PROGRAM EVALUATION

Evaluation of Aquaculture Program
Executive Summary

This publication is part of a series summarising program evaluations to enhance the accountability and transparency of NSW Department of Industry activities. The completed program evaluation template is attached.

The Aquaculture Program

The Aquaculture Program (hereafter the Program) sits within the broader management of NSW fisheries and aquatic resources, which aims to prevent unregulated access to the state’s fisheries resources and the degradation of aquatic habitat values. The Program promotes sustainable growth and development within the NSW aquaculture industry whilst regulating the industry through a lease and permit system to reduce negative impacts on the environment and other used or the shared resource.

The Program involves four integrated business units. These include: aquaculture management, aquaculture administration, aquaculture research and aquaculture compliance (a component of Fisheries Compliance).

Objective

The State’s fishery resources are a shared natural resource and are often associated with market failure. For example, phytoplankton is utilised by shellfish aquaculture operations such as mussels and oysters, but the use of this resource by one operator would impact on the productive capacity of other users, as well as on wild population of mussels, oysters and other filter feeding organisms.

The objective of the Aquaculture Program is, therefore, to promote business development in the aquaculture industry whilst conserving and sharing the fisheries resource for the benefit of present and future generations. This is consistent with the state priority of strong jobs and growth; and the DPI Strategic Plan 2015-2019 outcomes of Economic growth through innovation that improves resilience and boosts productivity.

Options

The alternative options for pursuing the objective that were considered in the evaluation of the Program included:

- the existing program with an annual budget of approximately $4.5 million;
- a streamlined program that would simplify administrative processes to reduce costs for new businesses; and
- an industry led, self-regulated, approach to aquaculture management with an industry code of conduct and the transfer of select functions to Biosecurity NSW, Roads and Maritime Services, Local Government, the Department of Planning and Environment and to Crown Lands.

Assessment

NSW Department of Industry program evaluations compare the efficiency and effectiveness of alternative options with that of the existing or proposed program. This involves an assessment of the costs and benefits of each option relative to the base case of ‘no program’ and, where these benefits and costs have been quantified, a comparison of the net benefit and benefit-cost ratio (BCR) of each option.
A qualitative assessment of options to achieve the stated objective was undertaken. The preferred option is Option 2 (the streamlined program). It is believed that Option 2 would achieve the stated objective while providing net benefits greater than those of the alternative options.

While the existing Program (Option 1) was assessed as providing a net benefit, the benefits were assessed as being lower than in Option 2 due to some administrative inefficiencies (e.g. a paper-based system to manage the lease and permit system) identified in the current program.

Option 3 involving the transfer of certain functions and industry led self-regulation was assessed as providing the smallest net benefit, or possibly a net cost.

Cost Recovery

The evaluation assessed the existing program pricing arrangements relative to the cost recovery principles outlined by the Productivity Commission in its 2001 Inquiry Report on Cost Recovery by Government Agencies.

Application of the Productivity Commission’s cost recovery principles to the existing Program indicates that current cost recovery measures, while via appropriate instruments, do not recover the appropriate amounts (i.e. they under-recover). The Commercial Fisheries and Aquaculture programs aim to develop a cost recovery policy that reduces the level of government subsidy and recovers a greater proportion of the administrative costs of managing industry regulation.

Performance Measures

Key performance measures and indicators measure program performance and progress towards meeting government policy objectives. They demonstrate how effective a program is in producing the required outputs and achieving the desired outcomes. Data collection for a small number of Aquaculture Program output and outcome performance measures that are not currently collected is proposed to commence soon.

The Program’s output measures include processing times of aquaculture transactions, the number of compliance checks undertaken, and the number or research projects completed.

Output measures:

- increased industry efficiency;
- number of leases; and
- qualitative survey on stakeholder satisfaction.

Outcome measures:

- production and productivity ($/ha);
- volume and value of farm gate production; and
- number of people employed in the industry (direct and indirect).

Future Evaluations

This is the first evaluation of the Aquaculture Program as part of the regular Departmental cycle of evaluations informed by the recently superseded NSW Government Evaluation Framework. The evaluation concentrated on the qualitative aspects of ‘formative’ evaluation to build capacity of program management to monitor program performance in the future - problem identification, program logic and KPI design. Under recent changes to the NSW Government Evaluation Framework, programs will be expected to carry out ‘outcome’
evaluation, measuring the causal impacts of a program’s activities. Data collection will be essential to enable an ‘outcome’ evaluation when the Program is next scheduled for evaluation under the updated Framework.
Attachment: Program Evaluation Template

<table>
<thead>
<tr>
<th>Division:</th>
<th>Department of Primary Industries - Fisheries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program (Current):</td>
<td>Aquaculture</td>
</tr>
</tbody>
</table>

**Step 1 Issue or Challenge and Objectives**

a. Describe the issue or challenge that the program aims to address. That is, why should the department intervene? What would happen in the absence of the program?

The management of NSW fisheries and aquatic resources aims to prevent unregulated access to the State’s fisheries resources and the degradation of aquatic habitat values. Unregulated activities have the potential to encourage unsustainable exploitation of fish and habitat resources that would quickly lead to a loss of fish stocks and conservation values ultimately resulting in a complete breakdown of ecological processes that support a healthy environment, a viable fisheries industry and the community enjoyment reliant on these natural resources.

The potential to over-exploit aquatic resources exists because they are ‘common pool resources’ (shared property that is ‘rival’ in consumption), creating an incentive for users to take what they can before the resource is taken by others. The management of aquaculture activities is an integrated subset of the overall management of NSW fisheries and aquatic resources. Multiple users of the aquatic environment can, without intervention, lead to over-exploitation and negative externalities, as well as inequitable access to the State’s shared natural resource.

b. Identify the groups that would be affected by the issue or challenge without departmental involvement (individuals, industry or community).

- NSW aquaculture industry: 298 oyster businesses utilising 2,815 hectares of public water land across 34 estuaries, and 135 land-based businesses utilising 1,500 hectares of private land.
- Associated industries: including seafood wholesalers, retailers, restaurants and other businesses that provide aquaculture produce and industry supplies.
- Seafood consumers who want access to fresh and locally sourced seafood (85% of seafood currently purchased in NSW is imported).
- Potential new investors for the aquaculture industry who, without government intervention, would not have access to expert advice and regulatory support to ensure success in developing a sustainable aquaculture business.
- NSW recreational fishing: approximately 1 million recreational fishers that benefit from stock enhancement and a sustainable aquaculture industry, and the associated businesses and regional economies that rely on the recreational fishing industry.
- NSW commercial fisheries: more than 1,000 commercial fishers who work with other associated industries to supply fresh seafood to communities across the State, as well as interstate and overseas markets.
- Users of the State’s aquatic resources for business purposes including licenced charter fishing businesses, dive charter businesses and other tourism operators that share the aquatic resource.
- Users of the State’s aquatic resources for recreational purposes including scuba divers and recreational boaters.
- Conservation groups and individuals concerned about appropriate fisheries and natural resource management issues that affect aquatic habitats, fish stocks and/or water quality.
- Aboriginal groups who utilise the State’s fishery resources for fishing activities and practices to meet...
their traditional and cultural needs.

- Coastal NSW communities that have an expectation of access, amenity, water quality protection, navigational safety and environmental protection.

c. Quantify the impact of the issue in the absence of departmental involvement - the severity of the issue should be demonstrated with quantitative data where possible on the significance and consequences of the issue or challenge in the absence of departmental involvement. If no such 'cost' estimate exists, proxy information can be provided to give an indication of potential 'scale', such as industry value of production.

Aquaculture is a growing industry in NSW and a major contributor to high quality seafood production. Aquaculture accounts for 44% of the State’s fisheries production. The industry contributes significantly to local and regional communities and supports more than 1,500 full and part-time jobs and. Table 1 identifies the main industries and groups that rely on a sustainable aquaculture industry and attempts to quantify the potential risks to these industries/groups in the absence of government intervention (i.e. the Aquaculture program).

Table 1: Estimated impact in the absence of the government intervention

<table>
<thead>
<tr>
<th>Industry/Group</th>
<th>Value ($ per annum)</th>
<th>Risks in the absence of government intervention</th>
</tr>
</thead>
</table>
| Aquaculture          | $60.6 million (gross value of aquaculture production in NSW in 2014/2015). (DPI, 2015) | - Reduced water and fisheries resource quality due to unsustainable practices.  
- Inequitable distribution of a shared fisheries resource.  
- Loss of economic benefit & employment particularly in regional areas.  
- Reduced aquaculture business development opportunities. |
| Commercial fisheries | $76.2 million (gross value of fisheries production in NSW in 2012/2013). (ABARES, 2014) | - Loss of fish stocks from reduced water quality & habitat values.  
- Loss of economic benefit & employment. |
| Recreational fishing | $1.6 billion (expenditure of adult anglers in NSW in 2012). (DPI, 2013)                | - Loss of fish stocks from reduced water quality & habitat values.  
- Loss of economic benefit for associated businesses and tourism.  
- Loss of recreational opportunities for the community.  
- Loss of fish stocking programs. |
| Conservation         | Intangible                                                                         | - Loss of fish stocks from reduced water quality & habitat degradation.  
- Impact of diseases/ pests  
- Loss of economic & environmental benefit.  
- Impacts on threatened and vulnerable species. |
| Tourism              | Intangible                                                                         | - Loss of water related tourism activities due to degraded amenity.  
- Loss of economic benefit & employment.  
- Loss of aquaculture related tourism and sales of local seafood. |
| Recreational boating | Intangible                                                                         | - Potential navigational hazards impacting on safety of waterways. |
| General public       | Intangible                                                                         | - Loss of economic benefit & employment particularly in regional areas.  
- Reduced water quality, habitat values and public amenity |
d. Describe who or what created the issue or challenge. Examples include specific industry participants (such as producers or consumers) and environmental factors (such as the effect of climate change).

Where the property rights over a valuable resource are not well defined, there exists an incentive for users to take what they can before other users take it and no incentive for any individual or industry to preserve the resource for the use of others. The aquaculture industry exhibits a common pool resource problem with respect to access to aquatic habitat that is exploitable for aquaculture production. Hence, use of the aquatic resource by one user reduces the ability of others to use it.

There are also other problems affecting the aquaculture industry in NSW, which fall into two categories.

Firstly, the oyster industry is a mature industry with low entry cost and high exit cost (partly due to regulatory requirements), leaving it with a large number of participants, highly variable margins and high numbers of low productivity businesses that have difficulty exiting. Administrative inefficiencies can place further time and monetary costs on already marginal businesses.

Secondly, industry production inefficiencies can have significant negative externalities effecting the environment and other stakeholders.

Intervention by government is therefore warranted to ensure aquaculture development does not cause and is not affected by degradation of water quality, the shared fisheries resource and habitat values. There are also international and national obligations to prevent and manage pest and disease incursions.

e. List current programs or legal instruments (provided by industry or any level of government) which aim to address the issue or challenge. Could these be altered to address the issue or challenge?

<table>
<thead>
<tr>
<th>Other Programs</th>
<th>Able to be altered?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Governments and the Department of Planning &amp; Environment</td>
<td>Yes - Councils could play a role in determining conditions of consent but only within their individual LGAs. Councils and the Department of Planning &amp; Environment however lack the expertise to provide detailed management and control of aquaculture industries to the level required to control impacts on the environment and aquatic ecosystems. Councils could provide greater incentives for investment and promotion of viable aquaculture industries through infrastructure development and proactive planning for aquaculture. Individual businesses and industries operate across multiple local government jurisdictions and require consistent regulation across all operations to maintain productivity.</td>
</tr>
<tr>
<td>NSW government agencies</td>
<td>No - The EPA’s focus and statutory role relates to pollution and does not include the broader range of management considerations required. The Office of Environment and Heritage and the Marine Parks Authority have no statutory function outside nature reserves and marine parks. Other agencies play restricted roles and many rely upon NSW DPI for expert advice. The majority of statutory administration for the NSW oyster industry is provided by NSW DPI – Aquaculture Management, NSW Food Authority and Crown Lands. The oyster industry has called for these functions to be combined to provide a</td>
</tr>
</tbody>
</table>
and Natural Resources, and the Office of Water also have statutory roles. NSW Marine Parks Authority plays a consultative role for aquaculture ventures within the State’s marine parks.

**Commonwealth agencies**

Aquaculture research programs run by Commonwealth agencies, other State agencies and the NSW aquaculture industry.

<table>
<thead>
<tr>
<th><strong>Commonwealth agencies</strong></th>
<th><strong>No</strong> - Many of these programs are struggling to meet the research needs of their own jurisdictions, do not conduct applied research, or have a research focus that is not relevant to NSW. Appropriate policy development for sustainable aquaculture development relies upon scientific evidence. There is an ongoing need to utilise science and research to address many sustainability and profitability issues affecting the NSW aquaculture industry.</th>
</tr>
</thead>
</table>

**Enforcement activities**

A range of NSW Government agencies provide on-water compliance and natural resource management functions including NSW Police Marine Area Command, NSW Roads & Maritime Services, NSW DPI (Fisheries Compliance and Marine Parks), the Office of Environment and Heritage (NSW National Parks & Wildlife Service and NSW Environment Protection Authority).

<table>
<thead>
<tr>
<th><strong>Enforcement activities</strong></th>
<th><strong>No</strong>. Many of these groups rely upon the expert advice of NSW DPI.</th>
</tr>
</thead>
</table>

**f. Identify who might benefit if action [such as the program being evaluated] is taken by the department.**

**Primary beneficiaries:**

- The NSW community benefits from the investment, employment and provision of local seafood.
- The NSW community and environment as aquatic ecosystems are used in a more socially responsible manner and aquatic related ecosystems are preserved.
- The NSW aquaculture industry which, without the provision of effective science-based management, would most likely face depleted resources and subsequent losses in viability and sustainability.
- Other groups identified in b) who have a shared interest in the sustainable management of the State’s fishery resources. All groups benefit from a well-managed aquaculture industry.

**Other beneficiaries:**

- Industries and individuals who benefit indirectly from healthy fisheries and aquatic habitats (e.g. tourism).
- Seafood consumers who want access to fresh and locally sourced seafood.
- The NSW community benefits from the State’s fishery resources being managed and protected for present and future generations.
- The aquatic environment and the various species that rely on healthy ecosystems.
- Bio-medical industries and energy companies taking advantage of products produced economically and sustainably from aquaculture (e.g. advances in algal extracts).

**g. Statement of Objectives: Determine whether there might be a role for the department in addressing the perceived problem (i.e. what high-level objective might a potential program achieve?)**

**Objective:** to promote business development in the aquaculture industry whilst conserving and sharing the fisheries resource for the economic benefit of the State.

**Policy Alignment:**

The Aquaculture Program directly meets:

- NSW Making it happen - State priority 2: Encouraging business investment.
- NSW Department of Primary Industries Strategic Plan (2015-2019):
- **DPI outcome – Economic growth through innovation that improves resilience and boosts productivity.**

**Market Failure:**
The State’s fishery resources are a shared natural resource and are often associated with ‘common pool resource’ market failures. Industry production inefficiencies can have significant negative externalities effecting the environment and other stakeholders. The potential to exploit fish stocks and aquatic habitat exists because they are ‘common pool resources’, which exhibit a high degree of rivalry in consumption but only a low degree of excludability. This means that, where the property rights over the resource are not well defined, there exists an incentive for users to take what they can before other users take it and no incentive for any individual or industry to preserve the resource for the use of others.

For example, phytoplankton is utilised by shellfish aquaculture operations such as mussels and oysters. Use of this resource produces **negative externalities** because its depletion by one operator would impact on the productive capacity of other users, as well as on wild population of mussels, oysters and other filter feeding organisms.

Negative externalities occur as operators, from an economic point of view, make decisions based on private benefits and costs. Any costs which are indirectly imposed on other operators (i.e. negative externalities) are not factored into the private decision-making process. This is the case in relation to issues like overstocking, inappropriate species selection, pollution, the introduction or spread of pests and disease, with costs partly or predominantly borne by other operators.

**Social Equity Goal:**
N/A
Step 2  Program Options & Design

Identify all potential options for achieving the objective, including those that least impede business activity.

<table>
<thead>
<tr>
<th>Option 1. The current Aquaculture Program</th>
<th>Description:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Under the current legislative framework, the Aquaculture program promotes sustainable growth and development within the NSW aquaculture industry whilst regulating the industry through a lease and permit system to reduce negative impacts on the environment and other users of the shared resource. To achieve this objective, the Aquaculture program is supported by four groups.</td>
</tr>
</tbody>
</table>

Aquaculture Management:

- Develops and maintains Aquaculture Industry Development Plans for lease, land and marine-based sectors, and:
  - Identifies areas where aquaculture is a priority outcome;
  - Secures resource access rights for present and future aquaculture operations;
  - Reduces red tape to encourage business investment;
  - Documents and promotes environmental, social and economic best practice;
  - Formalises industry’s commitment to environmental sustainable practices;
  - Provides a framework for the operation and development of a viable and sustainable aquaculture industry with a clear approval regime and up-front certainty for existing industry participants, new industry entrants, the community and decision makers;
  - Ensures that the requirements for aquaculture are considered in the State’s land and water management and strategic planning framework; and
  - Case manages investors.
- Develops policies to supplement the current legislation under which the NSW aquaculture industry is managed.
- Manages the State’s legacy portfolio of abandoned derelict aquaculture leases.
- Assesses new aquaculture lease and permit applications against environment sustainability criteria.
- Provides advice and support to new and existing stakeholders within the NSW aquaculture industry, to promote sustainable growth and development within the industry.
- Liaises with other branches of NSW DPI (e.g. Food Authority, Fisheries Compliance, Aquaculture Research), as well as other government agencies (e.g. Crown Lands) to ensure an all-encompassing approach to effectively managing the NSW aquaculture industry.

Aquaculture Administration:

- Issues aquaculture permits and aquaculture leases over public water land.
- Progresses lease/permit applications that are lodged under the Fisheries Management Act 1994.
- Manages the aquaculture lease tender project, where areas of public water land are offered to the NSW aquaculture industry via a competitive process.
**Evaluation of Aquaculture Program**

- Collects aquaculture production data and utilises these data to develop the annual Aquaculture Production Report publication.
- Manages the aquaculture accounts and debt management system, including the collection of fees that cover the administrative costs associated with the industry.
- Maintains a database of all aquaculture lease and permit holdings in NSW, an ArcGIS database of all aquaculture lease plans, and a register of all aquaculture permits held in NSW as per the FM Act 1994.

**Aquaculture Research:**

- Undertakes original research to promote sustainable aquaculture development.
- Provides scientific advice on matters affecting NSW aquaculture industry and fisheries biosecurity.
- Provides advice and support to new and existing stakeholders within the NSW aquaculture industry, to promote sustainable growth and development within the industry.
- Provides scientific advice to national and international goods and service providers servicing the NSW aquaculture industry.
- Liaises with other branches of NSW DPI (e.g. Food Authority, Fisheries Aquaculture management, Biosecurity), as well as other government agencies and research institutions to effectively encourage, direct and manage research for the NSW aquaculture industry.
- Manages the Aquaculture Research Advisory Committee and assists in the preparation of industry Research, Development and Extension (RD&E) plans and the dispersal of the industry research levy.
- Develops the NSW oyster industry breeding program.
- Directly supplies seed (spat and fingerlings) to support, develop and promote aquaculture sectors.
- Supports fisheries enhancement programs through fingerling supply.

**Aquaculture compliance (a component of Fisheries Compliance):**

Aquaculture compliance activities are designed to respond to non-compliance and include:

- Liaising with Aquaculture Management to formulate compliance responses.
- Providing, and training staff on, the development and maintenance of relevant work instructions and enforcement policy/procedures.
- Providing specialised plant and equipment (boats, devices, PPE) to ensure response capability across NSW.
- Undertaking formal inspections to verify compliance (triennial oyster lease inspections, aquaculture farm inspections on public water and private land), ad hoc inspections requested by Aquaculture Management in response to case management or in emergency situations).
- Investigating suspected breaches of permit/lease conditions.
- Issuing measures to encourage compliance without resorting to formal court action; for example, clean up notices, work plans - and penalty notices.
- Providing reports and briefs to management where notices have not been completed or undertaken subject to a lawful direction.
- Using sanctions where appropriate (e.g. prosecution).
### Annexures:

<table>
<thead>
<tr>
<th>Fisheries Compliance Unit Enforcement Policy and Procedure</th>
</tr>
</thead>
</table>

### Resourcing requirements:

Aquaculture is prohibited except in accordance with a permit (s.144 *Fisheries Management Act*); the fees charged vary according to the type of permit (see [Schedule of Aquaculture Fees 2015/2016](http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0010/639874/Fisheries-compliance-prosecution-policy-and-procedure.pdf)). The permit holder must pay an annual contribution for the cost of administration and research (s.156 *Fisheries Management Act*).

**Aquaculture Management:**

The current program cost $1.4 million; $0.8m of Budget funding and $0.6m of Industry funding (2015-16 budget allocation). It involves 5 Budget funded employees (4.5 FTE) and 7 Industry funded employees (5.7FTE).

**Aquaculture Research:**

The current program cost $3 million; $1.2m of Budget funding and $1.8m of Industry funding (2015-16 budget allocation). It involves 9 Budget funded employees (8.75 FTE) and 9 Industry funded employees. Research is conducted into areas of positive externalities such as reducing environmental impacts and linkages with other industries such water resource sharing, as well as on industry-focused productivity improvements.

**Aquaculture Compliance:**

A Supervising Fisheries Officer coordinates the Aquaculture Program compliance as a special project. This equates to about 20% of that officer’s time which pro-rata equates to around $28,000 p.a. Use of vehicles, boats and equipment are captured within these figures and included as overheads. The current program costs $0.56 million (based on 6800 hours per year/1672 annual Fisheries Officers hours) = ~4.08 FTE distributed across the state but concentrated on the coast and more so in areas of higher aquaculture activity. As the compliance activity is carried out as part of a broader compliance function, it is not cost effective to differentiate between programs and the costs are Budget funded.

### Governance arrangements:

Procedures and protocols as stipulated in the existing Departmental governance framework apply.

The Aquaculture program sits under the Fisheries NSW division of NSW Department of Primary Industries, within the NSW Department of Industry cluster. The Deputy Director General, DPI Fisheries is the divisional head. The Group Director, Commercial Fisheries & Aquaculture is the branch head and key decision maker for the Aquaculture program.

### Consultation strategy:

The Aquaculture program regularly consults with the aquaculture industry as part of its day-to-day business and works closely with peak advisory groups and representative industry groups. There are significant consultation strategies delivered during the development and review of the Aquaculture Industry Development Plans involving industry, other government agencies and the community.
**Existing or proposed program pricing strategy:**

The existing program pricing strategy involves recovering the cost of administration related to the issuing of aquaculture permits and leases, as well as the partial recovery of management programs. An industry research levy funds some key research activities, while a lease security contribution aims to cover the cost of lease clean-up in the case of the oyster industry.

Application of the Productivity Commission’s cost recovery principles to the existing Program indicates that the cost of aquaculture management should be recovered via a fee set at fully distributed cost. The pathway through the cost recovery decision framework is represented as 1, 2b, 3, 4, 6, 7, 10a, 11, 13a, 15, recommending provision with cost recovery via a levy on industry set at fully distributed cost (see Appendix A).

It is proposed that the Aquaculture program will move towards developing a cost recovery policy that reduces the level of government subsidy and recovers a greater proportion of management costs from the aquaculture industry.

Application of the Productivity Commission’s cost recovery principles to the existing Program indicates that the cost of aquaculture research should be recovered via a levy set at fully distributed cost. The pathway through the cost recovery decision framework is represented as 1, 2b, 3, 4, 9a, 10a, 10b, 11, 12, 13b, 14, recommending a levy on industry set at commercial cost (see Appendix A).

**Key performance measures:**

As per Fisheries NSW Business Plan 2015-16 the key for performance measure for Aquaculture is the value of aquaculture farm gate production. This is in-line with the NSW DPI Strategic Plan 2015-19 to see the overall value of primary production increase by 30%.

Output measures linking to outcome measures, which in turn link to the key performance measure of the value of aquaculture farm gate production are presented in Appendix B, and include:

*Output measures:*

- increased industry efficiency;
- number of leases; and
- qualitative survey on stakeholder satisfaction.

*Outcome measures:*

- production and productivity ($/ha);
- volume and value of farm gate production; and
- number of people employed in the industry (direct and indirect).

---

1 The recently developed program logic and program measures (see Appendix B) include a small number of Aquaculture Program output and outcome performance measures that are not currently collected. These additional measures would improve the monitoring and management of program activities. Data collection for these new performance measures is proposed to commence soon.
Evaluation of Aquaculture Program

Option 2. Streamlined Aquaculture Program

Description:

A recent review of the administration of the Aquaculture Program identified potential administrative processes that could be streamlined to reduce Program costs and the costs incurred by new (or potentially new) businesses in the aquaculture industry.

This option, therefore, proposes a streamlined Program that would continue to operate in a similar manner as outlined in Option 1 but with the additional streamlining activities that would further enhance the program’s ability to meet its overall objective of increasing investment and growth in the NSW aquaculture industry whilst conserving the shared fisheries resource for the benefit of present and future generations.

Additional streamlining activities would be:

**Reducing red tape and streamlining administrative services**

This activity will address program concerns by streamlining administrative processes to reduce time and monetary costs spent on already marginal businesses. This activity involves developing a one-stop-shop approach under the current Sustainable Aquaculture Strategies by identifying areas suitable for aquaculture and streamlining the approvals process for these areas. It is anticipated that a reduction in red tape would encourage business investment by reducing regulatory risk for potential investors. The creation of a new role within the program that is dedicated to industry development would provide potential investors with expert advice and a case management service that would ensure an efficient approvals process across multiple agencies/local Councils.

At present, the Aquaculture program relies on a paper-based system to manage its lease and permit system, which is considered inefficient by both DPI staff and the aquaculture industry. The implementation of an e-business system would improve efficiencies significantly by allowing growers within the industry to progress their lease/permit transactions online. This streamlining of administrative processes and reduction of red tape would encourage business investment by reducing regulatory risk and accelerating assessment processes. As part of this process, the current legislative framework relating to administrative processes would be reviewed and streamlined to further improve efficiencies. This is likely to include the integration of licence fees and levies, currently charged by the NSW Food Authority under the Food Regulation Act 2015, with those fees charged by the Aquaculture program under the Fisheries Management Act 1994, resulting in a streamlined accounts system for growers within the aquaculture industry. This would require a change to the finance system to support the integration effectively as the current system does not adequately support this regulatory integration.

**Identifying and seeking approval for marine lease sites**

This activity would address program concerns by streamlining administrative processes to reduce costs for new businesses. This activity involves providing industry development support to new businesses, which is anticipated to significantly increase the value of the industry. The NSW Marine Waters Sustainable Aquaculture Strategy, a research-based policy that will identify potential marine lease sites and streamline the approvals process for such sites, which will then be offered to potential investors via a competitive tender process, would also be further developed and promoted.

**Targeted Aquaculture Compliance**

This activity would address program concerns by streamlining administrative processes to reduce time and monetary costs spent on already marginal businesses by developing a simplified compliance audit program that would promote self-auditing and encourage the adoption of industry best practices as outlined in the Sustainable Aquaculture Strategies.
The creation of a role dedicated to Aquaculture Compliance would ensure that compliance issues are dealt with more effectively, thus minimising risks to the industry, local communities and the environment.

**NSW Oyster Strategy 2015**
This activity would address program concerns by developing strategies to reduce externalities resulting from inefficient production. Increased support for the industry implementation group (under the NSW Shellfish Committee) would prioritise and enact the recommendations outlined in the NSW Oyster Industry Strategy 2015. It is anticipated that such actions (as outlined in the recommendations) would attract investment to the NSW aquaculture industry, increase profitability, target research needs and halt production decline.

**Murray Cod RD&E Review and Workshop**
This activity would address program concerns by developing strategies to reduce externalities resulting from inefficient production by working with industry partners to organise an extension workshop for the Murray Cod industry in NSW. It is anticipated that the workshop would identify RD&E needs and outline future plans for industry development, which in turn would increase interest and investment for the industry. There is also the potential to host an international recirculation expert workshop to support industry development within the land-based sector.

**Socio-economic survey of aquaculture in NSW**
This activity would address program concerns by developing strategies to reduce externalities resulting from inefficient production by supporting an FRDC-funded socio-economic survey of aquaculture activities in NSW and downstream impacts. The survey would aim to examine employment, both within the industry, and downstream, as well as the financial impacts that aquaculture businesses have on local communities.

**Improved environmental monitoring platform for NSW**
This activity would address program concerns by developing strategies to reduce externalities resulting from inefficient production by supporting an application to implement an advanced real-time temperature and salinity monitoring system for major NSW oyster producing estuaries. The program would allow the amendment of salinity triggers governing oyster harvest areas, such that significant increases in the time estuaries are open to harvest will be achieved. Increase in oyster industry productivity and profitability.

**Yellowtail kingfish (YTK) fingerling supply**
This activity would address program concerns by developing strategies to reduce externalities resulting from inefficient production by promoting the development of a YTK industry in NSW through fingerling supply to commercial companies preparing to commence marine finfish production.

**Resourcing requirements:**
The resourcing requirements for this option would be higher than in Option 1, with the addition of two new roles as well as the funding required for the development of an online system. However it is likely that the benefits gained by both the aquaculture industry and the Aquaculture program in terms of improved efficiencies, reduced red tape, increased growth and investment within the industry would outweigh any such costs. Direct additional appointments needed to increase research outputs would be externally funded; however, additional general administrative load would be incurred.
Aquaculture Compliance:

Under this option there would be the same technical approach to compliance as in Option 1 but with a District Fisheries Officer grade position attributed to better co-ordinate aquaculture compliance activities across the state. The role of this position would also be to facilitate the Targeted Aquaculture Compliance component of Option 2 and drive the self-auditing and voluntary increase of industry best practices. This investment is designed to create appreciable efficiencies in enforcement while focusing on outcomes. The Aquaculture Compliance dedicated officer component would cost $119,025 p.a.\(^2\)

Over time this role would be expected to result in a no net cost increase to the program beyond Option 1 as compliance systems improve and less efficient compliance effort is reduced.

**Governance arrangements:**

As per Option 1.

**Consultation strategy:**

There may be some debate within the aquaculture industry about the distribution of costs and services as a result of the proposed changes, as well as any cost recovery measures that may be put forward to cover such costs. Internal consultation would need to be undertaken between the relevant branches of NSW DPI, to ensure that these factors are considered in the first instance. If the proposed changes are progressed, the department would need to consult with the aquaculture industry through peak advisory groups and representative industry groups.

The aquaculture industry has been requesting an efficient online system for some time and would most likely support this change to the Aquaculture program.

**Existing or proposed program pricing strategy:**

The pricing strategy would be similar to Option 1.

Current cost recovery measures would need to be revisited to ensure that any costs associated with the proposed changes are taken into consideration. The Commercial Fisheries and Aquaculture programs aim to develop a cost recovery policy that reduces the level of government subsidy and recovers a greater proportion of management costs from industry.

**Key performance measures:**

As per Option 1, but with increased focus on industry development, aquaculture compliance and administrative efficiencies

---

\(^2\) Base salary of District Fisheries Officer $97,163 (according to DPI AgCost salary system), plus another 22.5\% for on costs = $119,025.
<table>
<thead>
<tr>
<th>Option 3.</th>
<th>Industry self-regulation model</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td></td>
</tr>
<tr>
<td>Under this option, an industry self-regulation approach would be relied on to manage the impacts on common pool resources through instruments such as a code of conduct. All pest and disease research, regulation and emergency response activities are transferred to Biosecurity NSW. Marine impact management is transferred to the Roads and Maritime Services and NSW Marine Parks. Leasing of public water land is transferred to Crown Lands. All environmental impact assessments, planning and approval of new aquaculture activities are transferred to Local Government and the Department of Planning &amp; Environment for ad-hoc case by case approval. All research activities outsourced to other agencies and universities.</td>
<td></td>
</tr>
<tr>
<td>The risk of unsustainable practices occurring within the aquaculture industry would need to be accepted in this proposal and significant reductions in industry productivity would ensue through the loss of seed production and the improvements accrued through selective breeding.</td>
<td></td>
</tr>
</tbody>
</table>

| **Resourcing requirements:** |
| Much of the demand for resources would be transferred to other NSW DPI divisions. There would, however, be some reduction in resource demand for NSW DPI as a whole because of the transfer to other agencies and local governments spread across NSW. This would create a significant risk of higher overall costs through duplication of processes and activity. |
| There will also be greater costs borne by industry due to the need to develop active industry management processes. It is also likely that approval requirements of other agencies and councils would be enhanced to deal with the threats of unregulated aquaculture, which would burden industry with additional costs. |
| **Aquaculture Research:** |
| Transferring research needs to other NSW DPI divisions (e.g. pests and disease research to Biosecurity), other agencies or external research providers (Universities) would reduce resource demand on DPI but not necessarily reduce overall cost to government. It would significantly impact upon industry productivity through the loss of the oyster breeding program (which industry cannot sustain at this time) as well as the loss of production in developing sectors (Kingfish, pearls and flat oysters) that are dependent on DPI for seed supply. The quality of research delivered to industry would be reduced as the expertise and facilities found in house within DPI are not mirrored elsewhere in NSW or nationally. |
| **Aquaculture Compliance:** |
| There would be no activities performed by Compliance under this option. These costs would be transferred to other sectors of NSW DPI or borne by other NSW Government and local government departments and industry. |

<p>| <strong>Governance arrangements:</strong> |
| The proposed program would involve industry self-regulation and operations would be approved, regulated and supported by local government (when within Local Government Areas). Some aspects of operations would be regulated by the EPA and other agencies (as mentioned above). |</p>
<table>
<thead>
<tr>
<th>Consultation strategy:</th>
</tr>
</thead>
<tbody>
<tr>
<td>State-wide consultation could be carried out in some sectors with active peak industry organisations such as the oyster industry’s NSW Farmers Association, NSW Aquaculture Association and Freshwater Native Fish Association, Australian Prawn Farmers Association.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Existing or proposed program pricing strategy:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Councils and other agencies have pricing strategies in place; industry would need to assume responsibility for costs of self-management and the collection and expenditure of levies.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key performance measures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>As per Option 1 with amendments to ensure that industry, local councils and other agencies met sustainability and other key governance targets.</td>
</tr>
</tbody>
</table>
## Step 3  Options Assessment

Shortlist options by qualitatively listing below the benefits and costs of each option relative to the base case of ‘no program’. If the program contains sub-components, it may be easier to consider the benefits and costs of each subcomponent.

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs</th>
<th>Qualitative assessment of net impact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option 1. The current Aquaculture Program</strong></td>
<td><strong>Current budget allocation for 2015-16 includes $2.56m with an additional $2.4m of Industry funds. This involves 17.08 Budget funded employees (12.25 FTE) and 16 Industry funded employees (15.7 FTE). (Note: Data for employees for compliance are based on ~4.08 FTE based on hours worked by individual Fisheries Officers distributed across the state. Aquaculture compliance is concentrated in areas of higher aquaculture activity along the coast.</strong></td>
<td>The expected benefits exceed the costs of current program. However, inefficiencies within the program could be improved to maximise the benefits of the program (refer to Option 2). <strong>Ranking 2</strong></td>
</tr>
<tr>
<td>The benefits of this option include:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Viable aquaculture industry promoting economic growth and employment opportunities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Marine food sources maintained at sustainable levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Healthy levels of fish stocks and marine biodiversity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Reduced disease and pest outbreaks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• A reduction in abandoned aquaculture infrastructure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Equitable distribution of shared fisheries resource.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option 2. Streamlined Aquaculture Program</strong></td>
<td><strong>The same as Option 1 with the additional costs for:</strong></td>
<td></td>
</tr>
<tr>
<td>All benefits listed for Option 1, plus:</td>
<td>• The development of a new e-business system.</td>
<td>The expected benefits exceed the costs of this option. Higher initial costs are expected to be compensated for by larger, additional benefits. Therefore this is the recommended option. <strong>Ranking 1</strong></td>
</tr>
<tr>
<td>• Simplifying admin processes to improve efficiencies for both Government and Industry.</td>
<td>• The creation of two new full-time roles relating to Aquaculture Development and Aquaculture Compliance.</td>
<td></td>
</tr>
<tr>
<td>• Greater economic growth with increased investment and business development opportunities.</td>
<td>• Necessary changes to current systems, to streamline the accounts and debt management system.</td>
<td></td>
</tr>
<tr>
<td>• Improved regulatory compliance within the industry.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Option 3. Industry self-regulation model | The benefits of this option include:  
- Marine food sources maintained at sustainable levels.  
- Healthy level of fish stocks and marine biodiversity.  
- Reduced disease and pest outbreaks. | In comparison to the costs identified in Options 1 and 2:  
- Government costs would be reduced.  
- Industry costs would increase to support and contribute to self-management activities.  
- Potential increased costs associated with managing derelict lease areas (e.g. clean up costs for oyster leases can range from $10,000 to $100,000 per hectare).  
- Potential for significant cost to industry and local communities from aquatic diseases and environmental damage.  
- Loss of economic benefit and business development.  
- Potential inequitable distribution of a shared fisheries resource.  
- Immediate loss of industry productivity. | Short term benefits may still outweigh the costs; however, there is a high risk that longer term benefits would be reduced and costs will increase, resulting in an overall net cost from this option. Overall, benefits may outweigh costs, but to a much lesser extent than Options 1 and 2.  
**Ranking 3** |
Appendix A: Cost Recovery Decision Framework

1. **ACTION: Identify the nature of the issue that may potentially involve government intervention**

Then conduct a ‘market failure’/‘welfare’ test as follows:

2. **Market Failure:**
   - Are there participants in the market that have sufficient market power so as to artificially influence trade or price? (See Notes)
   - **Yes**
   - **No**

3. **Externalities:**
   - Are participants in the market imposing an unwanted cost on others not involved in the market transaction? (See Notes)
   - **Yes**
   - **No**

4. **Public Goods:**
   - Is the market failing to provide an adequate level of investment to address the issue identified above? (See Notes)
   - **Yes**
   - **No**

5. **Asymmetric Information:**
   - Does one party to a transaction have more or better information than the other party, thus creating an imbalance of power? (See Notes)
   - **Yes**
   - **No**

If market failure is present, government action may be justified (See Notes)

6. **No action required**

7. **ACTION: Devise a Proposed Government Program or Activity (if one does not already exist)**

The proposed intervention should be designed to overcome the specific market failure identified above (see notes), (the component parts of each activity/program should be considered separately through the remaining part of this diagram)

8. **Is it (or would it be) necessary to regulate for the provision of this activity/program?**
   - (e.g. to pursue impacters, establish industry levies, enforce compliance certification, etc.)
   - **Yes**
   - **No**

9. **Does the activity/program involve ‘Registration / Approvals’ or ‘Compliance / Enforcement’?**

10. **Is it (or would it be) appropriate to recover costs from the individual risk creator or individuals/firms?** (through a fee or fine, as opposed to recovering costs from an entire industry through a levy)

11. **ACTION: Conduct a Benefit Cost Analysis**

Only proceed with options in which benefits are greater than costs

12. **If the impacts of the issue in question lie solely within one sector or industry, the responsible funding party (government/levied industry) may decide for the proposed activity/program not to be provided. Otherwise…**

*Cost Recovery Components:
- A – Salaries & Out Costs
- B – Operating Expenses
- C – Overheads
- D – Return on Assets
- E – Profit Margin
Appendix B: Program Logic and Program Measures