funds set up by industry and paid into by industry members. The fund enables the risk and cost of responding to a supply disruption to be shared across members, geographies, and over time. The common fund option differs from the shared cost support mechanism in that it would be fully funded by industry, with no government co-contribution.

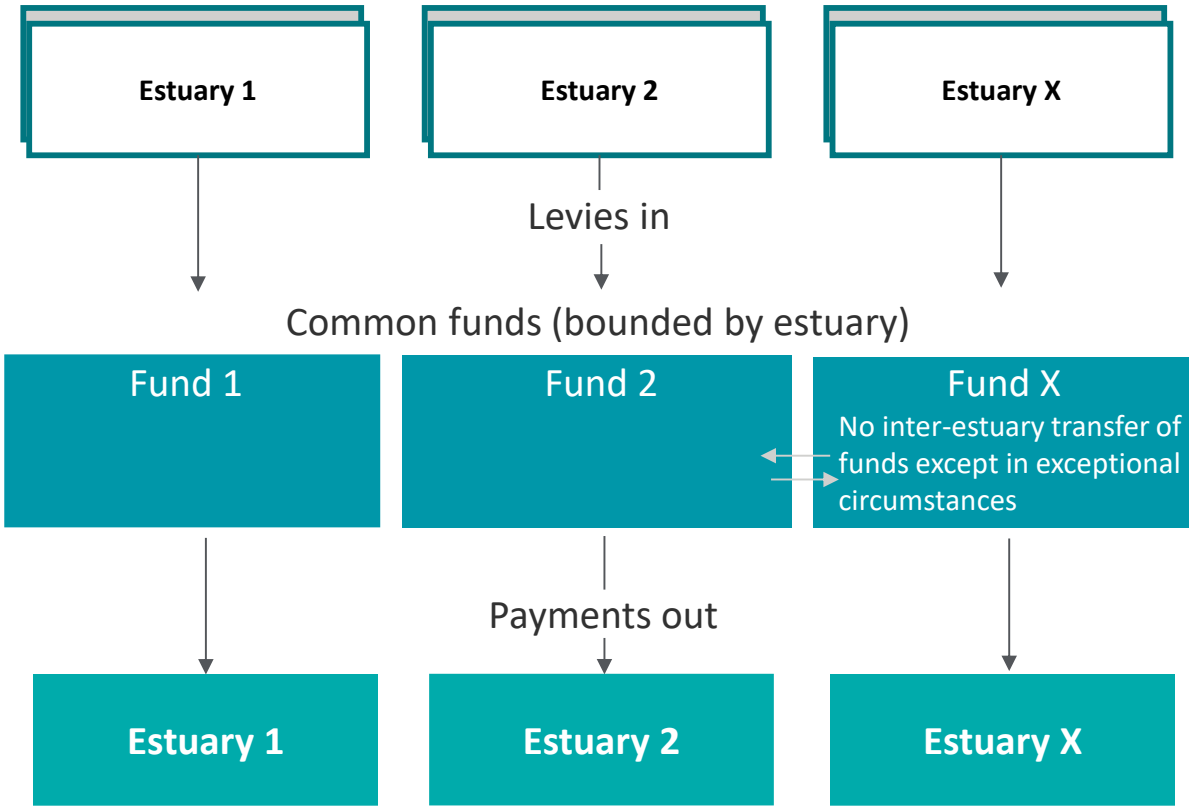
6.3.2 Practical implementation

A common fund would be established and administered by the representative body for NSW oyster growers. The fund would be established at an estuary level, i.e., payments made into and out of the fund would be bounded by estuaries. Oyster growers would pay into the fund on a consistent basis over time.

As in option 1, the specific supply disruptions and their thresholds covered by option 2 would be pre-determined by growers and the governing body in the scheme agreement. In the event of a supply disruption, the fund administrator would declare certain estuaries affected and follow a pre-determined set of rules to make payments to growers in those affected estuaries. Payments would be made on a cost recovery basis, i.e., they would reimburse growers for certain costs that they incur in responding to the disruption. The inter-estuary transfer of funds would not be allowed unless in exceptional circumstances where response costs in a particular estuary greatly exceed the available funds in that estuary. Transfers would need to be agreed upon by all fund stakeholders.

Payments would cover the cost of activities ranked in priority from the immediate short-term priorities (during or immediately after the disease outbreak) to the longer-term priorities. Payments would initially cover essential response costs such as disposing of dead stock, surveillance testing and reporting. If sufficient funds are available, medium- to longer-term activities such as staff retention, restocking, business restructuring or diversification could be supported.

Figure 6.2 Structure of industry-led common fund



Source: Deloitte Access Economics

6.3.3 Design considerations

Similar to the tiered shared cost option, the industry common fund could be configured in multiple ways. Proposed design settings are summarised in below, and explained in the subsequent sub-sections.

Table 6.3 Proposed design settings for industry-led common fund

Geographic coverage		Is membership compulsory or voluntary?	Who is responsible for governing the scheme?	What is the legal structure of the scheme?
What geographical level are payments made?	What geographical level is funding pooled?			
Estuary level (only estuaries affected by a supply disruption)	Separate pools at an estuary level	Voluntary	Oyster industry with general oversight from state government	New legal structure based on existing trust account framework

Source: Deloitte Access Economics

6.3.3.2 Geographic coverage

A common fund established at an estuary level was determined to be most suitable option for the NSW oyster industry. Feedback from growers suggested that a scheme designed and led by industry will have greater trust at the estuary level than the state level. This is partly because an estuary-wide scheme could be adapted to a greater degree than a state-wide scheme to better suit the needs of local producers. On the other hand, a mechanism co-funded by the state government (such as the tiered support, shared cost option) would be more suited to state coverage, given that the government operates at and coordinates biosecurity activities at the state level.

One disadvantage of an estuary-based scheme would be the inherently smaller pool of available funding due to the limited number of levy-paying growers in the estuary. The activities that the funding can cover would be therefore more constrained relative to a state-based scheme. For example, funding might only cover short-term costs such as testing and surveillance, while medium to longer-term costs such as staff salaries are borne by growers.

Furthermore, a risk associated with a scheme operated at an estuary level is that it would be more likely to experience a disruption affecting all members concurrently, meaning the fund may run out of money and be less likely to be able to pay out the full cost of recovery. Conversely, a state-wide, co-funded mechanism would have a much larger pool of money which might be sufficient to cover short-term costs, as well as overheads including staff, rent and utilities for a period (assuming the disruption was not state-wide).

Box 6.3: Hypothetical example of a common fund working in practice

In the event of a hypothetical Qx outbreak, a common fund with estuary-level coverage (in terms of payments and funding) would work as follows. The fund administrator would declare an outbreak in the affected estuary, which would enable money from that estuary's common fund (which growers in the area have paid into over time) to be drawn to pay for initial expenses such as testing and disposal of stock.

Funds would not be taken from other unaffected estuary common funds, except in the event of a catastrophic disease outbreak which affects most producers in the estuary and results in almost 100 per cent mortality. If this occurred, negotiations with representatives from other estuaries could enable the cross-subsidisation of costs incurred in the outbreak response.

6.3.3.3 Membership and eligibility criteria

Voluntary membership to an industry-led common fund is preferred over mandatory membership. It is more reasonable to expect growers to join voluntarily since levies are paid in advance of a disruption. Following a supply disruption, only members of the fund would be eligible to access financial support to assist with recovery. This is a fundamental difference in design from option 1, where all affected growers could receive funding. It should be noted that while a voluntary scheme is more palatable for oyster growers, it does run the

risk of not achieving sufficient buy-in, particularly in smaller oyster growing estuaries, which could limit the funds' capacity to financially support growers if an outbreak occurs.

A compulsory scheme would be challenging to establish for several reasons. Growers articulated that it would be difficult to gain broad industry support for a compulsory scheme. Some growers may have existing arrangements to reduce their financial exposure to supply disruptions, such as spreading production across multiple estuaries, and therefore have less need for financial support associated with a singular estuary. Additionally, in practice, growers could avoid becoming part of the scheme by not joining the oyster industry association responsible for scheme governance.

In terms of scheme funding, a levy could not be made compulsory by industry itself. A compulsory levy can only be established by the Commonwealth under the statutory levy framework.[64] A compulsory levy would be more challenging to legally administer than a voluntary levy for reasons outlined further in 6.3.3.7.

6.3.3.4 Payments to growers

Payments to growers would be managed by the fund administrating body. Payments would be calculated based on an estimate of the costs incurred by each grower, rather than the amount they pay into the fund. As in option 1, larger producers would receive more financial support than smaller producers. Only growers who contribute to the fund would be eligible to receive payments.

Growers would receive some amount of payment regardless of the length of time paying into the fund. Doing so would incentivise growers to join the scheme, as they are afforded financial security in the unlikely event that they experience a supply disruption shortly after receiving membership.

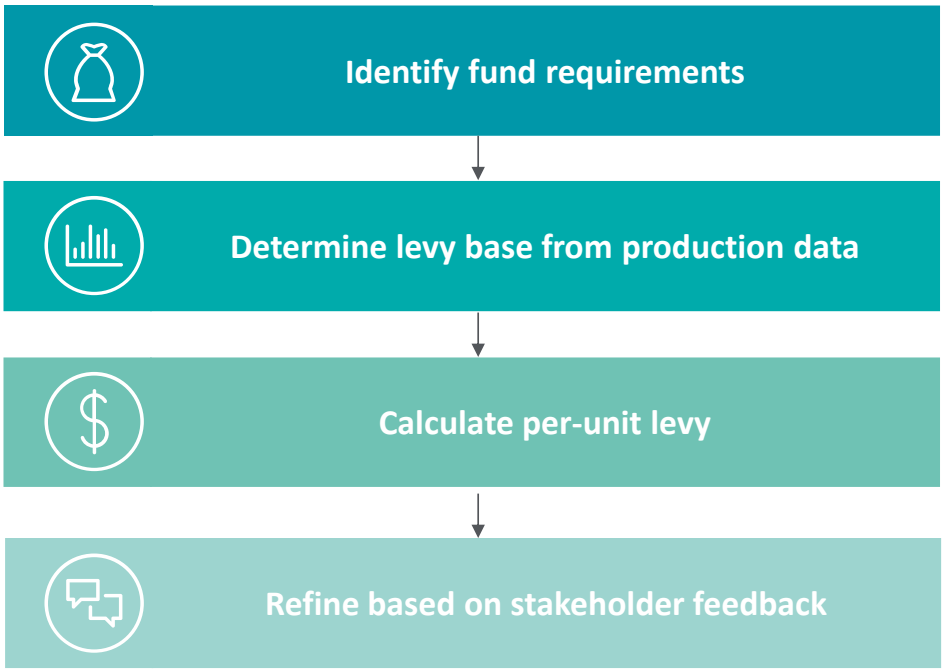
The activities that could be funded would depend on the levy price, the scope of eligible costs specified in the rules of the agreement (discussed further in Section 6.3.3.6), as well as the recent history of supply disruptions and therefore available funding. Payments would initially assist with covering costs incurred during and immediately after a supply disruption, progressing to longer-term costs such as restocking and restructuring business operations where feasible.

6.3.3.5 Funding

The principal revenue-raising mechanism for the fund would be a levy applied to beneficiaries of the fund. The primary beneficiaries are oyster producers, hatcheries and nurseries (including vendors of wild-caught seed oysters), all of whom are vulnerable to disruptors such as disease and are therefore eligible to receive support payments. The levy would be applied as a per-unit charge at the point of sale to market (for oyster growers) or transfer to a grower (for hatcheries and suppliers of seed oysters).

One method of determining the levy price could involve estimating the annual financial requirements of the fund and working backwards to determine a unit charge applied to oysters. As illustrated in Figure 6.3, industry would first calculate the total funding needed based on potential costs associated with supply shocks as well as administrative expenses. The levy base would be established by determining the quantity of seed oysters and finished oysters produced annually. The distribution of the levy between oyster and seed producers would also be determined. The per-unit levy would be calculated by dividing the total funding requirement by total units to get a per-unit charge.

Figure 6.3 Method of estimating levy price



Source: Deloitte Access Economics

6.3.3.6 Governance

Governance of an industry-level fund would primarily be led at the estuary level by representatives of the oyster industry. This approach ensures that industry retains autonomy to allocate funds in ways that best suit the needs of growers. At the same time, limited state-level governance would be necessary to maintain consistency in the broader objectives and remit of the scheme across the state. The oyster industry could adapt a draft constitution provided by the Office of Fair Trading to outline governance arrangements.

Oyster industry representatives would determine key settings for the fund at the estuary level, including payout structures and fund raising. These settings would likely vary by estuary to reflect disease risk and local priorities. For example, some estuaries might elect to limit payouts to short-term response costs, requiring growers to bear the financial burden of longer-term expenses. The fund administrator, in consultation with growers in each estuary, could also establish differentiated levies between estuaries which would account for local factors such as business' willingness to pay or the disease risk profile of the area.

Another key responsibility of the governing body would be to verify and approve costs eligible for reimbursement. Following a supply disruption, growers incur out-of-pocket expenses, such as the costs of disposing of dead oysters and testing for disease. The governing body would assess these expenses and determine which should be reimbursed from the fund. This approach allows for tailored support, as the activities covered by the fund could be adjusted through negotiations with local estuary representatives to reflect specific estuary needs.

State-level governance would complement estuary-level efforts by focusing on broader oversight and accountability. This would include providing general oversight to ensure the fund operates consistently with its objectives, as well as implementing measures to prevent fraud and mismanagement. Additionally, the state-level body would be responsible for evaluating and reviewing the performance of the fund to ensure it remains effective and continues to meet its intended goals.

In the longer term, the industry could choose to entrust the fund administration to an independent party. Passing administrative responsibility to an experienced fund manager could free up staffing resources to focus on other priorities within the industry. It could also lead to more efficient outcomes in terms of levy collection, documentation and reporting, and disbursement.

6.3.3.7 Legal structure

A new legal framework would need to be established to collect levies under an industry-led common fund. The framework could be modelled on the existing legal frameworks, such as the lease security trust account under Fisheries Management legislation, or AHA's levy collection mechanism. While the legal structure of a common industry fund would not be established as an extension of either legal mechanism, it could share common characteristics.

A common fund could also be established under the existing statutory levy framework. As well as providing a mechanism to recover an industry's share of costs underwritten by government, levies can also be set at a low rate to raise funds pre-emptively for use during an emergency response.[65] If choosing this option, government would assume responsibility for collecting and disbursing levies, although industry would maintain other key governance responsibilities outlined in Section 6.3.3.6.

There are advantages and disadvantages to both approaches. Establishing a levy under existing AHA, Fisheries Management or other legislation would be less costly than under the statutory levy system. It would also give greater autonomy to industry to manage levies flexibly as needed. Establishing a levy under the statutory levy framework on the other hand would require a poll of producers with a majority approval result, and would cost at least $60,000, significantly more than the alternative. There would also be a need to determine the holder of funds in trust.

Box 6.4: Examples of common funds adopted in other industries

Common funds exist in different forms and for various purposes (including biosecurity emergency response) in other industries. These are described briefly below.

Australian duck meat industry common fund

The Australian duck industry processes approximately 8 million birds every year and the value of the industry is estimated at $100 million. In 2012, an avian influenza outbreak occurred on a duck farm in Victoria. At the time, the duck meat industry was not a signatory to the EADRA and did not have a cost recovery mechanism in place. The egg and chicken meat industries (which were signatories to the EADRA) covered the duck meat industry's response and recovery costs on a one-off basis. This led the duck meat industry to establish a common fund known as the Voluntary Reserve Fund (VRF) to cover the costs of future disease outbreaks (principally avian influenza).

The VRF is a voluntary fund which duck farmers and processors contribute to on an ongoing basis. Being an industry-led fund, levy and charge rates are determined annually by consensus. Duck meat producers pay an annual fee proportional to farm size, while processors pay a levy per duck processed. As the industry is now a signatory to the EADRA, funds are drawn to cover the industry's share of emergency biosecurity response costs, including state laboratory testing, stock eradication, and compensation for destroyed stock. If the value of the fund reaches 1 per cent of total industry output, contributions may also be directed to other industry priorities including research and marketing.

The duck meat industry common fund has comfortably covered the costs of recent avian influenza outbreaks which occur on average every four to five years. However, the chicken meat and egg industries are shifting towards free-range systems, which increases exposure to avian influenza and therefore the risk of an outbreak. This has placed the long-term sustainability of the fund under pressure, which duck farmers are responding to by primarily using shed-based systems rather than free range to reduce pathogenic exposure.

Australian vegetable and potato industries

Biosecurity levies imposed under the Commonwealth levy system are often collected to repay to the government an industry's share of the costs of a response to a pest or disease incursion under the EADRA or EPPRD. This occurs where the government has underwritten the industry's contribution in the first instance. However, levies can also be set at a low rate to raise funds pre-emptively for use during an emergency response. An industry-led common fund is effectively established under the existing levy framework.

AUSVEG, the peak body representing Australian vegetable and fresh potato growers, has leveraged the statutory levy system in this way for the purpose of future emergency response. The vegetable and fresh potato Emergency Plant Pest Response (EPPR) levies were originally activated on 1 October 2018 to pay back

the Commonwealth Government for underwriting the industry's share of the tomato potato psyllid (TPP) response costs. In April 2024, AUSVEG opted to keep the vegetable and fresh potato EPPR levies active on an on-going basis. Keeping the levy active has allowed the vegetable and fresh potato industry to meet its negotiated cost share of the biosecurity response to Varroa mite from accrued reserves, with no additional costs imposed on growers.[66]

Oyster aquaculture and lease bond system

The Oyster Aquaculture Lease Bond system is an existing common fund arrangement within the NSW oyster industry. The system was introduced in January 2001 to ensure the industry shares responsibility for problems arising from lease management and maintenance issues. The bond is either a cash deposit or bank guarantee to the value of $1000 per hectare, or an annual non-refundable contribution of $30 - 50 per hectare, depending on lease compliance with best-practice guidelines.[67]

If a producer terminates their lease, enters bankruptcy and fails to clean-up their lease, funds are drawn to pay for the removal of cultivation equipment from the water. The Minister for Primary Industries is the trustee of this account, and the funds can only be used for the purposes of this bond system. Payments to the lease security trust account are legislated through the Fisheries Management Act 1994 (Section 152 (2)(d).

The bond system is an example of a common fund used to address a problem of collective action. However, rather than directly addressing a biosecurity issue, the fund targets issues of amenity within estuaries and public safety, as well as ensuring areas suitable for cultivating oysters are available for future producers.

6.3.4 Challenges to address and preconditions for success

A major challenge to implementing a common fund would be attracting sufficient industry support to build a pool of funds that would have meaningful impact in the event of a supply disruption. To address this challenge, clear communication around the purpose and objectives of the fund would be a necessary first step. Trust in the fund's objectives could be built via genuine engagement with growers during the design and establishment of the fund, as well as transparent governance arrangements Higher levels of trust are likely to translate into greater membership rates and levy contributions, therefore increasing the pool of available funds for disaster response.

Secondly, split governance at estuary and state levels could create conflict. Local resistance to state-level decision-making could undermine the fund's effectiveness. This risk could be addressed by limiting the state's role to general oversight, ensuring compliance with applicable laws, and evaluating the fund against its objectives. Operational decisions, including fund disbursement and levy management, should remain the responsibility of industry representatives in each estuary to reflect local priorities.

A third challenge is the risk of an estuary-wide fund being exhausted in the event of repeat disruptions, or a severe supply disruption which affects most or all growers in an estuary. The risk of fund exhaustion and growers suffering financial collapse is greater in an industry fund than under option 1 (where government partially covers emergency response costs) and option 3 (where costs are spread across all oyster producers in the state). While the inter-estuary transfer of funds could cover emergency response funding shortfalls in the short-term, transfers would not be sustainable in the long-term. A long-term solution to this issue is beyond the scope of this report but could be examined further in a subsequent design phase.

Furthermore, a key precondition for success of an industry-led fund is the availability of experienced staff within the NSW oyster industry to lead the fund's establishment and administration. The process will require multidisciplinary input and careful coordination among stakeholders. Assigning personnel with the necessary skills and expertise will be critical to ensuring the fund's success.

6.4 Oyster industry insurance

Aquaculture and agriculture stock insurance is a widely used tool to mitigate financial risks from environmental damage, accidents, and disease. Insurance is commonplace in the aquaculture industry globally; for example, tuna farmers can purchase stock insurance, enabling them to be compensated in the event of stock loss. However, such coverage has not been readily available to oyster producers, despite their exposure to similar risks as other aquaculture and terrestrial agriculture industries. Insurance offers a market-driven solution to risk management, allowing prouducers to tailor coverage to their specific needs and risk tolerance.

Developing an insurance product for the oyster industry would require sufficient interest and engagement from producers. While feasible, establishing a bespoke product could be costly for insurers, underscoring the importance of a coordinated, industry-wide effort to demonstrate market demand and support its development.

6.4.1 Option summary

This option would involve establishing an insurance scheme tailored for NSW oyster producers to mitigate the financial impacts of supply disruptions. Unlike options 1 and 2, it offers a market-based solution, funded through producer premiums. Government collaboration may be required to enhance longevity and feasibility, either through a public insurance provider or by acting as a guarantor – particularly when disruptions impact multiple estuaries.

Insurance products work by pooling risk, making a sufficiently large and diversified customer base essential for viability. Collaboration between insurers and the NSW (or national) oyster industry is recommended to design a product that encourages participatinon while maintaining affordable premiums. An industry-wide approach would ensure a collective solution, which is more effective than individual efforts that insurers might find financially unviable due to limited risk pooling and high product design costs.

As climate change increases the likelihood of disease outbreaks and other disruptions, an industry-wide scheme offers a scalable and sustainable solution, better equipped to provide reliable colverage than fragmented, individual arrangements.

6.4.2 Practical implementation

First and foremost, the establishment of oyster industry insurance requires an insurer who is willing to offer the insurance product. While offering insurance products is feasible within aquaculture, there are currently no products available to Australian oyster growers. A suitable product would need to be co-design by the insurance sector and industry to ensure (1) a commercial product can be developed, (2) the product delivers the financial support required by industry, and (3) will achieve sufficient buy-in. A suitable product may involve coverage types that can vary in line with the risk profile of different estuaries, and the risk appetite of different oyster producers.

6.4.3 Design considerations

The use of insurance as a financial support mechanism involves several design considerations including, but not limited to, the types of insurance products used, as well as the approach to participation. Proposed design settings are summarised in Table 6.4.

Table 6.4 Insurance proposed design settings

Geographic coverage		Is membership compulsory or voluntary?	Who is responsible for governing the scheme?	What is the legal structure of the scheme?
What geographical level are payments made?	What geographical level is funding pooled?			
Individual grower level	Largest spatial unit possible (estuary, state, national, etc.)	Voluntary	N/A	N/A

Source: Deloitte Access Economics

Note: Governance and legal structure are a commercial matter for the insurer.

6.4.3.2 Geographic coverage, membership and scheme participation

An insurance scheme can be established in two main ways:

1. The first involves collaboration with industry to establish a product. This could involve creating a **'master policy'** which is bought into by participating farmers, providing group purchasing power.
2. In the absence of majority industry buy-in, an alternative, **mutual fund** approach could be adopted. This involves members pooling their resources to fund some risk transfer themselves before purchasing an insurance product. Third-party contributors like government, could play a role in this fund.

By nature, insurance is a voluntary form of financial support and thus it will need to be designed in a way that incentivises participation from the majority of oyster producers to ensure it achieves the scale required to be commercially viable. Developing a new product is relatively costly for insurance brokers. Without clear and coordinated buy-in from the oyster industry, significant barriers exist to the creation of such products. Limited engagement from individual farmers is unlikely to provide the necessary incentives needed for insurers to develop a bespoke, long-term product offering.

Widespread coverage could be obtained from **NSW oyster growers, Australian oyster growers or in collaboration with other aquaculture producers facing similar risks.** Extending the potential scope of those eligible for a new insurance product suitable for oyster producers (and possibly other aquaculture industries) improves the potential commercial viability of an insurance product.

6.4.3.3 Payments to growers and scheme funding

There are many insurance products that could be used to manage the risks facing the oyster industry, each with distinct triggers and coverage implications shaping the payments growers receive. A combination of **parametric** and **traditional** insurance is recommended to provide comprehensive risk coverage, with parametric insurance addressing specific supply disruptions such as disease outbreaks, and traditional insurance covering day-to-day operational losses.

Parametric insurance is a 'trigger-based' solution, whereby payouts are made upon the occurrence of pre-determined events or parameters. The parameterised nature of this product means that it can effectively cover risk events that can be independently measured or identified by a third party. For instance, weather-related risks verified by the Bureau of Meteorology (BOM) or mechanical measurements, like flooding levels, can be used as triggers. In theory, disease outbreaks could be covered under parametric insurance, though careful design of triggers and how they would be identified – particularly the responsible third party – would be required. This is particularly important as typical annual mortality rates, as well as those associated with disease outbreaks, vary widely between estuaries and oyster species.

A key advantage of parametric insurance is that it can provide fast financial support for a major catastrophic event that would otherwise be uninsured. A parametric product eliminates the need for loss adjusting as with traditional insurance, meaning the insurer does not need to evaluate the extent of actual loss incurred.

As an example, parametric insurance products have been designed to provide pandemic coverage. For many of these products, a dual-trigger approach has been adopted whereby two criteria must be met for the payout to occur. An example of a pandemic dual-trigger might be a global health emergency declaration by the World Health Organisation *and* the subsequent introduction of movement restrictions. Although there is no defined measure for a disease outbreak in aquaculture, insurance providers claim similar concepts could apply. For instance, the response to a disease outbreak by the NSW government often involves setting up biosecurity zones or mandating removal of infected stock, both of which could serve as potential triggers. Parametric insurance could also be well suited to cover prolonged disruptions caused by HABs and other significant events linked to food safety. These events are typically identified through third-party laboratory tests, and result in the closure of harvest areas, providing a clear and measurable trigger for insurance coverage. The availability of historical data on HABs allows insurers to model the associated risk profile effectively and develop appropriate policies.

With parametric insurance, the payment structure and costs covered would be pre-determined based on agreed triggers. In this case, industry participants would pay a regular premium, and in the event of a trigger, an automatic payout would be provided. It is important to note that the payout may not cover the full value of a producer's losses.

Traditional insurance could be used by the oyster industry in conjunction with parametric insurance to provide a more comprehensive risk transfer. Traditional insurance products are more suited to ground-up risk transfer, meaning that the total amount of loss is covered by the insurance policy. Such products are also better suited for daily and smaller-scale losses that would not be covered under a parametric insurance policy.

While parametric insurance ensures a fast automatic payout based on a pre-defined trigger, enabling losses to be covered with or without damages, integrating parametric solutions within a single insurance product can be challenging due to its basis risk. This refers to the potential mismatch between the trigger event and actual losses. For instance, an area might experience a significant event, but this event may not be large enough to trigger the parametric policy, resulting in no payout despite substantial damage. Without working alongside traditional insurance, parametric insurance alone will not be able to provide comprehensive coverage.

With traditional insurance, the payment structure and costs covered would be based on the specific terms of the insurance policy. Industry participants would pay regular premiums and be required to submit claims for costs incurred.

A combination of both parametric and tradition insurance could be suitable for the NSW oyster industry, as while traditional insurance covers actual losses but often takes time to process, parametric insurance could supplement coverage beyond what the traditional insurance market is able to offer.

The insurance scheme aimed at encouraging and incentivising industry-wide participation funding would be based on an agreed contribution towards payment of an insurance premium for industry. This funding can be established in two ways. The first could involve the creation of a master policy that industry participants buy into, leveraging group purchasing power. Alternatively, the industry could pool resources to fund some of the risk transfer themselves before purchasing an insurance product. The funding principle for this approach would involve implementing a NSW industry-wide levy to generate a pooled insurance premium to be provided to insurers.

While the insurance scheme is a solution that is fundamentally funded using private contributions, there is the possibility to involve government within the scheme. In the case of an industry-wide catastrophic event, the government can be involved as a funder of last resort.

6.4.3.4 Governance

Governance of the industry-wide insurance scheme would depend on the type of insurance product. Under traditional insurance, the insurer would be responsible for assessing the risk, verifying costs and covering administrative costs. Both industry and insurers would undertake the review and oversight of the process. Under parametric insurance, there would be no need for risk assessment given the automatic payouts following a pre-established trigger that has been independently verified by a third party. The administrative burden for parametric insurance is lower relative to traditional insurance and would still be covered by the insurer.

6.4.3.5 Legal structure

There is no formal legal structure governing the arrangement between participants and the insurer. Instead, the system is market led, driven by industry and insurer agreements and the market supply and demand of the product. However, as an insurance product, it would operate under regulatory oversight from the Australian Prudential Regulation Authority (APRA), if the purchased product is written on an APRA regulated balance sheet.

Box 6.5: Examples of insurance products available to other aquaculture or terrestrial agriculture industries

The insurance market for agriculture in Australia is limited, with only a small number of insurers offering a limited range of products. One international insurance product example and two Australian examples – parametric and traditional insurance – are outlined below.

AXA XL aquaculture insurance

AXA XL is a Norwegian based insurer that offers aquaculture insurance as part of a risk management solution.[68] The insurer provides comprehensive coverage to protect the aquaculture industry from risks including disease, pollution, storms or other weather-related events, changes in water including deoxygenation and salinity, as well as damages to property and equipment.

Frost insurance available to UK sugar beet growers

The National Farmers Union (UK's NFU) offers a mutual fund utilised by British Sugar to compensate growers for severe frost events.[69] The frost insurance cover is designed to address early and severe frosts, which insurers define as an average minimum temperature of -4 °C or lower over a rolling 10-day period up to and including 30 January.

Once a 'trigger' frost event occurs, the payout under the policy for each beneficiary is calculated at the end of the campaign. British Sugar and the NFU manage the claim process. For a payout to be issued, a farmer must have incurred a loss exceeding the deductible, set at 15% of the insured (Approved) Tonnage.

Parametric insurance available to Australian primary industries

Parametric insurance policies are relatively new to the Australian market. Cover is provided by a small number of insurers for a range of risks faced by various agricultural industries, including horticulture, broadacre cropping, viticulture and carbon plantations. Parametric insurance is not currently available to the aquaculture sector. Examples of parametric insurance applications in terrestrial agriculture are given in Table 6.5 below.

An independent historical database is required to support underwriting the risk or peril. This could include BOM temperature, rainfall and radar data, official water or river heights, or the Richter scale. Product coverage is continually expanding with advances in technology and access to data.

Table 6.5 Examples of parametric insurance applications in Australian agriculture

Peril	Example of Index	Example of application
Cyclone	BOM Categorised Cyclone Path	Orchard or crop insurance
Fire	NDVI Burn Ratio index	Plantation/carbon insurance
Hail	BOM radar and in field recorder	Horticulture or viticulture crop
Flood	Water or river heights	Farm building, infrastructure and crop risks
Earthquake	Richter scale within an agreed radius	Farm building, infrastructure and crop risks
Temperature	BOM rainfall at nearest station or SILO Grid	Too hot/cold (frost) for crops during specified periods
Rainfall	BOM rainfall at nearest station or SILO Grid	Insufficient or excessive rainfall on crops during specified periods
Smoke Taint	Burnt Area Index and AWI lab confirmation	Wine grape growers
Production Shortfall	Area Yield based on shire or grid	Broadacre cropping

Source: Gallagher Insurance

Traditional insurance available to the Australian southern bluefin tuna industry

Tuna is one of the commodities within the aquaculture industry that uses insurance. However, mortality rates are very low in the tuna industry and consequently, the need to insure stock against disease is relatively lower than in the case of oysters.

The tuna industry is typically insured for what is known as 'quota value,' which represents their value at the point of wild catch, prior to being fed and grown out for four to five months. The term 'quota' refers to the number of wild tunas that a farmer is authorised to catch and place in pens for feeding. Insuring tuna at their final sale value, after their growth period, would result in unaffordable insurance premiums for producers. By insuring tuna at their initial quota value, farmers can afford the premiums while effectively managing the risk associated with their initial investment. Larger producers are more likely to access insurance and finance due to their high collateral and asset value compared to smaller producers.

6.4.4 Challenges to address and preconditions for success

While a collective solution is favourable and hence an industry-wide insurance scheme is recommended, there are some key considerations to ensure its successful implementation. Firstly, there must be sufficient interest from both the industry and insurance firms for it to be considered worthwhile for insurers to design and offer tailored products. The scheme would need to attract enough participation from industry to ensure financial viability, as a limited pool of participants could result in unsustainable risk sharing.

Furthermore, a critical component in the ability for an insurance scheme to be established is the availability of comprehensive and accurate data. Not only would this be crucial in allowing insurers to appropriately understand the risk and premiums during scheme design, but it would be critical for ongoing coverage and use of any insurance product. This would involve working with the insurance industry to assess the types of data required to inform their risk assessments, as well as consideration of how this can feasibly be captured by producers across the state.

A limitation to this option is that frequent events like POMS outbreaks elevate claim frequencies, complicate loss quantification and challenge the sustainability of insurance models. Additionally, climate change, with its associated increase in water temperatures, could heighten the likelihood of disease outbreaks and challenge the long-term financial stability of insurance programs. For example, POMS is linked to water temperatures above 21, which could occur more frequently in some estuaries. This report acknowledges that an increasing frequency of disease outbreaks and the influence of climate change is a risk to the financial viability of insurance. Further analysis could determine the estuaries in NSW which are most at risk of more frequent disruptions, as well as design mitigation strategies to ensure insurance remains a financially viable safety net.

The next steps to establishing an appropriate insurance scheme involve collaborating with insurers to gain a shared understanding of data requirements and appropriately communicating these to producers to encourage data collection practices. Furthermore, collaboration in industry-wide forums to consult and encourage buy-in will be critical for the long-term feasibility of establishing a scheme. Additionally, consulting with aquaculture insurers might reveal more specific triggers in relation to parametric insurance.

6.5 Summary

Table 6.6 below summarises the key strengths and weaknesses of the three shortlisted options.

Table 6.6 Summary of shortlisted options strengths and weaknesses

Option	Strengths	Weaknesses
Tiered support, shared cost mechanism	• Reduces the need for need for ad-hoc government funding. • Offers high financial protection certainty. • Scheme has high financial sustainability.	• Establishing levy may be expensive and challenging. • Government contributions may limit system flexibility.
Common industry fund	• Industry-led scheme affords greater flexibility and adaptability. • Fund can be tailored to the needs of individual estuaries.	• Securing sufficient industry support may be difficult. • Greater risk of fund exhaustion following large or repeat events.
Insurance	• Ensures high adaptability and flexibility through direct grower-insurer arrangements. • High industry buy-in translates to greater cost-sharing and a more affordable scheme for growers.	• Securing sufficient interest from industry may be difficult. • Requires comprehensive and accurate data. • Event frequency can undermine the sustainability of the scheme.

Source: Deloitte Access Economics

7 Conclusion and next steps

The current approach to managing supply-side disruption is based on individual business preparedness, with no guarantee or prospects of external support. This not only presents a risk to current production, but it also deters prospective market entrants and investors. The lack of certainty acts as a handbrake on the industry, undermining the future growth of the sector.

This report has explored how financial support measures, grounded in best-practice economic principles, could be adopted to mitigate the impacts of supply-side disruptions. Three key mechanisms have been identified for further consideration, emphasising the importance of collaboration between government, industry, and the private sector to bring these mechanisms to fruition. These mechanisms could play a critical role in supporting the oyster industry (and broader aquaculture sector) to achieve ambitious target set out in the 2024 Industry Vision Statement of $300 million in farmgate production by 2030.

7.1 Next steps

While the proposed options provide pathways to mitigate financial risks, they are presented at a high level and consider varying approaches to their design and implementation. There are several critical next steps that industry could take to tailor the options further and progress their implementation, which are summarised in Figure 7.1.

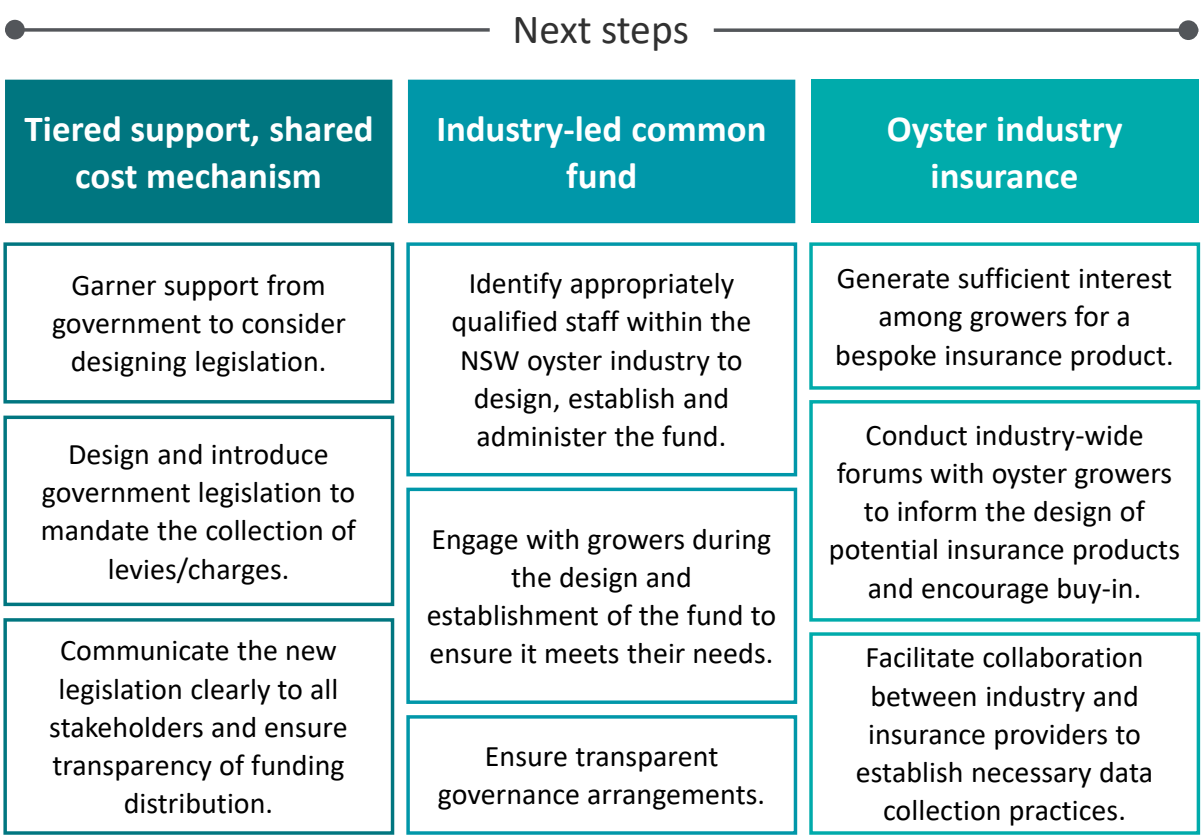
In terms of option 1 (tiered support, shared cost mechanism), a key next step is communicating the oyster industry's desire and readiness for a formal financial support framework to the NSW Government. Doing so would increase the likelihood of government involvement in establishing a shared cost scheme. A subsequent step would be garnering support from government to consider designing legislation to underpin the scheme. Additionally, establishing a support framework in collaboration with government would be expensive relative to an industry-led scheme. As such, it is important that the potential costs of establishing a co-funded scheme are quoted so that the industry can make an informed financial decision.

For option 2 (industry-led common fund), a first step would be to identify appropriate personnel within the NSW oyster industry who could lead the process of design, establishment and administration of the fund, while also encouraging participation and engagement across the industry. Alternatively, if sufficient skills and expertise were not available in-house, industry could investigate engaging a third party to assist with establishing the fund. As part of this process, extensive consultation with growers would be necessary to design a scheme that meets the unique needs of the oyster industry.

To establish option 3 (insurance), broad support from growers would first need to be earned. The greater buy-in from industry, the more affordable insurance premiums would be for growers. Conducting industry-wide forums with oyster growers to communicate the purpose and benefits of insurance could encourage buy-in, as well as enable industry to shape the design of potential insurance products. Demonstrating sufficient interest from industry will be key in gathering interest from insurers, as such a scheme would require their investment in designing a new product. As part of this collaboration, consultation would be required to understand and establish the data collection practices which would be required under such a produced.

Overall, Deloitte recommends the NSW oyster industry prioritise the establishment of an industry-led common fund. This recommendation reflects an outside-in assessment of the industry, and considers the benefits of giving oyster growers maximum autonomy over the scheme's design, implementation and administration. An industry-led fund would likely attract greater support from growers, as it avoids direct government involvement and therefore allows for quicker establishment and greater flexibility for adjustments over time. Unlike the cost-recovered model of option 1, a common fund provides a proactive approach to managing supply risks as growers contribute to the fund over time, and has successful precedence in other sectors (see Box 6.4, chapter 6). Given the extensive consultation required to reach consensus on key design elements such as funding, investigating an industry-led fund first is the most practical starting point.

Figure 7.1 Next steps associated with the shortlisted options



Source: Deloitte Access Economics

7.2 Adapting existing schemes in the short-term to support oyster producers

It is acknowledged that further pursuing the shortlist of options presented in this report will take time and additional financial resources. There are two existing schemes that could be adapted in the interim while the more permanent options put forward as part of this work are implemented. The existing financial support mechanisms are the Farm Management Deposit scheme, and low-interest loans provided by the Regional Investment Corporation. While both schemes currently preclude access by oyster growers, the assistance they provide would benefit oyster producers. The following sub-sections provide an overview of the two schemes as well as changes that could be made to make oyster producers eligible.

Farm Management Deposit scheme

The Farm Management Deposit (FMD) scheme allows primary producers to make deposits into an account during years of good cash flow and withdraw them during unfavourable years. This helps producers to manage fluctuations in cash flow, and meet business costs in low-income years by building up cash reserves. Income deposited into an FMD account is tax deductible in the financial year the deposit is made. [70]

While the scheme is available to all primary producers, a key barrier for oyster producers accessing the scheme is the 12-month rule. If participants withdraw any part of a deposit within 12 months, they can not claim a tax deduction for that amount.[71] Oyster producers could be affected by a disease outbreak, which acts as a deterrent from participating in the scheme. An exemption to this rule applies if producers are affected by a natural disaster or severe rainfall deficiency, although these conditions are most applicable to terrestrial agriculture. Exempting oyster producers from this rule in the event of a disease outbreak or major decline in water quality (for example) would increase equity in accessing the scheme's tax incentive. This could increase oyster producers' use of the scheme and therefore their own level of financial resilience against future supply disruptions.

Regional Investment Corporation loans

The Regional Investment Corporation (RIC) is a Commonwealth provider of low-interest loans for farm businesses and farm-related small businesses. The RIC provides loans for various purposes, including to recover and rebuild from (or prepare for) severe business disruption.[72]

Farm businesses in the aquaculture and commercial fisheries industries are eligible to apply for loans provided by the RIC. However, as part of the application process, the RIC requires applicants to provide 'sufficient and satisfactory security', which is commonly a registered mortgage over land or other assets. Oyster growers have reported that the RIC does not accept oyster leases as security, thereby excluding producers from accessing finance. Terms of security could be adjusted to allow oyster leases or other assets commonly owned by oyster producers be used as security. This would enable oyster growers to access loans for the same purposes as many terrestrial agriculture industries, including to recover from a major supply disruption.

Both existing schemes, the FMD and RIC low-interest loans, could become suitable financial safety-nets for oyster producers if changes to terms and conditions are made. Importantly, these schemes could be leveraged by oyster producers in the interim while more tailored mechanisms explored in this report are established.

References

[1] BDO – economic contribution of aquaculture to NSW

[2] Ibid.

[3] NSW Government, 'NSW aquaculture industry targets $300 million future' *Media release* (online, 4 September 2024) <https://www.nsw.gov.au/media-releases/nsw-aquaculture-industry-targets-300-million-future>.

[4] NSW DPIRD, *NSW Oyster Industry Sustainable Aquaculture Strategy Fourth Edition* (A NSW Government initiative, August 2020) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1363676/OISAS-Final-Document-August-2021-Final.pdf.

[5] NSW Oysters, 'Industry snapshot' https://www.nswoysters.com.au/industry-snapshot.html#:~:text=In%202018-2019%2C%20the%20NSW%20oyster%20industry%20produced%20about,businesses%20in%20NSW%2C%20spread%20across%2032%20coastal%20estuaries.

[6] Interview with Interviewee (5 July 2024).

[7] NSW DPIRD, 'Sydney Rock Oyster' https://www.dpi.nsw.gov.au/fishing/fish-species/species-list/sydney-rock-oyster.

[8] NSW DPIRD, *Sydney Rock Oyster Culture in NSW* (Publication) https://www.dpi.nsw.gov.au/dpi/fishing/aquaculture/publications/general-publications/species2/saltwater/sydney-rock-oyster-culture-in-nsw.

[9] NSW DPIRD, 'Pacific Oyster' https://www.dpi.nsw.gov.au/fishing/fish-species/species-list/pacific-oyster.

[10] NSW DPIRD, *Pacific Oyster culture in NSW* (Publication) https://www.dpi.nsw.gov.au/dpi/fishing/aquaculture/publications/general-publications/species2/saltwater/pacific-oyster-culture-in-nsw.

[11] NSW DPIRD, *NSW Oyster Industry Sustainable Aquaculture Strategy Fourth Edition* (A NSW Government initiative, August 2020) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1363676/OISAS-Final-Document-August-2021-Final.pdf.

[12] NSW DPIRD, *Production Data Comparison*, (accessed 4 July 2024) https://www.dpi.nsw.gov.au/dpi/fishing/aquaculture/publications/production-data/production-reports/production-data-comparison.

[13] Interview with Interviewee (5 July 2024).

[14] Consultation with Stakeholders (25 September 2024).

[15] Ibid.

[16] NSW DPIRD, *NSW Oyster Industry Sustainable Aquaculture Strategy Fourth Edition* (A NSW Government initiative, August 2020) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1363676/OISAS-Final-Document-August-2021-Final.pdf.

[17] NSW DPIRD, *Aquaculture production report 2022-2023* (January 2024) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/1499238/Aquaculture-production-report-2022-2023.pdf

[18] NSW DPIRD, 'Qx disease' https://www.dpi.nsw.gov.au/dpi/bfs/aquatic-biosecurity/aquaculture/oysters/qx-disease.

[19] Interview with Interviewee (5 July 2024).

[20] Kathryn Newton et al., 'Phenoloxidase and QX disease resistance in Sydney Rock oysters (Saccostrea glomerata)' (2004) 28 (6) *Developmental and Comparative Immunology* 565.

[21] NSW DPIRD, 'Pacific Oyster Mortality Syndrome' https://www.dpi.nsw.gov.au/dpi/bfs/aquatic-biosecurity/aquaculture/oysters/pacific-oyster-mortality-syndrome.

[22] Interview with Interviewee (5 July 2024).

[23] NSW DPIRD, 'Pacific Oyster Mortality Syndrome' https://www.dpi.nsw.gov.au/dpi/bfs/aquatic-biosecurity/aquaculture/oysters/pacific-oyster-mortality-syndrome.

[24] Matthew Cunningham et al., *Commercial production trail with high POMS tolerant triploid Pacific oysters in approved New South Wales estuaries* (FRDC Project No 2018-164, March 2021) https://www.frdc.com.au/sites/default/files/products/2018-164-DLD.pdf.

[25] NSW DPIRD, *NSW Oyster Industry Sustainable Aquaculture Strategy Fourth Edition* (A NSW Government initiative, August 2020) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1363676/OISAS-Final-Document-August-2021-Final.pdf.

[26] *Biosecurity Regulation 2017 NSW* (2017).

[27] NSW DPIRD, *NSW Oyster Industry Sustainable Aquaculture Strategy Fourth Edition* (A NSW Government initiative, August 2020) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1363676/OISAS-Final-Document-August-2021-Final.pdf.

[28] Commonwealth Scientific and Industrial Research (CSIRO), 'What are blue-green algae?' (online, 9 August 2021) https://www.csiro.au/en/research/natural-environment/ecosystems/Blue-green-algae/What-are-blue-green-algae.

[29] NSW Government Food Authority, *Vibrio risk management for NSW oyster farmers* (March 2024) https://www.foodauthority.nsw.gov.au/sites/default/files/2024-03/FA634-2403_Vibrio_risk_management_for_NSW_oyster_farmers_Final.pdf.

[30] Emily Fearnley et al., 'Vibrio parahaemolyticus Foodborne Illness Associated with Oysters, Australia, 2021–2022' (2024) 30 (11) *Emerging Infectious Diseases*.

[31] NSW Local Land Services, 'Collaborative flood recovery efforts in the NSW oyster industry' https://www.lls.nsw.gov.au/what-we-do/our-major-projects/early-needs-recovery-program/collaborative-flood-recovery-efforts-in-the-nsw-oyster-industry.

[32] NSW Government Food Authority, 'NSW Shellfish Committee' <NSW Government, NSW Oyster Industry Sustainable Aquaculture Strategy Fourth Edition (A NSW Government initiative, August 2020) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1363676/OISAS-Final-Document-August-2021-Final.pdf.

[33] NSW DPIRD, 'Aquaculture Research Advisory' https://www.dpi.nsw.gov.au/dpi/fishing/aquaculture/committees-and-contacts/arac.

[34] NSW DPIRD, *Sydney Rock Oyster Breeding Program* (April 2024) https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/1548052/Sydney-Rock-Oyster-Breeding-Program-Update-April-2024.pdf.

[35] NSW DPIRD, 'Hawkesbury's $3.1 million oyster clean-up program a success' https://www.dpi.nsw.gov.au/content/archive/news-releases/fishing-and-aquaculture/2008/oyster-clean-up-program.

[36] NSW DPIRD, 'Fee waiver to provide relief for Port Stephens oyster farmers' *Media release* (online, 15 November 2023) https://www.nsw.gov.au/media-releases/fee-waiver-to-provide-relief-for-port-stephens-oyster-farmers.

[37] Kim Honan, 'Highly contagious white spot disease detected at prawn farm in NSW for first time', ABC News (online, 25 August 2022) https://www.abc.net.au/news/rural/2022-08-25/white-spot-disease-detected-prawn-farm-nsw-contagious/101372408.

[38] Sarina Locke, 'Major failure of biosecurity likely led to white spot disease outbreak in Logan River, inspector-general finds', ABC News (online 12 December 2017) https://www.abc.net.au/news/rural/2017-12-12/systematic-failure-of-biosecurity-blamed-for-prawn-disease/9246796.

[39] Lisa Herbert, 'Commonwealth funds $20 million prawn white spot compensation package' (2017) https://www.abc.net.au/news/rural/2017-05-06/prawn-white-spot-compensation-package/8499680.

[40] Kim Honan, 'Prawn industry thrown $21.4m recovery package for white spot disease response' (2023) https://www.abc.net.au/news/2023-06-14/prawn-industry-payout-for-nsw-clarence-river-white-spot-outbreak/102476840.

[41] Australian Department of Agriculture, Fisheries and Forestry (DAFF), 'Levy and charge rates' https://www.agriculture.gov.au/agriculture-land/farm-food-drought/levies/rates#fisheries.

[42] Animal Health Australia, *Emergency Animal Disease Response Agreement* (Version No. 24/ 5 December 2023) https://animalhealthaustralia.com.au//wp-content/uploads/2024/04/EADRA.pdf.

[43] Agriculture Victoria, 'Avian influenza (bird flu)' https://agriculture.vic.gov.au/biosecurity/animal-diseases/poultry-diseases/avian-influenza-bird-flu.

[44] U.S. Centres for disease control and prevention, 'Current Bird Flu Situation in Wild Birds' https://www.cdc.gov/bird-flu/situation-summary/wildbirds.html.

[45] Australian Eggs, 'Australian Egg Industry Overview' https://www.australianeggs.org.au/egg-industry.

[46] Australian Chicken Meat Federation Ltd, 'Facts & Figures' https://chicken.org.au/our-product/facts-and-figures/.

[47] New Zealand Department of Work and Income, 'Enhanced Taskforce Green' https://www.workandincome.govt.nz/eligibility/emergencies/enhanced-taskforce-green.html.

[48] New Zealand Ministry for Primary Industries, *Bonamia Ostrea in Foveaux Strait* (May 2021) https://www.mpi.govt.nz/dmsdocument/44659/direct.

[49] Andrea Fox, 'Oyster farmers still waiting for millions in MPI compensation' (2018) https://www.nzherald.co.nz/business/oyster-farmers-still-waiting-for-millions-in-mpi-compensation/TONBVHMTBMWYUBISUMUQGDOHC4/.

[50] RNZ, 'Stewart Island oyster farmers get $2.4m compensation' (2019), https://www.rnz.co.nz/news/national/387007/stewart-island-oyster-farmers-get-2-point-4m-compensation.

[51] Plant Health Australia, *Emergency Plant Pest Response Deed* (23 October 2024) https://www.planthealthaustralia.com.au/response-arrangements/emergency-plant-pest-response-deed-epprd/.

[52] Commonwealth Services Australia, 'Farm Household Allowance' https://www.servicesaustralia.gov.au/farm-household-allowance.

[53] Rural Support Trust, 'Rural People Helping Rural Support' https://www.rural-support.org.nz/.

[54] DAFF, 'Rural Financial Counselling Service (RFCS)' https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/rural-financial-counselling-service.

[55] Agriculture Victoria, 'Anthrax in animals' https://agriculture.vic.gov.au/biosecurity/animal-diseases/important-animal-diseases/anthrax-in-animals.

[56] New Zealand Inland Revenue, 'Income equalisation schemes' https://www.ird.govt.nz/income-tax/income-tax-for-businesses-and-organisations/income-equalisation-scheme.

[57] DAFF, 'Farm Management Deposits' https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/fmd.

[58] ATO, 'Farm Management Deposit Scheme' https://www.ato.gov.au/businesses-and-organisations/income-deductions-and-concessions/primary-producers/in-detail/farm-management-deposits-scheme#ato-Repaymentwithin12monthsinadisasterordrought.

[59] Dairy News Australia, 'Farm deposits scheme reviewed' (2019) https://www.dairynewsaustralia.com.au/news/farm-deposits-scheme-reviewed/.

[60] Australian Government Cost Recovery Guidelines (2005, 2014) and the Productivity Commission Review of Cost Recovery by Commonwealth Agencies (2001).

[61] Biosecurity Act 2015 No 24 NSW (2015)

[62] Fisheries Management Act 1994 No 38 NSW (1994)

[63] For more information on establishing a levy, refer to DAFF's Levy Principles and Guidelines.

[64] DAFF, 'Levy Guidelines' (2020) https://www.agriculture.gov.au/sites/default/files/documents/levy-guidelines.pdf pg. 6.

[65] DAFF, 'About levies and the levy system' https://www.agriculture.gov.au/agriculture-land/farm-food-drought/levies/about-levies.

[66] AXA XL, 'Aquaculture Insurance & Fish Stock Coverage' https://axaxl.com/insurance/products/aquaculture-insurance.

[66] NFU, 'Frost insurance – how does it work and what does it cover?' (2023), https://www.nfuonline.com/updates-and-information/frost-insurance-how-does-it-work-and-what-does-it-cover/.

[66] DAFF, 'Farm Management Deposits' https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/fmd.

[66] ATO, 'Farm Management Deposit Scheme' https://www.ato.gov.au/businesses-and-organisations/income-deductions-and-concessions/primary-producers/in-detail/farm-management-deposits-scheme#ato-Repaymentwithin12monthsinadisasterordrought.

[66] Regional Investment Corporation, 'Our loans' https://www.ric.gov.au/loans.

[67] AXA XL, 'Aquaculture Insurance & Fish Stock Coverage' https://axaxl.com/insurance/products/aquaculture-insurance.

[69] NFU, 'Frost insurance – how does it work and what does it cover?' (2023), https://www.nfuonline.com/updates-and-information/frost-insurance-how-does-it-work-and-what-does-it-cover/.

[70] DAFF, 'Farm Management Deposits' https://www.agriculture.gov.au/agriculture-land/farm-food-drought/drought/fmd.

[71] ATO, 'Farm Management Deposit Scheme' https://www.ato.gov.au/businesses-and-organisations/income-deductions-and-concessions/primary-producers/in-detail/farm-management-deposits-scheme#ato-Repaymentwithin12monthsinadisasterordrought.

[72] Regional Investment Corporation, 'Our loans' https://www.ric.gov.au/loans.

Appendix A Case Studies

A.1. List of support mechanisms

Table A.1 Summary of potential support mechanisms for industry in response to disease or pest outbreaks

Financial support mechanism	Activities/services included	Cost recovery	Collection agency	Levy recipient body
EADRA	Cost of biosecurity response; owner reimbursement costs	Yes – EADR levy	DAFF	AHA
EPPRD	Cost of biosecurity response; owner reimbursement costs	Yes - EPPR levy	DAFF	PHA
AHA activities	Manages more than 50 national programs that improve animal and associated human health, biosecurity and market access, livestock welfare. • Manages the EADRA and the AUSVETPLAN • Provides education and training • Ensures access to vaccine stocks • Disease and pest surveillance	Yes – Membership fees and AHA levy.	AHA	AHA
PHA activities	Manages the EPPRD, provides training, surveillance, a suite of industry-funded programs.	Yes – Membership fees and PHA levy.	PHA	PHA
Farm Management Deposit Scheme	Enables primary producers to make tax-deductible deposits during profitable years and withdraw funds during bad years.		The Australian Taxation Office is responsible for the tax administration	
FHA	Assistance to farmers experiencing financial hardship for any reason. • Up to 4 years fortnightly income support • Allowances such as Telephone, Remote Area, Pharmaceutical, Rent, Health Care • Financial assessment of the farm business • Funding for skills, training, advice	No – Commonwealth Government funded		
Rural Financial Counselling Service (RFCS)	Provides free financial counselling to eligible farmers experiencing/risk financial hardship.	No – Commonwealth Government funded		
One-off funding packages				

Source: Deloitte Access Economics

A.2. Case studies overview

Table A.2 Summary of pests and diseases covered under Deeds

Case Study	Sector affected	Financial support mechanism activity					Activities occur under Deed?	Endemic/ Exotic	Deed category
		Early detection incentives and prevention Federal, State and/or Industry	**Eradication costs** Cost sharing (Federal, state and/or Industry)	**Compensation for destruction of stock** Cost sharing (Federal, state and/or Industry)	**Financial hardship support** Federal	**Assistance to restart, restructure or diversify operations** Federal, state government		National scale	If applicable
Avian Influenza	Chickens	×	✓	✓	✓	×	Yes	Exotic	Category 3
White Spot disease	Prawns	✓	✓	×	×	✓	No	Exotic	N/A
Foot & Mouth Disease	Cloven-hoofed animals	✓	✓	✓	✓	×	Yes	Exotic	Category 2
Varroa Mite	Bees	✓	✓	✓	✓	×	Yes	Endemic	Category 2
Anthrax	Cloven-hoofed animals	✓	✓	✓	✓	×	Yes	Endemic	Category 3
Equine Influenza	Horses	✓	✓	✓	✓	×	No (in 2007-08)	Exotic	Category 4
Banana Freckle	Bananas	✓	✓	✓	✓	×	Yes	Exotic	Category 3
American foulbrood disease	Bees	×	×	✓ partial	✓	×	No	Endemic	N/A
Red Witchweed	Sugarcane, rice wheat, rice	×	✓	×	✓	×	No	Exotic	N/A
Blue tongue disease	Cattle, sheep, goats	×	✓	✓	✓	×	Yes	Endemic	Category 3
TAS POMS outbreak	Tasmanian Pacific oysters	×	✓	×	×	✓	No	Endemic	N/A
Bonamia ostreae	Bluff oysters	×	✓	✓	✓	✓	N/A	Exotic	N/A
Qx and POMS	Oysters	×	×	×	×	×	No	Endemic	N/A

Source: Deloitte Access Economics

Appendix B Long list and shortlist of options

B.1. Overview of long listed options

The left-hand side of the table below summarises the key distinguishing features of the six long listed options. The right-hand side outlines the emergency response activities that could be supported under each option.

Table B.1 Key features of long listed options

Option		Option Type	Level of geographic implementation	Government co-funded	Cost recovery from Industry	Eliminates ad-hoc government funding	Financial support mechanism activity				
							Early detection incentives and prevention	Eradication costs	Compensation for destruction of stock	Financial hardship support	Assistance to restart, restructure or diversify operations
1	Tiered cost-shared	Compulsory; Voluntary	State-wide; Estuary-wide	Yes	Partial	Yes	×	Could enable	Could enable	Could enable	Could enable
2	Flat cost-shared	Compulsory; Voluntary	State-wide; Estuary-wide	Yes	Partial	Yes	×	Could enable	Could enable	Could enable	Could enable
3	Common industry fund	Compulsory; Voluntary	State-wide; Estuary-wide	No	Full	Possibly	×	Could enable	Could enable	Could enable	Could enable
4	Insurance	Compulsory; Voluntary	State-wide; Estuary-wide; Individual	No	Full	Possibly	×	Could enable	Could enable	×	×
5	Incentive payments and penalties	N/A	Individual	No	N/A	Unlikely	Could enable	×	×	Could enable	×
6	User pays	Voluntary	N/A	No	N/A	No	×	×	×	×	×

Source: Deloitte Access Economics

B.2. MCA outcomes

The long list of options was analysed using the criteria and weightings described in Table B.2. For each criterion, options were assessed relative to one another and ranked from low to high on a five-point scale. The rankings were developed by NSW oyster producers through a workshop format and validated by independent project stakeholders.

Table B.2 MCA criteria, description and weightings

Banner	Criteria	Description	Weighting	Sensitivity analysis
Practicality	Financial protection certainty	Scheme offers certainty of a pre-agreed level of financial protection in the event of a significant event affecting the NSW Oyster Industry. Long list of options have varying degrees of certainty, which will assist in short listing.	50%	40%
	Appropriate use of government funding	Scheme ensures a balance by making government funding available without encouraging overreliance. The scheme incorporates pre-committed government support rather than ad-hoc funding and minimises the need for government funding when appropriate.		
	Practical and permissible	Scheme is practically implementable, achievable, efficient and easy to administer. The scheme should ideally operate without any changes to existing legislation.		
	Adaptability and flexibility	Being adaptable/flexible enough to deal with future threats (including currently unknown threats). While a scheme works well in the present, it may not work in the future and therefore it is important to consider adaptability and flexibility.		
	Long term sustainability	Scheme is viable over an extended time-period with low risk of closure/withdrawal. For example, industry wide insurance could be more difficult to retain over time.		15%
Biosecurity	Incentives good behaviour	Scheme incentivises high standards for surveillance, prevention, mitigation and adaptation activities (i.e. minimisation of moral hazard). The scheme needs to balance the need for financial support and the level of risk creation associated with the support.	10%	10%
Fairness and equity	Fairness and equity	Scheme allows for fair and equitable sharing of costs with respect to risk and beneficiaries. There are high risk locations and risk creators that should bear the costs. Fairness and equity are important to support economic principles.	20%	15%
Cost-effectiveness	Cost-effectiveness	Scheme is cost-effective (financial and administrative) for all stakeholders.	20%	20%

Source: Deloitte Access Economics

The rankings from 'Low' to 'High' were assigned a score from one to five, where each increment on the five-point scale increases the score by one point – that is, a 'Low' ranking is assigned a score of one and a 'High' ranking is assigned a score of five. The final score depicts the average outcome on the five-point scale, with scores distributed by the weighting of each criterion. The MCA outcomes are shown in Table B.3 (developed by independent project stakeholders) and Table B.4 (developed by NSW oyster producers with support from NSWFA and Deloitte Access Economics).

Across both MCA processes, Options 1, 3, and 4 consistently ranked in the top three, demonstrating the higher cost effectiveness, fairness, adaptability, long term sustainability, and practicality of these options overall. As a result of their higher performance, these three options have been shortlisted for further development.

Table B.3 MCA outcomes for long listed options – independent project stakeholders

Criteria	Option 1: Tiered support, shared cost	Option 2: Uniform support, shared cost	Option 3: Common industry fund	Option 4: Insurance	Option 5: Incentive payments and penalties	Option 6: No intervention
Financial protection certainty	High	Med/High	Med/High	High	Low/Med	Low
Appropriate use of government funds	Med	Med/High	High	High	Low/Med	Low/Med
Practicality and permissibility	Med/High	High	High	High	Med/High	High
Long term sustainability	Med/High	High	Med/High	Med/High	Low	Low
Adaptability and flexibility	Med/High	Med	Med/High	Med	High	High
Ability to incentivise good behaviour	Med	Med	Med	Med	High	High
Fairness and equity	High	Med/High	Med/High	Med/High	Med/High	Low/Med
Cost effectiveness	Med	Med	High	Med/High	Med/High	High
Total Score	**3.9**	**3.8**	**4.3**	**4.1**	**3.5**	**3.3**
Sensitivity analysis	**3.85**	**3.85**	**4.3**	**4.1**	**3.35**	**3.25**

Source: Deloitte Access Economics

Table B.4 MCA outcomes for long listed options – oyster industry stakeholders

Criteria	Option 1: Tiered support, shared cost	Option 2: Uniform support, shared cost	Option 3: Common industry fund	Option 4: Insurance	Option 5: Incentive payments and penalties	Option 6: No intervention
Financial protection certainty	Med/High	High	Med/High	Medium	Low/Med	Low
Appropriate use of government funds	High	Medium	Med/High	Med/High	Medium	Low
Practicality and permissibility	Med/High	Medium	Med/High	Med/High	Medium	High
Long term sustainability	Med/High	Med/High	Medium	Medium	Medium	Low
Adaptability and flexibility	Medium	Medium	High	Med/High	Med/High	Medium
Ability to incentivise good behaviour	Medium	Medium	High	Med/High	High	Med/High
Fairness and equity	Med/High	Medium	Medium	Med/High	Low/Med	Low/Med
Cost effectiveness	Med/High	Low/Med	Med/High	Medium	Med/High	High
Total Score	**4.0**	**3.1**	**3.9**	**3.6**	**3.2**	**2.9**
Sensitivity analysis	**4.05**	**3.15**	**3.9**	**3.55**	**3.25**	**2.85**

Source: NSW oyster growers, with support from Deloitte Access Economics and NSWFA

Table B.5 MCA rationale

Criteria	Option 1: Tiered support, shared cost	Option 2: Uniform support, shared cost	Option 3: Common industry fund	Option 4: Insurance	Option 5: Incentive payments and penalties	Option 6: No intervention
Financial protection certainty	**Rating:** Med/High **Rationale:** With a pre-defined cost-sharing arrangement, this option is likely to provide a high level of financial certainty since all parties are aware of their financial obligations ahead of time.	**Rating:** High **Rationale:** With a pre-defined flat cost-sharing arrangement, this option is likely to provide the highest level of financial certainty due to the fixed nature of levies paid by oyster producers.	**Rating:** Med/High **Rationale:** With an established industry-led fund, this option is likely to provide a high level of financial certainty since all parties are aware of their financial obligations ahead of time.	**Rating:** Medium **Rationale:** With an established insurance scheme, this option is likely to provide a medium level of financial protection certainty since the decision whether to pay a claim rest with the insurance provider.	**Rating:** Low/Med **Rationale:** With a risk minimising arrangement, this option is likely to provide a low level of financial certainty since financial support is not always guaranteed.	**Rating:** Low **Rationale:** With the current status quo, this option provides the lowest level of financial certainty since producers must seek their own financial supports during supply disruptions.
Appropriate use of government funds	**Rating:** High **Rationale:** A co-funded system between government and industry eliminates the need for government ad-hoc funding, minimising the industry's overreliance on a less certain form of support.	**Rating:** Medium **Rationale:** While a co-funded system between government and industry eliminates the need for government ad-hoc funding, this option is rated medium due to the flat cost structure, leading to a potential overallocation or under allocation of funds.	**Rating:** Med/High **Rationale:** An industry-led fund is rated higher since the option minimises the industry's overreliance on ad-hoc government funding.	**Rating:** Med/High **Rationale:** An insurance scheme is rated higher since the option minimises the industry's overreliance on ad-hoc government funding.	**Rating:** Medium **Rationale:** A risk minimising scheme is rated medium since the option does not eliminate the need for government ad-hoc funding.	**Rating:** Low **Rationale:** No intervention is rated the lowest since this option does not eliminate the need for ad-hoc government funding, continuing the industry's overreliance on government short-term support.
Practicality and permissibility	**Rating:** Med/High **Rationale:** A mechanism that is co-funded between government and industry and features tiered support from government is a practical way of funding the response to a supply disruption.	**Rating:** Medium **Rationale:** In the event of a severe and costly supply disruption, industry may not be able to cover its share of costs, which could have financial implications such as bankruptcy and financial hardship.	**Rating:** Med/High **Rationale:** A fund designed and led by industry is a permissible and practical way of supporting growers.	**Rating:** Med/High **Rationale:** Spreading the risk of supply disruptions across time and geographical areas is a practical form of a financial safety-net.	**Rating:** Medium **Rationale:** This option is rated medium given the risk creator is unknown and therefore would be more difficult to implement.	**Rating:** High **Rationale:** This option is rated the highest because the option is the status-quo.

Criteria	Option 1: Tiered support, shared cost	Option 2: Uniform support, shared cost	Option 3: Common industry fund	Option 4: Insurance	Option 5: Incentive payments and penalties	Option 6: No intervention
Long term sustainability	**Rating:** Med/High **Rationale:** This option is rated higher because government involvement could contribute larger scale resources, ensuring the support system's long term stability.	**Rating:** Med/High **Rationale:** This option is rated higher because government involvement could contribute larger scale resources, ensuring the support system's long term stability.	**Rating:** Medium **Rationale:** This option is rated medium because the long term sustainability of the scheme depends on continued industry participation, and any loss of confidence could threaten this viability.	**Rating:** Medium **Rationale:** This option is rated medium because the long term sustainability of the scheme depends on continued industry participation, and any loss of confidence could threaten this viability.	**Rating:** Medium **Rationale:** This option is rated medium because the long term sustainability of the scheme depends on environmental factors and unknown risk creation.	**Rating:** Low **Rationale:** This option is rated low because the long term sustainability of the status quo is dependent on oyster producers financial capabilities.
Adaptability and flexibility	**Rating:** Medium **Rationale:** Government involvement can affect the ability to modify arrangements once they are established.	**Rating:** Medium **Rationale:** Government involvement can affect the ability to modify arrangements once they are established.	**Rating:** High **Rationale:** Industry-led involvement offers the highest adaptability and flexibility because the industry is responsible for both the design and implementation on industry.	**Rating:** Med/High **Rationale:** Industry and insurance involvement offers a relatively more adaptable and flexible option than options involving government.	**Rating:** Med/High **Rationale:** Incentive payments and penalties can be adapted and changed relatively easily over time.	**Rating:** Medium **Rationale:** No intervention is likely to be the least adaptable and flexible option because while producers may have some ability to adjust their practices, the financial burden could delay the adoption of changes.
Ability to incentivise good behaviour	**Rating:** Medium **Rationale:** This option is rated medium due to the assurance of financial backing, providing stakeholders with a safety net that can potentially diminish perceived need to minimise risk.	**Rating:** Medium **Rationale:** This option is rated medium due to the assurance of financial backing, providing stakeholders with a safety net that can potentially diminish their perceived need to minimise risk.	**Rating:** High **Rationale:** This option is rated high since the shared contributions by industry create an incentive to protect the fund's resources.	**Rating:** Med/High **Rationale:** The more frequently supply disruptions occur, the higher insurance premiums will be, which incentivises good behaviour to minimise their likelihood.	**Rating:** High **Rationale:** This option is rated high since it rewards efforts to reduce the risks of biosecurity and non-biosecurity threats.	**Rating:** Med/High **Rationale:** This option is rated higher since the producer, bearing the full cost of risk behaviour, has a direct financial stake in minimising risks and avoiding losses.
Fairness and equity	**Rating:** Med/High **Rationale:** This option is rated higher since the payout is proportional to	**Rating:** Medium **Rationale:** This option is rated medium since the proportion of cost sharing	**Rating:** Medium **Rationale:** Producers bear the costs of responding to severe supply disruptions	**Rating:** Med/High **Rationale:** Fairness and equity is lower in a voluntary scheme since	**Rating:** Low/Med **Rationale:** Given much is not known about disease risk, it is difficult to fairly	**Rating:** Low/Med **Rationale:** This option is rated lower since the risk activity of producers may

Criteria	Option 1: Tiered support, shared cost	Option 2: Uniform support, shared cost	Option 3: Common industry fund	Option 4: Insurance	Option 5: Incentive payments and penalties	Option 6: No intervention
	levies paid in. The tiered element ensures differentiation between payout and level of damages.	arrangements remain fixed, regardless of the level of damages.	which may have public benefits (e.g. slowing disease spread) that they are not compensated for.	only some producers bear risk (and the costs of a supply disruption), while it is high in a compulsory scheme since producers share risk equally.	reward or punish individuals for their behaviour which may or may not contribute to disease risk.	disproportionately affect those with fewer resources.
Cost effectiveness	**Rating:** Med/High **Rationale:** This option is rated higher since the tiered support element depends on the extent of damages.	**Rating:** Low/Med **Rationale:** In a major supply disruption, there is a greater chance that industry will not be able to cover its share of costs (given fixed cost sharing), warranting additional funding from government.	**Rating:** Med/High **Rationale:** This option is rated higher since an industry-led scheme will be less expensive to establish than a scheme co-funded by government.	**Rating:** Medium **Rationale:** This option is rated medium since affordable premiums are contingent on high levels of participation.	**Rating:** Med/High **Rationale:** this option is rated higher since funds raised from penalties could cover the costs of policy implementation, as well as incentive payments.	**Rating:** High **Rationale:** This option is rated high since there is no third party intervention.

Source: Deloitte Access Economics

Appendix C Stakeholder consultation insights

Stakeholder consultation served two key purposes within this engagement: providing insight into financial mechanisms which have supported industries in the past, as well as testing findings that have been developed through the course of this work. Consultations were undertaken in a staged process to first identify what financial mechanisms have been used in the past, how they have been effective and why, and then to test the insights gained from the first stage of consultations with stakeholders in the oyster industry. Consultations involved approximately 60-minute video calls with participants, though some were conducted via email. Stakeholders were categorised into the following groups:

- Commonwealth and state government agencies
- insurance
- agriculture and aquaculture industry
- oyster peak bodies
- oyster growers.

Stakeholder group	Stakeholder	Purpose
Agriculture and aquaculture industry	• Australian Prawn Farmers Association • Australian Barramundi Farmers Association • Australian Council of Prawn Fisheries • Australian Southern Bluefin Tuna Industry Association • Seafood Industry Australia • Australian Duck Meat Association • Animal Health Australia	To understand how stakeholders have been historically impacted by biosecurity risks and financial support mechanisms.
Commonwealth and state government Agencies	• NSW DPIRD	To understand government's role in providing financial support whilst managing biosecurity risk.
Insurance	• Lockton	To explore the suitability of insurance options in response to biosecurity risks.
Other agriculture and aquaculture bodies	• South Australian Oyster Growers Association (SAOGA) • Oysters Tasmania (OT) • Queensland Oyster Growers Association (QOGA) • Oysters Australia	To understand what options have already been explored or are being currently undertaken for industry impacted by biosecurity risks.
Oyster industry bodies	Participants of the 2024 NSW Oyster Conference, Port Macquarie	Presented initial findings at conference and welcomed feedback from attendees.
Oyster growers		To undertake a growers MCA to gain insights into their perspectives and needs.

Source: Deloitte Access Economics

C.1. Government ad-hoc funding has been beneficial but is unsustainable

There was consensus that ongoing support for producers is necessary, but views differ on the nature and adequacy of the assistance provided.

From a government perspective, there was recognition of the need for continuous support to assist producers through disease outbreaks and other supply disruptions. In the past, ad-hoc funding has proven unsustainable, especially given that it operates as a cost-recovery mechanism for the department. The department wishes to transition from ad-hoc funding towards a more financially sustainable and systemic program. Under the Biosecurity Act, the government is not required to provide support for endemic disease, so any assistance would fall outside its scope.

Peak bodies in Tasmania and South Australia reported receiving support from state governments through concessional loans and fee waivers for licences and leases, whereas Queensland has not received this same level of support. While there has been assistance for the industry across Australian states, it has been noted that this support is significantly smaller than that for inland-based farming, and equal treatment would be beneficial. Furthermore, insights from consultations suggest that the Australian oyster industry more broadly has a preference towards a long-term government co-contribution mechanism for more sustainable support.

C.2. Mutual or pooled insurance schemes are preferred

A mutual or pooled insurance scheme was typically preferred as an option for the oyster industry due to its collective strength and efficiency at managing risk. During stakeholder consultations, insurers expressed that while individual insurance policies can be tailored towards individual needs, they may be limited and costly. In contrast, a mutual approach can allow all members to share risks and resources, providing broader coverage at a lower cost to participants. By pooling resources and contributions from industry members, third-parties such as government, can provide additional support, creating a more robust financial safety net. This is especially valuable as the impacts of climate change contribute to increased risk of disease outbreak.

Oyster growers generally support an industry-wide insurance scheme to foster a larger pool of funding, making premiums more financially viable, especially for small producers. Oyster peak bodies regard insurance as a feasible option but there are concerns around affordability if such a scheme existed.

C.3. Varying perspectives on the financial support mechanism design

Stakeholder groups expressed differing opinions on the characteristics that should define a financial support system. While oyster peak bodies supported a voluntary and estuary-based design across all solutions, growers supported different variations depending on the type of support system.

There was consensus amongst oyster peak bodies for a voluntary, estuary-based approach across all solutions, including insurance, government co-contribution and industry common fund. The rationale for this was that making the system compulsory could lead to resistance amongst producers and an estuary-based system would allow for better visibility over activities, contributors and beneficiaries.

Oyster producers supported varied designs of the different financial support mechanisms. While the stakeholder group supported a government co-contribution option with a compulsory and statewide approach, they preferred a voluntary and estuary-based approach for an industry fund, as this would allow the industry to govern it and provide more flexibility in its design. Similarly, the Australian Duck Meat Association has preferred a voluntary fund as demonstrated with the establishment of the VFR. For insurance, producers believed incentivising large industry buy-in would be most suitable to ensure sufficient participation.

Animal Health Australia recommended considering the establishment of an industry-led fund as a viable alternative since an industry fund allows for greater control over levy rates and governance, reducing the risk of government intervention in setting levy parameters. This approach would offer producers more flexibility and ensure that the funds raised align with industry priorities.

C.4. Proactive and reactive solutions

There was a consensus amongst oyster peak bodies and other aquaculture industry peak bodies in support for more proactive prevention or risk minimisation solutions rather than reactive solutions like financial support mechanisms after supply disruption. On the other hand, while oyster farmers acknowledged the importance of mitigation strategies, they highlighted the difficulties and uncertainties with implementing such strategies.

Across the industry, there was agreement that focusing on prevention, such as covering costs of testing, is easier and more effective than implementing a cure. For example, there is an incentive for growers not to admit to the levels of risk and therefore, it may be beneficial to design a support mechanism based on rewarding producers for risk-minimising practices. An example was raised which highlighted the consequences of the Johne's disease outbreak in Queensland for cattle. There was a support system covered by a biosecurity levy, which provided farmers with compensation for the loss of their stock. The combination of low compensation, up to 50 per cent, and tight movement restrictions disincentivised producers from reporting the disease.

Other aquaculture peak bodies believed that although there are no formal support mechanisms available in other aquaculture industries, stronger biosecurity measures are preferred to minimise the risk of disease incursion. Peak bodies viewed financial support mechanisms as reactive policies. Instead, measures such as a ban on raw prawn imports or imposing levies on risk creators were seen as better ways to enhance industry resilience. The duck meat industry, for instance, minimizes risk by using shed-based systems rather than free range systems.

Oyster farmers emphasised the importance of mitigation efforts, particularly the need for encouraging good clean-up practices within estuaries. However, they noted the uncertainty surrounding the relationship between cause and effect linkages and environmental threats. Without a clear understanding of how certain actions directly influence outcomes, it becomes difficult to design targeted incentives that promote best practice and minimise risky behaviour. Despite this, one recommendation provided was to reduce levy fees for growers who adopt good practices such as vaccination. This approach would complement a reactive policy with a more proactive strategy.

Limitation of our work

General use restriction

This report is prepared solely for the internal use of the NSW Farmers Association. This report is not intended to and should not be used or relied upon by anyone else and we accept no duty of care to any other person or entity. The report has been prepared for the purpose of investigating financial mechanisms to support NSW oyster producers set out in our engagement contract dated 12/06/2024. You should not refer to or use our name or the advice for any other purpose.

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