



Department of
Primary Industries and
Regional Development

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Aquaculture Development Plan for Western Australia

Focusing on the key foundations for growth
May 2020



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Aquaculture Development Plan – Call for comment

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Government's commitment to develop a State Aquaculture Strategy is being fulfilled through the development of an Aquaculture Development Plan for Western Australia (WA) (Aquaculture Plan).

The Aquaculture Plan addresses the key issues which have commonly been considered as barriers to the development of aquaculture in WA. With added pressures of the COVID-19 pandemic, building strong foundations and continuing to move forward to address key issues is more important than ever. Aquaculture will play an increasingly vital role in diversifying our economy and creating new jobs in regional areas.

The Government of Western Australia through the Department of Primary Industries and Regional Development (DPIRD) is committed to supporting industry growth, now and in the future, by continuing to deliver core functions and activities and provide for new initiatives through the implementation of the Aquaculture Plan.

Consultation

The development of the Aquaculture Plan has been informed by the 2017 Aquaculture Industry Engagement Consortium, which was convened by the Premier. This forum enabled industry stakeholders to provide important feedback on the Government's key commitments to support future decision-making.

The draft Aquaculture Plan was released to the Regional Development Commissions, Aquaculture Council of WA (ACWA) and relevant state government agencies for comment.

Feedback

The Minister for Fisheries has released the current version of the plan prior to announcement of the final publication and welcomes feedback. Please forward comments to hayley.perhavec@dpird.wa.gov.au within six weeks of release of this plan.

Thank you,

Heather Brayford
DEPUTY DIRECTOR GENERAL
Sustainability and Biosecurity
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Introduction

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The purpose of the Aquaculture Development Plan for Western Australia (Aquaculture Plan) is to provide realistic and achievable targets in the short, medium and long terms, in a cohesive, logical order that will be the foundation for growth over the next ten years.

The Aquaculture Plan has been developed in response to a government election commitment and informed by input from industry and the Regional Development Commissions. Consultation on this Aquaculture plan provided further opportunity for comments and discussions within the aquaculture sector as well as relevant external agencies.

The Aquaculture Plan is included and referenced in the Department of Primary Industries and Regional Development's (DPIRD) Primary Industries Plan.

The development of the Aquaculture Plan has also been informed by the *Aquaculture Industry Engagement Consortium (2017)*,

convened by the Premier, which focused on how local aquaculture operations can take advantage of the rising global demand for quality seafood products. It enabled industry stakeholders to provide important feedback on the Government's key commitments to support future decision-making.

DPIRD utilised the outcomes of the consortium, and prior preliminary discussion, to identify foundations for growth and prioritised these to facilitate development of the industry in the future.

The Aquaculture Plan is intended to assist government focus and prioritise resources to implement relevant projects with a coordinated approach.

Government priorities and objectives

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The Government's vision is for a strong and diversified economy delivering quality and secure jobs through increased investment across a broad range of industries.

The development of the aquaculture industry, through implementation of the Aquaculture Plan, supports Government, industry and the community, to achieve the following development targets:

1. Economic growth
2. Resilience through diversification
3. Job security and quality.

In addition, the Aquaculture Plan is aligned with the following elements of DPIRD's 2018-21 Strategic Intent.

1. Sustainability
2. International competitiveness
3. Regional opportunities
4. Enabling environment.

The foundational elements of the Aquaculture Plan and the set of priority actions ensuing from it will support growth of, and investment in, the WA aquaculture industry.

A strong, well developed aquaculture industry will support regional communities, and diversify the economy by creating new types of jobs in the regions. It also provides opportunities for Aboriginal economic development and participation. An expanding aquaculture industry also creates upstream and downstream businesses such as feed manufacturing, equipment manufacturing, processing and value adding, particularly in regional areas. Direct and indirect economic benefits of aquaculture to WA will accrue by way of new sales revenues, capital expenditure, input and supply sources from local services, increased tourism and significant regional employment opportunities. When operating at full capacity, current and proposed investment is projected to increase direct and indirect employment from an estimated 280 jobs to almost 6000 jobs.



Government achievements

Since 2017 the Government has:

- Declared the Mid West Aquaculture Development Zone, which has since been fully allocated.
- Transferred the Australian Centre for Applied Aquaculture Research to DPIRD.
- Provided \$7 million for the construction and operation of a marine finfish nursery in Geraldton.
- In partnership with ACWA, established the Albany Shellfish Hatchery, which is operational and delivering spat to the growing shellfish industry.
- Commenced the development of a South Coast Aquaculture Development Zone near Albany and Esperance.
- Upgraded the Watermans Bay Fish Health Laboratory at DPIRD to provide improved fish health research and development and support services at a cost of \$1 million.
- Awarded \$109 000 in scholarship funding to help grow the sector as part of the Premier's Agriculture and Aquaculture Entrepreneurship Program, which is now completed.
- Implemented a centralised aquaculture reporting system to facilitate all industry reporting requirements.
- Appointed an officer within DPIRD for the WA Shellfish Quality Assurance Program (WASQAP).

Funding and implementation

DPIRD, in liaison with relevant stakeholders and partners, will prioritise implementation of the Aquaculture Plan in accordance with the foundations timeline. Some actions may require development of business cases and dedicated funding support to facilitate implementation.

Current Industry Snapshot

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Aquaculture, the world's fastest-growing food production sector, is set to overtake capture fisheries as the major source of seafood. The share of farmed species in global fishery production was 47% in 2016, is projected to exceed that of wild species for the first time in 2020 and to grow to 54% in 2030. Total world fish production (capture plus aquaculture) is expected to continue to expand to reach 201 million tonnes in 2030, with the major growth in production originating from aquaculture, which is projected to reach 109 million tonnes in 2030.

For the past decade, the pattern of Australia seafood production has changed significantly, with a production shift from wild-caught stocks towards aquaculture products. During that period, Australia's aquaculture sector has increased its share of total production value and volume.

In 2017–18, the value of Australian aquaculture production increased to \$1.42 billion and accounted for 45% of the value of Australian fisheries production. The largest Australian aquaculture industry sector is Tasmanian salmon, which continues to grow substantially and in 2017–18 reached \$840 million in value.

Australia's aquaculture industry is small by global standards, however, Australia has a reputation for producing safe, sustainable, high-quality and high-value aquaculture products. The Australian aquaculture industry has many advantages over its competitors: the ability to culture a large number of species over a range of climatic zones; access

to relatively inexpensive land and water; capacity to grow most ingredients required in high quality fish diets at competitive cost; and freedom from many of the diseases that affect aquaculture in other countries.

In WA, the total value of commercial fisheries and aquaculture production (including pearling) in 2017–18 was \$633 million with pearling contributing \$52 million and aquaculture \$27 million.

WA fisheries and aquaculture production value is highly dependent on rock lobster, which in 2017–18 accounted for \$438 million or 69% of the total. Significant growth in aquaculture production will be key to increasing the State's capability to supply larger quantities of seafood to domestic and export markets.

WA Aquaculture Status and Prospective Growth

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Kimberley Aquaculture Development Zone

The Kimberley Aquaculture Development Zone in Cone Bay consists of two sites; one leased to a company that was recently acquired by a prominent organisation with strong aquaculture interests based in Singapore; and the other to a four-way joint venture that includes three Traditional Owners in the vicinity of Cone Bay. The former project is in production and the latter in the planning and initial development stages. When at full capacity, production in Cone Bay and at additional sites in the region could reach 20 000 tonnes, equating to approximately \$200 million at full production. This represents a significant return to the State and boost to regional economy and job opportunities. The Kimberley Aquaculture Development Zone supports indigenous involvement and regional job opportunities. (Photo: Marine Produce Australia)



Mid West Aquaculture Development Zone

Two companies have been granted aquaculture approvals for the 3000-hectare Mid West Aquaculture Development Zone, which comprises separate northern and southern areas of 2200 and 800 hectares respectively. The licence for the larger, northern area authorises a biomass (standing crop) of 18 000 tonnes, which equates to annual production (harvest) of approximately 36 000 tonnes. When at full capacity, total production from the Mid West Aquaculture Development Zone (northern and southern areas combined) could reach 48 000 tonnes. Equating to approximately \$400 million at full production, this represents a significant return to the State and a boost to regional economy and job opportunities.



Albany Shellfish Hatchery

Now fully operational, the state-of-the-art Albany Shellfish Hatchery has the ability to grow multiple species of marine shellfish in mass quantities to supply growout farms throughout WA. In addition to meeting its primary role of providing spat and juvenile shellfish to existing commercial growout farms and several trial farms for edible rock oysters around WA, the hatchery may also have capacity to provide spat to growers in the eastern states once biosecurity conditions are met. The hatchery has reduced risk and costs to shellfish aquaculture operators and has resulted in companies investing significantly in the development of the industry. This investment is already resulting in benefits such as jobs and economic diversification to regional communities across the State. The hatchery is State-owned and leased to a private operator with a transition period to self-funding. Once operational costs are transferred the hatchery will remain a Government asset.



Rock Oyster aquaculture

Current and planned trials with industry involvement on rock oyster culture from the Kimberley to the south coast are providing encouraging preliminary results. The trials are designed to determine the commercial viability and sustainability of edible oyster aquaculture in the different areas. Successful outcomes will likely lead to development of larger-scale projects that will further drive industry growth, boost export markets and underpin regional economic development in associated industries such as tourism. Ensuring compliance with food safety standards through the WA Shellfish Quality Assurance Program (WASQAP) is an important enabler for industry. At this early stage of development of this sector, it is difficult to estimate economic impact and job creation; however, based on growth projections it is reasonable to project that around 1,200 direct jobs may be created in the Shellfish sector within five years.



Abalone aquaculture

There are three abalone aquaculture farms currently operating on the south coast of WA: two marine-based farms and one land-based farm. Production of cultured abalone from these farms is continuing to grow rapidly. Abalone aquaculture production has more than doubled in the past few years and expects to overtake wild catch within three to four years. Future expansion and growth is expected to increase more rapidly with the expansion of existing farms and identification and development of additional sites. Industry success has created exposure in international markets for WA aquaculture. Based on its growth projections, the abalone sector anticipates it will collectively employ approximately 170 people within five years.



Yellowtail kingfish

Ideally suited for large-scale commercial production along WA's temperate coastline, yellowtail kingfish meets all the criteria needed for a marine aquaculture candidate. Among other attributes, kingfish are highly fecund, spawn naturally in captivity, have a rapid growth rate, excellent food conversion efficiency and known culture technology. A highly-regarded fish in growing domestic and export markets, this white-fleshed fish is being targeted by current and prospective commercial operators in WA.



Marine prawn farm

A proposed development of a large-scale prawn farm at full production would see up to 150 000 tonnes of black tiger prawns grown in 10 000 hectares of ponds. The growout farm will be located in the Northern Territory, with processing works, export facility and founder population hatchery all located in WA. Job opportunities will be created in WA at the proposed processing plant near Kununurra and the foundation broodstock hatchery near Exmouth.



Barriers to Development and Opportunities for Growth

Through the various initiatives to consult and engage with the industry, Government has identified several areas commonly considered barriers to development. These barriers have been categorised according to the five key areas set out below.

1. Few sheltered and suitable coastal marine sites

WA coastal waters are generally exposed and there are few large areas that are sheltered. The limited areas of sheltered coastal marine sites and competition for other uses, reduces opportunities for investment or may require the use of new or emerging technologies for infrastructure capable of functioning in more exposed coastal waters.

2. A generally remote and high cost environment

There is a lack of infrastructure and services in some regional areas, resulting in high production costs particularly in relation to transportation, inputs such as feeds and power and retention of suitably qualified staff. Distance to markets impose additional barriers that are often exacerbated by limited airfreight availability.



Photo: Marine Produce Australia

3. Challenges within the regulatory environment

The complexity of the regulatory environment has been simplified in several key areas, through the implementation of important regulatory reform initiatives. It remains important to maintain a constant review of regulatory policies and processes to adapt to industry developments.

4. Perceived lack of integration in aquaculture training

WA is not sufficiently targeted nor competitive in training, with little flexibility within course selection or fee for service opportunities in comparison to some jurisdictions. WA aquaculture companies regularly send staff to Tasmania for some of their training needs.

5. Acceptance from local communities and other stakeholders

Building community trust and support (“social licence”) for sustainable aquaculture development is important for long-term industry success. This includes building both local and broader community support built on a strong environmental and food production credentials.

6. Biosecurity risks

A strong biosecurity system, including preparedness, management and response, is fundamental to the aquaculture industry particularly minimising the spread of disease. Unforeseeable biosecurity issues can cause severe risks to industry viability and affect market access and the State’s reputation as a supplier of safe and high quality food.

Potential growth

The State Government has invested in marine fish and hatchery development and in Aquaculture Development Zones. The way has also been cleared for the abalone aquaculture sector to thrive through policy development. Following lessons learned through the rapid rise of aquaculture in Tasmania and South Australia, the establishment of Aquaculture Development Zones has proved to be an effective stimulus for development. The WA aquaculture sector is now showing signs of accelerated growth.

The most significant growth is anticipated in the sectors culturing marine finfish and shellfish such as yellowtail kingfish, barramundi, abalone and edible oysters. The culture of fresh water species will continue to be an important part of aquaculture in WA and there is scope for the culture of non-native, high-value freshwater species in biosecure production systems. The continuing emergence of improved technology and new species such as coral and seaweed will further diversify the industry.

The WA marron aquaculture sector has a long history of farming this high-value species, mainly in purpose-built farm dams in the south west region. Annual production has remained

reasonably steady at around 50 tonnes with an approximate value of \$1.5 million per year. There are current indications of a resurgence in interest in marron production, driven by significant industry investment.

There is also potential for significant growth in regional tourism associated with creating unique freshwater fishing opportunities in the South West and in the Kimberley.

The pearling sector also has significant latent capacity to expand. Opportunity to expand this industry exists if improvements in productivity can be found.

Aquaculture also plays a role in recreational fishing in WA through:

- Growing trout, marron, pink snapper, barramundi and other important recreational species for stock recovery and enhancement programs
- Developing culture methodologies for popular species with this increased knowledge improving the chances of culturing techniques becoming commercially viable at a later time;



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- Smoothing out recruitment variations for popular recreational fisheries such as snapper in Cockburn Sound, and;
- Building inland fishing opportunities such as barramundi in Lake Kununurra with growing potential to stock Australian non-endemic native species in freshwater impoundments in the near future.

The WA aquaculture industry has the opportunity to become a key sector with the capability to meet rising local demand for home-grown products as well as the demand from Asia's expanding, urbanised middle class for premium, high-quality food with sound clear provenance. This capability delivers an unprecedented opportunity to drive growth, create jobs and build resilience in the State's economy.

WA is considered well placed to meet growing global demand for marine finfish and shellfish species such as yellowtail kingfish and rock oysters. Production of temperate marine finfish species in particular is expected to grow substantially in WA over the next decade, given the competitive advantages that exist in this State. These advantages include very large

areas of pristine-quality coastal waters, high-level biosecurity afforded by WA's isolation, technology improvements that enable large-scale offshore aquaculture in more exposed waters, world class DPIRD owned applied research and facilities and staff, scientific and engineering capabilities and political and economic stability.

Domestic and international markets exist for these species and consumer interest is high and, with increasing supply, WA will be positioned to capture global, high-end markets with clear provenance and branded (Brand WA) premium, sustainably farmed finfish and shellfish products cultured in our pristine oceanic waters.

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Foundations

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This section outlines the foundational elements and priority actions to support growth in the WA aquaculture industry. In addition to new initiatives, these include core functions and activities that need to be maintained throughout the stages of development to provide the stability necessary for growth. It is important to achieve and maintain the basics to build a strong industry so that it is able to adequately support new large scale and innovative projects in the future.



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1 Strategic Planning, Management & Coordination

Identify suitable sites

The identification of suitable sites to establish a South Coast Aquaculture Development Zone on the south coast of WA is progressing. Identified sites are considered suitable for the large-scale commercial aquaculture of valuable marine shellfish such as rock oysters.

Investment to establish aquaculture development zones provides excellent value for money and return on investment. Large-scale aquaculture affords benefits to the State and community. Aquaculture development zones provide opportunities for new aquaculture operations to be established, providing economic benefits to the local community through job creation and regional economic diversification. These benefits extend, both directly and indirectly, to regional areas and the Aboriginal community.

It is therefore acknowledged that the establishment of aquaculture development zones has been, and will most likely continue to be, a major factor in attracting investment in the WA aquaculture industry. Given the level of interest in the Mid West and South Coast aquaculture development zones, Government will explore opportunities to establish new aquaculture development

zones, for the production of marine finfish, off the southern or western coasts of WA, and undertake preliminary work and Business Case development to investigate additional aquaculture development zones.

Work to identify new aquaculture development zones will most likely consider areas suitable for marine finfish and shellfish as well as coastal land-based sites. It is possible that the process will provide a number of marine finfish and shellfish aquaculture development zones, although their exact nature will be dependent on the scoping work conducted, and business cases developed.

The development of further aquaculture development zones is consistent with the State Government election commitment to “identify future locations for aquaculture development”.

Recent industry interest for the growout of marine fish in land-based facilities may require investigation of coastal and inland sites.

Recent technological and engineering advances in sea cage construction also make aquaculture possible in more exposed oceanic waters. Large areas of Commonwealth waters off the WA coast may be suitable for large-scale commercial aquaculture and in the future

may be essential to enable industry expansion. Federal legislation to allow aquaculture in Commonwealth waters is required and work is underway in this regard.

As part of the above initiatives to identify suitable sites and zones, DPIRD is exploring

options to develop a broad scale mapping tool that can assist prospective applicants when determining a suitable site for their proposal.

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Actions

1. DPIRD will finalise the South Coast Aquaculture Development Zone.
2. DPIRD will explore opportunities to establish new aquaculture development zones along the west coast and south coast of the State (including coastal land-based systems).
3. DPIRD will continue to liaise with the Commonwealth to progress the legislative changes to enable aquaculture in Commonwealth waters.
4. DPIRD is undertaking a project to identify areas of WA coastal waters suitable primarily for marine finfish aquaculture and coastal land-based systems. The outcome is to develop an interactive map available to the public, which identifies prospective sites based on specific criteria inputted into a GIS model.

Identify and facilitate training opportunities

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The scale of the existing industry and the current focus on commercial trials means that the demand for specialists trained in hatchery techniques is currently low. Industry has indicated that the primary need at a farm level is for operational staff that have some understanding of fish husbandry needs and techniques and are well qualified in practical marine operations including boat handling, occupational health and safety in a marine environment, and diving.

Currently formal aquaculture training courses in WA have low take-up by students and industry and the funding may be better invested in direct skills set training developed in consultation with industry.

There is a need to determine the specific training needs of industry to ensure that accredited courses deliver on these needs; can be easily accessed; and are cost effective. As a first step, DPIRD will undertake a Training Needs Analysis in consultation with industry, which will review the learning

and development needs for the aquaculture industry, including the requisite knowledge and skills, and how to develop them effectively. Its purpose would be to deliver appropriate and effective training that meets the needs of individuals and the commercial operators.

The Training Needs Analysis, which is being undertaken in collaboration with the Department of Training and Workforce Development (DTWD) and the Food, Fibre and Timber Industries Training Council, will include consideration for effective training requirements to build local capacity to support new business and jobs for Aboriginal people within regional WA.

Additionally, the attraction and retention of qualified technical and scientific aquaculture, aquatic animal health and marine science specialists prepared to live and work in regional WA is an issue that requires attention.



Actions

1. DPIRD will aim to establish a process between ACWA and DTWD to identify specific skills and training needed for industry and review Technical and Further Education college (TAFE) courses. As part of this process, DPIRD will undertake a Training Needs Analysis, including a focus on Aboriginal opportunities.

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Biosecurity & Fish Health

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Maintain biosecurity and fish health capacity

Maintaining a strong fish health capability is essential to provide confidence to investors and support the growth of the aquaculture industry. DPIRD has capacity to diagnose known diseases and identify emerging disease threats associated with aquaculture.

As the industry grows, the demand for specialist veterinarian and pathology services will increase. The Government committed \$1 million in funding and established a new fish health research laboratory at Waterman, boosting the capacity for providing fish health research services to industry, in conjunction with State fish health diagnostic capacity, which is delivered through the DPIRD Diagnostic Laboratories in South Perth.

It will be important that the diagnostic and the research teams work together to protect and support the emerging aquaculture industry. Close alignment with the University sector will also be required to maximise resources for this vital role.

Aquatic pests and diseases in general are a significant threat to WA's pristine oceans and rivers, and to our market access opportunities and lifestyle. DPIRD recognises the need for a robust biosecurity system to prevent the arrival and establishment of these pathogens and pests in WA waters. DPIRD aims to minimise the negative impacts of aquatic pests and diseases in WA through prevention, eradication, containment and targeted asset protection actions. In partnership with industry and community, resources will be targeted at the highest priorities for cost-effective and efficient management. DPIRD's focus is on prevention of aquatic pest and disease establishment, and continuous improvement of biosecurity practices. DPIRD also continues to work at a national level to further prevent the spread of pests and diseases.

Chemical use in aquaculture

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The use of agricultural and veterinary chemicals by the aquaculture industry is essential to support effective disease management, environmental management and animal welfare. It is therefore critical for the WA aquaculture industry to have Minor Use Permits in place to enable legal use of certain chemicals. This matter will be best resolved through a co-operative approach at a national level under leadership of the National Aquaculture Council and with the relevant jurisdictions.



Actions

1. DPIRD will maintain a strong fish health capability and monitor the service delivery capacity of fish health service against industry growth.
2. DPIRD will work with the aquaculture industry, other state agencies and industry representative organisations to put in place an efficient and cost-effective mechanism to enable access to chemicals for aquaculture use through Minor Use Permits.
3. DPIRD will maintain, and continuously improve, a robust biosecurity system to prevent the introduction and spread of pests and diseases.

3

Research & Development

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Maintain research & development capacity – including university alignment

DPIRD's Aquaculture Research and Development (R&D) Directorate has responsibility for aquaculture-related research on finfish and shellfish. The group also has responsibility for production of marine finfish juveniles to meet requirements of commercial industry, at least in the start-up phase of commercial activity, as well as oversight of the Albany Shellfish Hatchery. The Aquaculture R&D group is also working with universities, which are developing their research activities to be aligned with the DPIRD's strategic priorities.

Aquaculture R&D must be driven by industry requirements. Alignment with industry has occurred in recent times and the maximisation of efficiencies, optimisation in the use of available resources and equipment will continue to occur.

Future industry growth and the development of new aquaculture development zones will require R&D through development and testing

of production technology and systems. Additional aquaculture development zones are likely to expand the number of species of finfish and shellfish produced through aquaculture in WA. As a result, it will be necessary for DPIRD to provide support to the establishment of these species, as previously done for barramundi, yellowtail kingfish and a range of shellfish species.

Researching and building capability into the breeding and rearing of juveniles is necessary to provide support to industry in early production. The establishment of new aquaculture development zones is likely to require aquaculture activities in less protected waters as well as onshore, which requires greater research and product testing of other related technologies including sea cages. It is anticipated that such research would be conducted in collaboration with industry, similar to trials conducted for yellowtail kingfish off Geraldton, but that some Government support will be required.

DPIRD's shellfish research facility at Hillarys and its marine finfish hatchery in Fremantle are both fundamental in maintaining R&D capabilities to support the development requirements of the industry.

The DPIRD Aquaculture R&D Committee engages with industry to ensure research

priorities are co-ordinated. The R&D Committee also engages with organisations including WA Universities and the WA Marine Science Institute to identify available resources and expertise with a view to coordinating aquaculture research and optimising use of resources.



Actions

1. DPIRD will continue to engage with the industry to ensure its R&D and support activities continue to meet the development requirements of the industry.

4 Regulatory Framework

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Regulatory reform

Since 2016, DPIRD has actively been reviewing policies and processes to improve the regulatory environment. DPIRD continues to progress and refine recommendations from the Department of Finance 90-Day Regulatory Mapping and Reform Project for Aquaculture in WA, as well as identify and implement further initiatives.

Initiatives include an upgrade and expansion of the DPIRD website and an online management and reporting system. To address issues associated with administration, DPIRD will also explore the option of combining aquaculture licences and leases into one instrument to further streamline application processes and management functions.

As the industry develops and management and operational processes evolve, it

will be important to monitor, review and amend policy and processes to ensure the regulatory framework remains aligned with the requirements of the industry to optimise opportunities for continuing development of aquaculture in WA.

It is also important to have a regulatory framework that provides industry with confidence and certainty to support investment and innovation. Implementation of the *Aquatic Resources Management Act 2016* (ARMA) will support regulatory reform and streamline and assist in clarifying processes that may be unclear. It will be key in ensuring that there is a robust and effective framework, which includes increased flexibility in management, including the ability to transfer and amalgamate leases.

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Actions

1. DPIRD will continue working to complete the Reform Project recommendations and identify further areas (not limited to approval processes) where the regulatory framework can be simplified.
2. Implementation of ARMA will allow for better regulation and will address issues associated with security of tenure.
3. DPIRD will periodically review and amend policy and regulation as industry develops, in consultation with industry.

5 Infrastructure

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Hatchery & nursery

In Australia and internationally, it is common for governments to invest in hatchery and nursery facilities capable of supplying the initial requirements of developing industries for shellfish spat and finfish juveniles or fingerlings. In these cases, this initial government investment in capital has led to industry then taking responsibility for the further stages of commercial growout operations. In WA, although the intention is for these facilities to transition to being industry operated, they facilities will remain Government assets.

In Australia and internationally, it is common for governments to invest in hatchery and nursery facilities capable of supplying the initial requirements of developing industries for shellfish spat and finfish juveniles or fingerlings. In these cases, this initial government investment in capital has led to industry then taking responsibility for the further stages of commercial growout operations. In WA, although the intention is for these facilities to transition to being industry operated, they facilities will remain Government assets.

Government investment in the Albany Shellfish Hatchery, for example, was fundamental to the rapid increase of interest and investment in the shellfish sector, which now has the capacity

for significant growth in several regional areas of the State reaching from the north coast to Albany and Esperance in the south.

The DPIRD marine finfish hatchery at Fremantle provides the only supply of juvenile finfish in WA, as well as specific targeted research to meet industry needs. There is an urgent need for additional broodstock facilities and for a commercial-scale nursery.

The DPIRD marine finfish nursery to be established at Geraldton will grow small juvenile fish reared at Fremantle to a size when they can be stocked in sea cages in the marine environment. The nursery funded by Government will comprise one module capable of providing quantities of juvenile finfish to operators in the Mid West Zone and at other sites. The nursery is expected to be operational in mid-2021.

Government is also exploring options for a new hatchery to underpin long term growth with a more modern replacement for the existing Fremantle facility. Possible locations for a new hatchery are being scoped.

Feed mill

Currently, fish farmers in WA who require manufactured feeds have to import the product from Tasmania, Queensland or overseas with associated high transport costs and logistical difficulties. Growth of the sector in WA will ultimately be dependent on the establishment of a feed mill in the State, noting that building and operating a feed mill requires high investment for initial infrastructure and machinery set-up and subsequent recurrent expenditure to operate the mill, which requires skilled labour and professional management.

Existing feed mill operators in WA and interstate who currently manufacture diets for terrestrial animals have expressed some interest in expanding their businesses to include a line for producing aquaculture diets. There may be a case for some Government investigation and facilitation of this concept, which will reduce reliance on imported feeds. Funding may be provided through the Royalties for Regions program or possibly an incentive scheme such as tax concessions, if, for example, a case can be made for Government to part fund investment in capital equipment.

It may be worth exploring the option of a contract manufacturer producing dedicated feed for each company at ingredient cost price plus a fee per tonne. Options include partnering with new technology companies and offering Government assistance to improve efficiency; and developing novel feed ingredients.

A study is needed to support the commercial feasibility of an aquaculture feed mill in WA, including supply chain and price analyses to test the competitiveness of the sector.

Other supporting infrastructure

As the industry grows there will be increasing need for land based infrastructure to support marine operations. This includes addition of breakwaters, boat ramps and jetties and port accessibility.



Actions

1. Government is injecting \$7 million over the next three years to help fast-track the growth of the Mid West aquaculture industry, which will address the urgent need for broodstock facilities and a commercial scale finfish nursery in Geraldton. The Nursery facility will breed and supply yellowtail kingfish to existing and new commercial operators, including those within the Mid West Aquaculture Development Zone, to grow in open water farms using sea cages.
2. DPIRD will investigate the potential for establishing a modern hatchery to better meet industry demands.
3. DPIRD will explore opportunities to support the establishment of an aquaculture feed mill in WA and facilitate discussion with existing feed mills and the aquaculture industry.
4. DPIRD will engage with the relevant Regional Development Commissions and industry to identify infrastructure requirements and develop proposals for their funding and establishment.

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Economic Development

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Economic feasibility and industry growth

Lack of information on economic feasibility can represent a risk to investment in aquaculture, particularly when undertaken in a remote area subject to a high-cost environment, or where exposure to tropical storms is an added risk, whether real or perceived. The Government will explore opportunities to undertake economic modelling on trial and commercial projects, to guide internal decision-making processes (for example, when assessing licence applications and the allocation of scarce resources) and to provide information and financial analyses to industry on production and supply chain issues.

Aboriginal communities have demonstrated increasing interest in the benefits that sustainable aquaculture development would provide for their communities. The Aboriginal Economic Development (AED) function within DPIRD aims to unlock significant and impactful regional Aboriginal economic development opportunities. It builds local capacity and supports new business and jobs for Aboriginal people through primary industries and strategic regional projects.

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Identify and facilitate domestic and international market opportunities

Market development activities need to focus on identifying and cultivating potential investment interests and promoting the development opportunities available in WA, including Aboriginal economic development. This will assist in refining industry development strategies and guide future investment decisions.

Government has committed to improving WA's profile both domestically and internationally through Invest and Trade WA, which aims to promote WA to attract appropriate foreign investment and create international trade demand for goods and services. Invest and Trade WA is a new Government agency that will identify and attract new investment and

innovation, unlocking economic growth and creating new industries. The WA Government will seek to establish a distinct brand and strong marketing campaign to attract increased investment. The WA Government will target key Asian nations attracting appropriate foreign investment stimulating the economy. Linking in with these agencies will assist the aquaculture industry to promote a premium market position. Some of the aquaculture species being developed (or currently under consideration) are mainly premium products whilst others will need to offer sufficient, meaningful differentiation from their competitors to support such pricing variation.

Building trust and community support

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Building trust and community support is a concept and practice that emerged in the mining sector to improve community industry relations, but is now spreading to other sectors including aquaculture.

To build and retain trust and community support, the aquaculture industry as a whole must actively engage with their communities to address trust and resultant social license to operate issues. Creating linkages between industry bodies, media and government is

important to maintain trust and community support to operate.

As the industry body for aquaculture in WA, ACWA will be integral in providing strong leadership and representation for industry and continued liaison with DPIRD to provide support throughout the implementation of the Aquaculture Plan.



Actions

1. DPIRD will undertake analyses of economic feasibility of aquaculture projects to assess investment options and opportunities and potential returns to the State and community, including opportunities to support Aboriginal economic development.
2. DPIRD will utilise the Invest and Trade WA agency to work to improve WA's profile and market access domestically and internationally.
3. DPIRD will explore opportunity for industry growth partnerships in the aquaculture sector (e.g. value- adding or access to premium markets through collaboration with industry to better position its products domestically and internationally).
4. DPIRD will support industry in attaining and maintaining trust and community support to operate through continued promotion of positive media opportunities and collaborative working relationship with ACWA.

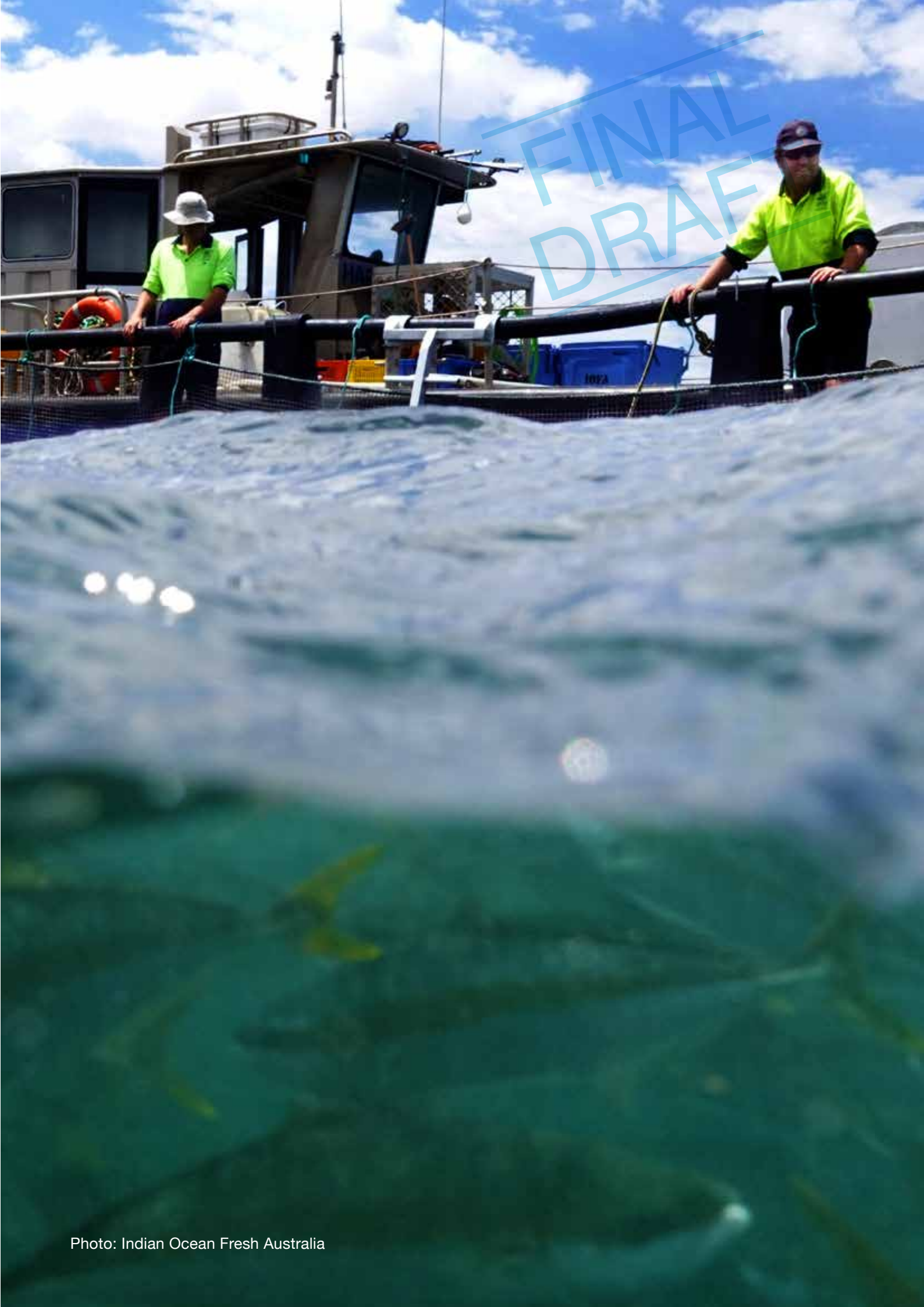


Photo: Indian Ocean Fresh Australia

Foundations overview

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1

Strategic planning, management and coordination

-  Maintain and review WA Aquaculture Development Plan
-  Identify suitable sites and investigate potential for new zones
-  Training opportunities

2

Biosecurity and fish health

-  Maintaining DPIRD fish health capacity
-  Chemical use in aquaculture

3

Research and development

-  Maintain research & development capacity

Estimated timeframe

- Ongoing
- Short term
- Medium term
- Long term

*Some actions may require business case development and dedicated funding support.

4

Regulatory framework



Red tape reform, including implementation of the Dept. of Finance Red Tape Review

5

Infrastructure*



Establishment of a nursery (Geraldton) and planning for a new modern government hatchery



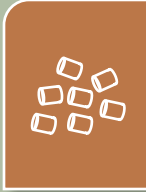
Feed mill preliminary discussions



Identify other supporting infrastructure



Building works – new modern hatchery



Existing feed mill to incorporate aquaculture pellets

6

Economic development



Economic feasibility & industry growth



Building trust & community support



Market opportunities (domestic & international)

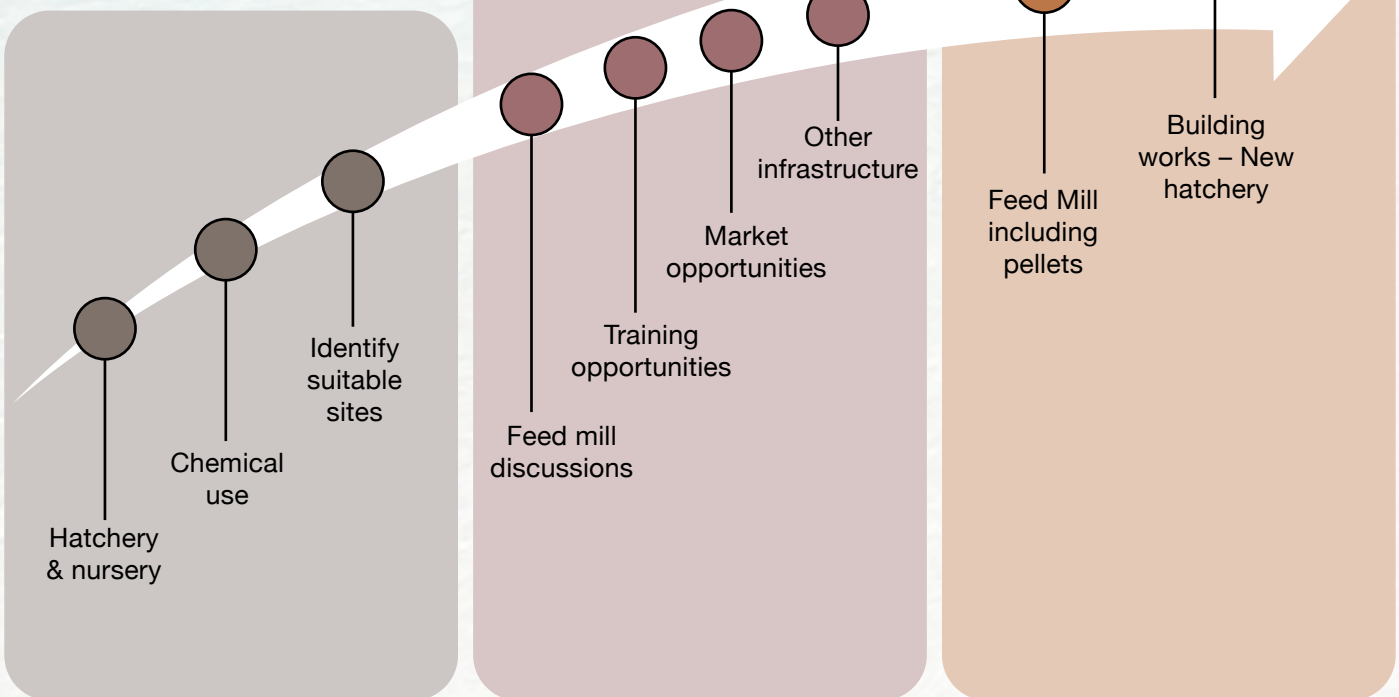
Foundations Timeline

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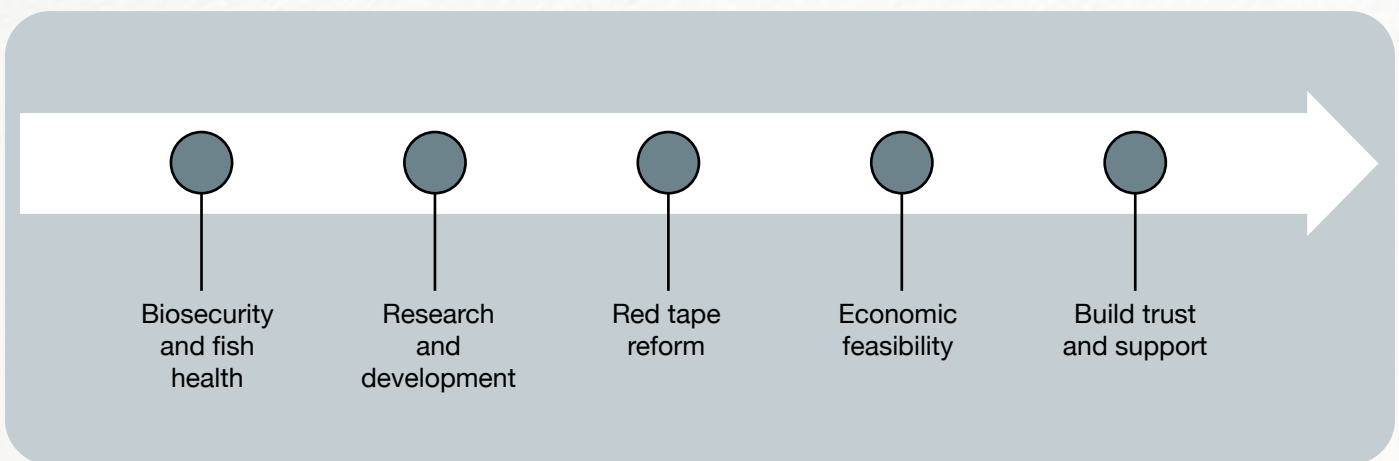
Long term

Medium term

Short term



Ongoing



Actions

Summary of priorities and actions

Actions are defined as: Short term – six months to three years; Medium term – three to five years; and Long term – five to 10 years. Some actions are defined as ongoing, meaning they are relevant for the life of the Aquaculture Plan.

DPIRD will be responsible for implementation of this Aquaculture Plan in consultation with ACWA and other relevant agencies.

Ongoing actions – Relevant for the life of the Aquaculture Plan

Priority: Maintain biosecurity and fish health capacity

Foundation: Biosecurity & Fish Health

- Actions:
- DPIRD will maintain a strong fish health capability and monitor the service delivery capacity of fish health service against industry growth.
 - DPIRD will work with the aquaculture industry, other state agencies and industry representative organisations to put in place an efficient and cost-effective mechanism to enable access to chemicals for aquaculture use through Minor Use Permits.
 - DPIRD will maintain, and continuously improve, a robust biosecurity system to prevent the introduction and spread of pests and diseases.

- Barriers:
- Challenges within the regulatory environment.
 - Biosecurity risks.

Priority: Maintain research and development capacity – including university alignment

Foundation: Research & Development

- Actions:
- DPIRD will engage with the industry to ensure its R&D and support activities continue to meet the development requirements of the industry.
- Barriers:
- Challenges within the regulatory environment.
 - Biosecurity risks.

Ongoing actions – Relevant for the life of the Aquaculture Plan (continued)

Priority: Regulatory reform

Foundation: Regulatory Framework

- Actions:
- DPIRD will continue working to complete the Reform Project recommendations and identify further areas (not limited to approval processes) where the regulatory framework can be simplified.
 - Implementation of ARMA will allow for better regulation and will address issues associated with security of tenure.
 - DPIRD will periodically review and amend policy and regulation as industry develops, in consultation with industry.

Barriers:

- Challenges within the regulatory environment.

Priority: Economic feasibility and industry growth

Foundation: Economic Development

- Actions:
- DPIRD will undertake analysis of economic feasibility of aquaculture projects to assess investment options and opportunities and potential returns to the State and community.

Barriers:

- A generally remote and high cost environment.

Priority: Building trust and community support

Foundation: Economic Development

- Actions:
- DPIRD will support industry in attaining and maintaining trust and community support to operate through continued promotion of positive media opportunities and collaborative working relationship with ACWA.

Barriers:

- Acceptance from local communities and other stakeholders.

Short term – six months to three years

Priority: Nursery (Geraldton)

Foundation: Infrastructure

Actions:

- Government is injecting \$7 million over the next three years to help fast-track the growth of the Mid West aquaculture industry, which will address the urgent need for broodstock facilities and a commercial scale finfish nursery in Geraldton. The Nursery facility will breed and supply yellowtail kingfish to existing and new commercial operators, including those within the Mid West Aquaculture Development Zone, to grow in open water farms using sea cages

Barriers:

- A generally remote and high cost environment.

Priority: Chemical use in aquaculture

Foundation: Biosecurity & Fish Health

Actions:

- DPIRD will work with the aquaculture industry, other state agencies and industry representative organisations to put in place an efficient and cost-effective mechanism to enable access to chemicals for aquaculture use through Minor Use Permits.

Barriers:

- Challenges within the regulatory environment.

Priority: Identify suitable sites

Foundation: Strategic Planning, Management & Coordination

Actions

- DPIRD will finalise the South Coast Aquaculture Development Zone.
- DPIRD will explore opportunities to establish new aquaculture development zones along the west coast and south coast of the State (including coastal land-based systems).
- DPIRD will continue to liaise with the Commonwealth to progress the legislative changes to enable aquaculture in Commonwealth waters.
- DPIRD is undertaking a project to identify areas of WA coastal waters suitable primarily for marine finfish aquaculture and coastal land-based systems. The outcome is to develop an interactive map available to the public, which identifies prospective sites based on specific criteria inputted into a GIS model.

Barriers:

- Few sheltered and suitable coastal marine sites.

Priority: Planning for proposed new modern hatchery

Foundation: Infrastructure

Actions:

- DPIRD will investigate the potential for establishing a modern hatchery to better meet industry demands.

Barriers:

- A generally remote and high cost environment.

Medium-term – Three to five years

Priority: Feed mill discussions

Foundation: Infrastructure

Actions:

- DPIRD will explore opportunities for establishment of an aquaculture feed mill in WA and facilitate discussion with existing feed mills and the aquaculture industry.

Barriers:

- A generally remote and high cost environment.

Priority: Identify and facilitate training opportunities

Foundation: Strategic Planning, Management & Coordination

Actions:

- DPIRD will aim to establish a process between ACWA and DTWD to identify specific skills and training needed for industry and review Technical and Further Education college (TAFE) courses. As part of this process, DPIRD will undertake a Training Needs Analysis, including a focus on Aboriginal opportunities.

Barriers:

- Perceived lack of integration in aquaculture training.

Priority: Identify and facilitate market opportunities

Foundation: Market Capability

Actions:

- DPIRD will utilise the Invest and Trade WA agency to work to improve WA's profile domestically and internationally.
- DPIRD will explore opportunity for industry growth partnerships in the aquaculture sector (e.g. value-adding or access to premium markets through collaboration with industry to better position its products domestically and internationally).

Barriers:

- A generally remote and high cost environment.

Priority: Other supporting infrastructure

Foundation: Infrastructure

Actions:

- DPIRD will engage with the relevant Regional Development Commissions and industry to identify infrastructure requirements and develop proposals for their funding and establishment.

Barriers:

- A generally remote and high cost environment.

Long-term – Five to 10 years

Priority: Building works for new modern hatchery and research facility

Foundation: Infrastructure

Actions:

- Following the outcome of the planning stages of a new hatchery, DPIRD will manage the contracts for the building works for establishment.

Barriers:

- A generally remote and high cost environment.

Priority: Feed mill (facilitation of an existing mill to incorporate aquaculture pellets)

Foundation: Infrastructure

Actions:

- Depending on the outcome of planning discussion, DPIRD will liaise with feed mills to implement the availability of aquaculture pellets from feed mills.

Barriers:

- A generally remote and high cost environment.

Review

The Aquaculture Plan will be reviewed after short term, medium term and long term milestones (three years, five years, 10 years) or as it progresses based on achievement of milestones and any need to amend it based on need and the status of industry growth.

An annual update on the actions will be provided to the Jobs and Economic Diversification Cabinet Sub Committee; and ACWA. The Director General, DPIRD may also convey an annual meeting to brief relevant Directors General on progress.

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