

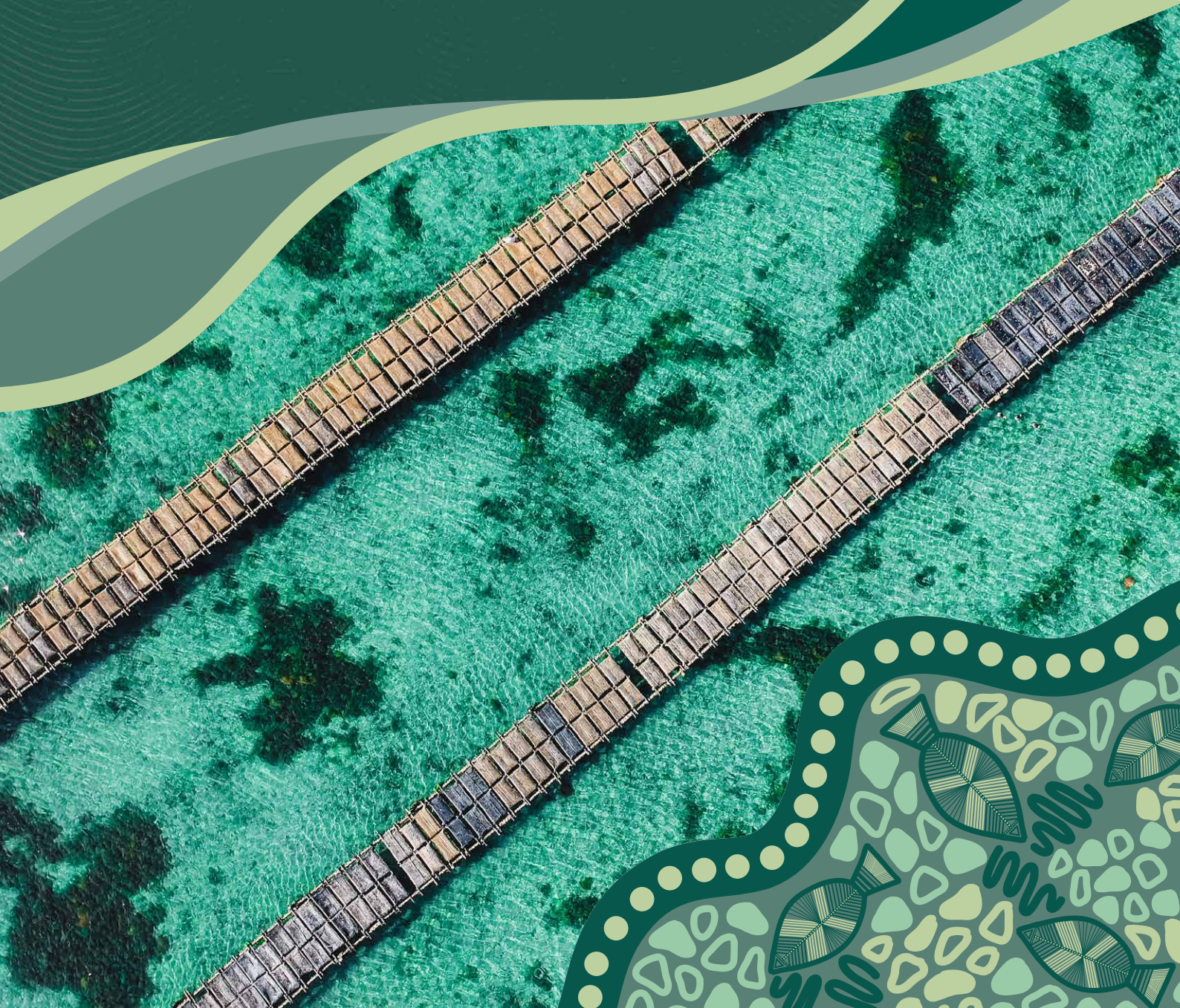


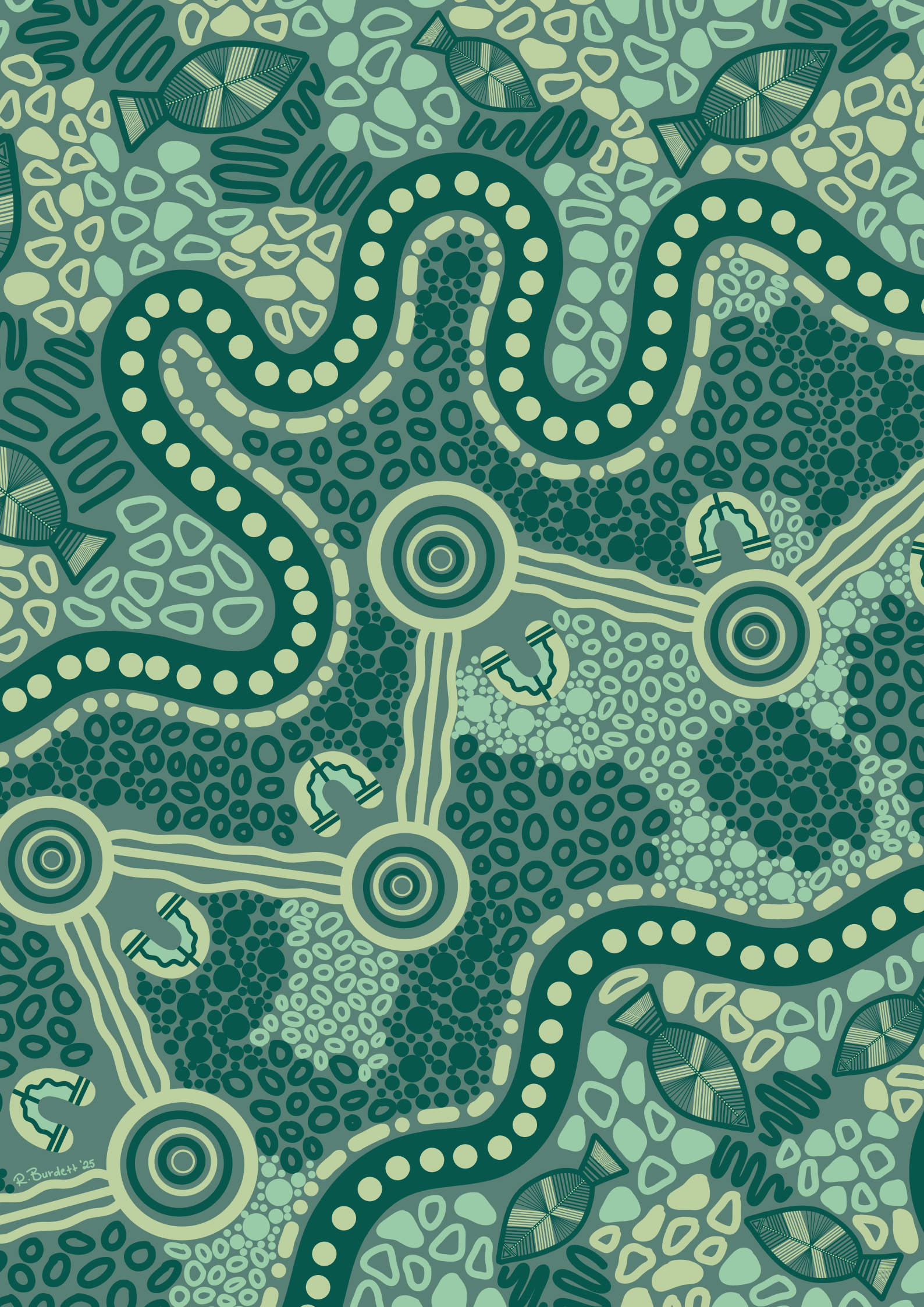
Department of
Primary Industries and
Regional Development



Setting up for Success Aquaculture

A practical guide for Aboriginal communities, organisations, businesses
and Registered Native Title Bodies Corporate in Western Australia





R. Burdett '25

Aquaculture Knowledge - By Rickesha Burdett

“This artwork represents the deep connection our peoples have with water, various aquaculture species and the knowledge that has been passed down through generations. The connecting lines between waterholes represent pathways of knowledge that has been passed down from Elders to younger generations. The fish throughout the artwork represent important aquatic species that have sustained First Nations peoples for thousands of years. They are also surrounded by fish traps, a traditional way of hunting.”

Acknowledgement of Country

The Department of Primary Industries and Regional Development (DPIRD) acknowledges the Traditional Custodians of Country, the Aboriginal people of the many lands and waters that we work on and their language groups throughout Western Australia, and recognises their continuing connection to land and waters. DPIRD respects the continuing culture of Aboriginal people and the contribution they make to the life of our regions, and we pay our respects to Elders past, present and emerging.

Acknowledgements

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Cultural sensitivity warning

Aboriginal and Torres Strait Islander people should be advised that this publication may contain images and names of people who are now deceased.

Important disclaimer

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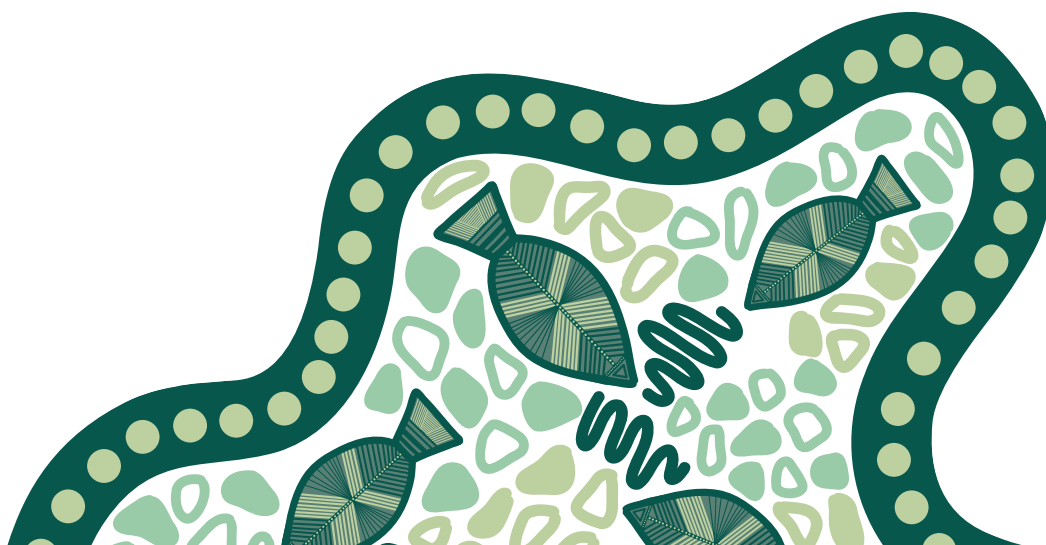
The information in this document is to be treated as guidance only. It is not legal, planning, development or policy advice. Information in the guide will change over time and may not address all scenarios. Legal advice should be sought on how the *Native Title Act 1993* (Cth), including the future act provisions, may apply to each project. Applications for aquaculture licences or leases under the *Fish Resources Management Act 1994*, or pearling activities under the *Pearling Act 1990*, are assessed on a case-by-case basis, as each project, waterbody and the aspirations of Aboriginal communities and organisations are different. You are encouraged to contact the Aquaculture Management team early in your project to seek preliminary advice on requirements.

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Contents

Introduction	8
How to use this guide	11
Part 1 - Overview of the aquaculture industry	12
Western Australian First Nations, aquatic resources and aquaculture	12
The Western Australian seafood sector and aquaculture	13
Western Australian aquaculture	15
Part 2 - What are the opportunities and risks – should I be doing this?	22
Opportunities for Western Australian First Nations	22
Risks for Western Australian First Nations	22
Part 3 - What are my assets?	24
First Nations aquaculture assets	26
Legal rights in Country	26
Legal rights in Indigenous Cultural and Intellectual Property	29
Normative rights	29
Part 4 - How aquaculture works: production systems	32
1. Producing or sourcing juveniles	32
2. Grow-out	37
3. Harvesting	41
4. Processing, distribution and marketing	42

Part 5 - Rules and regulations	44
Approvals and operational regulations	45
Food safety regulations	52
Part 6 - Business development pathways	54
First Nations owned and operated aquaculture business	55
Joint venture	57
Passive beneficiary	58
Part 7 - How do I keep my aquaculture business running?	60
Do your homework and kill quick, kill cheap	60
Good business planning	62
Key aquaculture business drivers and risks	65
Ensuring the product is safe	68
Protecting Indigenous Cultural and Intellectual Property	68
Seafood market risks	68
Part 8 - Where to get help?	70
Glossary	72
Species table	74



Abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics and Sciences
ACWA	Aquaculture Council of Western Australia
AMSA	Australian Maritime Safety Authority
AUD	Australian Dollar
CCIWA	Chamber of Commerce and Industry WA
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Regional Development (WA)
DPLH	Department of Planning, Lands and Heritage (WA)
DTMI	Department of Transport and Major Infrastructure
DWER	Department of Water and Environmental Regulation (WA)
EMMP	Environmental Monitoring and Management Plan
EPA	Environmental Protection Authority (WA)
ESG	Environmental, Social and Governance
ETNTAC	Esperance Tjaltjraak Native Title Aboriginal Corporation
FCR	Feed conversion rate
FPIC	Free, Prior and Informed Consent
GABC	Goldfields Aboriginal Business Chamber
GR	Genetic resources
GVP	Gross Value Production
IBA	Indigenous Business Australia
ICIP	Indigenous Cultural and Intellectual Property
ILUA	Indigenous Land Use Agreement
IPA	Indigenous Protected Area
KADZ	Kimberley Aquaculture Development Zone
LGIRS	Department of Local Government, Commerce, Industry Regulation and Safety (WA)
MEMP	Management and Environmental Monitoring Plan
NCCI	Noongar Chamber of Commerce and Industry
PBC	Prescribed Body Corporate
PSL	Pearling Seeding Licence
PWL	Pearling Wildstock Licence
RAS	Recirculating Aquaculture Systems
RNTBC	Registered Native Title Body Corporate
SBDC	Small Business Development Corporation
TCE	Traditional Cultural Expressions
TEK	Traditional Ecological Knowledge
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
WA	Western Australia
WASQAP	Western Australian Shellfish Quality Assurance Program

Key terms used in this guide

A glossary of terms can be found at the end of this guide.

Aquaculture is the farming of water-living species. It involves the breeding, raising and harvesting of fish, shellfish such as oysters, crustaceans such as prawns, aquatic plants such as seaweed and other aquatic products.

Aboriginal, First Nations and **Indigenous** are used as appropriate to the context in which they occur. In this guide, these terms refer to Aboriginal and Torres Strait Islander peoples in Australia. The term Indigenous may also describe peoples in other countries where required by context.

Country is capitalised to reflect its cultural, spiritual and practical significance. For Australian First Nations peoples, Country includes land, freshwater and saltwater areas and relates to identity, community and ongoing connection.

Law is used instead of lore to acknowledge the depth and authority of Australian First Nations governance systems that have shaped communities for thousands of years and continue to guide responsibilities and relationships.



Fremantle Seaweed longlines
(Photo: Chris De Cuyper, Fremantle Seaweed)

Introduction

What is aquaculture?

Aquaculture is farming in water. Aquaculture can involve the breeding, hatching, culturing and harvesting of fish, other aquatic animals and aquatic plants.

Good to know!

“Fish” includes any water-living creature, alive or dead, as well as their eggs, young, body parts, live rock and live sand.

Aquaculture is about working with water on land, freshwater or seawater Country to produce food and other valuable products such as jewellery, ornaments, medicines, other chemical compounds and materials.

Where can aquaculture take place?

Aquaculture can take place in all kinds of water environments. It can be done in a controlled part of the natural environment such as in the ocean, lagoons, estuaries, rivers and lakes. Aquaculture can also occur in human-made environments such as ponds, dams and tank systems that create suitable conditions for growing aquatic species.

Two main types of aquaculture

Aquaculture operations are often grouped into 2 broad types of production.

Land-based systems

Land-based aquaculture takes place mainly on land in dams, ponds or specialised tank systems that replicate natural conditions.

Land-based aquaculture systems can be very simple, such as farm dams stocked with yabbies, or more complex networks of earthen ponds used to grow barramundi, freshwater finfishes and prawns. They can also include technology-based systems such as Recirculating Aquaculture Systems (RAS) and flow-through onshore systems.

The Ardyaloon Hatchery pictured is an example of a land-based system.



Ardyaloon community, One Arm Point, Dampier Peninsula. DPIRD staff viewing land-based aquaculture facilities with Ardyaloon manager.

Water-based systems

Water-based aquaculture takes place on water in environments such as oceans, lagoons, estuaries, rivers and lakes.

Australian First Nations peoples have produced fish and other aquatic foods from water-based systems for tens of thousands of years. The Brewarrina Fish Traps in north-western New South Wales, traditionally used by the Ngemba, Murrawari and Euahlayi peoples, are recognised as some of the oldest known engineered fish trap systems in the world.

Modern water-based aquaculture in Western Australia includes the sea-cage production of barramundi in Cone Bay in the Buccaneer Archipelago and farming of blue mussels and oysters at various coastal locations.

Another development in Western Australia is the ranching of greenlip abalone on the south coast, which involves hatchery-produced juvenile abalone being grown on artificial reefs.



Cone Bay barramundi sea cages, Buccaneer Archipelago



Oyster farming in the Albany Aquaculture Development Zone, Oyster Harbour

Aquaculture operations vary depending on the species and place. Farming barramundi needs different equipment, skills and labour compared to growing oysters. Producing abalone also takes place in a different region and climate and uses its own methods.



The First Nations aquaculture advantage

Western Australian First Nations peoples, particularly saltwater and freshwater peoples, have deep connections to aquatic species. These connections are grounded in:

- the long-standing role of seafood in First Nations diets
- the Traditional Ecological Knowledge (TEK) passed down from generation to generation, which provides knowledge about species, places and safe ways to harvest and prepare aquatic foods
- the role that aquatic products played in First Nations trade across the continent and with communities in southeast Asia before colonisation
- the cultural significance of many aquatic species for Western Australian First Nations peoples, including as important totemic species. From the Gija and Miriwoong Peoples of the East Kimberley to the Wudjari Nyungar of the south-east coast, aquatic species are deeply embedded in First Nations Law.

The rich Indigenous Cultural and Intellectual Property (ICIP) that stems from these enduring connections provides First Nations with a unique advantage. This knowledge can inform aquaculture practices and support the development of products that reflect First Nations identity and knowledge.

Who is this guide for?

This guide is for Aboriginal communities, organisations, businesses and Registered Native Title Bodies Corporate.

Aboriginal communities, organisations, businesses and Registered Native Title Bodies Corporate who are interested in developing an aquaculture project.

Aboriginal communities, organisations, businesses and Registered Native Title Bodies deciding whether aquaculture is something they want to do.

Aboriginal communities, organisations, businesses and Registered Native Title Bodies Corporate who have been approached by third-party proponents who want to develop an aquaculture project on Country.

How to use this guide

The guide contains 8 parts. Table 1 outlines the information in each part.

This guide provides clear and practical information about aquaculture in Western Australia, including industry context, different production systems, the regulatory environment, business models, key risks and opportunities.

Aquaculture can be complex and can carry risks. This guide is not intended to be a step-by-step manual for aquaculture in Western Australia and it cannot cover every situation or requirement.

Before progressing with an aquaculture venture, readers are advised to seek professional business, technical and legal advice so they fully understand the requirements and risks.

Table 1 – Summary of the content of this guide

Part	Description
Part 1 – Overview of the aquaculture industry	This section provides an overview of the aquaculture industry globally and nationally, with a focus on Western Australia. It describes the history of the industry in Western Australia, its current status and likely trajectory. It offers background information for people who may not be familiar with the industry or the opportunities and challenges it faces in Western Australia.
Part 2 – What are the opportunities and risks – should I be doing this?	This section outlines the opportunities and risks that Western Australian First Nations may face when considering aquaculture at a strategic level. Specific operational risks are discussed in Part 7.
Part 3 – What are my assets?	This section discusses the unique assets that Western Australian First Nations bring to the development or operation of an aquaculture business.
Part 4 – How aquaculture works: production systems	This section describes the aquaculture production process and the systems that can be used at each stage.
Part 5 – Rules and regulations	This section provides an overview of the regulatory requirements for establishing an aquaculture business and its ongoing operations.
Part 6 – Business development pathways	This section describes 3 pathways through which First Nations can engage in aquaculture: owning an aquaculture business, partnering in a joint venture or being a passive beneficiary of a third-party aquaculture project on Country.
Part 7 – How do I keep my aquaculture business running?	This section discusses the importance of analysing and assessing an aquaculture business concept and planning for its implementation and operation.
Part 8 – Where to get help?	This section provides a list of resources that can be accessed to help better understand, plan for and implement aquaculture business aspirations.

Part 1 – Overview of the aquaculture industry

This section provides an overview of the Western Australian aquaculture industry, including:

- First Nations, aquatic resources and aquaculture
- global and Australian trends in aquaculture
- history, status and trajectory of the Western Australian aquaculture industry.

Tip!

Refer to the Species Table in this guide to find the scientific names that match the common names used throughout this document.

Western Australian First Nations, aquatic resources and aquaculture

Western Australian First Nations peoples have been sustainably managing and harvesting the State's natural resources for at least 65,000 years in northern regions and for at least 45,000 years in southern regions.

Across freshwater, riparian, estuarine and marine environments – freshwater and saltwater Country – aquatic animals and plants have fed families and communities, provided materials for the manufacture of various tools and implements and held cultural, social, spiritual and totemic values since time immemorial.

Archaeological evidence of Western Australian First Nations peoples' use of aquaculture-like production systems, such as the 7,000-year-old Menang Noongar fish traps in the State's Great Southern Region (see Figure 1 on page 13), places Western Australian First Nations as some of the earliest aquatic farmers in the world.

First Nations peoples in northern Western Australia were trading aquatic products, including south sea pearl and trepang, across the continent and with southeast Asian communities long before colonisation.^{1,2}

While the policies of the Colonial Government and, later, the State Government often restricted Aboriginal people's access to freshwater and saltwater Country and to the resources found there, aquatic products remain important to both customary and modern ways of life for Western Australian First Nations peoples. Looking to the future, both aquaculture and wild-catch continue to offer meaningful pathways for economic self-determination, as they do for many Indigenous communities across the world.

¹ McCarthy, F. (1939), 'Trade in Aboriginal Australia and trade relationships with Torres Strait, New Guinea and Malaya', *Oceania*, Vol.9, No. 4, pp 405-438

² Ormond-Parker, L. (2020), 'Aboriginal Trade with Macassan Seafarers', *Agora*, 55:3, Melbourne University School of Population and Global Health



Figure 1 – Menang Noongar fish traps, Oyster Harbour, Albany

The Western Australian seafood sector and aquaculture

Global aquaculture

Indigenous aquaculture practices have existed for thousands of years. Modern aquaculture, however, has expanded rapidly over the past 4 decades to become a major global industry. In 2022, aquaculture produced 130.9 million tonnes of fish and other aquatic products with a total value of US\$312.8 billion, led by production in China, Indonesia, India, Vietnam, Bangladesh, South Korea, Egypt, Norway and Japan.³

Growing demand for seafood, combined with reduced wild-catch production in response to sustainability pressures, has contributed to the expansion of global aquaculture. Aquaculture now accounts for 51% of global seafood production.⁴

³ Food and Agriculture Organization (2024), State of World Fisheries and Aquaculture, United Nations, Rome

⁴ Ibid

Australian aquaculture

This global trend is reflected in Australian seafood production. In Australia, aquaculture accounts for just under 60% of total seafood Gross Value of Product (GVP), and the Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES) projects continued growth to 2030 (see Figure 2).⁵

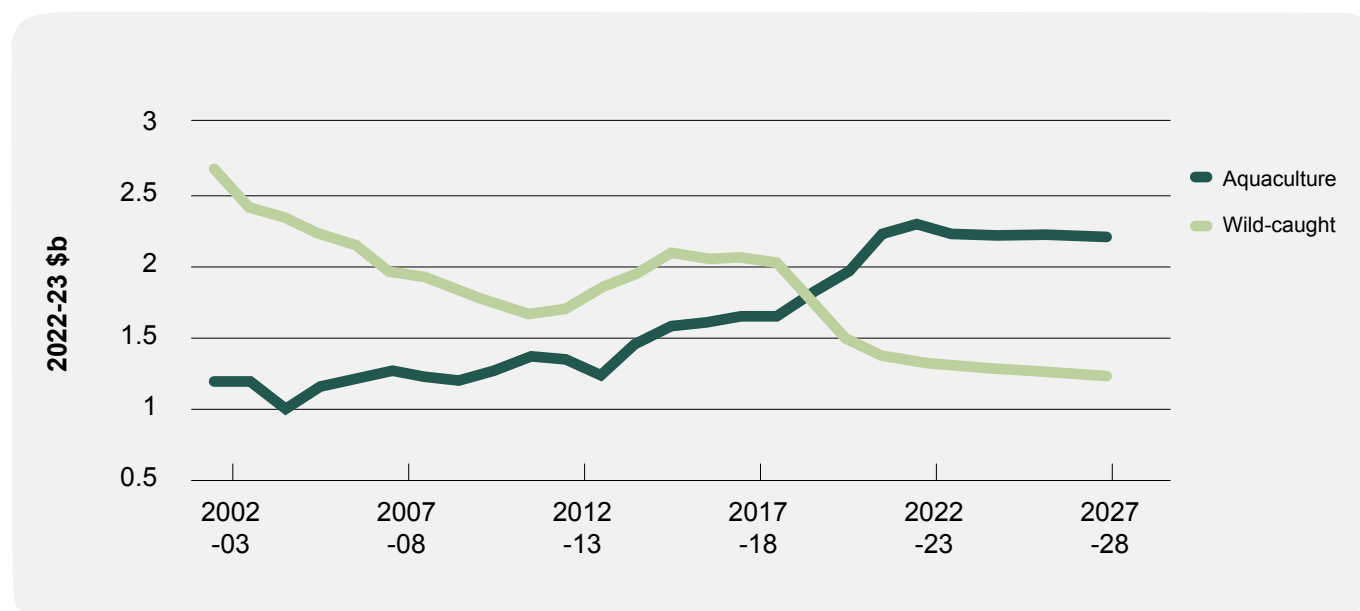


Figure 2 – Historical and forecast Australian aquaculture and wild-caught seafood production

Edible oysters, black tiger prawns, banana prawns and Atlantic salmon account for around 75% of the total value of Australian aquaculture production. Atlantic salmon, an introduced species, accounts for about 60% of this value on its own.⁶

Other species produced across Australia include pearl oysters (*Pinctada maxima* and *Pinctada margaritifera*), southern bluefin tuna, greenlip abalone, blacklip abalone, barramundi, blue mussels, yellowtail kingfish, silver perch, trout, eels and various species of aquarium fish and seaweed.

Around half of Australian seafood production – mainly premium species such as lobster, abalone, Atlantic salmon and tuna – is exported to Asian markets. Around 62% of the seafood eaten in Australia is imported.

⁵ Australian Bureau of Agricultural and Resource Economics and Sciences (2023), Fisheries and aquaculture outlook 2023, Department of Agriculture, Fisheries and Forestry, Australian Government, Canberra

⁶ Data sourced Commonwealth Department of Agriculture, Fisheries and Forestry; Australian Bureau of Agricultural and Resource Economics and Sciences

Western Australian aquaculture

Overview

Aquaculture is a small but growing industry in Western Australia.

Despite Western Australia hosting the second largest seafood industry in the country, aquaculture accounts for only 20% of Western Australian seafood GVP, with around half of this attributable to south sea pearls (*Pinctada maxima*) (see Figure 3).⁷

Good to know!

While pearl production uses methods similar to aquaculture, pearling is regulated separately under the *Pearling Act 1990*, more in Part 5.

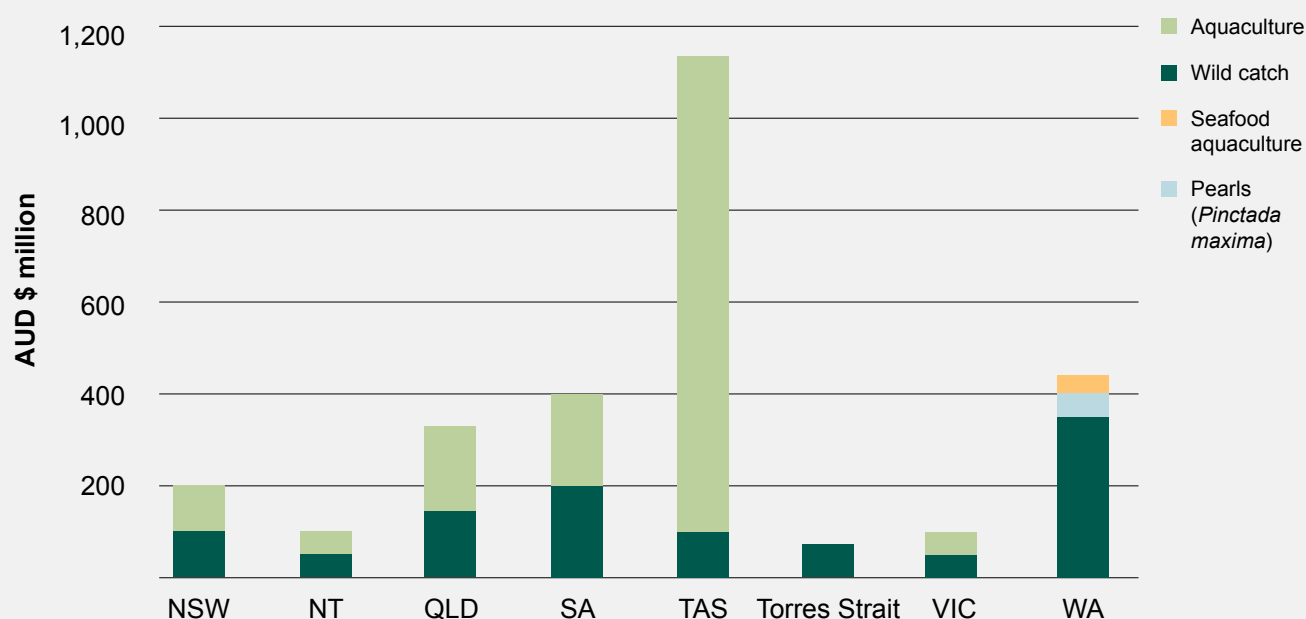


Figure 3 – Wild-catch and aquaculture production by Australian state

Over the past several decades, many aquaculture projects have been proposed in Western Australia. Some have been established, while many others have not progressed.

The challenges that aquaculture has faced in Western Australia are now well known. These include access to suitable sites, high capital and operating costs, regulatory requirements, limited species advantages and a small and geographically fragmented industry.⁸

⁷ Australian Bureau of Agricultural and Resource Economics (2023), Australian Fisheries and Aquaculture Statistics, Department of Agriculture, Fisheries and Forestry, Australian Government, Canberra

⁸ Australian Venture Consultants (2016), State aquaculture training, research and service delivery capabilities, Department of Fisheries and Department of Training and Workforce Development, Western Australian Government, Perth

In recent years, however, the Western Australian aquaculture industry has made significant progress. This reflects Western Australian Government investment in infrastructure, regulatory reform and project support, together with the efforts of industry participants. Several major projects have emerged, such as Tassal Group Limited's acquisition and expansion of the 20-year-old Cone Bay barramundi farm, Leeuwin Coast's Albany edible oyster operations, the Abrolhos Islands non-*Pinctada maxima* pearling sector and various seaweed projects that build on knowledge developed over the past quarter-century.

Alongside the established *Pinctada maxima* pearl sector and smaller sectors such as marron and introduced yabbies, these developments provide assurance that aquaculture has a future in Western Australia. This may also give First Nations people and organisations greater confidence to explore opportunities in the industry.

A brief history of modern aquaculture in Western Australia

Western Australia's modern aquaculture sector began around 40 years ago, when the State's potential was identified in a study commissioned by the Australian Science and Technology Council. From the early 1990s onward, consecutive Western Australian Governments produced 20 studies into the potential of aquaculture, developed strategies and established advisory bodies.

These planning efforts have been supported by an estimated investment of at least \$100 million in infrastructure and policy initiatives. This investment has included training, research and common-user hatchery facilities. It has also supported the development of the Kimberley, Mid West and Albany Aquaculture Development Zones, subsidised some capital and operational costs linked to trials and project development and funded restocking programs. Restocking has mainly focused on trout for recreational fishers in south-west waterways, with some programs for native species.

Despite this work, growth remains limited. In the decade leading up to 2013–14, seafood aquaculture GVP in Western Australia more than doubled from around \$7 million to \$16 million. Around 80% of this growth was driven by the establishment of the Cone Bay barramundi farm. The remainder of GVP came from around 230 aquaculture licences, 80% of which were for marron in the State's south-west. At that time, the marron sector generated GVP of only \$1.5 million.⁹

As shown in Table 2, pearl production (*Pinctada maxima*) continues to dominate Western Australia's aquaculture and pearling GVP. Limited growth in seafood aquaculture GVP has been driven mainly by the Cone Bay barramundi farm.

⁹ Department of Fisheries (2015), Western Australian Aquaculture Production Data, Department of Fisheries, Western Australian Government, Perth

Table 2 – Western Australian aquaculture production 2018–19 to 2023–24¹⁰

Species	2018–19 (\$'000s)	2019–20 (\$'000s)	2020–21 (\$'000s)	2021–22 (\$'000s)	2022–23 (\$'000s)	2023–24 (\$'000s)
Pearls	63,483	62,873	56,793	64,842	57,965	95,849
Yabbies	431	197	76	211	213	175
Marron	2,186	2,076	2,146	4,311	2,499	2,317
Other species	325	341	17,235	346	502	13,065
Goldfish and European Carp	206	137	158	324	Not applicable	Not applicable
Ornamental species	307	436	353	702	530	387
Other aquaculture*	24,773	19,071	5,481	40,272	10,654	11,212
Total	91,712	85,130	82,242	111,008	72,363	123,005

*Other aquaculture includes barramundi, silver perch and rainbow trout.

Other species that have been the subject of aquaculture trials or research in Western Australia include yellowtail kingfish, seaweed, trochus, cherabin, tropical rock lobster, bluefin tuna, yellowfin tuna, black bream, freshwater cobbler and pink snapper.

Studies undertaken by DPIRD have identified areas along the Western Australian coast that are prospective for the aquaculture production of various species (see Figure 4).

¹⁰ Curtotti, R, Tuynman, H, Black, S and Dylewski M 2025, Australian fisheries and aquaculture statistics: Data to 2024–25, ABARES, Canberra, December, DOI: <https://doi.org/10.25814/9vwb-nc60>. CC BY 4.0.



Figure 4 – Areas of the Western Australian coastline deemed prospective for aquaculture

Marine finfish

Several species of marine finfish native to Western Australian waters have been identified as potentially suitable for aquaculture production. These include various species of snapper, grouper and tuna, as well as mullet and cobia.

A range of finfish projects have been explored or trialled across the State, including barramundi at Cone Bay, mahi mahi in the Exmouth Gulf, bluefin tuna in the Recherche Archipelago off the coast of Esperance, and yellowtail kingfish off the coasts of Jurien Bay and Geraldton.

While there have been attempts to produce some of these species in RAS, sustained large-scale production of marine finfish in Western Australia has only been achieved using sea cage systems (see Part 4).

Marine shellfish

Production of south sea pearls (*Pinctada maxima*) is by far the largest sector of the Western Australian aquaculture industry.

For Western Australian First Nations peoples, the south sea pearl shell has significant cultural value, particularly for Kimberley First Nations peoples, and was traded extensively between First Nations across the continent before colonisation.

While it is still the largest sector of Western Australia's aquaculture industry, output has decreased from about \$120 million in 2006–07 to around \$60 million today.¹¹ This decline is mainly linked to reduced global demand for jewellery and a sustained period of disease.

Other shellfish have also been farmed in Western Australia for some time. In recent years, production has increased for greenlip abalone from an onshore farm in Bremer Bay and from ranching operations near Augusta and Albany. There has also been growth in the production of Sydney rock oysters and, to a lesser extent, akoya pearl oysters, and tropical rock oysters. A previous blue mussel industry is now discontinued due to productivity and predation issues. An emerging black pearl sector is also developing at the Houtman Abrolhos Islands in the Mid West.

¹¹ Australian Bureau of Agricultural and Resource Economics (2023), Australian Fisheries and Aquaculture Statistics, Department of Agriculture, Fisheries and Forestry, Australian Government, Canberra

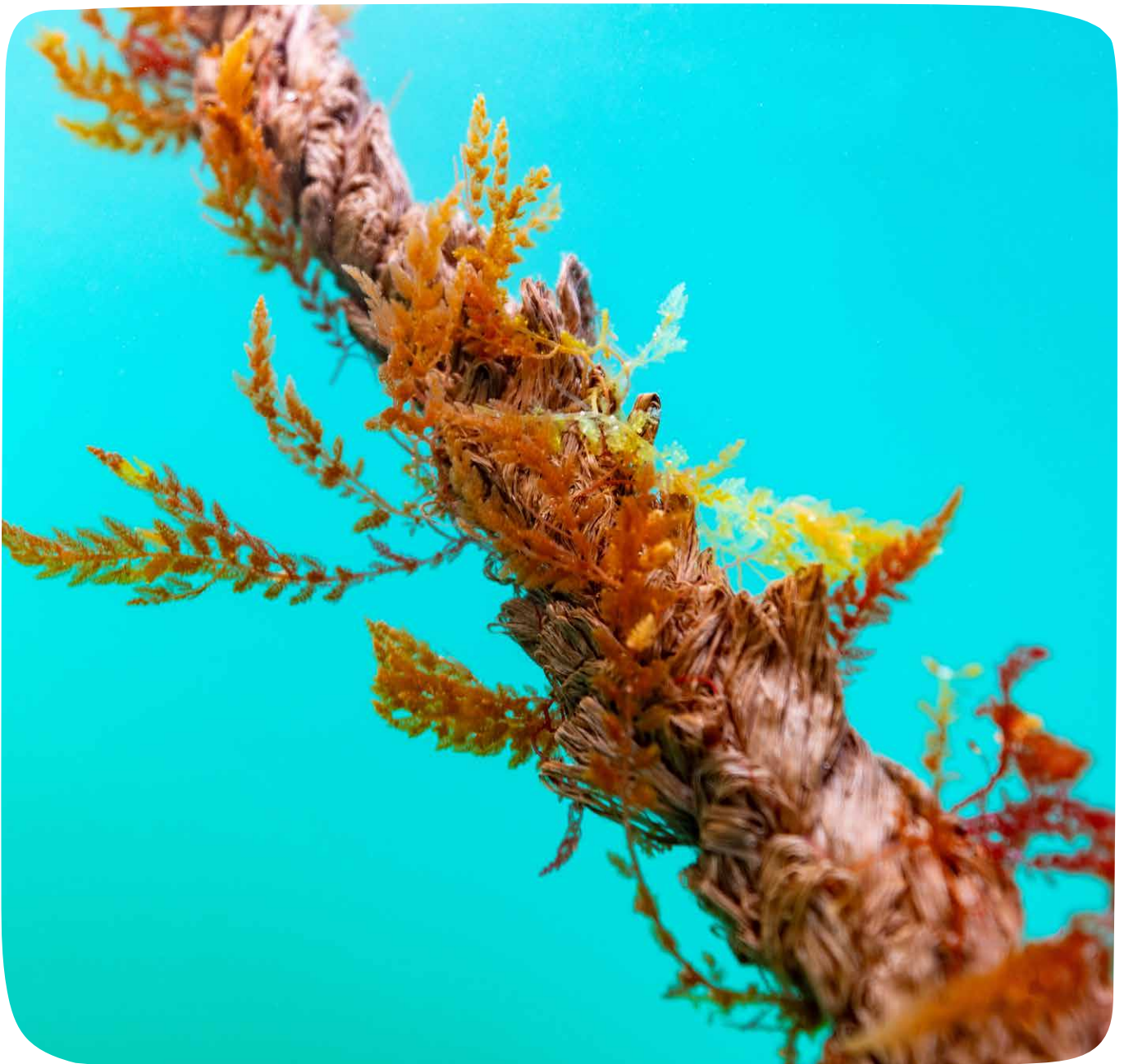


Seaweed and marine algae

Although production data is not publicly available, one of the largest aquaculture projects in Western Australia is the BASF beta-carotene facility at Hutt Lagoon, south of Kalbarri. It has been operating for around 40 years and produces beta-carotene from algae.

Recent years have seen renewed interest in the aquaculture production of seaweed in Western Australia. With applications in carbon sequestration and nature repair markets, as well as a source of unique chemical compounds for pharmaceutical, nutraceutical, livestock feed and materials manufacturing industries, seaweed aquaculture is an emerging sector that holds significant promise.

Seaweed ventures in Fremantle, Esperance and various locations through the Mid West are trialling a range of species, including *Asparagopsis*, which has potential use in methane-reducing livestock production and carbon sequestration.



Asparagopsis armata on aquaculture grow ropes (Photo: Chris De Cuyper, Fremantle Seaweed)

Freshwater aquaculture

Freshwater (mainly inland) aquaculture in Western Australia has centred on the production of barramundi in freshwater systems (including sea cage and RAS), marron farming, harvesting yabbies from farm dams and DPIRD's production of rainbow trout (an introduced species) for stocking south-west waterways to support recreational fishing.

Marine invertebrates

Marine invertebrates include sea fauna such as crustaceans, molluscs, echinoderms and cnidarians. There is a small-scale aquaculture production of corals and live rock at the Houtman Abrolhos Islands, as well as production of other invertebrate species throughout the State. To date, none of these ventures have resulted in sustained commercial aquaculture operations.



Cnidaria species (Coral) (Photo: Alkira Remaj)

Part 2 – What are the opportunities and risks – should I be doing this?

Developing aquaculture operations, particularly at commercial scale, is a complex and risky undertaking. As outlined in Part 7, there are many technical and business challenges that need to be carefully managed.

Through ICIP, First Nations people can develop a competitive advantage in aquaculture enterprises. Support is available, and well-designed aquaculture businesses can bring significant opportunities for First Nations people and communities.

Opportunities for Western Australian First Nations

Western Australian First Nations peoples have deep cultural, social and economic connection to the State's aquatic resources. However, the commercial fishing entitlement system, which is fundamental to the viability of commercial fishing, can create significant financial barriers for First Nations people wanting to enter the commercial fishing industry. By comparison, while aquaculture can be capital intensive and complex, many of the structural barriers to establishing an aquaculture business are more manageable.

For First Nations entrepreneurs and communities, aquaculture can be more than just a commercial opportunity. Aquaculture enterprises can be structured to support cultural connections to saltwater, freshwater and land Country, while contributing to social and economic community benefits.

First Nations people can also strengthen production and create distinct products by drawing on cultural knowledge. This includes using TEK in production, and cultural expressions in branding and product development (see Part 3).

Risks for Western Australian First Nations

Aquaculture can be a difficult and high-risk business.

Licencing, environmental approvals and other regulatory processes can take considerable time and may be uncertain (see Part 5). Depending on the production system (see Part 4), the initial capital investment can be large and difficult to secure. Operations can require continuous monitoring and a consistent regime of activities such as feeding, grading, cleaning and administering treatments. Biosecurity management (see Part 7) requires strict adherence to procedures and the ability to respond quickly. Food safety requirements demand controlled environments from harvest through to consumption. Seafood markets can also be difficult to access and maintain.

All these risks can be managed, as described in subsequent sections of this guide.

Opportunities for First Nations Aquaculture



Economic self-determination

Globally, aquaculture is emerging as an important pathway to First Nations independent wealth creation.



Jobs on country

Provided the necessary training is available, aquaculture enterprise can provide a range of employment opportunities for the local community across administration, marketing and technical functions of operating an aquaculture enterprise. It provides opportunity for people to work on saltwater, freshwater and land Country with species that are of cultural significance.



Community connection

Aquaculture operations provide opportunity for First Nations people to work together in a culturally safe workplace, supporting connection to culture and kin. Through outreach activities with the community, they can also be a source of local pride and education.



Food security and health

Aquaculture operations can be established solely to supply local communities with fresh fish, or a more commercially focused operation can also quarantine some supply for local markets. This ensures that communities have access to healthy, fresh protein.



Application of Cultural and Intellectual Property

First Nations have a distinct advantage in seafood markets where they can apply their unique cultural and intellectual property - Traditional Ecological Knowledge and other cultural practice in production end design and stories for the purposes of product differentiation in the market.

Challenges for First Nations Aquaculture



Financial risk

Capital investment required to set up an aquaculture system can be significant. Further, for species that have long grow-out periods, significant time can pass until revenue can be generated. Collectively, these factors can make financing and aquaculture project problematic.



Regulatory risk

While the pathway for regulatory approvals of an aquaculture project are established, depending on what is being produced and where it is being produced, this can be lengthy and expensive process requiring high levels of environmental technical expertise and uncertainty. Managing ongoing compliance also entails significant resources.



Human resources

In most instances, establishing and operating an aquaculture business requires a wide range of expertise - administration, marketing, finance and aquaculture production technical expertise. Sourcing this workforce for aquaculture is challenging across Western Australia, particularly in regional and remote locations.



Market risk

Because of relatively high production costs, most seafood production from Western Australia has to address premium market segments. First Nations aquaculture operations have the advantage that they can use their unique cultural and intellectual property to differentiate products. However, premium seafood markets can be very fickle and getting product to market from remote locations, expensive.



Biosecurity risk

As with any livestock production business, intensive stocking presents heightened levels of disease risk in most aquaculture operations. This is exacerbated where stock is exposed to open waters.

Figure 5 – Sources of opportunities and challenges for First Nations aquaculture

Part 3 – What are my assets?

Most First Nations participate in aquaculture projects in 3 main ways:

- **First Nations led:** aquaculture projects that are owned and operated by a First Nations controlled entity.
- **Joint venture with a capacity:** aquaculture projects where a First Nations party and a third-party (typically an experienced aquaculture operator) share ownership and decision-making.
- **First Nations passive beneficiary:** aquaculture projects led by other entities that seek to place production systems on Country where First Nations hold a legal interest.

Across all these aquaculture project models, Western Australian First Nations have 3 unique competitive advantages: legal rights in Country, normative rights in Country and rights in ICIP.

These rights are a powerful tool for developing competitive advantage and negotiating good terms with third-party developers. In most cases, these rights are not simple or easily exercised, such as private property rights in Western legal systems. Turning these rights into a practical asset often requires navigating a complex mix of legal and normative rights.

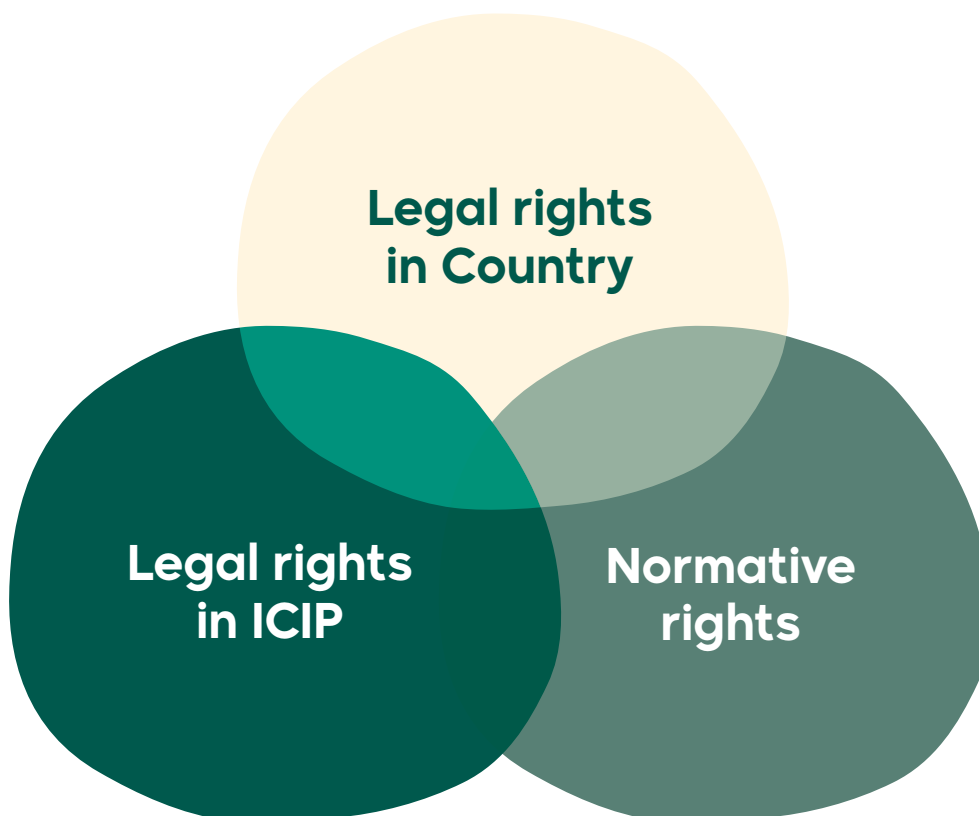


Figure 6 – Legal and normative rights



Food for thought

First Nations people and communities hold valuable assets through culture and Law.

Generally, these are classified as:

Traditional Knowledge (TK): ‘pure’ knowledge, including know-how, practices, skills and innovations, explicitly taught or passed down from Elders. When this knowledge relates to the plants, animals and ecosystems of Country, it is often called Traditional Ecological Knowledge (TEK).

Traditional Cultural Expressions (TCE): creations of human artistic spirit and drive associated with traditional culture, including music, dance, art, designs, names, signs and symbols and performances.

Genetic Resources (GR): refers to fish, plants, animals and other organisms found on Country. While not specifically held by First Nations peoples, these resources often carry specific cultural and ecological knowledge that can be of economical value.

Together, TK, TEK and TCE are commonly referred to as Indigenous Cultural and Intellectual Property (ICIP). For First Nations business, ICIP is a core asset. Like any asset, it deserves to be protected.

First Nations aquaculture assets

Legal rights in Country

First Nations people in Western Australia can hold legal interests in land, sea and freshwater Country. These rights are often secured through formal instruments and represent valuable assets in the development of aquaculture projects. They are also a source of leverage when third parties seek to operate on Country.

Native title

More than 30 years have passed since the Mabo High Court decision overturned the doctrine of *terra nullius*¹² and led to the *Native Title Act 1993* (Cth). This Act created a new system for recognising First Nations interests in land and water.

Today, around 90% of the Western Australian landmass is under a native title claim or determination. Around 15% of these determinations include sea Country. These lands and waters are typically managed by almost 100 Registered Native Title Bodies Corporate (RNTBC), also referred to as Prescribed Bodies Corporate (PBC), acting as trustees or agents for Traditional Owners.

This guide does not attempt to explain the full complexity of native title law, and First Nations groups are encouraged to seek independent legal advice. A few important points provide helpful context:

- **Coexistence rights:** native title can coexist with other land interests, such as pastoral and mining leases, but is often subordinate to those interests.
- **Determination-specific rights:** native title rights vary in each determination, ranging from ceremonial purposes at certain times of the year to exclusive possession.
- **Extinguishment:** native title is automatically extinguished where free simple (freehold) title exists.

Native title is a legally enforceable interest in land and sea Country under Australian law. The right to negotiate¹³ and future acts¹⁴ provisions of the *Native Title Act* can be important tools for securing economic opportunities relating to land and waters.

¹² Mabo & others v Queensland (No.2) [1992] HCA 23; (1992) 175 CLR 1

¹³ Part 2, Division 3, Subdivision H, *Native Title Act 1993* (Cth)

¹⁴ Part 2, Division 3, *Native Title Act 1993* (Cth)



Hearson Cove (Photo: Amy Stevens, Murujuga Aboriginal Corporation)

Other legal interests in Country

Western Australian First Nations may also hold rights in Country through other legal mechanisms, including the following:

- **Statutory land frameworks:** First Nations may have legal interests in Country that are created by other statutory frameworks such as the Western Australian Aboriginal Lands Trust.¹⁵
- **Indigenous Land Use Agreements (ILUAs):** these agreements provide formal consent for third-party use of traditional lands. ILUAs are typically negotiated with government, mining companies or other developers, and increasingly form part of settlements or compensation agreements. Examples include the Rubibi Global Agreement, Esperance-Nyungar Government Standard Heritage Agreement, Tjiwarl Palyakuwu (Agreement) Indigenous Land Use Agreement, Yamatji Nation ILUA and the 6 ILUAs that make up the Noongar Southwest Native Title Settlement.
- ILUAs can create a portfolio of assets, including cash, co-management roles, decision-making rights, and stronger forms of tenure than native title and most other forms of Aboriginal land rights (see Table 3).

The unique case of sea and freshwater Country

Tenure over sea and freshwater Country is more complex. Native title has been recognised over sea Country since 2001,¹⁶ and around 15% of native title determinations in Western Australia include areas of sea Country. However, native title over sea Country cannot be exclusive because Australia is bound by international agreements that protect maritime navigation and access.

Freshwater Country is subject to a different legal framework. All surface and underground freshwater resources are vested in the Western Australian Government.¹⁷ Historically, the Western Australian Government has provided very limited water allocations for First Nations interests. In some cases, ILUAs have created legal pathways for securing stronger water rights, such as through the Yamatji Nation ILUA.

¹⁵ *Aboriginal Affairs Planning Authority Act 1972* (WA)

¹⁶ *Commonwealth v Yarmirr* [2001] HCA 56

¹⁷ *Rights in Water and Irrigation Act 1914* (WA)

Food for thought

The first point of contact for commercial proponents to engage with Aboriginal organisations is through the appropriate PBC contact person (found on ORIC) or the relevant land and sea council organisation.

Table 3 – Different types of Western Australian land tenure for land-based operations

Tenure type	Third-party investment attractiveness for aquaculture facilities	Government funding application able to invest?	Change of tenure required (triggering future act provisions)?	Renewal required for a third-party investor?
Freehold	High	Yes	No	Depends on contract
Unallocated Crown Land	Low	Maybe	Yes	Yes
Aboriginal reserve	Low	Yes	Yes	Yes
Lease for specified purpose	Medium	Yes	Maybe (depends on conditions)	Yes
Pastoral lease	Not applicable	Yes	Yes	Yes
Management lease	Low	Yes	Yes	Yes
Conditional freehold	Medium (depends on conditions)	Yes (if consistent with conditions)	Maybe (if conditions restrict aquaculture use)	Depends on conditions or contract
Diversification lease	Medium	Yes	Yes	Yes
Lease to advance interests of Aboriginal people	Medium (depends on governance and approvals)	Yes	Yes	Yes



Cygnnet Bay Pearl Farm (Photo: Tourism Western Australia)

Legal rights in Indigenous Cultural and Intellectual Property

As discussed throughout this guide, ICIP is an important source of competitive advantage for Western Australian First Nations aquaculture businesses. ICIP can add distinctive value to products and strengthen branding. However, Australian intellectual property law does not currently recognise ICIP in a way that reflects its true nature, which limits legal options for enforcement.

IP Australia is investigating pathways to better address this issue through the development of a legally enforceable Indigenous Knowledge Right. For now, copyright remains the primary mechanism for protecting cultural expression such as stories, artwork, designs and performances.

International frameworks, such as the Convention on Biological Diversity and associated Nagoya Protocol, provide broader protections in some contexts.

Normative rights

As noted earlier, current Australian law does not provide First Nations with legal rights over land, sea and freshwater Country or ICIP in ways that translate into commercially valuable assets. Because of this, normative First Nations rights are critical for strengthening the position of First Nations aquaculture businesses.

First Nations normative rights arise from 2 factors:

International Conventions

Recognise the economic rights of Indigenous peoples.

Australia is a signatory to the following international agreements relevant to aquaculture:

- United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP)
- The Convention of Biological Diversity
- Nagoya Protocol

These conventions are not legally binding in Australia, but they influence how governments, industries and investors operate.



Market Expectations

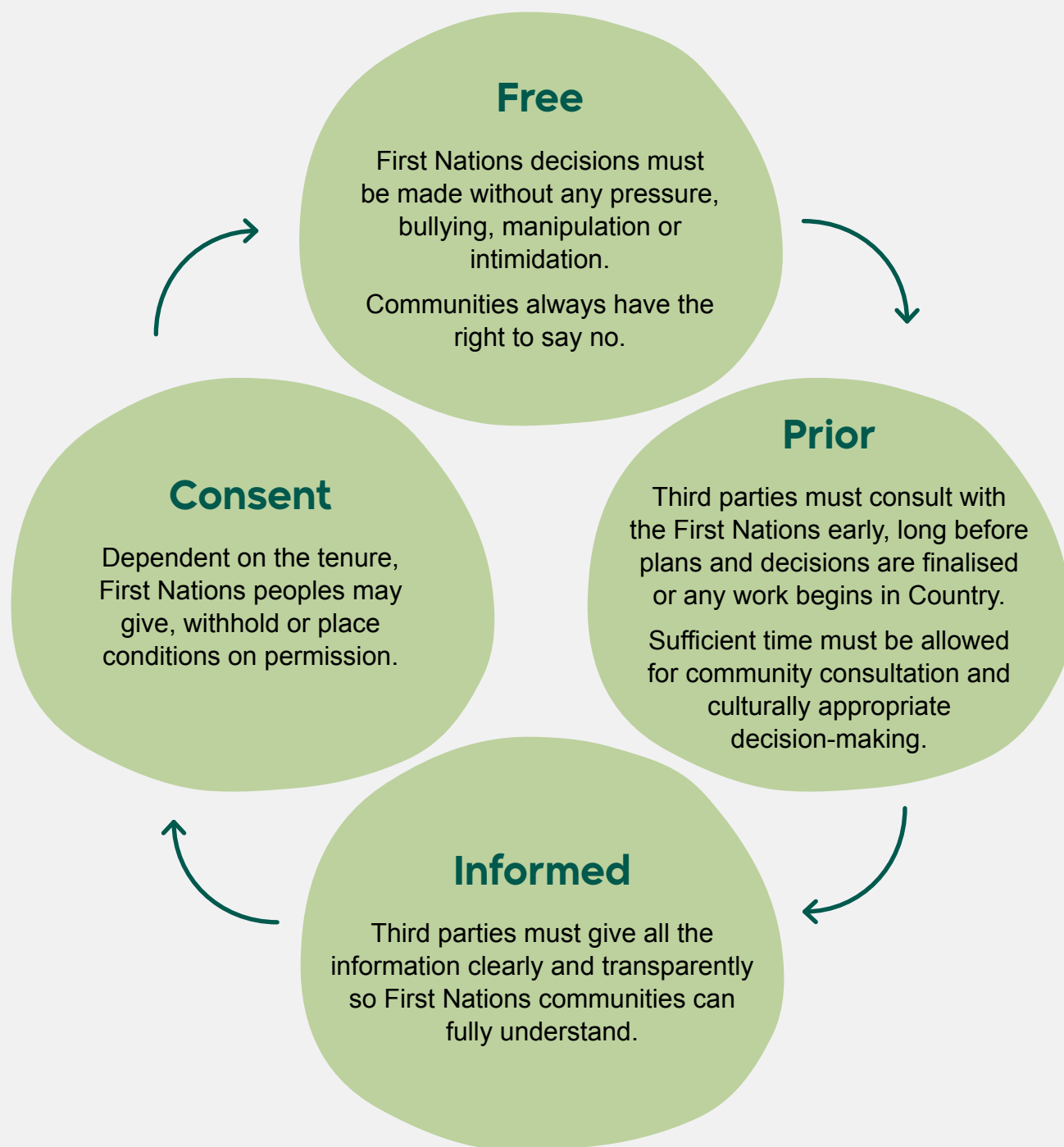
Environmental, social and governance (ESG) expectations mean respect for Indigenous economic rights increasingly affects access to finance and markets.

Western Australian First Nations aquaculture businesses are well placed to use these normative rights to enhance their competitive advantage.

United Nations Declaration on the Rights of Indigenous Peoples

Eleven of the 46 articles of the UNDRIP relate to the economic self-determination of Indigenous peoples. Australia endorsed UNDRIP in 2009, and although it has not been incorporated into Australian law, it informs how many organisations shape their First Nations engagement.

A key principle is the right to Free, Prior and Informed Consent (FPIC), which has become a norm for engaging on First Nations Country:



FPIC definitions adapted from the Food and Agriculture Organisation of the United Nations.²

Nagoya Protocol

The Nagoya Protocol is an international agreement that provides a framework for recognising Indigenous interests in plants, animals and microorganisms (genetic resources) and the traditional knowledge associated with them. Australia signed the Nagoya Protocol in 2012, but, like UNDRIP, it has not been incorporated into Australian law.

The Nagoya Protocol establishes principles for accessing genetic resources and ensuring the fair and equitable sharing of benefits between users and First Nations who hold rights in those resources or associated knowledge. It also requires that only legally acquired genetic resources and traditional knowledge are used.

As with UNDRIP, many Australian organisations design their First Nations engagement processes in accordance with the Nagoya Protocol.

Own frameworks

Increasingly, First Nations are drawing on the international conventions and combining them with their rights under Australian law to create their own governance and engagement frameworks. These frameworks help guide internal decision-making, set expectations for how third parties should engage in line with FPIC and outline minimum acceptable terms for projects on Country.

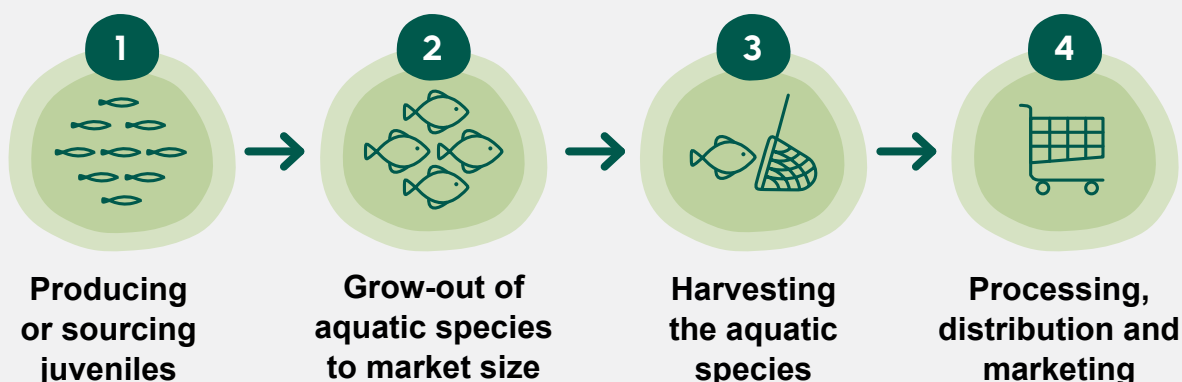


Photo: (shannonstent, istock)

Part 4 – How aquaculture works: production systems

There are many different systems and technologies that can be used in aquaculture. In all cases, the design of a production system is dependent on the locations, species, scale and intended product.

Broadly speaking, aquaculture systems can be categorised according to the following stages of aquaculture production:



1. Producing or sourcing juveniles

Producing or sourcing juveniles that will then be grown into larger fish is the most technically challenging stage. Doing this well is critically important to the success of the entire aquaculture business, as it determines the quantity, quality and reliability of the fish that will be grown out in step 2.

Just like farmers select the best animals to fatten on their farms, aquaculture producers select genetics that will result in desirable traits such as feed conversion and growth rate, disease resistance and fecundity (reproduction rate).

Juveniles can be sourced in 3 ways: wild recruitment, wild collection and hatchery production.

Wild recruitment

Sourcing juveniles by wild recruitment only works for some species and is generally suitable for smaller-scale operations.

Wild recruitment works by placing a collection device – ranging in complexity from a simple stick to specifically engineered collection plates (see Figure 7) – into the water where the sought-after species is known to reproduce, and leaving it there for a period of time. Small numbers of seeds, eggs, larvae or other juvenile forms will naturally colonise the device. The device is then removed, and the collected juveniles are transferred to a nursery, where they mature to a stage suitable for grow-out.

While wild recruitment is a relatively low-cost method of sourcing juveniles, it is subject to seasonal variation and can be unpredictable. It is also only suitable for a limited number of seaweed and shellfish species.

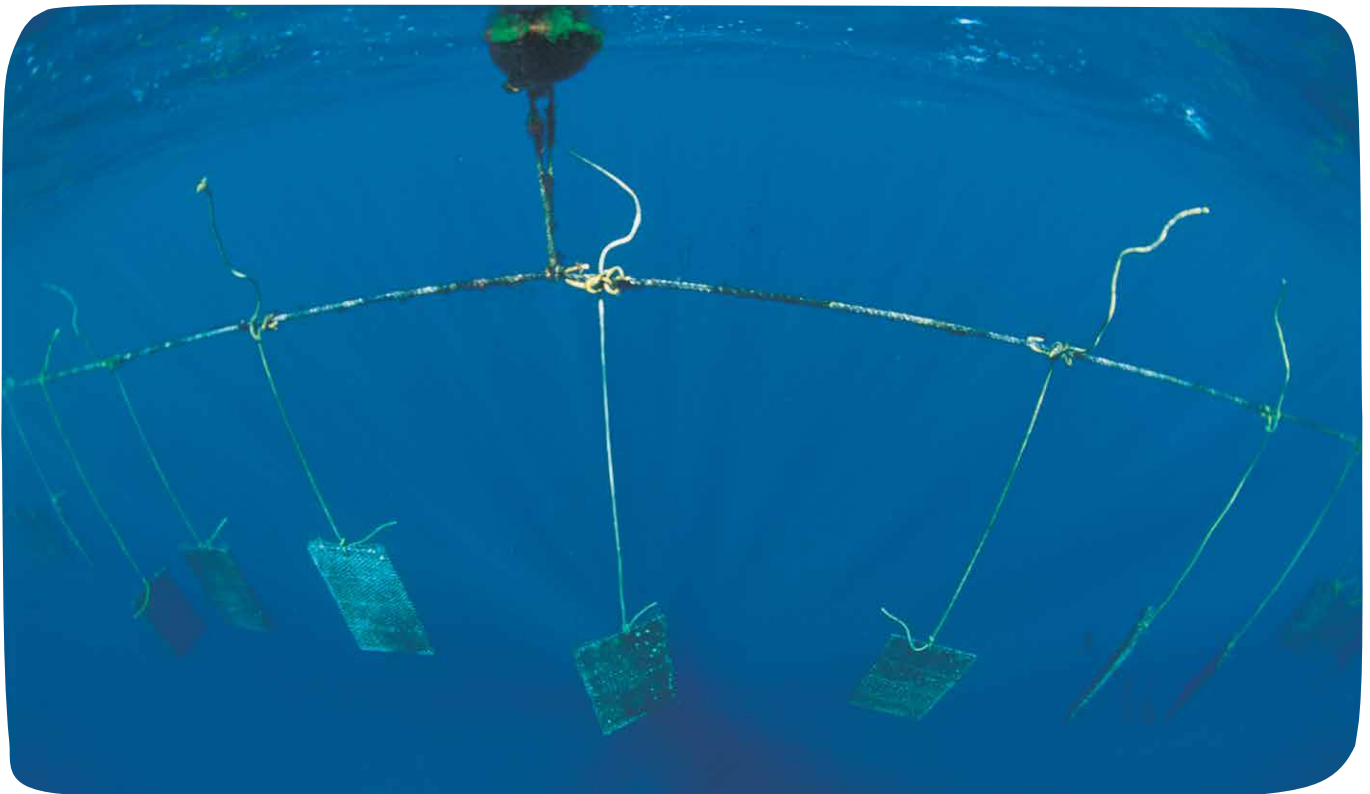


Figure 7 – Wild recruitment collection plates



Wild collection

Wild collection involves collecting aquatic plants and animals from wild populations for aquaculture production for one of the following purposes:

- **Grow-out:** aquatic organisms may be collected as juveniles in their final metamorphic stage to be transferred to a grow-out system or collected as adults for use as broodstock to support and improve genetic lines in hatchery breeding operations (see below).
- **Broodstock:** sexually mature adult aquatic organisms may be collected from the wild for the use of broodstock in hatchery operations (see below).

Wild collection uses wild-catch fishing techniques to source juveniles. For broodstock collection, this can be straightforward and may involve simple netting, trapping or angling techniques. Collecting large numbers of juveniles for transfer to grow-out systems often requires commercial fishing methods and skills such as purse seine netting.

One of Australia's most significant aquaculture sectors – South Australia's bluefin tuna industry – uses this process, including one of Australia's most successful First Nations aquaculture joint ventures, Wanna Mar.

To ensure sustainability of wild fish stocks, wild-collection is subject to a regulatory approvals and compliance framework.¹⁸

¹⁸ Fish Resources Management Act 1994 (WA)



Case study: Wanna Mar

South Australia's southern bluefin tuna aquaculture industry, valued at approximately \$165 million annually, is one of Australia's most significant seafood export sectors, supplying premium sashimi-grade fish to high-end restaurants across Japan and other major sashimi markets.

Each year, juvenile southern bluefin tuna migrate from warmer northern waters and aggregate in the Great Australian Bight. These fish are captured using purse seine fishing methods, where schooling fish are carefully encircled with large nets deployed by multiple vessels before being transferred for grow-out in sea cages. Wanna Mar is a First Nations-led joint venture based in Port Lincoln, established between the Traditional Owners with deep connections to sea Country and the Stehr Group, one of Australia's largest and most experienced southern bluefin tuna operators. Through this joint venture, Wanna Mar holds and fishes a commercial quota allocation of approximately 25 tonnes of southern bluefin tuna, which are then transferred for grow-out in the Stehr Group's sea cage farming operations.



Southern bluefin tuna (photo: Wanna Mar)



Pauly Vandenberg standing in front of southern bluefin tuna sea-cages (photo: Wanna Mar)

Hatchery production

Most hatcheries are tank-based systems that replicate the natural environment in which a species spawns and juveniles transition through the early metamorphic stages of life.

Hatcheries are technology- and capital-intensive. They form a critical part of the value chain for most large integrated aquaculture systems. Because of their cost, it is common for governments to invest in common-user hatcheries. Examples in Western Australia include the Albany Shellfish Hatchery and DPIRD's Fremantle Marine Finfish Research Hatchery.

Good to know!

Operating a hatchery requires significant expertise in areas such as reproductive biology, the application of hormonal treatments, larval nutrition and the management of live feeds such as algae and zooplankton.



A hatchery typically has 3 components:

1

Broodstock holding tanks

Water conditions are modified to replicate conditions in the natural environment.



Broodstock holding tanks for Yellowtail Kingfish

2

Downstream tanks

As the offspring grow, they are transferred here. Grading needs to occur to minimise mortality.



DPIRD marine finfish fingerlings being graded at the Fremantle Marine Research Hatchery

3

Nursery phase

Can be required between hatchery production and transfer to a grow-out system.



DPIRD marine finfish hatchery (nursery area), Fremantle – Yellowtail Kingfish

2. Grow-out

The grow-out phase is where juveniles produced through wild recruitment, wild collection, hatcheries and nursery systems are farmed to market size.

The specific design of a grow-out system depends on species, market requirements, local climate and available infrastructure.

You should seek technical advice based on your location and chosen species, and check for any new or emerging technologies that may support your grow-out plans.

Table 4 lists grow-out systems you are likely to encounter for key species, along with example benefits, risks and considerations. You will need to look into these further for your specific situation, as this guide does not cover them in detail.

Tip!

Production requirements vary across species, sites and system types. This information provides general guidance only and cannot capture all risks or scenarios.

You should seek advice based on your location and chosen species and check for any new or emerging technologies that may support your grow-out plans. The Aquaculture Council of Western Australia (ACWA) can be the first point of contact. Scan the QR code to view the [ACWA website](#).



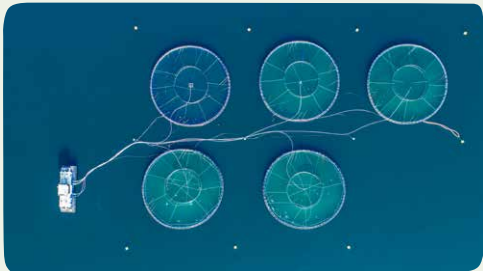
Terry Hunter, Borrgoron Tours (Photo: Tourism Western Australia)

Table 4 – Common grow-out systems, benefits, risks and key considerations

Grow-out system		How it works	
Pond systems		• Uses excavated ponds where water is pumped in and managed with aerators and controlled water exchange • Wastewater is directed to settlement ponds for solids to settle, sometimes with plants added to improve filtration • Harvesting is species-dependent but typically done with nets or by draining the pond to collect stock efficiently	
Species	Benefits	Risks	Key Considerations
• Prawns • Barramundi • Cherabin • Yabbies • Marron • Freshwater finfish	• Lower initial capital cost than RAS • Easy to manage and monitor • Potential to use natural productivity to support growth	• Water quality can change quickly • Predation • Weather can impact production	• If waste is not managed, nutrient run-off can occur • Access to suitable land • Reliable source of quality water required

Grow-out system		How it works	
Recirculating Aquaculture Systems		• RAS typically use indoor tanks and continuously recycled and treated water to tightly control growing conditions while minimising water use • Organisms are in tanks designed to suit their needs and are fed and managed as they grow • Harvesting is straightforward because the controlled system makes it easy to gather and remove mature stock through netting or pumping out	
Species	Benefits	Risks	Key Considerations
• Kingfish • Barramundi • Salmon • Coral • Seaweed • Most species grown in aquaculture	• High level of control of environmental parameters • Suitable for large range of species • Easier biosecurity management	• High running and set-up cost • High stocking densities can lead to greater mortality • Small faults can cause catastrophic loss if not addressed	• High energy consumption • Low nutrient runoff • Complex systems requiring highly trained staff • Not ideal for remote locations due to logistics and technical support requirements

Table 4 – Common grow-out systems, benefits, risks and key considerations continued

Grow-out system		How it works	
Sea cages 		• Use large floating net pens/cages moored in coastal or offshore waters, with cage size and design varying widely • Frames and nets are built from durable, corrosion-resistant materials to suit marine conditions • Cages are placed where strong currents help maintain water quality and disperse waste • Daily boat access is needed for feeding, monitoring, cleaning, maintenance and sometimes dive work • Harvesting can be carried out using purse seine gear, hand seine nets, or a dedicated harvest cage, depending on the operation's scale	
Species	Benefits	Risks	Key Considerations
• Barramundi • Southern bluefin tuna • Yellowtail kingfish	• Best suited to large-scale production	• Capital intensive (boats, cage and mooring systems) • Dangerous predator attraction • Disease and biosecurity are more difficult to control • Gear susceptible to environmental conditions	• Biosecurity risk • Production risk associated with changing natural conditions • Entry is most likely achieved through a joint venture with an established industry partner • Should be placed in high-flow areas • Capital-intensive, requiring significant maritime operational capacity

Sea cages (Photo: Marius Dobilas/Shutterstock.com)

Grow-out system		How it works	
Baskets, sticks, lines, racks 		• Placing animals in clean, healthy but nutrient-rich waters and letting them grow • Simple, low-expense aquaculture systems use sticks, poles or ropes placed in the intertidal zone for oysters • More advanced systems use floating baskets, racks or suspended ropes that can be raised or lowered to keep shellfish in the best condition • Harvesting is usually done by hand or from a vessel • Oysters and scallops are collected from baskets or trays, while mussels are stripped from ropes using specialised equipment	
Species	Benefits	Risks	Key Considerations
• Oysters • Pearls • Mussels	• Low capital • Low operational expenditure • No feed requirements • Simple harvest	• Some environments will produce shellfish that do not meet food safety requirements • Susceptible to changes in climate	• Minimal negative impact on the environment • For shellfish, be aware of WASQAP requirements (Part 5) • May require a vessel for harvesting

Leeuwin Coast Oysters from Harvest Road

Table 4 – Common grow-out systems, benefits, risks and key considerations continued

Grow-out system		How it works		
Sea ranching		• Culturing a species through its early life stages in a land-based hatchery and then releasing the juveniles into open waters to grow to maturity • Harvest will closely resemble whatever methods the wild catch fishery of that species would use		
Species	Benefits	Risks	Key Considerations	
• Abalone • Sea cucumbers • Scallops	• Once juveniles are released, they grow naturally with minimal feeding or infrastructure	• May be low survival rate of species once placed in the wild • Dependent on environmental conditions	• Releasing lots of hatchery-raised fish into the wild can affect the natural wild population if not managed properly • Impact on local ecology needs to be understood • Operation varies significantly across species	

Sea ranching modules, Flinders Bay Augusta (Photo: Rare Foods Australia Abalone)



Sea ranching modules, Flinders Bay Augusta (Photo: Rare Foods Australia Abalone)

3. Harvesting

Once cohorts reach market size or weight, they are harvested. The method used depends on the grow-out system, species and market requirements. It can include netting, draining tanks or ponds and collecting from a sump, or hand-collecting.

It is important that clear procedures are in place for harvesting.

Harvesting procedure checklist



Increase animal welfare

- ☒ Humane, low stress harvesting methods
- ☒ Live product to be held in good conditions



Increase product integrity

- ☒ Careful handling to avoid product damage
- ☒ Strict food safety practices must be followed
- ☒ Recover production costs



Reduce cost

- ☒ Carry out harvesting efficiently



Sydney rock oysters (Photo: Harvest Road)

4. Processing, distribution and marketing

Food safety regulations (Part 5) require seafood to be continuously stored within a controlled temperature range from harvest to consumption.

While aquaculture products in their farm gate form are valuable (and in some cases, such as edible oysters, represent the most valuable form), success in a global market often depends on the ability to differentiate among many competitors.

This can involve value-adding, where further processing creates a product with more desirable characteristics. First Nations have a unique advantage to differentiate both value-added and live or fresh-chilled aquaculture products by incorporating ICIP into the product. This can be done through how it is produced, branding and stories associated with the final product.



Terry Hunter, Borrgoron Tours (Photo: Tourism Western Australia)

Tip!

For more information on this topic, refer to this factsheet.





Hearson Cove
(Photo: Amy Stevens, Murujuga Aboriginal Corporation)

Part 5 – Rules and regulations

Starting and operating an aquaculture business is regulated by the Government of Western Australia. In some cases, Commonwealth Government regulations also apply. Understanding and complying with these regulations is important not only to avoid prosecution, but to ensure the operation is sustainable, safe, respectful of other water and land users and capable of running a successful business.

Depending on the project, gaining approvals from regulators can be long, uncertain and expensive. It is important to engage with the Western Australian Government early in planning to understand the process.

The main agency you will work with is DPIRD. DPIRD should be your first point of contact when considering an aquaculture business and can help you understand and navigate the regulatory process, both within DPIRD and other Western Australian and, where relevant, Commonwealth agencies. Private service providers can also support you with aquaculture regulatory processes.

Tip!

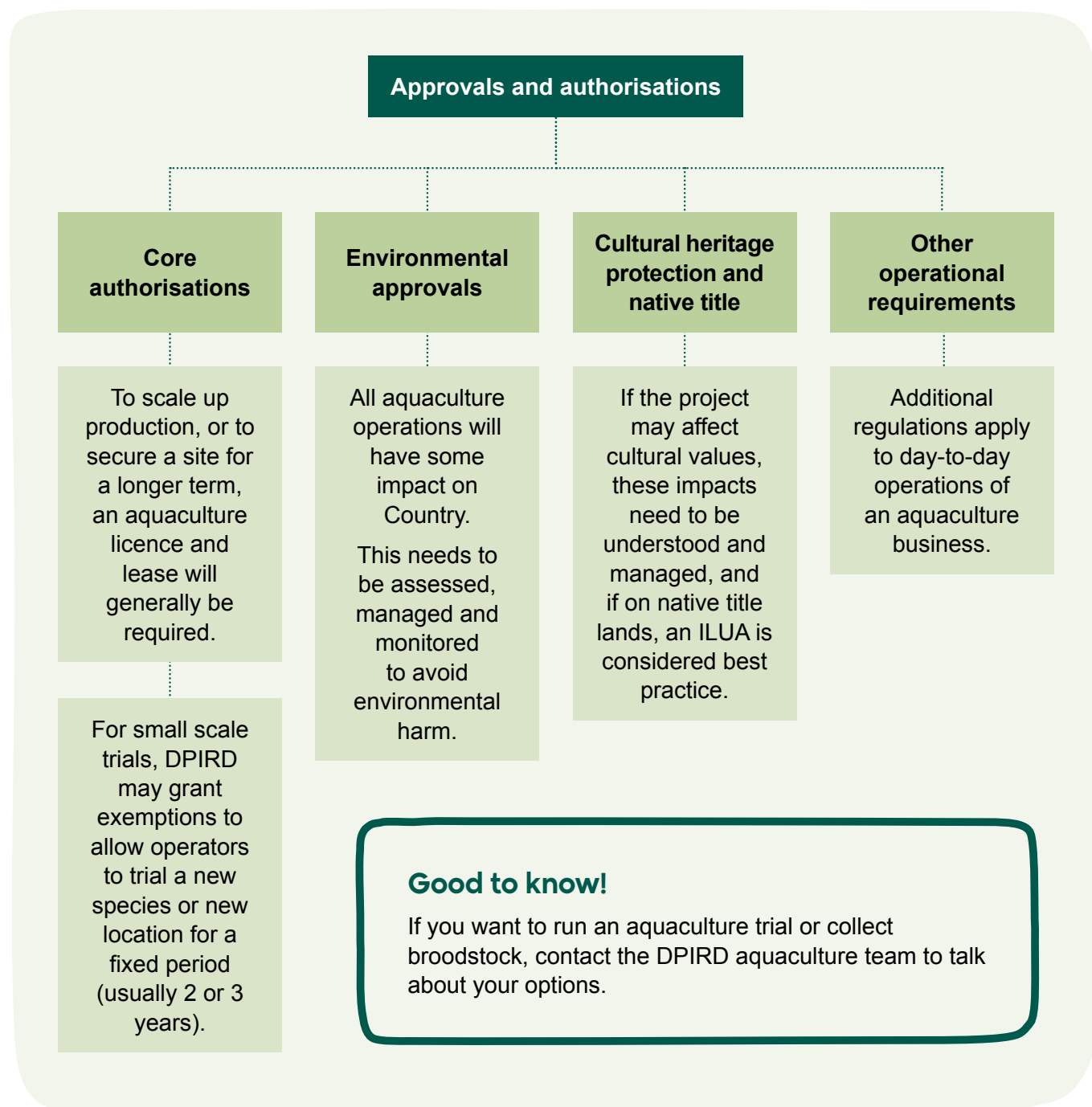
Native title is complicated, and before you embark on your journey, seek legal advice regarding your specific situation.



Buccaneer Archipelago Marine Parks

Approvals and operational regulations

A full description of the regulatory authorisations required to establish and operate an aquaculture business cannot be covered in this guide. However, there are 4 main areas of regulatory approvals:



Good to know!

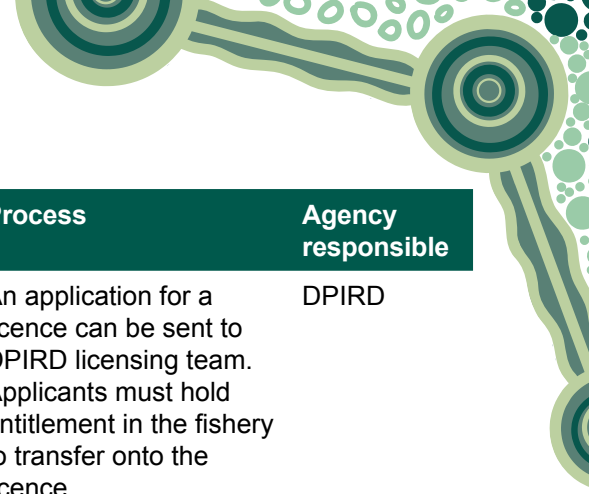
Know what you can and cannot do in the area you intend to use, and check if it is a protected area. Scan the QR code to visit the [Explore Parks WA Park finder map](#).



The following Table 5 summarises the key regulatory requirements according to these categories.

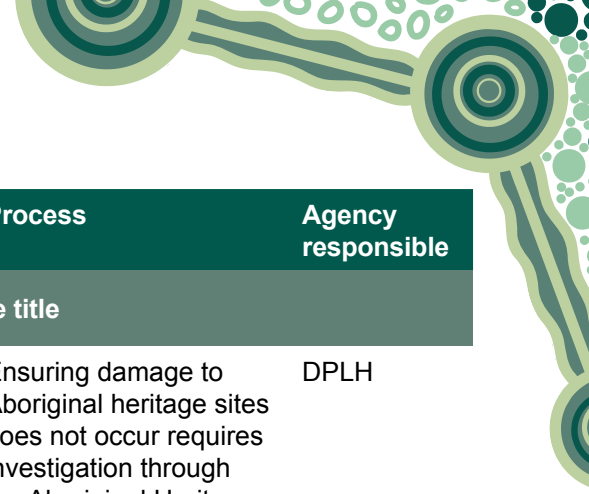
Table 5 – Key approval and operational authorisation for an aquaculture or pearling business

Regulatory requirement	Description	The law	Process	Agency responsible
Aquaculture core approvals				
Aquaculture licence	Provides permission to conduct the activity of culturing a specific species in a specific area.	s.92 of the <i>Fish Resources Management Act 1994</i> (WA).	An application, including a detailed proposal outlining the proposed aquaculture activity and the entity responsible, must be submitted to DPIRD. DPIRD will assess the application, including consultation with other agencies, stakeholders and public.	DPIRD
Management and Environmental Monitoring Plan (MEMP)	A detailed plan on how the aquaculture project will be run that forms part of the aquaculture licence application.	The requirements of the MEMP are set out in s.92A of the <i>Fish Resources Management Act 1994</i> (WA) and must include details of how the operation will be run on a day-to-day basis, biosecurity plan, environmental monitoring plan and processes for reporting on production and environmental impacts to DPIRD.	This detailed document is provided to DPIRD at the time of applying for an aquaculture licence. For larger aquaculture projects, a more detailed study known as an Environmental Monitoring and Management Plan (EMMP) may be required as part of an additional assessment by the Environmental Protection Authority (EPA).	DPIRD
Aquaculture lease	Provides permission to use a specific area of land and/or water for the purposes of the aquaculture activity.	If the project is within 3 nautical miles of the mainland it may be subject to an aquaculture lease in accordance with s.97 of the <i>Fish Resources Management Act 1994</i> (WA).	Usually submitted at the same time as the aquaculture licence application. Must include an Aquaculture Development Plan outlining proposed production targets over 10 years.	DPIRD
Pearling core approvals				
Pearling Wildstock Licence (PWL)	Allows fishing for and seeding of wild pearl oysters.	Requirements described in Division 1 of the <i>Pearling Act 1990</i> (WA).	An application for a licence can be sent to DPIRD licensing team. Applicants must hold fishery entitlement to transfer onto the licence.	DPIRD



Regulatory requirement	Description	The law	Process	Agency responsible
Pearling Seeding Licence (PSL)	Allows seeding of hatchery-reared pearl oysters. Held by persons also holding PWLs.	Requirements described in Division 1 of the <i>Pearling Act 1990</i> (WA).	An application for a licence can be sent to DPIRD licensing team. Applicants must hold entitlement in the fishery to transfer onto the licence.	DPIRD
Pearl Oyster Farm Leases	Allows the holder to farm seeded pearl oysters.	Requirements described in Division 3, Section 16 of the <i>Pearling Act 1990</i> (WA). Pearl Oyster Farm Leases are granted in line with Administrative Guideline 1.	An application for a licence can be sent to DPIRD licensing team. Maximum area: 4 nautical miles squared. Minimum lease separation: 5 or 2 nautical miles. Lease term: 21 years.	DPIRD
Environmental approvals				
EPA referral	If the aquaculture licence, lease or MEMP assessment identifies risk or significant environmental impact, the project may be referred to the EPA for formal assessment.	Under Part IV of the <i>Environment Protection Act 1986</i> (WA), if the EPA determines that the project is likely to have a significant environmental impact, an Environmental Impact Assessment may be required as part of the assessment process The risk of needing an Environmental Impact Assessment can be reduced by locating the project in existing Aquaculture Development Zones.	An Environmental Impact Assessment is a detailed scientific study into the likely impacts of the project, including management measures. The assessment process includes public consultation.	EPA
Clearing native vegetation	Clearing any native vegetation for establishing any part of an aquaculture project requires regulatory approvals.	Part V of the <i>Environment Protection Act 1986</i> (WA) makes it an offence to clear native vegetation – including aquatic or riparian vegetation – without a permit or valid exemption.	Unless the planned clearing has already been assessed under an Environmental Impact Assessment approved by the EPA, a native vegetation clearing permit from the Department of Water and Environmental Regulation (DWER) is required.	DWER, EPA

Regulatory requirement	Description	The law	Process	Agency responsible
Works approval and prescribed premises	If the project includes structures such as a seafood processing facility, certain workshops or water-processing plant, these structures may be considered as prescribed premises.	Part V Division 3 of the <i>Environment Protection Act 1986</i> (WA) requires a project to attain a works approval before constructing the structure and licence to operate the structure and manage its ongoing emissions and discharges once it is built.	If the structure is deemed a prescribed premises, an application must be made to DWER for a works approval. The application must detail construction plans and how environmental impacts during construction will be managed. Once construction is completed, a licence must be obtained from DWER. The licence will set out legal conditions that apply to the operation of the structure.	DWER
Waste discharge	The discharge of any waste associated with the project may also be subject to regulation.	In accordance with Part V of the <i>Environment Protection Act 1986</i> (WA), it is an offense to discharge any industrial waste into water or onto land.	When DWER issues a licence for the project, it will specify limits for waste streams, including the volume and contents of the waste stream.	DWER
Protecting and preserving freshwater	In Western Australia, all naturally occurring freshwater is considered to be owned by the State Government and therefore its use is subject to approvals and regulation.	Under the Rights in <i>Water and Irrigation Act 1914</i> (WA), it is an offense to take water from a watercourse, wetland or underground source for commercial purposes without a licence.	When intending to take water from a water source, a licence must be attained from DWER.	DWER
Commonwealth environmental approvals	Commonwealth approvals may be required where the project may impact environmental matters of national importance.	If the project may impact Commonwealth marine areas, World Heritage areas, Ramsar wetlands or certain species or ecological communities of national significance, it may be referred to the Minister for the Environment for assessment and approval in accordance with the <i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Cth).	A legal arrangement between the Commonwealth and Western Australian Governments allows DWER and EPA assessments to inform the Commonwealth's decision.	Department of Climate Change, Energy, the Environment and Water (DCCEEW)



Regulatory requirement	Description	The law	Process	Agency responsible
Cultural heritage protection and native title				
Cultural heritage	Protection of First Nations cultural values associated with Country is a requirement of any development project.	The <i>Aboriginal Heritage Act 1972</i> (WA) makes it an offense for anyone to excavate, destroy, damage, conceal or alter any Aboriginal site without authorisation from the Minister for Aboriginal Affairs. If the project cannot be developed without impacting an Aboriginal heritage site, proponents must apply to the Minister for Aboriginal Affairs under s.18 of the <i>Aboriginal Heritage Act 1972</i> (WA). Where a location is subject to an existing ILUA, the ILUA may prescribe processes for managing cultural heritage matters.	Ensuring damage to Aboriginal heritage sites does not occur requires investigation through the Aboriginal Heritage Inquiry System managed by the Department of Planning, Lands and Heritage (DPLH), engagement with the relevant Traditional Owners and a heritage survey conducted in collaboration with Traditional Owners.	DPLH
Native Title Matters	Where the location of the proposed aquaculture project is subject to a native title determination, additional processes apply.	The <i>Native Title Act 1993</i> (Cth) sets out the process governments must follow before taking certain actions on native title lands or waters. Described as future acts, these include granting an aquaculture approval and trigger certain rights for native title holders, including notification and the opportunity to comment on proposed aquaculture activities on Country. Aquaculture and pearling leases or licences, along with any related approvals for port or marine infrastructure, might constitute future acts.	Where an aquaculture project is proposed for native title waters or lands, the project and the government must engage with the PBC that holds the native title rights as agent or trustee for the common law native title holders. If agreement is reached with the PBC, the terms are set out in an ILUA, which is then registered with the National Native Title Tribunal. Even if the project proponent is a Traditional Owner or the PBC responsible for the native title lands, establishing an ILUA is still considered best practice.	DPLH

Regulatory requirement	Description	The law	Process	Agency responsible
Other operational regulations				
Workplace health and safety	Aquaculture operations can be hazardous environments, presenting risk of injury or death. Ensuring people are safe is a legal requirement that carries significant potential liability for all business owners and operators.	The <i>Work Health and Safety Act 2020</i> (WA) places a statutory duty of care on a person conducting a business or undertaking to ensure, as far as reasonably practical, the physical and mental safety of workers.	The only way to mitigate risk under the <i>Work Health and Safety Act 2020</i> (WA) is to implement and maintain a comprehensive workplace safety system that proactively identifies risks and puts in place systems, practices and cultures that eliminate or minimise those risks. Several Codes of Practice are available to support this work.	Department of Local Government, Commerce, Industry Regulation and Safety (LGIRS)
Commercial vessel operations	Any boat that is used in an aquaculture operation is considered a commercial vessel, and the operator must hold the required qualifications and licences.	Operating commercial vessels in Western Australia is regulated by the <i>Marine Safety (Domestic Commercial Vessel National Law Application) Act 2023</i> (WA). Qualifications depend on vessel type and operational activity.	For near-shore and coastal aquaculture, operators generally require a Coxswain Grade 1 or Grade 2 Near Coastal qualification for vessels up to 12 metres. Operating larger vessels may require a Vessel Master qualification. These qualifications can be attained through registered training courses, include TAFE.	Australian Maritime Safety Authority (AMSA)
On-water safety	General boat safety is regulated in Western Australia.	Safety requirements are contained in the <i>Western Australian Marine Act 1982</i> (WA) and the <i>Navigable Waters Regulations 1958</i> (WA). These are administered by the Department of Transport and Major Infrastructure (DTMI).	The skipper of any vessel is responsible for the safety of crew and other people who may be affected by the vessel. This includes safe navigation, keeping clear of divers, and complying with drug and alcohol regulations.	DTMI
On-water navigation	There are rules for navigating vessels to avoid collisions and other dangers.	Navigation is regulated by the <i>Prevention of Collision at Sea Regulations 1983</i> (WA).	Vessel operators must remain alert, travel at safe speeds in unregulated areas, give way when required, and comply with lights and signalling requirements.	DTMI



Aquaculture Development Zone

Getting regulatory approvals for an aquaculture project is always more difficult if it is planned for a new site where there is limited baseline environmental knowledge and data.

For First Nations peoples whose Country intersects with one of the Western Australian Aquaculture Development Zones – the Kimberley Aquaculture Development Zone, Mid West Aquaculture Development Zone or South Coast Aquaculture Development Zone – these zones can, in some cases, provide a more streamlined approvals process. This is particularly relevant for environmental impact assessment.

Tip!

For information about licences or permits, contact DPIRD Licensing.
Scan to view the [DPIRD website](#).



Food safety regulations

Most aquaculture is done to produce food. The production, processing, distribution and sale of all food products is regulated in Western Australia to ensure that products are safe to consume and that claims made by producers are correct and true.¹⁹

Tip!

The Department of Health, Disabilities and Ageing is responsible for food quality assurance.



Seafood presents specific food safety challenges. Adhering to these regulations is vital to avoid prosecution, protect community health and ensure you produce a high-quality seafood product.

Because of their biology and environment, shellfish are particularly prone to food safety issues. A specific regulatory framework applies to the production, distribution and sale of shellfish. For bivalve molluscs such as oysters and mussels, which are often consumed raw and pose a higher food safety risk, the Western Australian Shellfish Quality Assurance Program (WASQAP) provides an even more rigorous, internationally recognised framework. WASQAP manages food safety from the classification of harvesting areas through to post-harvest handling, depuration (a process of holding shellfish in clean water to purge contaminants), storage and labelling.

Unless you are selling live product, maintaining an unbroken chain of refrigeration – keeping the product at or below 5°C from the moment of harvest through to the final consumer – is critical for preserving quality, extending shelf life and ensuring food safety.

¹⁹ Food Act 2008 (WA)



Food safety sorting seafood into plastic containers while standing by processing line in factory
(Photo: pressmaster, stock.adobe.com)



Terry Hunter, Borrgoron Tours
(Photo: Tourism Western Australia)

Part 6 – Business development pathways

There are 3 pathways through which First Nations can become involved in an aquaculture project. First Nations organisations or individuals may establish their own aquaculture business, enter into a joint venture with an aquaculture operator, or be a passive beneficiary of a third-party aquaculture project on their Country.

This section outlines the opportunities and challenges associated with each pathway. It is intended to support First Nations exploring aquaculture, as well as third-party aquaculture proponents who wish to engage with a First Nations partner.

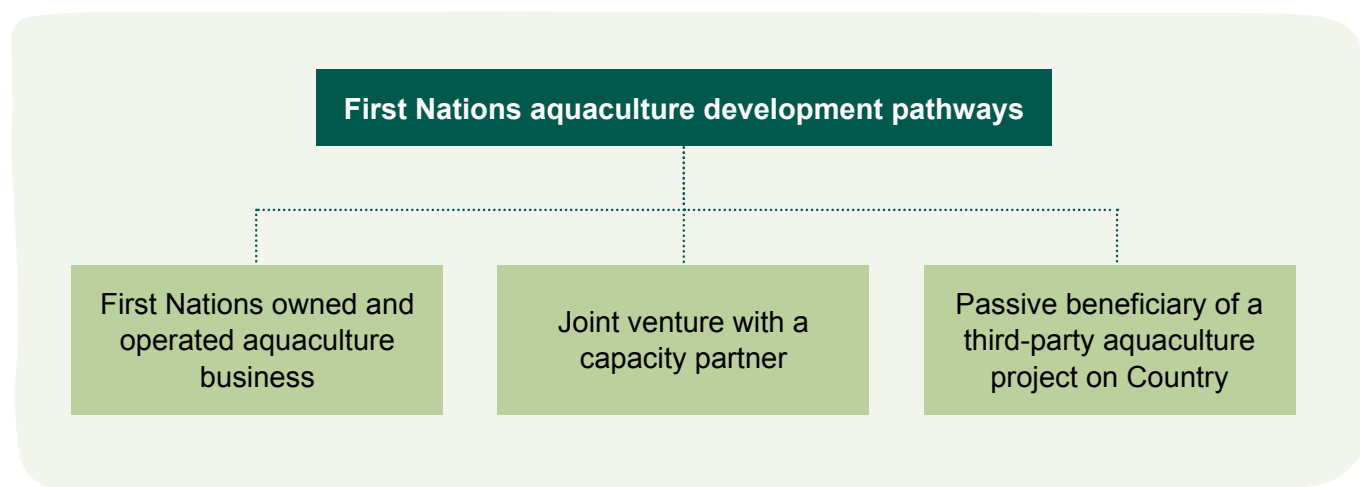


Figure 8 – Pathways for First Nations aquaculture development

Each pathway in Figure 8 is a valid way to participate in aquaculture. The suitability of any option depends on the aspirations, risk appetite, capacity and resources of the First Nations party, along with any cultural considerations.

First Nations owned and operated aquaculture business

Under this pathway, the First Nations organisation owns the aquaculture business. This involves setting up a business structure that holds the aquaculture assets, defines who carries the risk and determines how financial surpluses are distributed.

As summarised in Table 6, there are many ownership structures that can be considered. For most Aboriginal organisations seeking to establish an aquaculture operation, a subsidiary company incorporated under the *Corporations Act 2001* (Cth) is often the most suitable option.

However, each business structure carries different liability, legal and governance implications, depending on how it is structured and used. Anyone setting up a business should seek professional advice before deciding how the business assets will be held.

Table 6 – Common business ownership structures

Structure	Strengths	Weaknesses	Opportunities	Risks
Sole trader	• Easy and cheap to set up • Full control • Simple tax and reporting	• Only suitable for very small individual owned businesses • Unlimited personal liability • Hard to raise finance • Profits taxed at personal tax rate	• Flexible and fast decision-making	• Personal assets at risk
Partnership	• Easy and low cost • Share resources and responsibilities • Tax losses are shared with partners	• Only suitable for very small businesses • Unlimited personal liability • Risks of disputes between partners	• Shared workload	• One partners debt affects all partners
Indigenous Corporation under the <i>Corporations (Aboriginal and Torres Strait Islander) Act 2005</i>	• Lower administration costs • Flexible rules • Better access to grants	• Minimum of 5 members and 3 directors who all have to be First Nations people • Difficult to distribute financial surplus	• Easier access to Indigenous-specific grants	• Not well suited to commercial businesses
Company (Pty Ltd or Ltd) under the <i>Corporations Act 2001</i> (Cth)	• Limited liability • Easy to bring in new shareholders • Easy to distribute financial surpluses	• Relatively expensive and complex to administer • Strict legal duties for directors • Higher reporting requirements • Ongoing compliance costs	• Easy to bring in new shareholders	• Penalties under the <i>Corporations Act 2001</i> (Cth) if rules are not followed
Company limited by guarantee under the <i>Corporations Act 2001</i> (Cth)	• Limited liability • Suitable for not-for-profit purposes requiring a stricter governance arrangement than that which applies to Indigenous Corporations	• Difficult to bring in new shareholders • Relatively expensive and complex to administer • Strict legal duties for directors • Higher reporting requirement • Ongoing compliance costs	• Can be easier to attract philanthropy and mainstream grants	• Not well suited to commercial businesses

When developing a wholly-owned First Nations aquaculture business, it is imperative that the owner undertakes comprehensive business planning and analysis as outlined in Part 7.

Case study: Kepa Kurl Aquaculture Precinct

Wudjari sea Country off Esperance on Western Australia's south-eastern coast has immense cultural value to the Wudjari Nyungar and significant environmental values, now protected by the Wudjari Marine Park. The suitability of these waters for high-quality aquaculture production has also been recognised for decades, with Western Australian seafood industry stalwart MG Kailis demonstrating interest in ranching bluefin tuna in the early 2000s.

In 2021, established abalone producers Rare Foods Australia and Yumbah Aquaculture identified an opportunity to source water from Wudjari sea Country and develop what would be Australia's largest abalone farm on Wylie Bay, just east of the township of Esperance. After conducting a feasibility study for the proposed 600-tonne-per-annum operation, it became apparent to key stakeholders that Wudjari land and sea Country offered much greater potential.

With a view to protecting Country and culture while ensuring economic prosperity for the Wudjari Nyungar, the Esperance Tjaltjraak Native Title Aboriginal Corporation (ETNTAC) acquired 295 hectares of land on Wylie Bay in 2023. This acquisition supports collaboration with stakeholders to establish one of the world's largest multi-species onshore aquaculture precincts. Detailed initial concept planning focuses on establishing common-use aquaculture production infrastructure, enabling species-specific production system investments by commercial shellfish, marine finfish, algae and seaweed producers.

The proposed Kepa Kurl Aquaculture Precinct will also include the Kepa Kurl Marine Centre, incorporating ETNTAC's Sea Ranger operations that service the Wudjari Marine Park. The centre will support a unique 2-way learning research capability, designed to attract marine researchers from around the world to study the region's distinctive marine environmental values in collaboration with Traditional Owners who hold deep knowledge of the region, dating back to when the island archipelago was connected to the mainland.



Proposed Kepa Kurl Aquaculture Precinct
(Photo: Esperance Tjaltjraak Native Title Aboriginal Corporation)

Joint venture

Joint ventures can be a useful way of bringing in technical and business resources and expertise that may not exist in the First Nations aquaculture business, but which complement land, freshwater and sea Country and ICIP assets that the First Nations organisation holds.

Under a joint venture arrangement, a First Nations organisation effectively co-owns an aquaculture project with a third party, typically an experienced aquaculture business. The structure used for this purpose is commonly a company (Pty Ltd) incorporated under the *Corporations Act 2001* (Cth), as described in Table 6 above. However, joint ventures can also be established on a contractual basis, provided they align with the lease and licence conditions.

Under such arrangements, the First Nations party should at least participate in the governance of the project but may also participate in the day-to-day management and operations of the aquaculture project.

A quick checklist for negotiations:

- ☒ Who needs to be in the room?
- ☒ Get your own trusted advisers.
- ☒ Know who you're dealing with.
- ☒ Have your first sit-down meeting.
- ☒ Consult widely and with everyone who needs to be involved.
- ☒ Negotiate.
- ☒ Finalise the deal – or walk away.
- ☒ Stay involved and regularly review outcomes.

The First Nations party to the joint venture may acquire its equity (ownership) share in several ways. This may include purchasing equity for cash, having equity issued in exchange for the value the First Nation organisation brings to the project through access to land, freshwater or sea Country and ICIP, or through a free-carried arrangement, where equity is issued in recognition that the project is taking place on Country.

Generally, the greater the value contributed by the First Nations party to the joint venture, the larger the equity share should be. In determining this value, joint venture partners should consider the First Nations assets discussed in Part 3.

Regardless of the First Nations equity share, the First Nations party should always have representation on the board of directors of the joint venture business. Consideration should also be given to decision-making rights, including veto rights, over matters that may impact important cultural and environmental values or the community.

It is also common in joint venture arrangements for the First Nations party to have rights to community-oriented benefits. These may include training and employment pathways, participation in management, procurement targets with local First Nations owned businesses and royalty-like payments to supplement returns received through shareholding in the joint venture. In practice, any of the benefits that a passive beneficiary might seek can be considered (see below).

Passive beneficiary

It is important to understand that even if a First Nation organisation does not want to own or operate an aquaculture business, it can still benefit from third parties operating aquaculture projects on Country. Equally, it is important that proponents of these projects understand their obligations to the Traditional Owners of that Country.

Under a passive beneficiary model, the First Nations party does not have an ownership interest in the aquaculture project. This situation arises where a third-party aquaculture project proposes to operate on First Nations land, freshwater or sea Country, but the First Nations organisation does not wish to be a partner in the project.

As discussed in Part 3, in these circumstances, First Nations have clear legal and normative rights that can be used to ensure they benefit appropriately from a project operating on Country. The nature and level of benefits received are determined through negotiation and may vary depending on the circumstances of each agreement, including the size and scale of the aquaculture operation. First Nations have the right to FPIC and the right to negotiate terms.

Food for thought

It's important to stay involved and engaged throughout the life of a project to make sure it is delivering for everyone.

This includes not only checking that commitments around lease payments, community contributions, environmental protection and cultural heritage are being met, but also making sure the underlying business model remains fit for purpose. A project that starts as an unincorporated partnership does not have to stay that way forever. Over time, the developer or the community may decide that a different model works better, such as establishing a company in which the community holds shares.

Thinking about business negotiations

Administration fee

Ensuring FPIC and negotiating with third-party project proponent costs money. It is reasonable to require the proponent to reimburse reasonable expenses.

Community investment

Investment in community infrastructure, such as common-user jetties, recreational facilities or cultural centres.

Shared decision-making and decision vetoes

First Nations may require shared decision-making or decision veto rights over matters that affect important cultural or environmental values.

Royalty

It is common for the First Nations hosting a third-party aquaculture project to receive a revenue-linked payment, such as a share of sales revenue.

Procurement opportunities

Local First Nations businesses may be given first right of refusal for key procurement contracts, such as environmental monitoring or worker accommodation.

Training and employment pathways

Opportunities for local community members to be trained and employed in the operation.

Local supply

Guarantees for a portion of fresh seafood to be supplied to the community.



West Lewis Island (Photo: Amy Stevens,
Murujuga Aboriginal Corporation)



Part 7 – How do I keep my aquaculture business running?

Like any new business venture, establishing a successful aquaculture business requires careful, evidence-based opportunity analysis, a comprehensive business plan, and strong knowledge of the key risks and how to manage them.

Aquaculture is a technically and commercially complex industry that carries significant risks. No one should go into an aquaculture venture without seeking expert advice within the aquaculture industry.

Do your homework and kill quick, kill cheap

Before investing any significant money in an aquaculture business, it is important to do your homework.

When developing a new business idea, it is easy to get caught up in the excitement and overlook key details. The reality is that the majority of business ideas in any industry fail. Understanding what could cause an aquaculture business to fail, and whether those risks can be adequately managed early in the process, can prevent resources being spent on an idea that was never viable.

This approach is often described as “kill quick, kill cheap”, and can save a significant amount of money.

Food for thought

Potential avenues for support offered to First Nations businesses:

Local Capability Fund grants administered by the Department of Energy and Economic Diversification provide funding for small-to-medium First Nations businesses to participate in supplying major markets or projects.

Finance and support packages offered by Indigenous Business Australia include general flexible loans, start-up finance packages, business workshops and other services.

Aquaculture for the Future, part of the Farm Business Resilience project and delivered by ACWA in partnership with DPIRD, provides training and support to current and prospective aquaculture ventures to promote climate resiliency.

The process of investigating the viability of an aquaculture venture can be categorised into the following stages:

- **Concept study:** involves evidence-based analysis of the overall potential viability of the project. This includes identifying and quantifying markets, selecting suitable species, assessing potential production sites and systems, identifying key performance drivers, risks and risk mitigation strategies and undertaking high-level financial analysis. At this stage, obvious flaws in the aquaculture business concept are typically identified.
- **Pre-feasibility study:** builds further detail into the concept and includes preliminary system design, capital and operating cost estimates, identification of the regulatory pathway, more detailed market analysis and sales forecasting, operational and capital cost forecasting, detailed financial modelling and identification of potential funding sources. Completing this stage provides greater confidence that the project may be viable.
- **Definitive or bankable feasibility study:** is a more detailed and often costly process, but is critical for reducing the risk that earlier investment is wasted on a project that ultimately fails. It is also generally required to secure commercial finance and government funding. At a minimum, this stage includes detailed engineering design and costing, a clear understanding of production parameters, a detailed operations plan and cost structure, a clearly defined and risk-assessed approvals pathway, an evidence-based marketing plan and financial modelling. A positive outcome at this stage provides a much higher level of confidence in the project.

Following this staged process (see Figure 9) helps ensure you do not throw good money after bad, and the progressed proposal is the strongest version possible.

While this process can be daunting, particularly in the later stages of analysis, aquaculture industry experts that can provide support, and grant programs may be available to assist.

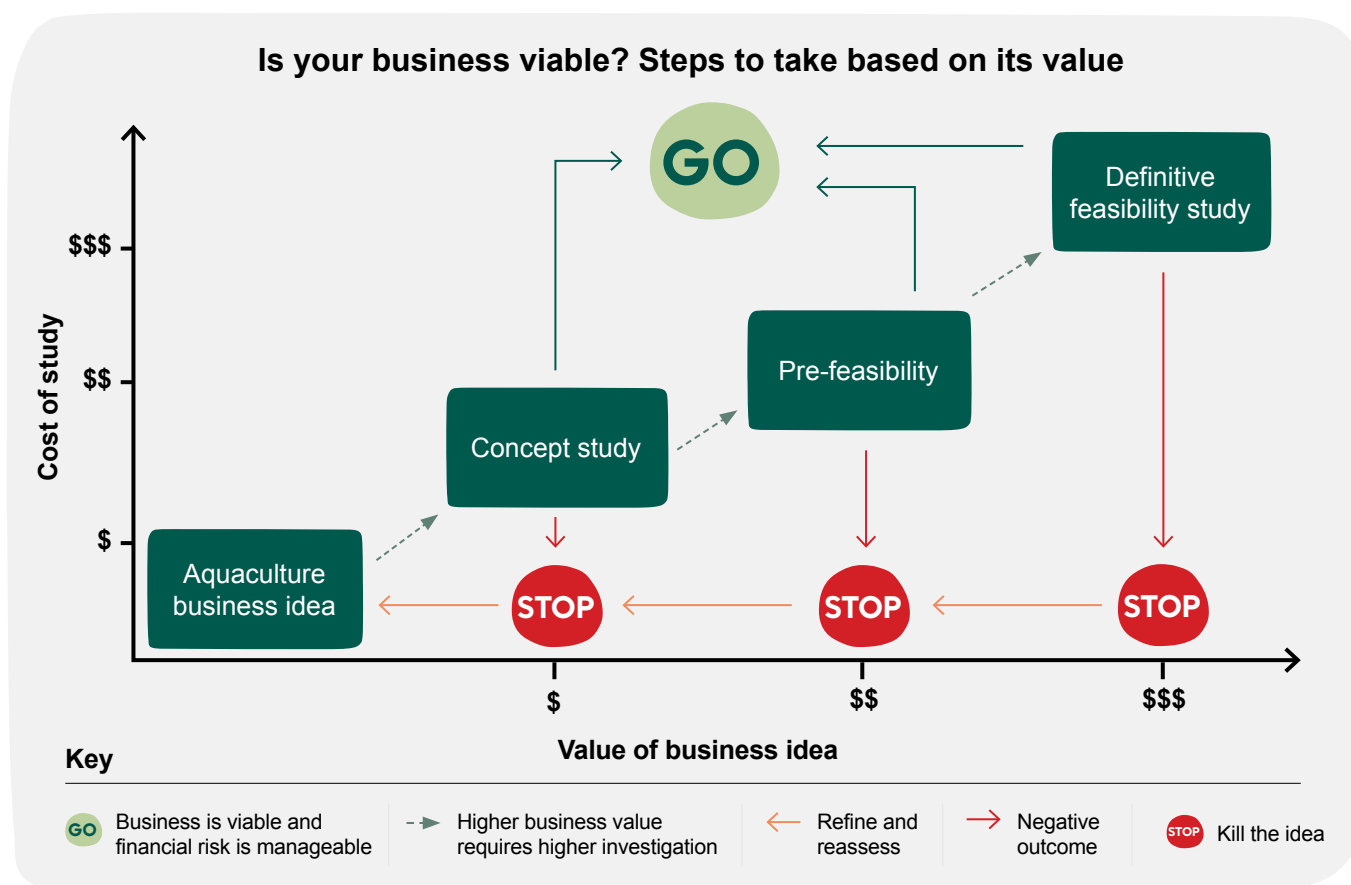


Figure 9 – Concept development framework

Good business planning

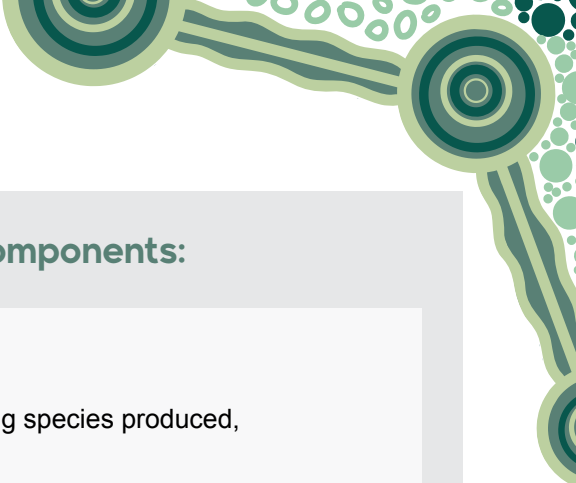
A comprehensive, evidence-based business plan is a key input to the feasibility assessment process discussed above. For any dynamic and complex business such as aquaculture, business planning does not stop once operations begin. Good business plans are living documents that respond to change and evolve as the business matures.

As you work through the initial stages of concept development and feasibility assessment, the level of detail and supporting evidence in the business plan will increase. As the operation starts and grows, evidence will increasingly come from operational experience, refined procedures and real-world market performance.

Evidence supporting the business plan can include desktop research, commissioned studies and personal or organisational experience, provided the source of evidence is clearly identified.



Cultural Tour at Cape Leveque
(Photo: Tourism Western Australia)



A typical business plan will include the following components:

Overview of the business concept

An introduction summarising the key aspects of the business, including species produced, production volumes, target markets and a financial snapshot.

Market analysis

Identification of target markets, customer segments and the reasons customers are expected to purchase the product.

Regulatory compliance plan

Explanation of how approvals, licences and ongoing compliance will be managed.

Competitor analysis

Assessment of competing producers, including their strengths and weaknesses relative to the proposed business.

Intellectual property plan

Description of how ICIP and other intellectual property will be used and protected to create value.

Overall strategy

Identification of the assets and capabilities that will be used to manage risks and capitalise on opportunities identified through market and competitor analysis.

Governance plan

Outline of governance structures and decision-making frameworks, including cultural governance and business structure (see Part 6).

Marketing plan

Outline of the strategies and sales tactics that will be used to attract customers and grow market share.

Financial analysis

Detailed modelling of cashflow and profitability, including capital and operating costs, revenue forecasts, breakeven analysis and sensitivity testing against key business drivers.

Operations plan

Detailed description of operational systems, including juvenile sourcing, grow-out, harvesting, processing and distribution and marketing, as well as biosecurity, administration, workforce, logistics and premises requirements.

Financing plan

Identification of suitable financial options, potential funding sources and preferred financing terms, informed by the financial analysis and overall business plan.

As with feasibility assessment, developing a strong business plan can feel daunting. However, following the structured process outlined in Figure 10 helps simplify the task. Specialist aquaculture business planning expertise is also available and can provide valuable support.

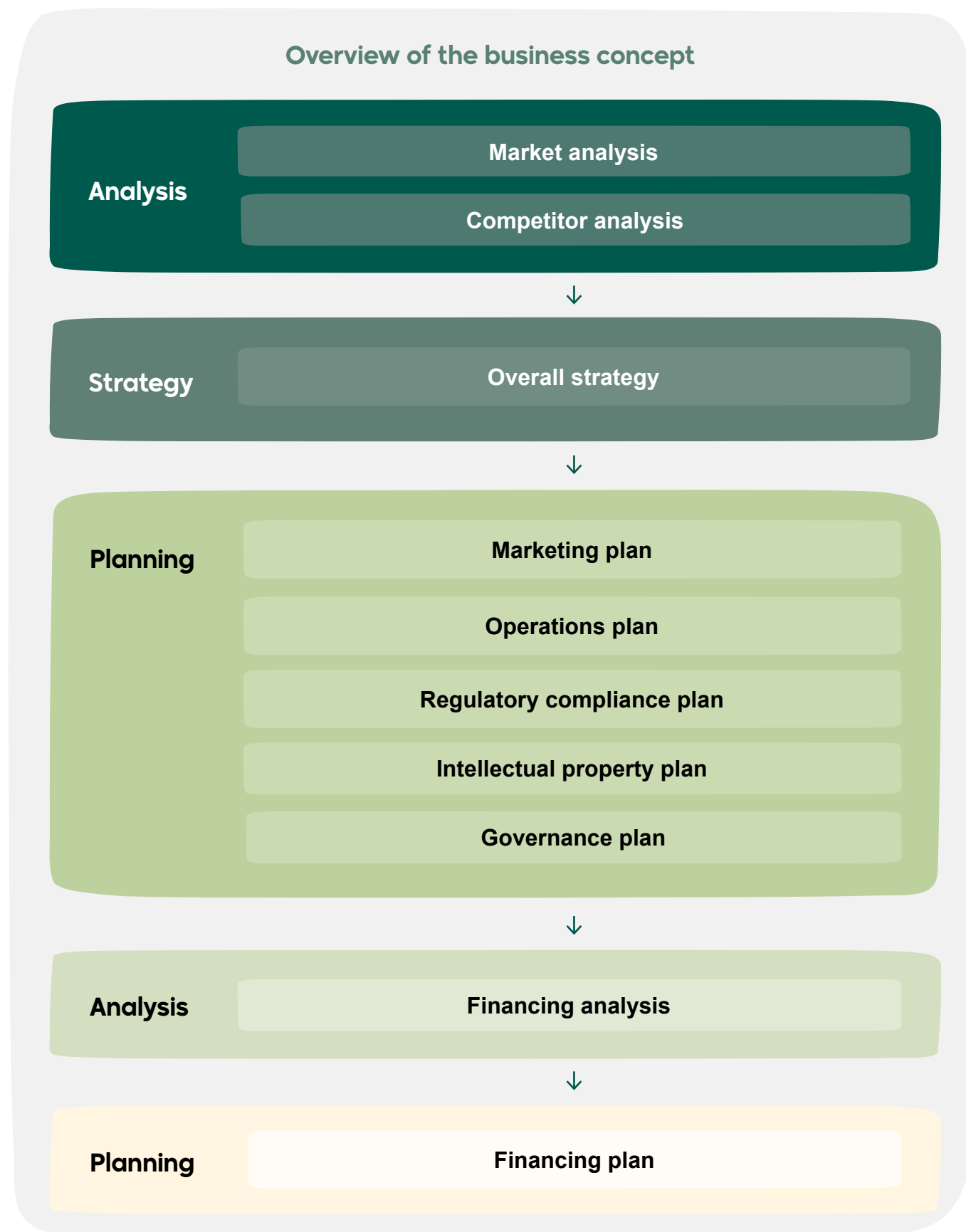
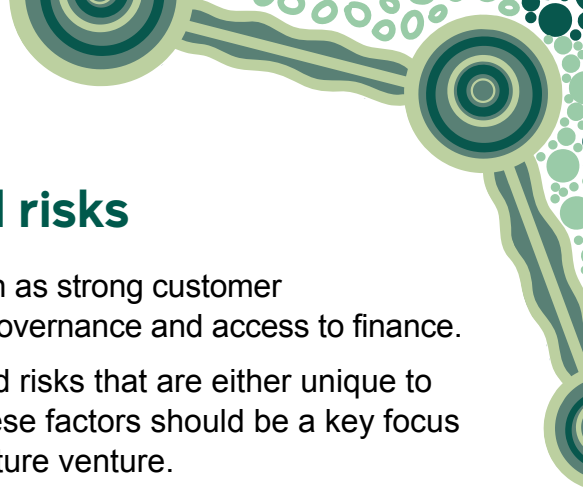


Figure 10 – Business planning process



Key aquaculture business drivers and risks

Like any business, aquaculture relies on core fundamentals such as strong customer relationships, careful cost control, capable management, good governance and access to finance.

At the same time, aquaculture has a set of business drivers and risks that are either unique to the industry or more significant than in many other sectors. These factors should be a key focus of feasibility assessment and business planning for an aquaculture venture.

Feed conversion rate and feed management

For aquaculture systems that require feeding, feed management is critical. Feed is often the largest operating cost, accounting for up to 70% of total operating costs in some cases.

Providing the right nutrients, in the right quantities and at the right time directly affects growth rates, animal health, waste production and overall system performance. Getting the feeding regime right is critical to business viability.

Feed-related risks can be managed by selecting species and genetics with strong feed conversion rates (FCR), using feeds suited to the species and life stage and maintaining an optimal feeding regime.

There are currently only a small number of aquaculture feed manufacturers in Australia, mostly based in Tasmania and Queensland. Reliable logistics, adequate on-site storage and contingency planning are important risk mitigation measures. Some feeds require specialised storage facilities.

Exposure to agricultural risk

As with all primary production, aquaculture stock is exposed to agricultural risks such as adverse weather, disease, environmental events and, in some case, spray drift or pollution. In general, the longer stock remains in the production system, the greater the exposure to these risks.

This risk can be reduced through careful site selection, appropriate system design, and by choosing species or genetics with shorter grow-out times.

Energy and fuel costs

Energy requirements vary widely across aquaculture systems (see Part 4). For regional and remote communities, access to reliable and affordable energy is crucial for maintaining water quality, oxygen levels and system reliability.

Limited grid access can increase costs and introduce additional risk. In some situations, renewable or hybrid energy systems may offer practical alternative. Careful energy planning and investment in efficient equipment can improve reliability and long-term business sustainability.

Labour

Labour is a major cost and operational factor in aquaculture, particularly in regional and remote locations. Many tasks such as feeding, water quality monitoring, maintenance and harvesting need to be done every day, making workforce reliability essential.

Aquaculture operations require a range of skills, including animal husbandry, biosecurity management, machinery operation and, for marine sites, boating or diving. Building these skills within local communities can support long-term employment, strengthen community capability and reduce reliance on external labour.

Common challenges include attracting and retaining skilled workers, managing shift and weekend work and maintaining safe working conditions in sometimes harsh outdoor environments. These risks can be reduced through good workforce planning, investment in training, strong safety systems and aligning operations with local labour capacity.

Aquaculture can create meaningful jobs close to Country, but success depends on developing a stable, skilled local workforce and supporting ongoing training and development.

Biosecurity

Biosecurity is one of the most significant risks facing aquaculture businesses. A disease outbreak can result in stock losses, regulated culls, increased costs and, in severe cases, catastrophic loss of revenue.

Effective biosecurity relies on a comprehensive, farm-specific biosecurity plan that is actively implemented and regularly reviewed. A strong plan functions as a multi-layered defence against the introduction and spread of disease.

Food for thought

Some businesses can view biosecurity as a box-ticking exercise.

Do not make this mistake. A biosecurity plan protects you and your aquaculture operation.

Your stock – your fish, oysters, seaweed or other organism – is your business.

No stock, no business.

Biosecurity Plan: Components to Consider

Quarantine and stock introduction



This includes animals, people, equipment and supplies entering the site which must be treated as a potential source of disease.

Stock

New stock introduces disease risk; all incoming animals should be treated as potential carriers.

Quarantine protocols should be used before adding new animals to the main system (e.g. separate enclosures and health checks/ observation).

When choosing suppliers, factor in their disease history to reduce risk.

People & Site Access (Movement & Operations)

Operations must control who enters, maintain hygiene standards, and manage movement pathways.

Land-based sites can control access more easily, but all operators must understand their access rights and responsibilities.

Risks from people, vehicles, and supplies can be reduced with restricted access, wash-down facilities, and appropriate protective clothing.

Avoiding risk early is better than managing disease after it arrives.

Inoculation and other animal health measures



Routine health measures such as testing, vaccination or treatment of baths may be required to keep stock healthy (particularly in finfish).

This will reduce the risk of diseases, parasites (such as sea lice) or other pathogens being passed on to the surrounding environment.

Water quality and treatment



Poor water conditions can cause stress, slow growth, increase disease risk and lead to mortalities.

In closed systems, water quality can be managed through filtration, aeration, treatment of intake water or regular exchange with surrounding waters.

Open-water ventures require the monitoring of local environmental conditions which may require cages to be relocated in more suitable conditions.

Waste water will need to be managed in line with environmental approvals.

Record keeping



Track all stock movements, health checks, mortalities, water quality and feed use.

These records are invaluable for understanding what has happened in an outbreak to respond quickly.

They also support compliance with licence conditions and help operations resume sooner after disruptions.

Incident response



While prevention is always the priority, some level of risk will remain.

Every biosecurity plan should include clear and practical procedures for responding to a known or suspected disease event including:

- Staff training to monitor early signs of an outbreak, ensuring staff clearly understand what actions to take if disease is suspected through a stepped approach.
- Developing a stepped approach to explain how to isolate and remove affected stock, manage treatment and recovery, and report any suspected notifiable disease to the relevant authorities such as DPIRD and, where required, Animal Health Australia via the national Emergency Animal Disease Watch Hotline.

Ensuring the product is safe

For aquaculture operations producing food, which will be most, it is critical that the final product is safe to consume. A range of food standards apply to support this (see Part 5).

Compliance with these standards is essential and requires investment in appropriate facilities, staff training and quality management systems.

For non-edible products, such as pearls, other regulatory standards and codes of compliance may apply. These typically relate to the final product, including requirements around quality, safety and consumer guarantees under Australian Consumer Law.

Protecting Indigenous Cultural and Intellectual Property

First Nations have a unique advantage in differentiating both value-added and live or fresh-chilled aquaculture product by linking them to culture and Country (see Part 3).

This can include identifying the product's connection to traditional Country, using distinctive branding and design, sharing cultural stories, and highlighting that the product is produced by a First Nations owned and operated enterprise.

To make the most of this and to protect the integrity of these claims, it is important that First Nations aquaculture operators retain control over how their story is told. Businesses should seek legal advice on business names, trademarks and copyright, which can be complex areas of law.

Where the origin of a product and its cultural credentials are clearly demonstrated, a premium market position can often be achieved.

Food for thought

Consumers in Australia and overseas are increasingly willing to pay a premium for products with a clear story of authenticity, sustainability and community benefit.



Seafood market risks

All categories of seafood markets, from commodity bulk supply through to premium products, can be unpredictable. Customer preferences often change in response to shifts in values, expectations and perceptions of value.

To manage this risk, marketing plans should include strong, ongoing engagement with target markets and customers, along with strategies to diversify market exposure where possible.



Cultural Tour at Cape Leveque
(Photo: Tourism Western Australia)

Part 8 – Where to get help?

Starting and running a business is a big journey, but you don't have to do it alone. There is a strong network of organisations in Western Australia and across Australia that can support you. Knowing who to contact, and when, can save time and help you get the right advice at the right stage.

Organisation	What they can help you with	Contact details
Department of Primary Industries and Regional Development – Aboriginal Economic Development	Support for Aboriginal businesses, including business planning, governance training, and connections to grants and government procurement opportunities.	Email: aed@dpird.wa.gov.au Website: dpird.wa.gov.au/regional-communities/aboriginal-economic-development/
Department of Primary Industries and Regional Development – Aquaculture Management	The main government body for aquaculture in WA. Handles licensing, regulations and provide technical advice on the industry. This should be your first point of contact for questions about aquaculture rules and approvals.	Phone: 1300 374 731 Email: aquaculture@dpird.wa.gov.au Website: dpird.wa.gov.au
Indigenous Business Australia (IBA)	Funding and business support for First Nations businesses, including start-up finance (part-loan, part-grant), business loans and equipment finance.	Phone: 1800 107 107 Website: iba.gov.au/business/starting-a-business
Noongar Chamber of Commerce and Industry (NCCI)	Business advocacy and support for Noongar and other Aboriginal-owned businesses in WA, including networking and capacity building, particularly in the South West.	Website: ncci.com.au
Goldfields Aboriginal Business Chamber (GABC)	Supports Aboriginal businesses in the Goldfields-Esperance region by increasing visibility and connecting them with opportunities in major industries.	Website: gab.org.au
Supply Nation	Australia's national directory of verified Indigenous businesses. Free registration helps connect businesses with corporate and government buyers who are looking to procure from Indigenous suppliers.	Website: supplynation.org.au

Organisation	What they can help you with	Contact details
Aboriginal Business Directory WA	A WA-specific directory of Aboriginal businesses, managed by the Chamber of Commerce and Industry WA (CCIWA). Registration helps WA Government agencies identify Aboriginal suppliers.	Website: abdwa.icn.org.au
Aquaculture Council of WA (ACWA)	Peak industry body representing the aquaculture sector in WA. Provides advice, advocacy and connections across the sector.	Website: aquaculturecouncilwa.com
Small Business Development Corporation (SBDC)	Free advice, workshops and resources for small business starting or growing in WA. A great source of general business information.	Website: smallbusiness.wa.gov.au
Morrgul	Kimberley-based not-for-profit providing free procurement support to Aboriginal businesses in regional WA, including help to tender for goods and services contracts.	Email: info@morrgul.com.au Website: morrgul.com.au
Waalitj Hub	Provides business coaching and commercial advice to Indigenous businesses, particularly in the South West and Great Southern regions.	Email: waalitjhub@wf.org.au Website: wf.org.au/business/waalitj-business-hub
Indigenous Land and Sea Council	Provides funding and support to Aboriginal and Torres Strait Islander people to acquire and manage land, water and water-related rights for economic, environmental, social and cultural benefit.	Website: https://www.ilsc.gov.au/ Western divisional office: (08) 9420 6300
Department of Planning, Lands and Heritage (DPLH)	Responsible for land use planning, Crown land administration and oversight of Aboriginal cultural heritage in WA. This includes land tenure over Crown land and the management of Crown land, pastoral leases, heritage matters and support for the Aboriginal Lands Trust and the Pastoral Lands Board.	Website: https://www.wa.gov.au/organisation/departments-of-planning-lands-and-heritage Email: proposals@dplh.wa.gov.au (08) 6551 8002
Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Can assist with Commonwealth environmental approvals where required.	Website: https://www.dcceew.gov.au/



Glossary

Term	What the term means in this guide
Aquaculture	The process of growing aquatic species in a controlled environment.
Archaeological	Relates to the scientific study of the human past through the recovery and analysis of material remains such as artifacts, buildings and other physical evidence.
Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES)	A Commonwealth Government agency that produces data and statistics relating to Australia's agriculture and resources industries.
Cnidaria	A phylum within the kingdom Animalia that includes over 11,000 species of aquatic invertebrates found in freshwater and marine environments.
Gross Value of Product (GVP)	Total value of all goods and services produced by an industry before the deduction of any costs.
Crustacea	A subphylum of mostly aquatic arthropods characterised by a hard exoskeleton, jointed legs and segmented (for example, crabs, lobsters and prawns).
Echinodermata	A phylum of exclusively marine animals that exhibit radial symmetry as adults and use a water vascular system for movement, digestion and respiration (for example, sea urchins, starfish and trepang)
Economic self-determination	The right of a people to freely pursue their economic, social and cultural development and exercise meaningful control over their own affairs.
Estuarine	Relating to an estuary, where freshwater from rivers mixes with saltwater from the sea.
Eutrophication	The process where a body of water becomes overly enriched with nutrients, like nitrogen and phosphorus, leading to an overgrowth of algae and aquatic plants.
Farm gate	When an aquaculture product (for example, live fish, shellfish or seaweed) leaves the aquaculture facility and is first sold. Farm-gate value refers to the price received by the producer before any transport, processing, packaging, distribution or marketing costs are added.
Food Conversion Rate (FCR)	A measure of how efficiently an animal converts feed into body mass or another desired product.
Indigenous Cultural and Intellectual Property (ICIP)	The rights Aboriginal and Torres Strait Islander peoples have to their cultural heritage, traditional knowledge and cultural expressions. ICIP includes both tangible items such as art, as well as intangible elements like stories, languages and ceremonies that are developed and passed down through generations.
Indigenous Land Use Agreement	A voluntary agreement between Native Title Parties and other people or bodies about the use and management of areas of land and waters. It is an agreement meeting the requirements of sections 24BB to 24BE of the <i>Native Title Act 1993</i> (Cth).

Term	What the term means in this guide
Invertebrate	An animal that does not have a backbone or spinal column.
Kimberley Aquaculture Development Zone (KADZ)	An area of ocean within the Buccaneer Archipelago that has been zoned for the sea-cage production of marine finfish.
Legal rights	Rights that are enforceable under Australia common law or statute law.
Marine	Related to the sea.
Metamorphic	Relating to a stage an organism's life cycle during which it undergoes physical transformation.
Mid West Aquaculture Development Zone	An area of ocean near the Houtman Abrolhos Islands that has been zoned for sea-cage production of marine finfish.
Nutraceutical	A food or product derived from food that is believed to provide health benefits beyond basic nutrition.
Normative rights	Social, ethical or customary expectations about what is owed to people, which influence behaviour and decision-making even where they are not legally enforceable.
Pharmaceutical	A drug or medicine used to prevent, diagnose, treat or manage disease, or to restore or modify bodily functions.
Phylum	A major level of biological classification that groups organisms sharing a basic body plan and evolutionary history.
Purse seine	A large fishing net used to surround and enclose schools of fish near the water's surface.
Registered Native Title Body Corporate (RNTBC)	A corporation established under the <i>Corporations (Aboriginal and Torres Strait Islander) Act 2005</i> (Cth) that holds determined native title rights as agent or trustee for the common law native title holders.
Riparian	Relating to land and vegetation alongside rivers, streams, lakes or wetlands.
Sea cage	A large net structure used to farm aquatic species in open marine or freshwater environments.
South Coast Aquaculture Development Zone	An area of coastline near Albany that has been zoned for aquaculture shellfish production.
Terra nullius	A Latin term meaning 'nobody's land'. It refers to a legal doctrine used by Britain to claim sovereignty over Australia, which was overturned by the Mabo High Court decision.
Traditional Ecological Knowledge (TEK)	Knowledge, practices and beliefs developed by Indigenous peoples over generations about the relationship between living beings and their environment. This includes understanding of animal behaviour, plant uses and seasonal patterns, and supports the sustainable management of natural resources.



Species table

Common name	Species name
Mollusc	
Akoya pearl oyster	<i>Pinctada imbricata</i>
Black-lip Pearl oyster	<i>Pinctada margaritifera</i>
Blacklip abalone	<i>Haliotis rubra</i>
Blue mussels	<i>Mytilus edulis</i>
Greenlip abalone	<i>Haliotis laevis</i>
Tropical rock oysters	<i>Saccostrea spp.</i>
Pearl oyster	<i>Pinctada maxima</i>
Sydney rock oyster	<i>Saccostrea glomerata</i>
Crustacean	
Banana prawns	<i>Penaeus merguensis</i>
Black tiger prawns	<i>Penaeus monodon</i>
Cherabin	<i>Macrobrachium spinipes</i>
Marron	<i>Cherax cainii</i>
Yabbies	<i>Cherax destructor</i>
Algae/plant	
Asparagopsis (tropical water species)	<i>Asparagopsis taxiformis</i>
Asparagopsis (temperate water species)	<i>Asparagopsis armata</i>
Finfish	
Atlantic bluefin tuna	<i>Thunnus thynnus</i>
Atlantic salmon	<i>Salmo salar</i>
Barramundi	<i>Lates calcarifer</i>
Black bream	<i>Acanthopagrus butcheri</i>
Cobia	<i>Rachycentron canadum</i>
Eels	<i>Anguilla australis and Anguilla reinhardtii</i>
Freshwater cobbler	<i>Tandanus bostocki</i>
Mahi mahi	<i>Coryphaena hippurus</i>
Pink snapper	<i>Pagrus auratus</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>
Silver perch	<i>Bidyanus bidyanus</i>
Southern bluefin tuna	<i>Thunnus maccoyii</i>
Echinoderm	
Trepang	<i>Holothuria scabra</i>



Clownfish and sea anemone
(Photo: Alkira Remaj)

