FISHERIES OCCASIONAL PUBLICATION

REVIEW OF PEARL OYSTER HATCHERY POLICY

Phase II – Policy Direction

Prepared by the Pearling Industry Advisory Committee

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OPPORTUNITY FOR PUBLIC COMMENT

The paper “Review of Pearl Oyster Hatchery Policy Phase II Policy Direction” provides an initial information basis from which public comment and opinion may be derived. Comments are sought in relation to the paper from all stakeholders, including industry members, relevant interest groups and interested members of the public.

To ensure your submission is as effective as possible, please:
- Make it clear and concise;
- List your points according to the topic sections and page numbers in this paper;
- Describe briefly each topic or issue you wish to discuss;
- Say whether you agree or disagree with any or all of the information within each topic or just those of specific interest to you. Clearly state your reasons, particularly if you disagree, and give sources of information where possible; and
- Suggest alternatives to address any issues that you disagree with.

Your comments would be appreciated by 7 October 2005. Comments can be made electronically by emailing to ltaylor@fish.wa.gov.au or be made in writing to:

Mr Michael Smith
Chairman, Pearling Industry Advisory Committee
c/- Department of Fisheries
Locked Bag 39
Cloisters Square Post Office
PERTH WA 6850

All comments submitted will be considered by the Pearling Industry Advisory Committee in its determination of advice to the Minister for Fisheries in relation to a revised Pearl Oyster Hatchery Policy.
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SECTION 1  INTRODUCTION

The Australian pearling industry referred to in this document relates to the *Pinctada maxima* pearl oyster fishery, the overwhelming majority of which operates in Western Australia and Northern Territory.

The hatchery policy was introduced in 1992 within the following context:
(i) The Australian pearling industry was dominated by pearl production from wild stock pearl oysters taken by fishing off Western Australia.
(ii) Australia was recognised on the world market as the source of the largest volume of the highest quality South Sea pearls.
(iii) Australian pearl prices were being maintained on the basis of quality, luxury and rarity.
(iv) There was a need for growth in the production of Australian South Sea Pearls to occur in an orderly manner and to reflect market demand.
(v) There was an apparent likelihood of increased pearl oyster production from Indonesia and possibly other Asian countries from the utilisation of hatchery bred pearl oysters.
(vi) The potential for increased pearl production in Australia was considerable, due to improved farm management practices, second and third re-operations and the steady progress to full production by exploitation of the latent potential of current licence rights.

The key policy focus was to achieve an alternative supply of shell upon which to conduct the pearl culture process and to develop grow-out competence within the Western Australian pearling industry from the use of hatchery bred pearl oyster spat. It was clearly recognised that it was not economically justifiable for all licensees to have their own hatchery operation but it was felt that all licensees should have the ability to grow out spat. Hence the incentive was introduced allowing hatchery options to be converted to quota provided that the licensee could show that they had grown out the shell from less than 40mm.

The WA industry and Government, given the prevailing circumstances, took the overriding view that further growth in production of Australian South Sea Pearls must occur in an orderly manner, to reflect market demand. The hatchery policy allowed for control over the rate of expansion of total pearl production.

The number of annual hatchery options allocated to each licensee was selected by the application of two criteria:
- A number sufficient to justify the capital investment required; and
- A number not so large that the potential increase in pearl production would distort the market.

The number selected, 20,000 per licensee, was a compromise position as it was felt that any less would not provide sufficient incentive for producers to explore such a risky investment as hatchery development and any more would have distorted the supply and demand equation too much.
The policy was clearly designed to achieve the strategic position of having the ability, should it be required, to respond to increases in South Sea Pearl production of an equivalent quality to Australia’s production from other nations, whilst aiming to ensure the maximum economic benefit for both the pearling industry and the Western Australian community.

It must also be remembered that technologies have also been advanced significantly during the same period.

Genetic technology is now being developed to select superior *Pinctada maxima* lines for pearl oyster production. That work is being undertaken by several companies in association with academic and applied research institutions, as well as through commercial organisations.

Grow-out and pearl farming technology has also improved. There has been greater emphasis on understanding the biology and environmental requirements for successful spat production and there is now an improved understanding of environmental and management variables affecting farm sites. Australian pearl production remains unique in that each pearl oyster now has the opportunity to be seeded a second or third time, adding significantly to the economic efficiency of pearling operations and an improved size and range of pearls on the world market.

Western Australia remains the only pearling industry in the world with a sustainable wild pearl oyster fishery in pristine waters, ensuring quality in pearl oyster stock for seeding and hatchery broodstock purposes. Multiple seeding of individual oysters has provided Australian producers a differentiation point of larger sizes whilst maintaining high quality as well as the economic efficiency of maximising return from a pearl oyster.

The success of the industry under this policy in developing hatchery technology and improved husbandry techniques has been largely responsible for the substantial increase in production of South Sea Pearls in Australia since that time. It is the view of industry experts that the subsequent increase in supply has been one of the major contributing factors to the decline in prices for Australian South Sea Pearls over the last ten years.

The product that flowed from this policy was directly competitive with the industry’s existing output (as against the usually smaller sizes and lower quality of the majority of offshore production), increasing supply dramatically of high quality pearls above 10mm in size. At the same time, there was very little done by the majority of producers or the Government to effectively stimulate growth on the demand side of the equation.

There have been several requests for increases in hatchery quota levels during the time of the current policy but the Government has taken the view that its role is to consider the pearling industry as a whole, and not on the profitability or otherwise of individual operators.

The Government has made a commitment on more than one occasion to allow the hatchery policy to run its full course. It has also committed to a comprehensive and
thorough process for review of the policy due to the uncertainty about the impact of variations to hatchery quota units on the viability of the pearl markets. In the past, the Government has taken the view that increases in quota outside this review process would have produced significant risks to the entire Australian pearling industry.

The Government recognised that the quota management framework provided for transferability of hatchery options and quotas during the policy, allowing the operation of a secondary market. That secondary market allowed participants to make their own commercial decisions on matters such as operational scale and their economic viability within a framework of finite resources.

Following on from the conclusion of the National Competition Policy (NCP) process in March 2002 and expiry of the current hatchery policy due at the end of 2005, the Minister for Agriculture, Forestry and Fisheries, in liaison with Western Australia's Pearling Industry Advisory Committee (PIAC), approved in May 2004 a review process comprising three phases:

Phase I Statement of current hatchery options policy (which expire 31 December 2005), consisting of:
- A description and objectives of the current policy;
- The current status - conversions of options to quota, production levels under current quota, etc;
- Outcomes of the policy to date – including production levels, technology development, market and price stability; and
- Key issues for the future – including quota framework, demand/supply issues, certification, appellation.

Phase II Development of a draft Hatchery Policy Statement to identify and outline:
- The review of issues (as a summary of issues identified in Phase I above);
- Mechanisms for assessing the total quota level and determining new hatchery quota level;
- Allocation models for any increase in hatchery quota; and
- Proposed future policy direction.

The Phase II document was to be drafted by the Department of Fisheries with input from the PIAC and will be released for industry and public comment.

Phase III Development of a final Hatchery Policy Statement:
- The Hatchery Policy Statement is based on consideration of comments received in Phase II above and this will ultimately replace section 10 of the current Ministerial Policy Guidelines¹ and will need to be framed either as a Ministerial Policy Guideline and/or in legislation.

¹ ‘MPG 17 – Pearl Oyster Fishery’
### 1.1 Consultancy support to review process

This Phase II Hatchery Policy Direction document refers to the consultancy report on the public policy issues around variation to pearling quota entitled “Pearl Hatchery Quota – Issues, mechanisms and policy basis for the modification of pearl oyster hatchery quota in Western Australia” – prepared by consultants ACIL Tasman, Canberra for the Department of Fisheries, February 2004.

This document is available on the Department of Fisheries website at [www.fish.wa.gov.au](http://www.fish.wa.gov.au) for reference.

### 1.2 Current pearl quota units in Western Australia and the Northern Territory

<table>
<thead>
<tr>
<th>COMPANY NAME</th>
<th>Combined Wild &amp; Hatchery Quota Units</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Western Australian Licenced Pearl Quota Holders</strong></td>
<td></td>
</tr>
<tr>
<td>Arrow Pearls</td>
<td>45</td>
</tr>
<tr>
<td>Australian Sea Pearls</td>
<td>45</td>
</tr>
<tr>
<td>Blue Seas Pearling</td>
<td>45</td>
</tr>
<tr>
<td>Broome Pearls P/L</td>
<td>95</td>
</tr>
<tr>
<td>Clipper Pearls</td>
<td>37</td>
</tr>
<tr>
<td>Cygnet Bay Pearls</td>
<td>75</td>
</tr>
<tr>
<td>Dampier Pearls</td>
<td>35</td>
</tr>
<tr>
<td>Exmouth Pearls</td>
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</tr>
<tr>
<td>Fantome Pearls</td>
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<td>Hamaguchi Pearls</td>
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<td>Maxima Pearls</td>
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<td>Morgan &amp; Co</td>
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<tr>
<td>NorWest Pearls</td>
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</tr>
<tr>
<td>Paspaley Pearls</td>
<td>120</td>
</tr>
<tr>
<td>Pearls Pty. Ltd.</td>
<td>100</td>
</tr>
<tr>
<td>Roebuck Pearl Producers</td>
<td>75</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>922</strong></td>
</tr>
</tbody>
</table>

| **Northern Territory Licenced Pearl Quota Holders** |                                      |
| Arafura Pearls                      | 20                                   |
| Arrow Pearlling                     | 60                                   |
| Broome Pearls                       | 40                                   |
| Paspaley Pearls                     | 120                                  |
| South Sea Pearling                  | 80                                   |
| Tiwi Pearls                         | 40                                   |
| Toomebridge                         | 60                                   |
| **TOTAL**                           | **420**                              |
SECTION 2 SCOPE OF REVIEW

2.1 The Minister’s requests

On 25 March 2002, the Minister for Fisheries released the State’s summary of outcomes in response to the National Competition Policy (NCP) review of the *Pearling Act 1990*.

Outcome 14 stated that:

“The current hatchery options/quota policy will expire in December 2005. In view of this the Department of Fisheries is to review alternative strategies for managing hatchery quotas. This review should incorporate mechanisms for both the determination and allocation of quotas including an analysis of options for a more liberated, or market-driven, means of distributing additional quota units including possible auctioning”.

The State Government also announced in March 2002 that it was of the view that it was not in the public interest to deregulate supply at this point in time, but that there would need to be further consideration of the matter at the conclusion of the current hatchery policy in December 2005.

Industry and market circumstances have changed considerably in the pearling industry in recent times, meaning that any consideration needs to be given to the prevailing circumstances in order to ensure the appropriate policy outcome is achieved. In particular, the industry faces ongoing cost/price pressures because prices have declined considerably since their highs of the 1990s. The price decline has been exacerbated by recent high values of the Australian dollar against major trading currencies, particularly the US dollar and the Japanese yen.

On the cost side, the industry is continuing its focus on the cost of production and different methods of production, although at this stage there are no fundamental shifts in production technology on the immediate horizon.

Another pressure is the increasing competition for quality lease sites in Western Australia and the Northern Territory including competition for access to remote sites from tourism, recreational boating, mining and conservation interests.

In summary, the main changes in the industry include:
- Profits in the industry have declined substantially since the 1990s.
- There are increasing constraints on the industry with competition for quality lease sites in Western Australia and Northern Territory becoming intense.
- There is little evidence of major shifts in technology in pearl production that will lower costs at this time.

Phase I of the review of pearl oyster hatchery policy was finalised in November 2004 and released to pearling licensees under cover of a letter from the Executive Director dated 6 December 2004.
In liaison with the Pearling Industry Advisory Committee (PIAC), the former Minister for Fisheries, Hon. Kim Chance, had approved the format of Phase II of the review, which was to develop a draft hatchery policy statement.

In his letter dated 6 December 2004, the Executive Director stated that Phase II of the review would include:

a) An identification and review of issues as identified in Phase I;
b) Mechanisms for assessing the total quota level and determining new hatchery quota levels;
c) Identification of allocation models for any increase in hatchery quota; and
d) An outline of proposed future policy direction.

The new Minister for Fisheries, Hon Jon Ford, subsequently wrote to the Chairman of the PIAC in April 2005, indicating his support for the review process that was put into place by his predecessor. He also requested that the review examine the impact of removing hatchery quota limits within five years, under the appropriate circumstances. In his letter, the Minister requested that this be considered alongside the development of:

- An appropriate industry marketing strategy;
- An appropriate pearl farm lease pricing and allocation process; and
- Alternative policy options.
SECTION 3 MAJOR POLICY CHANGES

As a consequence of the new Minister’s request that the review examine the impact of removing hatchery quota limits within five years, the scope for Phase II of the hatchery review was extended to include the topic of whether hatchery quota restrictions should be retained or removed.

On reviewing the scoping paper, which set out issues to be dealt with in both a regulated or deregulated environment, the Pearling Industry Advisory Committee (PIAC) considered that it would be inefficient and ultimately confusing, to the public and industry, to consider all possible management framework matters in the Phase II hatchery review document.

The PIAC agreed that the issue of whether to retain regulation or move to deregulate should be considered immediately as the first review issue and that whichever path was preferred would need the stated support of the majority of industry if the process of review was to move to completion by end of 2005, as required.

It was agreed that it was necessary to establish the PIAC’s preferred model and to seek advice from the Minister and industry as to which policy direction – regulation or deregulation - should be developed in detail within the Phase II paper.

3.1 PIAC review considerations

The PIAC accepted that market circumstances have changed considerably in the pearling industry since the 1999 National Competition Policy (NCP) review of the Pearling Act 1990, with producers faced with prices that are almost half of what they were at that time of the NCP review. It is likely therefore, that the Australian market power may well be reduced.

However, it was noted that the changes in the Australian South Sea Pearl market do not automatically mean that there no longer be a policy of control over the rate of expansion of total pearl production. The Hatchery Policy, combined with the wildstock quota management from 1992, has been built around a policy of constraining growth in the production of pearls through controls in hatchery options and their conversion to hatchery quota.

In the Tahitian black South Sea pearl market, there has been a recent move to re-regulate the supply of pearls in order to support an improvement in market prices for their pearling industry by reducing over-production and rejecting the export of low quality pearls.

The PIAC has a clear understanding that existing pearling quota units, whether hatchery quota units or wildstock quota units, are now considered equal in the secondary market. Pearls produced from wild and hatchery oysters are deemed of equal marketable quality and value through supply chains.
In view of this, it seems appropriate that the regulatory management should change focus to the management of total first operation seeding rights of all pearl oysters, whether produced by hatchery or wildstock shell.

The PIAC was very mindful that any change in policy should not result in the current asset values in quota units being eliminated overnight, as this would have a seriously negative effect on the financial position of pearl producers and confidence of the financial sector.

The PIAC stressed the need to ensure that any variation in hatchery quota units considered the issue of equity across all pearl producers. It was noted that there are precedents across Australian fisheries for the need to vary access rights and other fisheries entitlements in an equitable way across all existing access rights.

An ability to preserve the status quo in the distribution of the existing equity must be achieved, whether through a market mechanism or an administrative decision mechanism for any variation in quota (i.e. must be proportionally across all existing quota holdings).

Current evidence suggests that the major cost of production of pearls is the pearl producing process itself. There is no differentiation in the quality of pearls produced from hatchery shell and wildstock shell at this point in time.

Logically any measure that varies the quota unit should deal with total quotas unit holdings of wildstock and hatchery shell and not one sector or the other separately.

The PIAC resolved that it was not practical to develop an accurate, quantitative evaluation mechanism upon which government could make regular decisions on the appropriateness of existing quota levels. The concern is that such a mechanism would expose government to constant criticism about the assumptions and model used to carry out the evaluation because it is likely to be very difficult to undertake such an evaluation with any degree of precision.

The difficulty in achieving a precise evaluation gain stems from the lack of sufficiently independent data, the lack of precision around pricing and quality of pearls and the lack of experience in a market driven largely by perception and fashion. In these real world circumstances it is hard to try to match future demand against time lags in pearl production. Industry, operating daily in the marketplace, is best placed to make these judgements.

In consequence to this, the PIAC took the view it is not the normal business of government to predict the supply and demand interactions at a domestic and world market level. It determined that it would be inappropriate for the government to be involved in such an assessment

The last major variation in quota occurred with the introduction of hatchery options in 1992. The success of the industry under this policy in developing hatchery technology and improved husbandry techniques (including ongoing improvements in multiple seeding of individual oysters) has been largely responsible for the substantial increase in production of Australian South Sea pearls since that time.
It is believed by many that the subsequent increase in supply has been one of the major contributing factors to the decline in prices for Australian South Sea pearls over the last ten years. This policy demonstrates just how difficult it is to make decisions on predicting production impacts with any degree of confidence.

The product that flowed from this policy was directly competitive with the industry’s existing output (as against the usually smaller sizes and lower quality of the majority of offshore production). The dramatically increased supply of high quality pearls above 10mm in size has taken place with very little done by the majority of producers or the Government to effectively stimulate growth on the demand side of the equation.

In view of the impact of decisions to vary quotas on prices (and therefore the profits of pearl licensees), it seems appropriate that decisions to changes to the supply levels (i.e. vary quota units) should be made by those who have the most to lose or gain from those decisions and who have regular interaction with, and feedback from world markets.

The PIAC recognises that industry should have the prime advisory role in determining the overall production level into the future where the principal issue is market impacts, rather than those of wild oyster resource sustainability.

A policy environment of control over the rate of expansion of total pearl production requires matching increases in supply with market growth and stimulating market growth through a range of strategies. In an unrestrained supply environment, industry and government run the risk of oversupply. This could result in a significant loss of market confidence and falling producer profits with compromises in pearl quality and international competitiveness flowing from cashflow or profitability pressure.

In a market driven primarily by consumer perception of pearls as a unique luxury item, this represents a high risk to Australian producers, which are currently operating at this luxury end of the market with high production end costs to deliver superior quality. The maximisation of industry profits in essentially an export-dominated industry ensures optimisation of return for the Australian economy.

The PIAC concluded that there was a need for the future policy to provide certainty, equity and remove any ambiguity regarding variations in quota units that tends to breed confusion and reduce confidence in investments. Investor confidence can only be built around certainty in future allocation decisions.

The PIAC resolved to recommend that the way forward be through continued restraint on the rate of growth of supply. This raises the issue of what allocation method to use, following a decision to increase the total first seeding rights.

In their 2004 report, consultants, ACIL Tasman\textsuperscript{2} set out that there is high risk in using auctions or price-based systems if government gets it wrong and purchasers pay too

\textsuperscript{2} Pearl Hatchery Quota – Issues, mechanisms and policy basis for the modification of pearl oyster hatchery quota in Western Australia – Prepared for the Department of Fisheries, February 2004.
much or too little for quota. Such a scenario could impact adversely on industry structure as well as its long-term viability.

ACIL did not support market mechanisms such as auctions due to the difficulties which arise, especially the case in regard to pearling hatchery quota where the community does not own the vast majority of the economic rents embedded in quota. This may raise the cost of production to Australian producers to the detriment of their competitive position and continue to leave scope for litigation.

The PIAC noted that while it was possible to vary quota units on a basis, other than by administrative decision, to do so would pose legal risks if there is either a diminution in the value, or change in the equitable distribution of first operation seeding rights, as a result of government policy changes. Any process to vary quota units that was not proportional to total quota holdings could be expected to be subject to substantial legal challenge.

The PIAC determined that future variation in quota units should be administratively allocated on a pro-rata basis, using the current combined wild and hatchery quota shares in industry today.

3.1.1 Legislative Support

For a strategy of control over the rate of expansion of total pearl production to accommodate market demand growth for Australian producers, there needs to be an improved legislative framework put in place on a consistent basis across the Northern Territory and in Western Australia.

There are many significant issues currently in train to improve the management of the pearling industry. Whilst current Western Australian pearling legislation does not preclude the maintenance of the ongoing policy of regulation, it needs to provide adequately for the formalisation of substantial proprietary interests in existing quotas and further improvements in the future.

These improvements need to be progressed to support the policy focussing on first operations seeding rights within Western Australian and Northern Territory legislation. The early introduction of a Pearling Management Bill, together with a complementary industry strategy facilitating market expansion with a focus on differentiating Australian produced pearls from those of the world market, is desirable. Complementary action by the Northern Territory is essential for the strategy to work.

In order to promote certainty in the industry, which is required for continued investor confidence, and to depoliticise the decision process as much as possible, it was recommended that legislation be developed to facilitate an administrative variation in first operation seeding rights.

Furthermore, the PIAC is of the view that the industry is best equipped to be the primary source of advice regarding the timing and volume of any variation in value of
quota units. Importantly, it is acknowledged that this approach would require an agreed set of business rules for attaining an industry consensus on the scale and time of future variation in quota values and therefore total production. The key principles for the business rules are set out in Attachment 2.

In considering the above issues the PIAC resolved unanimously:

That a regulated hatchery allocation model was the preferred industry model if industry consensus support could be established. The PIAC discussed the most workable model that would be likely to gain industry consensus and not be subject to legal challenge and settled on the following model:

1. **Regulated Model**

1.1 No new licences – except where a person or corporate entity acquires quota from an existing quota holder.

1.2 Changes to legislation to ensure that all future allocations are pro-rata and administratively allocated in line with combined current hatchery and wild quotas.

1.3 Industry to have a formal role of advising on timing and allocation of quota. The details of business rules would need to be determined by industry.

The PIAC also articulated the Deregulated Model, as follows.

2. **Deregulated Model**

The removal of hatchery quota limits, but the continued use of regulations to manage pearl farm leases, disease management and the harvest of wild shell.

Under this model, deregulation of hatchery quota is to occur over five years, following administrative allocation of quota pro-rata in line with combined current hatchery and wild quota holding.

The PIAC unanimously agreed that 'Option 1 – Regulated Model' was the most effective way forward.

The PIAC recommended that the two options be forwarded to the industry for advice on which option industry preferred before forwarding both the PIAC recommended preferred model and industry’s preference to the Minister for his decision as to which direction to develop in detail through Phase II of the hatchery policy review process.

The peak industry representative body, the Pearl Producers Association (PPA), hosted an industry meeting in Broome on 13 May 2005 to which all Western Australian licensees were invited to attend to allow consideration of the PIAC request for advice on which option industry preferred. The PPA responded in writing on behalf of participants, representing 15 of the 16 pearling licences issued in Western Australia,
advising of a unanimous resolution that industry supports Option 1 (a well managed industry operating under a policy of control over the rate of expansion of total pearl production) as the preferred model based on the key principles of:

- Certainty and equity;
- Consistency in approach to pearling management and variations in quota across jurisdictions; and
- Appropriate mechanisms for setting and adjusting levels of production.

The PIAC forwarded to the Minister for Fisheries its preferred 'Option 1 (the Regulated Model)', noting that industry’s option preference was established through the industry process outlined above, and requested the Minister’s decision as to which direction to develop the policy in detail through Phase II of the hatchery policy review process.
SECTION 4  MINISTER'S DECISION ON POLICY DIRECTION

The Minister for Fisheries, Hon Jon Ford, MLC first responded on 27 May 2005 to the PIAC request by supporting the PIAC and industry preferred model to maintain a policy of control over the rate of expansion of total pearl production as per Option 1 (see Minister's letter, Attachment 1).

The Minister, in the advice of his decision on policy direction, sought a range of information from the PIAC and the industry to assist in the support of the public policy position, requesting:

- Information that will enable him to report to Cabinet that the ongoing policy of control over the rate of expansion of total pearl production is necessary to sustain value in the industry and the value generated for the community.
- Information from the industry to assist with decision-making regarding the variation in the number of pearl oysters per unit of quota from time to time including:
  - The degree to which Australian production remains differentiated from other South Sea pearl products.
  - The extent to which industry has participated and cooperated in various programs to expand market demand, for example a strategy of appellation.
  - The ongoing profitability of industry in broad terms (use of the word “profitability” in this context relates to the returns of the overall performance of industry rather than individual companies).
  - General trends in technology, business pressures and other costs.
  - Information on international competitors.

The Minister’s response was considered by the PIAC in early June, recognising that the Minister must be confident that he is making decisions necessary to sustain value in the industry and the value generated for the community and not to protect inflated profits.

The PIAC has developed the Phase II Policy Direction document to be presented for public, industry and government consideration based on the policy to maintain a control over the rate of expansion of total pearl production for the Australian pearl industry.

4.1 Summary of review

The review raises six policy objectives to be addressed in the Phase II Policy Direction document.
The objectives are:

**Policy Objective 1** - to achieve a co-ordinated and consistent approach by the Northern Territory and Western Australian governments so as to achieve integrated management for both pearling industries.

**Policy Objective 2** – to establish a consistent framework for the determination of the appropriate level, and timing of variation in first operations seeding rights and clarify the role of the government and industry.

**Policy Objective 3** - to establish a set of consistent principles for the determination of the appropriate level, and timing of variation in first operations seeding rights.

**Policy Objective 4** – to assess the impact of any policy proposals arising from Phase II Hatchery Policy Direction report on the utilisation and availability of pearl farm lease sites.

**Policy Objective 5** - to assess the potential contribution to consolidated revenue from the proposals arising from this review.

**Policy Objective 6** – to identify strategies to expand market demand for pearls cultured in Western Australia and Northern Territory through the whole supply chain.

### 4.2 Policy objectives in detail

#### 4.2.1 Background

The main objective of the hatchery policy was to ensure industry development of hatchery techniques to provide an alternative source of pearl oyster stock.

Part of the government objectives set out in the current Ministerial Policy Guidelines No. 17 was that the hatchery policy should aim to ensure “the volume of Australian South Sea Pearls offered to the world market does not seriously alter the pricing mechanisms currently operating” so as to maximise the net economic, social and other benefits from pearling to the industry and the community.

A commercially viable and vibrant industry is in the better interest of the State and Australia as a whole and is most likely to be achieved by ongoing management of supply, as evidenced by:

- The price premium that Australian South Sea Pearls attract on the international market.
- The apparent elasticity of supply within Australia (that means that there is considerable capacity to grow production such that over-production could negatively impact on prices).
• The relatively inelastic demand for pearls sufficient to conclude that deregulation would still result in a net reduction in producer profits, if it were to occur in the current market (although it is noted that the elasticity of demand has increased in recent years.

Furthermore, a decision to remove the policy of control over the rate of expansion of total pearl production in Western Australia would be advisable only if:
• The quality, size and the price of Australia South Sea Pearls were broadly comparable to that of pearls grown overseas; and
• It was clear that any existing differential (favouring Western Australian production) in the quality and the price of pearls is being eroded at a rate which will mean there will be little difference in product grown locally and overseas in the near future; or
• The Northern Territory deregulated its pearl production;
• There was clear industry support for removal of the policy to restrain the rate of growth in supply.

An analysis of pearls grown in Australia compared to those grown overseas indicates that Australian pearls differentiate themselves from others through larger sizes, higher quality and therefore command higher prices and are likely to continue to do so for some time in the future, meaning removal of the policy of control over the rate of expansion of total pearl production is unlikely to result in a net economic benefit.

In their report of February 2004 the consultants, ACIL Tasman stated that the key public policy issues involved in a review of the hatchery policy are:
• Ensure the quota management framework is supported by a clear legislation framework;
• Ensure that economic efficiency is maximised in the quota management framework;
• Consider alternative mechanisms for setting the restriction of supply;
• Consider the basis for setting and altering the value of quota units over time; and
• If the value of quota units are to be varied, determine how should any variation in value of quota be allocated or withdrawn to ensure equity is maintained and to reduce potential litigation.

Policy Objective 1 - to achieve a co-ordinated and consistent approach by the Northern Territory and Western Australian governments so as to achieve integrated management for both pearling industries.

Any policy direction to sustain value in the Australian industry and the value generated for the Australian community through a policy of control over the rate of expansion of total pearl production will require a joint and consistent approach by the Northern Territory and Western Australian governments to achieve “whole of industry” management of the Australian pearling industry.

The Northern Territory manages its pearling industry under wildstock and hatchery quotas, in a manner similar to the Western Australian management system.
This consistent approach would best be achieved through:

- A Memorandum of Understanding (MOU) between the Northern Territory and Western Australian Governments, setting out common principles;
- Consistent pearling legislation and management frameworks;
- Consistent cost structures and pricing principles for the allocation of additional quota, pearl farm leases and management;
- Joint decision-making in relation to variation of quota unit values (either up or down), across both jurisdictions;
- Parallel quota management frameworks, and similar compliance regimes; and
- Joint involvement of Northern Territory and Western Australian jurisdictions in a single pearling industry advisory committee process reporting to respective Ministers.

4.2.2 Memorandum of Understanding Between Governments

It is proposed that the Government of Western Australia will enter into a Memorandum of Understanding (MOU) with the Government of Northern Territory to ensure, to the largest extent possible, consistent standards and policies to deal with management, compliance and industry development, including future pearl supply within a total quota framework and to capitalise on efficiencies and synergies that may be achieved through formalised cooperative arrangements.

Consistent with the proposed Western Australian industry quota management policy and complementary market demand growth strategy, there is a need to manage South Sea pearl production cooperatively with the Northern Territory, in order to maintain the integrity of supply management system in the Australian industry and thereby maintain its value to the industry and the community.

The Western Australian and Northern Territory Governments will need to align management measures, legislation, a consistent approach to variation of quota in each jurisdiction, consistent cost structures and pricing principles and a joint decision-making process in relation to variation of the number of pearl oysters for a unit of quota (either up or down).

4.2.3 Parallel and separate pearling legislation in each jurisdiction

With the introduction of the Pearling Act 1990, separate pearling legislation has been implemented in Western Australia, rather than incorporation of pearling provisions within the Fish Resources Management Act 1994. The PIAC and the Department of Fisheries hold the view that the hybrid nature of the pearling industry, (with fishing and aquaculture components supplying the live resource), based on a production system that produces an inanimate object (the pearl) rather than a living organism for consumption, the scale of capital investment, the history and distinct character of pearling and pearl farming, justified the retention of a stand-alone Act.
In addition, issues identified in the National Competition Policy review required legislative mechanisms that are unique to pearling.

The extent of the proposed changes calls for a new Act and Regulations, together with amended Ministerial Policy Guidelines, rather than amendment of the Pearling Act 1990, although longstanding management principles will be carried over to the new Act.

It is proposed that for these very same reasons a separate Pearling Act is desirable in the Northern Territory.

Having parallel legislation will assist in the development of complementary compliance regimes and quota management frameworks. Involvement of respective jurisdictions in the pearling industry advisory committee processes in each state or, ideally, a joint pearling industry advisory committee process will maintain the consistency.

| Policy Objective 2 – to establish a consistent framework for the determination of the appropriate level, and timing of variation in first operations seeding rights and clarify the role of the government and industry. |

There is a need for the future policy of control over the rate of expansion of total pearl production to provide certainty, equity and remove any ambiguity about possible variations in number of pearl oysters assigned to a unit of quota because this tends to breed confusion and reduce the confidence of investors. ACIL Tasman set out that in addition, these requirements remove the risks for governments, both in terms of litigation, compensatory risks and management.

4.2.4 Economic Return from the Pearling Industry

Maximising the economic returns to the industry and the community through an economic efficiency objective is the most relevant consideration in the case of setting an optimal supply level. Equity considerations that relate to how the wealth, or opportunities to earn wealth, are distributed among competing interests, is also a significantly relevant consideration for Government.

This is particularly the case for the pearling industry where quota entitlements have been established historically and in practise are treated as proprietary in nature. Substantial investment decisions have been committed within that quota management framework. Anything that seeks to change that framework other than on a proportional basis will add substantially to the risks of litigation.

Maximising the economic benefit involves maximising the surplus derived from a resource - consisting of the value placed on the output (what people are prepared to pay) less the costs of producing that output. Normally the benefits derived by Australian consumers of lower prices would need to be considered; however, as more than 90 per cent of the pearls are sold overseas the ‘consumer surplus’ considerations
are minimal. The maximisation of value in pearling is therefore solely derived from the collective profits of the Australian pearling industry.

Having said this, it is not in Australian pearl consumer’s interest to have falling world prices for pearls which will impact the level of their own investment in pearls and perception of their worth.

4.3 Policy principles of variations in pearl quota units

In their report into policy issues for the variations in number of pearl oysters assigned to a unit of quota, consultants ACIL Tasman\(^3\) considered that to achieve its objectives, the Government needs to follow certain principles governing the design of any policy. These are:

- Flexibility and adaptability (responsiveness to changing conditions including markets);
- Simplicity in administration and compliance (minimising unnecessary costs);
- Transparency and consistency (to minimise the cost of uncertainty); and
- Minimisation of the probability and therefore costs of litigation or disputation.

A set of consistent principles must be established upon which to determine the appropriate level of first operations seeding rights within the Australian pearling industry at any point in time and provide the basis for taking decisions to vary the level of those seeding rights.

To do this, the Minister for Fisheries has clearly outlined in his May 2005 letter to the PIAC (Attachment 1) advising of the government decision on direction for future hatchery policy, that he must be confident that he is taking decisions that are necessary to sustain economic returns in the industry and the benefits generated for the community and not only to protect the profitability of the industry.

One of the purposes of the policy of control over the rate of expansion of total pearl production approach of matching production to future demand is to provide some reassurance to the market that the supply of Australian pearls will not be unlimited. Such a perception by the trade and consumers, when associated with a good that is marketed as a rare luxury item, would cause prices to fall and this is likely to result in a fall in total revenue gained from the production of pearls.

This would ultimately reduce the economic benefit for the Australian community and pearl producers. Even in circumstances where the demand of pearls is relatively elastic and total revenue from pearl production increases under an unrestrained supply regime, this could still result in decline industry profitability.

In many other examples where industries have been unrestrained, (for example the domestic dairy industry), the subsequent reduction in profits of industry has been more than offset by the benefits of lower prices to consumers so the public interest has been served by removing the restriction on production. However, in the case of pearls,\(\)

\(^{3}\) Pearl Hatchery Quota – Issues, mechanisms and policy basis for the modification of pearl oyster hatchery quota in Western Australia – Prepared for the Department of Fisheries, February 2004.
the benefit to consumers is not a primary consideration, as they predominantly reside overseas. Anything that adds value through the supply chain in the hands of Australian producers will increase benefits to producers and thus to the Australian community.

Ideally the aim would be to set the quota at the exact level that maximises profits to industry. While this is ideal, it would be difficult to determine the exact optimal level of quota. A more realistic objective is to set the quota level such that supply grows over time, broadly in line with demand, in a way that does not cause prices to fall substantially.

The support for control over the rate of expansion of total pearl production ensures producers have the incentive to maximise the value of every pearl oyster used through raising the yield per oyster, minimising production costs and reducing the call on limited grow-out sites.

4.4 Variations in pearl quota unit

The review proposes that the total number of quota units (wild and hatchery) currently under management should not increase and that any decision to allocate additional first operation seeding rights will be through a legislative mechanism that allows for the variation in number of pearl oysters assigned to a unit of quota. This approach ensures government has a simple yet equitable process for adjusting the number of pearl oysters assigned to a unit of quota, up or down, dependent on the advice developed under the policy.

Regulations or Ministerial Guidelines can be developed to manage this function without the need to change legislation each time you amend unit value. This power currently exists where the quota unit value of wildstock is replaced by an ordinance (facilitated by a “Notice”) based on sustainability recommendations on total allowable catch. Similar powers exist to amend fees levels each year.

The 2004 ACIL Tasman review supports this position. ACIL Tasman noted that any quota variation formula must be demonstrably consistent with the objectives of the legislation under which the industry is managed. Governments have recognised that the variation of quota unit value is consistent with economic efficiency provided that the quota is freely tradeable and they have relied on this policy approach to produce efficient secondary market outcomes rather than the higher risk approach through adhoc decision-making.

The allocation of any form of rights can have significant impacts on the distribution of income or wealth across individuals in the community (see page 18 of ACIL Tasman report, February 2004). Courts have overturned allocations in fisheries on inequity grounds where equity has been measured in terms of changes in the relative economic position of individuals (refer AFMA v Graham (2003) FCA 231, Fischer v AFMA (2002) AATA 857).

Similarly the Australian Fisheries Management Authority Fisheries Management Paper No. 8 (FMP No.8) sets out that a body of legal case history in relation to
allocation of fishing concessions has been established both in Australia and overseas which demonstrates that fishing concession allocations resulting in a significant and differential economic impact on individual operators (which cannot be balanced against fisheries management objectives) run the risk of being successfully challenged.

FMP No.8 goes on to say that fishing concessions that exist at the time that management arrangements are proposed to change are the ones that will be taken into account under any allocation of concessions required by the move from one management regime to another.

4.5 Administrative decisions versus market mechanisms for allocation

ACIL Tasman recommends allocation to existing quota holders (wild and hatchery quotas combined) by administrative decision based on non-market considerations. They did not support market mechanisms such as auctions of quota units due to the difficulties which arise as to whom owns the value produced from pearling hatchery quota and other limitations. The auctioning of units of quota also raises the dilemma of the compensatory risk (usually for government) should market forces demand a reduction in production levels.

ACIL Tasman set out that there is high risk in using auctions or price based systems if government gets it wrong and purchasers pay too much or too little for quota which could impact adversely on industry structure as well as its long term viability. This is especially the case in regard to pearling hatchery quota where the community does not own the vast majority of the economic rents embedded in quota.

It is argued that from an economic perspective it is better to leave the value in quota in the hands of the existing industry where it will earn a higher rate of return rather than transferring a small proportion of it to the government through an auction. In situations where a substantial proportion of the value in the rights are owned by industry, governments should rely on clear, legislated, administrative allocation mechanisms leaving it to the secondary markets to ensure an efficient allocation of quota over time rather than attempting to sell the variation in quota levels. Moreover, provided the legislation is clear and decisions taken are both consistent with legislation and reasonable the risks of litigation can be minimised.

ACIL Tasman went on to set out that the choice of which administrative mechanism to use turns on four considerations:

1. The need to minimise litigation potential through minimising any significant changes in the relative economic position of individuals or significant changes in the distribution of existing income and wealth of stakeholders including the community.
2. The desire to maintain equity through minimising the impact on the relative wealth of existing producers.
3. The desire to minimise windfall gains through allocation outside the existing industry.
4. The need to minimise cost inefficiencies in the allocation method selected.
ACIL Tasman found that variation to quota units allocated to existing producers, on a proportional basis across all existing entitlements held (wild and hatchery quota), is entirely consistent with these considerations and also consistent with past approaches to allocating quota increases in other Australian fisheries and other industries. They found that once converted from the initial options a hatchery quota unit becomes identical in nature to a wild pearl oyster quota unit in the market, able to be sold and realise an increase in wealth.

It is expected that the total amount of quota on the market will also impact upon the expected supply of pearls and anticipated prices for pearls and therefore the market value of all quota. Any increase or decrease in hatchery quota unit value will have the same impact on market price for all quota and all quota holders are therefore exposed to the risk of a loss in the value of their existing quota holdings if both quotas were not combined for variation purposes.

The proportional allocation across all quota units in the fisheries sector has proven the most effective elsewhere in Australia to avoid unnecessary litigation costs and delays by eliminating arbitrary decisions through implementing legislation providing clear direction about how quota is to be varied and the variations allocated. Litigation detracts from the effectiveness of the policy and results in substantial costs to the regulator and the industry.

ACIL Tasman set out that the current quota holdings of the industry licensees are the result of trade in quota (options, hatchery and wild) incurring considerable investments in utilising that quota. A pro rata allocation across all quotas is consistent with current distribution of the industry and minimise the impact on the existing distribution of assets.

4.6 Capacity for new entrants

ACIL Tasman found that there is no barrier to entry for new entrants into the pearling industry as the secondary market exists and functions well, given that several new entrants have acquired entry through the purchase of existing quota units with quota price accepted as a cost of entry to the industry along with other capital costs.

It has been argued that new entrants who must purchase quota through the secondary markets do not receive the “windfall gains created for the initial allocatee of that quota. In their report, ACIL Tasman establishes that the initial allocations were made in exchange for significant investment commitments by industry in infrastructure, technology, personnel and market development which have produced the bulk of the current value in the hatchery quota. The gains are therefore arguably not in the nature of a windfall gain, but a return on the risk capital invested in the process of converting hatchery options.

The legislative power to establish a mechanism by which regular decisions could be made is also less likely to be challenged through the courts and provide a more consistent framework for allocation.
The PIAC came to the conclusion that development of a mechanism by which regular decisions could be made by Government on the appropriateness of existing levels of first operation seeding rights is not easily achievable and therefore could be open to constant criticism due to imprecision. Industry is best equipped to be the primary driver with regard to the information base, timing and volume for any variation in value of quota units as they are best placed with regard to the market sensitivities and most at risk from such decisions.

The provision of information from the industry to assist with a decision around any variation in the number of pearl oysters for a unit of quota from time to time should include:
1. The degree to which Australian production remains differentiated from other South Sea pearl products;
2. The extent to which industry members have participated in various programs to expand market demand, for example a strategy of appellation;
3. The ongoing rate of return for industry capital invested in broad terms;
4. General trends in technology, business pressures and other costs; and
5. Information on international competitors.

This type of information will assist the Minister to understand that the industry continues to be progressive, has commitment to expanding the market and continues to maintain a competitive advantage through quality pearl production within the international context. Whilst it does so, it is in the Northern Territory and Western Australian governments’ interest to continue to support the policy of control over the rate of expansion of total pearl production (Option 1).

| Policy Objective 3 - to establish consistent principles for the determination of the appropriate level and timing of the variation of the level of first operations seeding rights. |

Industry annual production and relevant financial information is to be gathered by way of statutory declarations provided by pearling licensees. The Minister will also be provided an “independent opinion” of the status of the industry based on a return on capital analysis of industry by independent audit firm.

The respective Ministers will need to have the power to obtain an independent audit of production and values declared where there is concern surrounding the legitimacy of any individual company declaration provided.

Industry from both Western Australia and the Northern Territory will need to combine to provide information, on an agreed basis arrived under a set of defined of business rules, on the status of world pearl markets and future trends in demand growth. It is recommended that industry and government provide joint advice, ideally via a single pearling industry advisory committee, to their respective Ministers on any recommendation to vary the number of pearl oysters for a unit quota.

To ensure public policy objectives continue to be met, legislation will provide for Ministerial intervention to take a decision to vary the number of pearl oysters for a unit quota as required.
4.7 Opportunities to promote commercial development for Indigenous interests

As part of the government/industry negotiated package progressing this proposed policy position, an initial once-off allocation of quota units might be assigned to Indigenous interests in both Western Australia and the Northern Territory.

This option would promote Indigenous development of pearling and provides appropriate opportunity for economic development of Indigenous enterprises in northern Australia. To whom this is to be initially allocated is an issue for Ministers across both governments. The same management framework would be applied to these units, which will allow adjustment on a proportional basis across all quota unit holders.

4.8 Provision of data

In order to establish an understanding of the annual production and relevant financial information in the industry, licensees will be required to provide statutory declaration detailing agreed data requirements set out in guidelines (for example the weight and value of all pearls produced annually). All production is to be included to ensure consistency in reporting across the Australian industry and allow comparison with reporting from other pearl producing countries.

The PIAC and ACIL Tasman considered it unrealistic and potentially unworkable for industry not to be the primary source of information required in order to make an informed decision on the appropriate levels of first operation seeding rights, as the majority of the information resides with the industry.

More importantly, they will bear the vast majority of the cost of any inappropriate decisions. ACIL Tasman supports the view that the PIAC is the most suitable forum to acquire industry views on the range of factors that the Government will need to consider in taking decisions. It will then advise the Minister in regard to the level of any variation in the number of pearl oysters for a unit of quota.

This approach will draw on the agreement derived from those best informed and experienced market participants from industry. It will encompass industry developing a base level of information (e.g. trends in pearl production and markets, concepts of income growth in market sectors, income and price elasticity, production potential etc).

It is proposed that an agreed view of informed market participants should not be under-rated in terms of its sophistication as they are aware of many market aspects or nuances that simply cannot be captured in mathematical form or through modelling.
4.9 **Assessment and management process for variations in quota units**

Industry will need to carry out the assessment under an agreed set of business rules when providing advice to the Minister on any variation to the number of pearl oysters for a unit of quota (refer to Attachment 2).

The business rules should include:
- Licensees to meet every two years (at a minimum) to consider the question of total pearl oyster first operations seeding rights across the Australian pearling industry (Northern Territory and Western Australia);
- Licensee voting entitlements to be proportional to unit holdings in the combined Northern Territory/Western Australian managed pearl industries (one unit equals one vote);
- Licensee agreement for resolution of any proposal for change in quota levels be set at a voting support level of a minimum of 75 per cent of total quota units held for combined Northern Territory/Western Australian unit holdings; and
- Ministers having the responsibility for pearling to determine the final changes (if any) to the level of total first operation seeding rights in accordance with allocation rules by 1 December for implementation in the following year.

This industry process is seen to be evolutionary and the expectation is for industry to mature and become more sophisticated in the development of the assessment process and its advice to government.

If information is supporting a variation in existing quota levels, but industry agreement can not be achieved, the Minister for Fisheries may be required to make a decision on the appropriate production level. Defining and establishing a trigger mechanism for this type of Ministerial decision to effect a variation in the number of pearl oysters for a unit of quota will be required. This is to ensure that the integrity of the management approach is maintained, placing pressure on the industry to meet its obligations to the quota variation advice process.

In practice, if pearl prices increase on average across world markets, the industry should be making the necessary assessments and recommendations to the Minister to vary the value in quota units to meet market demand growth. Should the Minister establish that the agreed trigger mechanism has been reached without appropriate industry advice forthcoming, administrative arrangements should provide a mechanism for Ministerial intervention. In this way, Ministers can take action to vary the number of pearl oysters for a unit of quota in order to optimise value to industry and the community.

Any decision taken to vary the number of pearl oysters for a unit of quota will need to consider a number of issues in determining the level of variation in number of pearl oysters for a unit of the wild and hatchery quota held at the time of the decision being taken.
1. **Determining wildstock TAC to account for shifts in stock abundance.**

   Wildstock number of pearl oysters per quota unit will continue to vary up and down dependent on the sustainability factors for the fishery. In any year this matter will be settled first and then any variation on a proportional basis will be applied where a decision to increase or decrease supply is taken for the industry overall.

2. **Mechanism for ensuring utilisation of wildstock TAC.**

   The review has identified the importance from a policy perspective of continuing to utilise wildstock pearl oysters for pearl production. This maintains a competitive edge for the Australian pearling industry due to the minimisation of risks by having alternative sources of shell to hatchery production.

   For this reason, encouraging the pearling industry to utilise wildstock quota remains a priority. One option is to develop a mechanism whereby pearling licence holders holding wildstock pearl oyster quota will be asked to nominate to the Department of Fisheries their intention to fish their wildstock quota by April each year.

   An intention not to fish wildstock quota would require a licensee to seek to swap an equivalent number of hatchery quota units with a licensee who has indicated a preference to take wildstock pearl oysters. If no swap can be found then the licensees can substitute hatchery shell against wildstock quota. The maintenance of a viable wildstock fishery and its supporting infrastructure and technology is an ongoing strategic policy position.

3. **Mechanism for ensuring utilisation of existing quota units.**

   The review has identified the need for a mechanism to ensure that, prior to receiving a variation to the value of their quota units, a licensee has adequately utilised their existing quota. This approach needs to manage risks of variation of business activities and therefore use of quota as against long term non-utilisation of quota by a licensee and therefore directly impacting on future quota settings of all quota units.

4. **Mechanism for ensuring utilisation of a variation in value of quota units against an agreed work program.**

   The review has identified the need for a mechanism to ensure licensees utilise any variation in value of their quota units. It is proposed for example that a work program be required, setting out the licensee plan for bringing additional production on line.

   The proposal could require a five-year work plan be submitted, which may include the agreement to sub-licence, temporarily transfer or otherwise enable another pearl farmer to undertake seeding in reliance on those quota units, or to enter a joint venture arrangement for bringing the additional production on-line.
Failure to meet the nominated work plan without adequate explanation may result in forfeiture of the unused seeding rights. This would assist in matching long term supply objectives with those of demand projections.

4.9.1 Administrative allocation mechanism

The allocation of quota through an administrative mechanism is consistent with economic efficiency principles, provided that the quota is freely tradeable. Governments have relied upon this approach, which guarantees efficiency according to the authors of Fisheries Management Report No. 2 by the Department of Fisheries (Western Australia), which provides a useful discussion of the issues around initial allocation versus secondary markets for quota.

Entry to the pearling industry under this policy direction paper is proposed to be through the mechanism of acquisition of existing quota units through the secondary market. A person/group will then need to accumulate the legislative minimum quota unit holding before any application to approve the grant of a separate pearling licence can be considered by government.

This framework of freely tradeable quota enables new entry to the industry – there are no barriers to entry. The market price of quota is no different from the cost of acquiring a commercially useable asset. New entrants pay a cost but benefit from access to a developed industry, access to a developed market system, access to a product with a worldwide reputation and to technology that has been developed by the industry over many years. A tradeable quota framework that ensures the right to produce pearls will flow to those who value the rights most highly.

Provided quota units are freely tradeable the quota variation method chosen tends to have greater implications for equity issues than it does for economic efficiency. This is because secondary trade in quota will tend to result in a situation whereby the quota are bought by those who place the highest value on them - people who expect to earn more from the quota than the current holder and who are able to utilise them most efficiently.

Policy Objective 4 – to assess the impact of any policy proposals arising from Phase II Hatchery Policy Direction report on the utilisation and availability of pearl farm lease sites.

Any decision to maintain a policy of control over the rate of expansion of total pearl production in the pearling industry will require careful planning and the development of practical management arrangements to provide for:

- Increased requirement for pearl farm leases;
- Increased stocking rates on existing pearl farm lease sites;
- Competition from other marine users (e.g. tourist operators, mining industry, charter boats and conservation groups etc);
- An appropriate fee structure;
- Performance criteria for new grants;
• Long-term development of marine planning; and
• Other aquaculture.

Government must consider their responsibility to support lease site availability when considering changing the rate of growth in supply through variations to the number of pearl oysters assigned to a unit of quota. Similarly, industry must provide clear advice to government in relation to stocking densities and other requirements in conjunction with advice on whether to change the rate of growth in supply.

There is also a collateral risk for both government and industry in the management of adjoining pearling leases as stocking densities increase from disease and compliance risk.

Future arrangement for leases will be heavily influenced by the increasingly prescriptive framework for marine planning within Western Australia. There are currently several overlapping elements to this planning framework which include proposed marine conservation reserves for areas of interest to the pearling industry (including the Dampier Archipelago and the Montebello Islands), impending bioregional planning by the Commonwealth’s National Oceans Office (which is expected to target the northwest coast of Western Australia) and pressure for new Fish Habitat Protection Areas administered by the Department of Fisheries. In addition to these, there has been a long-term need recognised for state-wide integrated coastal and marine planning.

Marine planning processes, and the increasing public and industry interest in access to the northern coast of Western Australia, is also likely to affect the grant of future leases. These will be scrutinised against alternative uses of the area for other industry sectors and/or for conservation purposes.

4.9.2 Increased requirement for pearl farm leases

To capitalise on variations in the value of quota units, industry will need to develop strategies to allow the farming of this additional shell, recognising that access to the "traditional" farming areas in sheltered coastal waters may be limited.

Grow-out and pearl farming technology has also improved. Farming is increasingly occurring in waters that until recently where considered too exposed to weather (especially cyclones) and tidal influences to farm.

In conjunction with the increased awareness of environmental and management factors affecting pearl oysters, there has been a corresponding focus on how those issues impact on pearl oyster health. Within the industry there is now a much greater knowledge base on management of pearl oyster health issues and any threats.

Any growth in production, from technological improvements or variation in value of quota units, will see an increase in the requirement for suitable sites for pearl farm grow-out operations.
4.9.3 Increased stocking rates on existing pearl farm lease sites

Competition for suitable pearl farm sites, improved technologies and continued cost pressures may see increased stocking rates on existing pearl farm sites. This outcome requires careful management for compliance and disease, particularly in situations where sites from competing pearling interests are adjoining, as well as ensuring industry standards are maintained for quality of pearl production under the regulated model.

Technological advances, including deeper water pearl oyster grow-out techniques, could reduce the demand on current sheltered water pearling lease sites.

4.9.4 An appropriate fee structure consistent with market values

The PIAC is carrying out a separate review of all pearling fees and charges, including lease rentals, which is running parallel to the hatchery policy review. This review is establishing the necessary methodology for the setting of lease rental arrangements for future pearl farm leases.

4.9.5 Performance criteria for new pearl lease grants

The competitive nature of pearl lease site selection and access requires criteria to be applied to new grants to ensure that limited marine area resources are being optimised in order to sustain returns within the industry, as well as the benefits generated for the community from the pearling industry.

Several changes to the management and administration of pearl farm leases are proposed in the drafting instructions for the Pearling Management Bill to give lease holders greater security of tenure, whilst at the same time ensuring a suite of provisions that protect the community’s interest in relevant public resources in the allocation of new sites and that existing lease areas are effectively utilised.

Performance conditions for leases must be flexible to meet the changing circumstances over time and are therefore proposed to be expressed in Regulations and Ministerial Policy Guidelines. These will need to be continually reviewed and updated as new knowledge and circumstances evolve over time.

Policy Objective 5 - to assess the potential contribution to consolidated revenue from the proposals arising from this review.

The identified revenue source points under this policy proposal are:

- Increased employment, income tax, GST etc;
- Resource access fees recovering compliance and management costs;

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4 Details of performance criteria for pearling leases and granting of leases can be found in the Ministerial Policy Guidelines No. 8 and No. 17 on the Department of Fisheries website.
Pearl farm lease rentals; and
• One-off payments for the issue of additional first operations seeding rights.

4.9.6 Recovering compliance and management costs via an access fee

In September 1995, the then Minister for Fisheries (Hon. Monty House MLA) and the then Chairman of the Western Australian Fishing Industry Council (WAFIC), (Mr John Cole) jointly released the document “Future Directions for Fisheries Management in Western Australia” (commonly referred to as the Cole-House Agreement). This document was prepared following the decision of the Coalition Government to implement the findings of the Fisheries Portfolio Review of 1994.

The incoming Labor Government of 2001 endorsed the Cole-House Agreement as Government policy and this stance was reiterated in the Minister’s letter to the PIAC in August 2004 regarding the review of fees and charges where he states that “…I see no reason to change the fundamentals of the Cole-House Agreement, and would do so only after extensive consultation with industry.”

This remains government policy under the present Gallop Government.

The fishery and pearling access fee structure is determined through two tiers consisting of a “cost recovery” component and a “development and better interest” component. (page 14, Cole-House Agreement).

The cost recovery component of the access fee is fully applied to the six major fisheries including pearling. Over time, business rules and guidelines have been developed to better manage this process.

The development and better interest component is captured through the Development and Better Interest levy (DBI). Revenue raised through the DBI is directed to research and management on a broad range of fisheries and community issues as determined by the Minister.

The Cole-House Agreement (page 24) noted that the better interest component “…must be seen as a return to the Government as representatives of the community for application by the Minister for Fisheries on those items which are in the best interest of fisheries and fish and habitat management”.

Since the introduction of the Cole-House document in 1995 there has been considerable review and fine-tuning of the fee structure management but there has been no change to the current access fee components (which are the cost recovery component and the development and better interest component).

In parallel with the Hatchery Policy Review, the Minister for Fisheries has asked the PIAC to carry out a review of Pearling Fees & Charges. This is nearing completion and deals with all matters pertaining to the appropriateness of methodologies for fees and charges applied within the pearling industry. Lease fees have been also been considered within the fees and charges review.
Part of the outcomes from this review of fees and charges has been identification of the need to separately consider the differences, if any, in the rights proposed in the PMB with those currently existing within the *Pearling Act 1990*. The review of fees and charges will also consider the matter of “community return” as it applied to the pearling industry.

One option for consideration is for licensees paying an up-front, one-off payment for any additional first operations seeding rights resulting from a decision by government to vary the value of quota units in the industry. This matter needs careful consideration within the debate on rights and community return especially, as highlighted by ACIL Tasman, the case in regard to pearling hatchery quota where the community does not own the vast majority of the economic rents embedded in quota.

The outcomes of this review should be consistent within any future pricing policy within the Northern Territory.

| Policy Objective 6 – strategies to expand market demand for pearls cultured in Western Australia and the Northern Territory through the whole supply chain. |

The purpose of industry strategies that result in the expansion of market demand for Australian pearls across the whole supply chain is to lift overall industry economic performance in terms of outcomes that are available to participants directly and to the State more generally.

In particular, these strategies are intended to mitigate the risks surrounding the potentially significant impact to the pearl market of increases in supply leading to inability to sustain price. This may impact at the retail level through loss in consumer faith of the South Sea Pearl product. The strategies therefore provide an opportunity for long-term measured increase in market demand growth linked to long-term supply related factors.

The PIAC is currently managing a process to assist industry in developing strategies for the long-term measured increase in market demand growth linked to long-term supply related factors. Industry will be primarily responsible for advising the government on future expectations of the market and capability of industry to maximise economic benefits from controlled expansion of demand for industry and the community.

Government has accepted that corporate branding and marketing of product using individual company marketing methods is superior to government intervention in the marketing of pearl production.

The individual company approaches could be assisted in their efforts to influence the demand side of the pearl market by a broad-based industry strategy to develop a process of appellation, achieved principally through certification. The certification would provide a process for Australian South Sea pearls to be certified in terms of their quality and origin, which would add value to them compared to lesser quality pearl products.
This type of information will assist the Minister to understand that the industry continues to be progressive, has commitment to expanding the market and continues to maintain a competitive advantage through quality pearl production within the international context. While it does so, it is in the Northern Territory and Western Australian governments’ interest to continue to support the regulated regime (Option 1).
SECTION 5 CONCLUSIONS

The paper sets out the framework and policy objectives for a new Pearling Hatchery Policy.

The PIAC and industry believe that the benefits from this policy will exceed the costs for both industry and government where additional first operations seeding rights are determined under a regulated, controlled growth model.

Benefits to government should include:
- A clearer separation of roles between government and industry;
- A consistent management approach between the Northern Territory and Western Australian governments, which is the major part of the Australian South Sea Pearling industry;
- Removes for government the future risks of litigation, compensation and management by the adoption of an appropriate regulated management approach (Option 1);
- Sustained community benefits, through ongoing growth of the pearling industry consistent with market expansion and optimising financial returns to Australian producers; and
- Ongoing clarity in the management of fees and cost recovery arrangements for the pearling industry, within a consistent policy framework.

Benefits to industry should include:
- The provision of certainty of equity and removal of ambiguity within the quota management framework across jurisdictions providing long-term confidence for investors in the pearling industry;
- The ability for industry to actively participate in the variation in value of quota units with the support of government to meet future market demand and growth consistent with maintaining industry profitability; and
- Encourages industry cooperation in the further development of strategies that enhance market demand and to differentiate Australian production from its competitors.

Costs to government may include:
- The need to develop consistent management and legislative regimes across Western Australia and the Northern Territory;
- Dealing with those licensees (if any) who do not support the agreement of industry; and
- Reduces ongoing government flexibility of decision making as it requires the agreement of two jurisdictions.

Costs to industry may include:
- Costs of cooperation between industry participants and therefore engagement in future decision-making.
ATTACHMENT 1

MINISTER'S LETTER TO THE PIAC REGARDING POLICY DIRECTION PREFERENCE – MAY 2005.

HON JON FORD JP MLC
Minister For Fisheries; the Kimberley, Pilbara And Gascoyne

Our Ref: 21-00514

Mr Michael Smith
Chairman
Pearling Industry Advisory Committee

Dear Mike,

DEVELOPMENT OF HATCHERY POLICY PHASE TWO REVIEW DOCUMENT FOR PUBLIC CONSULTATION

I refer to your recent letter outlining the outcomes of the Pearling Industry Advisory Council (PIAC) held on 27 April 2005.

It is important to state at the outset that the Government’s decisions about hatchery policy and any future pearling legislation will be driven by the need to support and maintain the Western Australian pearling industry in the face of a changing and sometimes adverse world market. I am encouraged that the industry through PIAC and the Pearl Producers Association (PPA) has come together to support a way forward that is acceptable to participants.

While I support the further scoping of Option 1 for a document suitable for public release, I am concerned that there may be an unfounded perception that regulation of quota allocation entrenches existing participants in an industry of extraordinary profit and will do so at the unreasonable exclusion of any other aspiring participant.

I believe that the Government will support Option 1 if the industry can adequately demonstrate the adverse circumstances facing the industry, in particular the recent reduction of the industry’s profitability due to the effect of world markets/supply and the impacts of the Australian Dollar.

Clearly if the argument presented is one of preserving the Australian industry and not one of protecting profits, the attractiveness of Option 1 is easier to demonstrate from a public policy perspective, when the alternative is deregulation.

To that extent, I ask PIAC with the co-operation of the PPA to facilitate an independent audit of the industry’s profitability on a return on capital basis that will clearly allow me to demonstrate publicly and to Cabinet that on-going regulation of hatchery policy is necessary for the survival of the domestic pearl producing industry.

14th Floor, May Holman Centre, 32 St Georges Terrace, Perth WA 6000
Telephone (08) 9425 4200  Facsimile (08) 9425 4244
Please note that I do not require information that is commercial-in-confidence, but rather an independent opinion about the profitability of industry as a whole, not a detailed analysis.

On the matter of new licensing under Option 1, I have interpreted this to mean any entity that acquires the minimum unit holding within the overall units for quota would be granted a pearlimg license and I concur with that position.

With regard to the second point of Option 1, I would expect that PIAC would formulate a mechanism by which an increase in quota is managed through unitisation, where additional quota is allocated to licensees through an increase in the value of units.

I also agree, in relation to the third point of Option 1, that industry should have a formal role in advising the Government on any additional allocation of quota. But it is also important that PIAC, when scoping Option 1, allows for the retention by the Minister for Fisheries, on behalf of the State of Western Australia, the discretion to decide whether an allocation of additional quota should be made.

Such discretion would only be exercised after the formal receipt of appropriate information when a change in quota is considered. This discretion would be exercised on the provision of the following information from PIAC and the industry:

1. The degree to which local Australian product is differentiated from other South Sea products;
2. The extent to which industry has participated and cooperated in various programs to expand demand, for example a system of appellation;
3. The ongoing profitability of the industry in broad terms;
4. General trends in the technology, business pressures and other costs; and
5. Industry information on international competitors.

Of utmost importance is advice from industry about the extent of any additional quota. When scoping the Phase Two Hatchery Policy, I would appreciate PIAC’s advice about any other information that the Minister might reasonably expect in order to make a considered judgement about whether to increase or decrease quota.

Having said this, let me re-iterate my support for the inclusion of Option 1 for public release in Hatchery Policy Phase Two Review on the above basis, with the opportunity to further discuss these issues and the above points as they evolve.

Yours sincerely,

HON JON FORD JP MLC
MINISTER FOR FISHERIES
27 MAY 2005
Key Principles:

- A head power be established under the respective Pearling Bills for regulation power to require all pearling licences to meet every two years (at a minimum) to consider the question of total pearl oyster seeding rights across the Australian pearling industry (Northern Territory and Western Australia).

- The powers to require the Northern Territory and Western Australian pearling licensees to appoint a Chairman to manage the industry process including meeting notification, attendance by licensees, and the procedure for formal voting by licensees (or their appointed proxy) to determine a resolution of advice to the Northern Territory and Western Australian Ministers on changes (if any) to the level of total first operation seeding rights.

- Requirement for licensee voting entitlements to be proportional to unit holdings in the combined Northern Territory/Western Australian managed pearl industries (one unit equals one vote).

- Licensee agreement for resolution of any proposal for change in quota levels be set at a voting support level of a minimum of 75 per cent of total quota units held for combined Northern Territory/Western Australian unit holdings.

- That the Chairman be required to report the advice from the resolutions reached at the licensee meeting/s together with relevant reporting requirements for Ministers by the end of August of every year (as relevant).

- Relevant Ministers seek the advice and comment from respective Pearling Management Advisory Committee (MAC) on the industry advice and resolutions proposed.

- Relevant Northern Territory and Western Australian Ministers having the responsibility for pearling to determine the final changes (if any) to the level of total first operation seeding rights in accordance with allocation rules.

- Ministers to take into account the relevant industry and subsequent MAC advice, the better interests of Australian pearling industry, rate of utilisation of industry first operation seeding rights, markets, market demand, pearling business (e.g. cost and technology shifts), competition trends within Australia and overseas and any other information, as relevant in determining a joint decision by 1 December on changes to overall level of first operation seeding rights for implementation in the following year.
ATTACHMENT 3

REVIEW OF PEARL OYSTER HATCHERY POLICY - PHASE I

REVIEW OF PEARL OYSTER HATCHERY POLICY

PHASE ONE

NOVEMBER 2004
# REVIEW OF PEARL OYSTER HATCHERY POLICY
## PHASE I

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## Appendix 1
REVIEW OF PEARL OYSTER HATCHERY POLICY
PHASE I

1. Introduction

1.1 Background

The current pearl oyster hatchery policy (“the hatchery policy”) is the product of extensive discussions between industry and government more than a decade ago, on the merits of ensuring that there was an alternative source of pearl oyster supply to the wild fishery available for the Western Australian pearling industry to utilise for the existing process of round pearl culturing.

This issue was raised by the then Executive Director of Fisheries who perceived a threat from other nations producing South Sea pearls utilising hatchery shell, which did not have the same environmental limit on their abundance as wild shell.

The pearl oyster hatchery policy, agreed with industry, provided for the issue of 20,000 annual hatchery options to each of the holders of the thirteen pearling licences that existed in October 1992, under Ministerial Policy Guidelines (“the Guidelines”).

One company was issued with an additional 30,000 annual hatchery options, in recognition of having constructed a hatchery.

The Guidelines provide for the grant of annual hatchery options for a term of 10 years, unless extended by the Executive Director of Fisheries in accordance with specific criteria.

The granting of three new Zone 1 wildstock licences in 1995 resulted in a further allocation of 20,000 annual hatchery options per licence, bringing the total number of licenses to 16 and issued annual hatchery options at that time to 350,000 or 350 units.

Subsequently, the Executive Director approved a three year extension of the initial option period, resulting in a revised expiry date of December 2005.

The terms of issue provided that any annual hatchery options not converted to hatchery quota by the expiry of the policy (December 2005) would lapse.

All annual hatchery options have now been converted to hatchery quota.

There is a need to review the hatchery policy as currently set out in Parts 2 and 10 of the Guidelines prior to December 2005, with a view to the implementation of a new policy in January 2006.
In addition, in March 2002 the Western Australian Government approved the following outcome following a review of the *Pearling Act 1990* under the National Competition Policy (NCP) agreement-

“The current hatchery options/quota policy will expire in December 2005. In view of this the Department of Fisheries is to review alternative strategies for managing hatchery quotas. This review should incorporate mechanisms for both the determination and allocation of quotas including an analysis of options for a more liberated, or market driven, means of distributing additional quota units including possible auctioning.”

1.2 Review Process

In liaison with the Pearling Industry Advisory Committee (PIAC), the Minister for Agriculture, Forestry and Fisheries has approved a review process comprising three phases:

Phase I – Statement of current hatchery options policy including the:
- Description and objectives of the current policy;
- Current status - conversions of options to quota, production levels under current quota etc;
- Outcomes of the policy to date – including production levels, technology development, market/price stability; and
- Key issues for the future – including quota framework, demand/supply issues, certification, appellation.

This document will be circulated to *industry*.

Phase II - Development of a draft Hatchery Policy Statement including the:
- Identification and review of issues (as a summary of issues identified in Phase I above);
- Mechanisms for assessing the total quota level and determining new hatchery quota level. Note that in the future it is proposed that management and compliance arrangements be based on the setting of an overall total (first operations) seeding rights level. Hatchery quota would be one component of that total;
- Identification of allocation models for any increase in hatchery quota; and
- Proposed future policy direction.

The Phase II document will be drafted by the Department with input from the PIAC and be released for *industry* and *public* comment.

Phase III - Development of a final Hatchery Policy Statement, based on consideration of comments received in Phase II above. This will ultimately replace section 10 of the current Guidelines and will need to be framed either as a Ministerial Policy Guideline and/or in legislation.

The Minister may opt for a final round of consultation with *industry* prior to issuing a final policy statement.
This paper set out below is the first of these phases. The paper is focussed on the current policy and, while it raises a number of issues for future consideration, it does not deal with any future policy settings. Future policy settings will be the subject of Phases II and III.

2. New Pearling Legislation

Concurrently with Phases II and III of the hatchery review process, drafting of the proposed Pearling Management Bill will proceed.

It is not envisaged that the final Hatchery Policy Statement will alter the principles of the proposed Bill, but will determine much of the detail to be included in the Regulations that will be made upon enactment of the new Bill. Subject to Government consideration, the legislation is proposed to include elements such as recognition of the proprietary nature implicit in quota units and security of tenure in pearl farm leases.

3. Objectives of Current Policy

The implementation of the current hatchery policy, in October 1992, followed extensive discussions between government and industry over the period 1989 to 1991 on the merits of establishing an alternate source of pearl oyster supply for the Western Australian pearling industry, so as to supplement reliance on wildstock pearl oysters for the purposes of round pearl cultivation.

The hatchery policy was introduced against the following background:

(vii) An Australian pearling industry dominated by pearl production from wild stock pearl oysters taken by fishing off Western Australia.

(viii) Australia being recognised on the world market as the source of the largest volume of the highest quality South Sea pearls.

(ix) Australian pearl prices being maintained on the basis of quality, luxury and rarity.

(x) The need for growth in the production of Australian South Sea pearls to occur in an orderly manner and to reflect market demand.

(xi) The apparent likelihood of increased pearl oyster production from Indonesia and possibly other Asian countries from the utilisation of hatchery bred pearl oysters.

(xii) Increased pearl production in Australia from improved farm management practices, second and third re-operations and the steady progress to full production by exploitation of the latent potential of current licence rights.
Given the above, the key driver of the hatchery policy was to develop grow-out competence within the Western Australian pearling industry from the use of hatchery bred pearl oyster spat. It was clearly recognised that it was not economically justifiable for all licensees to have their own hatchery operation but it was felt that all licensees should have the ability to grow-out spat. Hence the rule that options could be converted to quota provided that the licensee could show that they had grown out the shell from less than 40mm.

The policy focus was therefore all about an alternate supply of shell upon which to conduct the culture process and not related to the processes of culturing round pearls, an already established process.

The Western Australian industry and Government, given prevailing circumstances, took the overriding view that further growth in production of Australian South Sea pearls must occur in an orderly manner, to reflect market demand. The hatchery policy provided appropriate control over the rate of expansion of total pearl production.

At the time of development of the hatchery policy, there was also a clear view that hatchery technology and expertise needed to be available to the Western Australian pearling industry. Not to have that technology and expertise could have resulted in Western Australian producers being placed at a disadvantage in the future if:

- Hatchery produced animals in other places were proved to provide pearl oysters comparable to Australian wild stock at a comparable or cheaper price; and/or
- There was a change in global market circumstances to the extent that production constraints on South Sea pearls produced by the Western Australian pearling industry should be removed.

A number of possible arrangements were considered in relation to the development of hatchery production expertise, including a potential role for established aquaculture hatcheries that were not already directly involved with licensees in the pearling industry.

The hatchery options policy included an incentive (conversion to full quota rights within a timeframe), so as to encourage the development of grow-out technology by all licensees. The number of annual hatchery options allocated to each licensee was selected by the application of two criteria: a number sufficient to justify the capital investment required and a number not so large that the potential increase in pearl production would distort the market.

The number selected, 20,000 per licensee, was a compromise position reached as it was felt that any less would not provide sufficient incentive for producers to explore such a risky investment as hatchery development was at that time and any more would have distorted the supply and demand equation too much.

The policy was clearly designed to achieve the strategic position of having the ability, should it be required, to respond to increases in South Sea pearl production of an
equivalent quality to Australia’s production from other nations, whilst aiming to ensure the maximum economic benefit for both the pearling industry and the Western Australian community.

4. Description of Current Policy

The main elements of the current policy (in general terms), as set out in the Guidelines, are:

- Annual hatchery options are transferable between pearling licensees.
- Annual hatchery options can be converted to permanent pearl oyster hatchery quota, on a one for one basis, for those licensees who, over a three-year period, have successfully produced (i.e. seeded for round pearl production and placed on a pearl farm to carry out pearl culture techniques) an average of at least 1,000 pearl oysters suitable for pearl culture. The minimum criteria for success is 1,000 pearl oysters.
- The conversion to hatchery quota can be progressed annually, subject to meeting the conversion requirements set down in the Guidelines, until all of the licensee’s annual hatchery options have been converted or the options expire.
- Once converted, hatchery quota is, for all intents and purposes, to be treated in the same way as wildstock quota for round pearl production.
- Hatchery produced pearl oysters can be substituted for wildstock pearl oysters under the wildstock quota units held by a licensee.

The hatchery policy results in each pearling licensee holding hatchery quota to have the right to acquire an annual supply of pearl oysters to seed for round pearl production from hatchery bred pearl oysters.

Further details of the operational arrangements associated with the hatchery policy and the process for the conversion of annual hatchery options to hatchery quota can be found in the Guidelines.

5. Current Status

All licensees as at the date of this paper have converted their hatchery options to hatchery quota in accordance with the Guidelines.

The total number of hatchery bred shell which can now be used for first operations in round pearl production each year is 350,000 (or 350 units, where one unit equals a nominal value of 1,000 shell).

Appendix 1 shows the initial hatchery options and converted hatchery quota holdings per licence. There are currently four hatcheries in Western Australia supplying pearl oyster spat to pearling licensees for grow-out.

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5 Full details of the policy are set out in sections 2 and 10 of Ministerial Policy Guideline No. 17, which is available from the Department of Fisheries
6 Note that for the purposes of the Guidelines pearl oyster spat collected by way of spat collector technology was considered the same as pearl oyster spat produced from hatchery technology.
6. Policy Outcomes

6.1 Industry and Technology Development

The key driver of the hatchery policy was to encourage the development of grow-out technology of hatchery-reared pearl oyster spat by Western Australian licensed pearl farmers. The policy has been successful and has resulted in all licensees taking up their options and achieving full conversion to hatchery quota.

The success of the policy was achieved because the licensees to whom the annual hatchery options were issued invested the necessary financial and other resources. The capital investment was substantial, at high risk and offered no guaranteed return. Pearl production from wildstock pearl oysters is based on a two year cycle, production from hatchery-bred spat is between five and six years. During the grow-out phase, significant spat husbandry costs are incurred, but cannot be recouped before the round pearl culture cycle is complete.

The increase in the number of first operation pearl oysters available to the industry during the period of the hatchery policy (from 572,000 shell to 922,000), placed heavy demands on licensees’ physical resources such as ships and pearl farm infrastructure. In addition, the ensuing production from the policy has placed heavy demand on the established distribution networks developed by the pearling companies who had established the production and marketing chain. These demands were experienced while the industry was also realising the latent potential in the wildstock quota, by perfecting reoperation and other pearl culture and pearl oyster husbandry techniques.

All technologies have also been advanced significantly during the same period.

Genetic technology is now being utilised to develop and select superior *Pinctada maxima* lines for pearl oyster production. That work is being undertaken by several companies in association with academic and applied research institutions, as well as through commercial organisations.

Grow-out and pearl farming technology has also improved. There has been greater emphasis on understanding the biology and environmental requirements for successful spat production and there is now an improved understanding of environmental and management variables affecting farm sites.

In conjunction with the increased awareness of the myriad of environmental and management factors affecting pearl oysters, both spat and adult, there has been a corresponding focus on how those issues impact on pearl oyster health. Within the industry there is now a much greater knowledge base on pearl oyster health issues and threats. The result is that a more active and better informed role may now be taken in the development of pearl oyster health policies.
6.2 Market Value

A key driver of the hatchery policy is the need to maintain the value of Western Australian pearl production in the international market.

Under the wildstock and hatchery quota system, there has been an incentive to produce at the higher quality end of the market in order for Australian producers to maximise value from their operable shell rights, which are limited by quota. Industry has focussed on improving the general quality of the Australian product, the productive potential of each oyster and the technology to support these improvements, as outlined in 6.1 above. As a result, Australia has maintained its dominance at the higher quality (and higher price) end of the market, while increasing total production levels.

That is not to suggest that the hatchery quota level may not be adjusted in the future. As described above, that is a matter for separate and more detailed consideration as part of Phases II and III of the overall review process.

7. Policy Impacts/Issues

The hatchery policy has allowed controlled expansion in the rate of pearl production growth, as annual hatchery options have been converted to quota.

The basis for the current hatchery policy is to provide an alternate source of pearl oyster supply, whilst maintaining Australia’s strong market position and thereby maximise the return to the industry and community.

From a government perspective, it is acknowledged that there is limited information or understanding about the precise supply and demand forces affecting the global market. There is also a greatly varied degree of understanding amongst industry participants as some are fully vertically integrated but most sell their productions via agency agreements, which exclude them from direct market exposure.

However, while it is accepted that a rapid increase in pearl production will reduce average product value, the impact of that effect on the higher quality end of the market is unclear. That points to the need for an assessment mechanism for reviewing and setting quota levels within the proposed framework of total (first operation) seeding rights, which could include market analysis to assist in making prudent decisions.

8. Future Management Framework/Directions

In accordance with the requirements of Phase I of the review process, the following is a general description of issues that need to be taken into account in the development of a new hatchery policy. These are summarised for information only at this stage and will be dealt with in more detail in Phases II and III of the review process.
8.1 Key Strategic Issues

The PIAC, through its consultation process with the industry and the Department of Fisheries, has identified the following key strategic issues for the pearling sector:

- Description of future management arrangements for the industry, including the quota management framework;
- Determination of appropriate rates of managed production within the quota framework;
- Process for allocation of new hatchery quota;
- Assessment of market and demand expansion; and
- Integration of Western Australian and Northern Territory management approaches.

The new pearl oyster hatchery policy should be consistent with the principles and directions established to meet these strategic issues. This is discussed in more detail in section 9 below.

8.2 Compliance

Before their conversion to hatchery quota and while annual hatchery options were on issue, compliance in respect of the hatchery sector was focussed principally on monitoring the numbers of oysters held under grow-out and ensuring the seeding of selected hatchery bred oysters was in accordance with allocated annual hatchery options/quota rights.

Other compliance policies monitored the utilisation of authorised grow-out areas, management of disease prevention procedures and the management of the wider environment in which the pearling industry operates.

Compliance arrangements for the industry have recently undergone a review as part of the development of new pearling legislation. In essence, industry and government are seeking to make compliance both more efficient and more cost effective.

As outlined above, future compliance activities will be simplified by shifting the primary focus to regulating the number of pearl oysters seeded for the first time.

8.3 Arrangements with the Northern Territory

The Northern Territory manages its pearling industry under wildstock and hatchery quotas, in a manner similar to the Western Australian management system.

It is proposed that the Government of Western Australia will enter into a Memorandum of Understanding (MOU) with the Government of Northern Territory to ensure, to the largest extent possible, consistent standards and policies to deal with management, compliance and industry development, including future pearl supply within a total quota framework and to capitalise on efficiencies and synergies that may be achieved through formalised cooperative arrangements.
Consistent with the proposed Western Australian industry strategy, there is a need to manage South Sea pearl production cooperatively with the Northern Territory, in order to maintain the integrity of the Australian industry and its value to the community. The Western Australian and Northern Territory governments will be seeking to align, wherever possible, management measures.

8.4 Fee Structure

The Minister has requested the PIAC, through the Department of Fisheries, to undertake a review of fees and charges for the pearling sector. The review will encompass a number of elements including the basis upon which annual (access) fees are set for pearling (wildstock) licensees and pearling (seeding) licences.

Under current arrangements, annual access fees (under cost recovery arrangements and the Development and Better Interest Fund) are significantly skewed toward a higher payment for wildstock units. This is largely a consequence of the history of the industry and the past focus of management and compliance on fishing for wildstock oysters.

With the increasing focus on hatchery activities and the hatchery option/quotas system, the disparity in fee distribution needs to be addressed.

9. Issues for the Future Hatchery Policy

Development of the future hatchery policy needs to be cognisant of management directions for the industry as outlined in section 8 above. Specific issues to be addressed in the new policy include:

9.1 Hatchery Quota Framework

As part of its National Competition Policy review of pearling legislation, the Western Australian Government has determined that a quota framework for the production of round pearls from hatchery-produced pearl oysters will continue post December 2005.

Now that all existing licensees have converted their annual hatchery options to quota, there are a total of 922 quota units in the pearling management system. The total of 922 quota units allow the exercise of 922,000 first operation seeding rights each year, at the nominal value of 1,000 shells per unit.

Those quota units, both wildstock and hatchery, are secure. There is a need however to be in a position to review the appropriateness of the total allocated quota level under this framework from time to time and to provide a basis for decisions to increase that total by way of the possible grant and allocation of additional hatchery quota.
9.2 Future Quota Level

In relation to the setting of future hatchery quota levels, the issues will revolve around the establishment of a formal mechanism to review the total quota level, inputs to support that mechanism and the principles for the allocation of any additional quota, should that decision be taken.

This process will require analysis of a number of matters including:
1. How would Government be informed and advised on quota level decisions, what sources of data should be used and who would be engaged to collect data?
2. How often should quota levels be reviewed and what should trigger a review?
3. The steps which need to be taken to review the quota level including an analysis of potential production from the existing total quota (including latent potential) over the period of the policy (e.g. five or 10 years) and predictions of expected growth in demand.

It is proposed that the determination of future hatchery quota (post 2005) - as a component of the total (first operation) seeding right - will be undertaken by government with a formal Ministerial review process (on advice from the PIAC), with the involvement of industry (through the PPA).

The hatchery quota level review process is proposed to occur on a five yearly basis, based on the capability of industry to maximise economic benefits from controlled expansion of production against future expectations of market demand. Market expansion and market research will be key elements of that process.

9.3 Future Hatchery Quota Allocation

With respect to allocation mechanisms for new hatchery quota, the government has stated, as one of its decisions following the National Competition Policy review of the Pearling Act 1990 that the hatchery review process should incorporate mechanisms for determining the amount and allocation of any new hatchery quota including an analysis of options for a more liberated, or market driven, means of distributing additional quota, including possible auctioning.

The initial draft industry strategy proposes that there may ultimately be a mix of administrative and market allocation of new quota. Any market allocation mechanism would likely be subject to pre-qualification criteria that would be consistent with the intent and direction of the industry strategy as a whole.

9.4 Pearl Farm Lease Sites

As part of the development of a new hatchery policy, consideration needs to be given to the requirements associated with pearl farm lease sites and management of those sites.
9.5 Operational Issues

As part of the determination of the future direction for the hatchery policy, there is a need to consider the operational detail to support the policy direction. That detail must be set down in Ministerial Guidelines and/or in regulation. Matters of operational detail include:

- Efficient compliance arrangements (refer section 8.2);
- Reasonable fee structures (refer section 8.4); and
- Spat collection arrangements, as relevant.

10. Summary

This document has outlined the current pearl oyster hatchery policy as set out in section 10 of the Guidelines. The document is to a large extent retrospective in terms of the rational and operations of the current policy. While it has raised a number of issues for future consideration, these will be addressed in more detail in the draft Hatchery Policy Statement, under development as a separate document.

Reference Material

BK Bowen, Discussion Paper – Pearl Oyster Hatcheries and Spat Collection, Unpublished.

Department of Fisheries, Ministerial Policy Guideline No. 17, Pearl Oyster Fishery, As Amended to 16 August 2001.


***
## APPENDIX 1 – WESTERN AUSTRALIAN QUOTA UNIT ALLOCATIONS – AS AT JULY 2004

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Total Quota Units</th>
<th>Wild Stock Quota</th>
<th>Hatchery Options Initially Granted</th>
<th>Current Hatchery Options (as at July 2004)</th>
<th>Hatchery Quota (As at July 2004)</th>
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<tr>
<td>Paspaley Pearling Co P/L</td>
<td>100</td>
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<td>Broome Pearls P/L</td>
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<tr>
<td>SJ &amp; JD Arrow</td>
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<tr>
<td>Dampier Pearling Co P/L</td>
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<tr>
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<tr>
<td>BR &amp; LM Brown (Cygnet Bay)</td>
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<td>55,000</td>
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<tr>
<td>Blue Seas Pearling Co</td>
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<td>Maxima Pearling Co P/L</td>
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<tr>
<td>Fantome Pearls P/L</td>
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<td><strong>TOTAL:</strong></td>
<td><strong>572</strong></td>
<td><strong>572,000</strong></td>
<td><strong>350,000</strong></td>
<td><strong>0</strong></td>
<td><strong>350,000</strong></td>
</tr>
</tbody>
</table>

* As part of the grant of new pearling licences for Zone 1 in 1995 these companies were granted options subject to meeting minimum performance criteria.
Pearl Hatchery Quota

Issues, mechanisms and policy basis for the modification of pearl oyster hatchery quota in Western Australia

Prepared for WA Fisheries

February 2004

ACIL Tasman
Economics Policy Strategy
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Overview

WA Fisheries commissioned ACIL Tasman to report on future hatchery policy management arrangements for the pearling industry in Western Australia. The pearl oyster hatchery policy is due to expire in December 2005. This report, therefore, reviews and recommends mechanisms for changing the aggregate amount of hatchery quota, and if it is decided to increase the aggregate amount of hatchery quota, methods of allocating that quota. These same mechanisms should allow the government and the industry to determine whether market conditions dictate that maintaining a hatchery quota is no longer in the community interest.

Government objectives

The Government's objectives in regulating hatchery production are to maximise the economic efficiency of the industry and in doing so to maximise the community's benefit.

Regardless of whether equity considerations are formally included in legislation, these are clearly a relevant consideration for Government.

In order to achieve its objectives, ACIL Tasman considers the Government needs to follow certain principles governing the design of hatchery policy:

- Flexibility and adaptability;
- Simplicity of administration and compliance;
- Transparency and consistency; and
- Minimising the probability of litigation or disputation.

These principles underpin the analysis and recommendations ACIL Tasman has made in this report.

Lessons from Australian experience with quota allocation

In Australian fisheries (and in many overseas fisheries), fisheries' managers have tended to use administrative rather than market-based quota allocation mechanisms. There are sound reasons as to why this has occurred and we go into these reasons below. ACIL Tasman examined the Australian experience with quota allocation. In preparing this report, we have taken into account the following seven implications and lessons learned from that experience:

- If governments choose to allocate new quota, the objectives in doing so must be clearly stated.
Pearl Hatchery Quota

- To avoid unnecessary litigation costs and delays, legislation should eliminate arbitrary decisions by providing clear direction about how quota is to be allocated.
- Any allocation formula used must be demonstrably consistent with the objectives of the legislation.
- While an allocation formula used need not be the best available in terms of meeting objectives, it should be reasonable.
- Fisheries' managers have sought to produce efficient market outcomes not through allocation formulae but rather through making allocated quota freely transferable.
- If a government were to choose to allocate an increase in hatchery quota entirely to existing pearl producers, this would be consistent with past approaches to allocating increases in quota adopted in Australian fisheries jurisdictions (where quota has been wholly allocated to those with catch history in a fishery).
- If governments choose to allocate an increase in hatchery quota in proportion to existing entitlements (wild stock plus hatchery quota), this also would be consistent with past approaches adopted in Australian fisheries' jurisdictions.

What should be regulated

It is taken as a given in this report that the government and the industry consider the continuation of the hatchery policy as desirable. In considering what should be regulated, ACIL Tasman concludes that the only viable option is to restrict shell seeded rather than the number of pearls supplied. This is the case because of the impossibilities otherwise of ensuring compliance. ACIL Tasman recommends that restrictions on shell seeded should continue as the regulatory mechanism.

Who should regulate

In considering who should regulate, the option of industry self-regulation was examined. ACIL Tasman concludes that regulation by Government is more likely to achieve the policy objectives. This is the case due to the inherent instability of private arrangements and difficulties of private enforcement, as well as the risks of anti-competitive behaviour arising from private regulation.

Similarly, we consider it is unrealistic and potentially unworkable for industry to set the hatchery quota. The corollary is that Government should do so, although this does not and should not preclude industry advice being taken into account since much of the information required to take an informed decision resides within industry. Industry would also bear the large part of the
cost of any inappropriate decisions. There is an existing formal industry advisory structure – in the form of the Pearling Industry Advisory Committee (PIAC) – that would be suitable for the Government to use in, at the least, acquiring industry views, and more usefully, in reviewing and advising on the range of factors that the Government will need to consider in taking quota level decisions.

ACIL Tasman, therefore, recommends that the Government continue to set the hatchery quota and that it should use PIAC to review and advise it on taking quota level decisions.

In terms of how the Government should go about taking decisions concerning hatchery quota, ACIL Tasman recommends that decisions be informed both by some level of modelling and by the judgement of an informed group of market participants.

The outcome of informed judgement by itself leaves much to chance. In considering an investment decision, instinct is normally backed by a sound financial analysis. In this situation, a sound analysis of pearling markets would enhance the credibility and defensibility of a quota decision, which is why we believe both are essential. That said, the choice of approach to setting quota would be dictated by the availability of market data.

While data may be available on Australian sales of South Sea pearls, individual firms hold this data closely and there is little prospect of their being released for market research. Moreover, there is little if any reliable data available relating to sales by producers in other countries and producers of competing products. The data situation suggests that only a fairly basic level of modelling would be possible. Despite this, ACIL Tasman recommends that modelling, albeit basic, should be developed and used in taking decisions on changing the level of quota. We consider that data collection is possible to the extent required by the review process.

It is critically important for decision-makers to have access to data accurately reflecting market conditions. We recommend that alternatives to the industry and Government sources of data be used. Given sensitivities involved here, the best option would be for a third party, acceptable to Government and industry, to be engaged to collect data. A market research group could be such a candidate.

ACIL Tasman recommends the following approach to reviewing quota levels:

- Quota levels be reviewed and set on a ten year basis, with a mid-period review after 5 years;
Pearl Hatchery Quota

- In order to avoid the dangers of arbitrary decisions to increase quota, the pearling legislation should include provision for a formal review and advisory process involving PIAC prior to any decision being made to increase or release quota;

- In reviewing the hatchery quota, the Government should commission PIAC to review and advise it, initially prior to the hatchery policy’s expiration, and then subsequent to that at least each five years, on:
  - whether
  - if so, by how much, and
  - when

  the pearling quota should be altered and released; and

- Any additional quota should be released in tranches, the timing of which should be decided only after review by PIAC.

ACIL Tasman recommends PIAC adopts a 5-step approach in undertaking such reviews, which should include using the data collected to construct a model of the pearling industry market:

**Step 1:** Review the history of quota, production, marketing and prices over the past period (a decade in the case of the initial review, and subsequently five years) in order to build a clearer picture of where the market has come from in arriving at its current level of revenue from pearls. Attention should be paid to industry actions to increase demand for its product over the period, particularly in order to inform government considerations of whether it should continue to regulate supply via the quota system.

The Government should maintain quota restrictions only so long as the WA pearling industry continues to exercise a reasonable degree of market power. This is why it is necessary to monitor the industry and to continue to evaluate whether or not the hatchery quota is in the national interest. As the degree of market power of Australian producers falls, the hatchery quota should be expanded until it effectively no longer limits the industry. In this way, industry can expand production in the face of expanding production from competing suppliers.

There would be a need here to take into account what has happened with respect to production and sale of substitutes for Australian South Sea pearls. This includes competitors or potential competitors, such as Indonesian pearl producers, as well as other jewellery.

**Step 2:** To understand what is likely to happen to supply if no change is made to the quota, explore potential production from the existing total quota (wild shell and hatchery quota). This should be used to produce a forecast of growth in the volume of production over the next ten years. This growth will
Pearl Hatchery Quota

be the result of the increase in the volume of pearls produced from the (unchanged) quota.

Step 3: Model some plausible scenarios about expected future growth in demand. For example, ACIL Tasman would expect real GDP (income) growth in the US and the European Community to average about 3 percent per annum over the next ten years. Assuming demand for pearls is income elastic, this might convert to growth in demand of about 4 percent a year on average. In addition, the scenarios would need to take into account other factors that might impact on demand in either a positive (for example, via promotion) or negative sense (such as the further growth in competitors' and substitutable products).

Market research could be used to provide a stronger basis for the plausibility of scenarios, including input to modelling the market. PIAC would need to commission research to collect data and other information on the following range of factors:

- Prices for the various grades of South Sea pearls and competing products;
- Income levels in the major export markets;
- The level of supply of South Sea pearls from Australian competing producers (including factors that might constrain supply growth and investment plans by competitors);
- Supplies of competing pearls and other jewellery;
- Technological developments that might result in improved or more predictable quality and cost reductions;
- Developments in regulations overseas that have implications for markets;
- Consumer preferences and marketing campaigns by Australian producers and their competitors to influence or change such preferences; and
- Changing market structures (for example, a move away from farm gate sales towards closer contact with ultimate consumers).

Step 4: Compare the forecast rate of growth in projected demand to growth in the past period.

Step 5: Determine the state of the market at the starting point. This is important. For example, it is necessary to know if the market is currently characterised by excess supply (and stock build up). If this is the case, it may be necessary to let the market drain away this excess supply before adding to the hatchery quota (noting that this may mean no increase in quota for the entire period in question).
Pearl Hatchery Quota

Before determining whether a change in quota were advisable, once PIAC had completed its 5-step review and presented its advice, the Government would need to consider the key issues:

- What will the level of demand be at the conclusion of the next decade (or other period)?
- What total quota is needed to supply the level of forecast demand?
- What is the current state of the market?
- When, if at all, should additional quota be released?
- What should be monitored over the 10-year, or other, period?

Placing large amounts of quota on the water at one time would seriously undermine the market. Therefore, releasing the quota in tranches would be more successful in maintaining prices.

In between tranche releases, the Government would need to monitor industry developments including movements in prices for indicator pearls. For example, a drop in prices should be interpreted as the market being over-supplied and this could cause a reconsideration of the timing of, or any, release of the next tranche. It is in these types of circumstances where the industry’s plans for promotional activity aimed at increasing demand to a level where prices could at least stabilise (if not rise) that attention would need to focus.

Approach to allocating quota

Should the Government determine market conditions warrant the addition of new quota, there are two broad methods of allocating it:

- By administrative means whereby the government allocates the quota among competing stakeholders based largely on non-market considerations; or
- A market mechanism (such as a sale or an auction).

While the normal default position is to prefer market mechanisms to administrative interventions, there are several factors that led ACIL Tasman to opt for administrative intervention in this case.

Issues of co-ownership of additional quota created and to be allocated

ACIL Tasman recommends against using auctions. If the community owns a resource, it is appropriate that the government obtain compensation for the community from the users of that resource. An auction would be an efficient and equitable way of allocating such rights to community owned property (provided it was a well designed, competitive auction). However, the community or the government do not own hatchery quota.
Pearl hatchery production is a manufacturing process that takes place largely on pearl farms, with industry owning the value produced from the manufacturing process. What is more, while government has contributed to the creation of the value embedded in hatchery quota (by restricting supply), industry owns a substantial part of this value as well (industry effort in converting hatchery options to quota produced the embedded value). Therefore, the industry rather than the community also owns a substantial proportion of the ‘rents’ created by the artificial restriction on supply.

The initiator of the policy that has increased the value of the industry could claim the right to a share of these rents. However, the hatchery policy is very much a joint industry-government initiative. If Government were to opt for setting a price for or auctioning quota, any price set or auction used would need to be designed so as not to collect rents that more appropriately should substantially remain with the industry owners. An alternative approach would be for the government and the industry to share the proceeds raised by the auction. But how would the government allocate the share to the industry? This could be in the form of an industry research and promotion fund. However, experience has shown that these approaches tend to be wasteful in terms of the rate of return from the funds employed. From an economic efficiency perspective it may be better to leave all of the money in the industry where it will earn a higher rate of return rather than transferring it to the government through an auction.

In situations where a substantial portion of the value of the rights are owned by industry, governments should rely on administrative allocation methods leaving it to secondary markets to ensure an efficient allocation of quota over time, rather than attempting to sell quota.

**Risks in using auctions to sell new quota**

The case of allocating new pearling quota is quite different to many other fisheries based industries – in that pearling is essentially a manufacturing process in which community owned resources add little value. However, in terms of the very high risks involved in designing and implementing either an auction-based or price-based sale system, the pearling industry is no different to many other fisheries based (and other) industries. There are several factors that act either separately or in unison to endanger competition when auctions are employed. These factors can arise either from the ways in which the auction is designed or from the bidders’ incentives to maximise their gains. These include:

- Restricting the number of bidders
Pearl Hatchery Quota

- Restriction on entry to the auction may seriously undermine the degree of competition and result in under valuation of quota, with serious consequences of eroding the value of existing quota holders;

- The pros and cons of using reserve prices
  - A reserve price can discourage participation and reduce competition and depending on whether the level selected is 'right', it could increase or decrease auction prices; but on the other hand it could counter strategic price manipulation or collusion;

- Collusive and strategic bidder behaviour
  - There are various ways in which bidders can collude to reduce the amount of competition and the price paid, as well as counter-mechanisms for preventing collusion among bidders by encouraging collusive participants to cheat on other colluders. Some countermeasures may conflict with other auction design actions;

- Bidding and entry costs
  - Costs determine numbers participating, so containing the costs of entry and bidding costs can strengthen bidding competition and increase potential revenue.

In addition to these inherent risks, there are several important and complex factors that would challenge governments in designing an efficient quota auction including:

- Defining what is to be auctioned
  - The quota auctioned, along with existing quota, should be a total quota share to facilitate the management of the industry in response to changing market circumstances. Existing hatchery quota would need to be converted into quota shares, or variable shell quota, whereas they are currently defined in terms of a fixed number of shell;

- Determining the size and number of lots
  - Dividing the quota into too many lots may result in fragmentation and may make an auction unnecessarily complex. It may also subsequently add to compliance or enforcement tasks;

- Selecting the type of auction (English, Dutch etc)
  - There are many choices between auction types, most of which turn on their suitability for preventing collusion between candidates, preventing wide participation or shyness (for example, by limiting candidates’ perceptions that they will suffer winner’s curse);

- Dealing with risk aversion and uncertainty and the need to minimise their adverse effects
  - Bids depend on how others are expected to bid, with bidders discounting their bids according to their perceptions of the risks and uncertainties. The design of an auction can reduce bidder valuation...
uncertainty, for example, by setting the price as a combination of an up
front amount plus a series of payments over time; and
• Dealing with 'winner's curse'
  – Where the winner faces a risk of paying more than the good is worth,
    discounting of bids is encouraged; and
  – Full disclosure and encouraging the sharing of information among
    potential bidders through selection of particular types of auction
    designs may counter this risk.

There are good reasons why fisheries authorities in general – and government
more widely in relation to other regulated industries – have not elected to use
auctions to allocate quota or quota-like goods or services even where it is clear
that it is dealing in community owned resources (which is not the case with the
hatchery quota).

The high risk in using auctions or price-based systems occurs if government
gets it wrong. If industry pays either too much or too little for quota, this could
impact directly and adversely on industry structure as well as its long-term
viability. Given that the community does not own the economic rents
embedded in quota, sales or auctions of quota would ensure that governments
captured that rent producing for itself a revenue raising outcome. This, of
course, is an action that any government can choose to do. Appropriately, such
action should be done transparently and having taken into account the full
costs and benefits.

ACIL Tasman suggests that there would be much simpler and more direct
ways of raising additional revenue from the pearling industry – should the
government wish to do so – that would not at the same time entail the high
risks, and costs, that auctions or sales-based processes would.

ACIL Tasman recommends that administrative rather than market
mechanisms be used to allocate new quota. We consider that legislated
administrative mechanisms can produce efficient market outcomes – provided
secondary markets remain unimpeded. Moreover, provided the legislation is
clear and decisions taken are both consistent with the legislation and
reasonable, the risks of litigation can be minimised.
**Pearl Hatchery Quota**

**Administrative mechanisms of allocating quota**

There are several choices if government is to allocate new hatchery quota by an administrative mechanism:

- Allocating quota to existing pearl producers only through either:
  - Equal allocation to all licensed producers;
  - Proportional allocation to all licensed producers; or
  - Allocation only to hatchery quota holders;
- Earmarking at least part of the new quota to other groups outside the industry; and
- Work program bidding.

The three alternatives methods of allocating quota to existing producers can each achieve efficient market outcomes, provided that the quota is transferable (to those inside or outside the industry). The choice of method turns on considerations of equity and minimising litigation potential.

ACIL Tasman recommends that new quota be allocated to:

- Existing producers only, and
- In proportion to their current total holdings of quota (hatchery and wildshell).

This recommendation stems from four considerations:

1. The need to minimise litigation potential.
2. The desire to maintain equity.
3. The desire to minimise windfall gains; and
4. The need to minimise cost inefficiencies in the allocation method selected.

Each of these is considered in summary form below.

**The need to minimise litigation potential**

Minimising impacts on wealth distribution generally lessens the potential for litigation (or at least successful litigation).

Over the past decade, various governments have adopted several different approaches to the allocation of quota or other rights. Of note as well are various legal challenges, some of which have been successful in overturning administrative decisions. This has been particularly the case in fisheries where the allocation formulae adopted have been demonstrated as unreasonable. From this history, it can be seen that litigation is most likely to arise when an allocation formula causes significant changes in the distribution of income or wealth among interested parties.
Pearl Hatchery Quota

The allocation or re-allocation of any form of rights (licence, concession, franchise or quota) can have significant impacts on the distribution of income or wealth across individuals in the community. Governments have traditionally addressed the issue of equity by designing policies or allocating rights in a way that attempts to minimise the impact on the existing distribution of income or wealth of stakeholders. Participation history (for example, catch history in fisheries, or an existing broadcasting licence in relation to the allocation of spectrum) has played a major role in deciding the allocation of changed or additional rights to exploit common property resources. The courts have overturned allocations on inequity grounds where equity has been measured in terms of changes to the relative economic position of individuals.

All producers should be allocated some additional quota because it is the holding of both types of quota, hatchery and wildshell, which is relevant in terms of income or wealth impacts. Changing the volume of quota impacts on the value of all quota.

ACIL Tasman considers that all producers should be allocated some additional quota

- in proportion to current holding of quota (wild shell plus hatchery)
- because it minimises redistribution of wealth
- and is less prone to litigation

The desire to maintain equity

ACIL Tasman favours the proportional allocation method since this method minimises the impact on the relative distribution of wealth of current producers, as well as recognising the additional investment (and risks taken) of the larger producers.

Our interpretation of past litigation history in relation to quota allocation, is that using a proportional basis is also less likely to trigger litigation than using an equal allocation of quota. This is because the allocation formula would be considered as reasonable.

However, it should be acknowledged that this is an area that is highly unpredictable and arguments could be mounted that an equal allocation achieves a better outcome if equity is interpreted in an absolute rather than a relative amount sense.

Equal allocation is equitable in an absolute sense because all producers are allocated quota of equal dollar value. However, this has different implications for the relative wealth, or income positions, of producers.

Fisheries authorities, especially the Australian Fisheries Management Authority, have tended to base allocation decisions on catch history so that those with a greater historical catch are allocated more quota. Sometimes this has involved part of the additional quota being allocated on an equal basis and part allocated according to catch history.
Pearl Hatchery Quota

The desire to minimise windfall gains

Our main concerns in giving away new quota free arise from its:
• Being inequitable;
• Producing windfall gains; and
• Rewarding recipients with competitive advantages.

When something of value is allocated to an individual, this could be considered to be a windfall or unearned gain. If new hatchery quota were allocated for free to those outside of the industry, then clearly this would be a windfall gain, as these people have done nothing to earn the quota. When quota is given for free to those inside the industry there is less of a windfall involved because existing quota holders have done something to earn the quota. For example:
• The industry was responsible for developing the technology of producing pearls from hatchery quota;
• The industry has created a valuable market in pearls through their production and marketing activities that have undoubtedly increased the value of the pearls;
• The existing holders of quota bear all of the downside of new quota allocations. That is, if there is an increase in quota, this may have the effect of depressing quota prices and therefore the wealth of existing quota holders. Allocating them quota on a gratis basis could be seen partly as compensation for the risk of significant reductions in wealth from increasing quota supply; and
• The hatchery quota restricted the industry (in that many would have liked to produce more pearls but were bound by the quota).

There is a view that the interests of equity and competition would be served by allocating some of the quota to those currently outside the industry. If the quota is simply given to individuals or groups outside of the industry, this would produce windfall gains. On the surface, it would place new entrants at a competitive advantage relative to:
• Those in the industry who have earned the value of their original options allocations through investment, risk taking and through the development of technology; and
• Those who purchased hatchery options or quota from original recipients.

Granting free quota to potential entrants would, therefore, be inequitable by comparison.

More importantly, it could be judged as a capital subsidy that would distort the allocation of resources. A capital subsidy would artificially increase the rate of return to resources employed in pearling causing resources to be allocated to pearling that would otherwise have been allocated to another economic...
activity. From the perspective of the WA economy as a whole, there would be an efficiency loss.

There is no barrier to entry into the industry. The cost of quota, along with other capital costs, is a cost of entry to the industry. Such a cost does not preclude an efficient allocation of resources.

Depending on choices made as to who should receive free allocation, the Government could be accused of folding into pressure from interest groups. This could undermine the credibility of the pearl hatchery policy.

ACIL Tasman concludes that free allocation to those outside the industry would be inconsistent with both the efficiency objective of the pearl hatchery policy and equity considerations.

ACIL Tasman recommends against allocating a portion of new quota for free to those outside the industry.

The desire to minimise cost inefficiencies in allocation method selected

ACIL Tasman recommends against allocation by work program bidding since it is likely to result in costs incurred, for a given value of production, that exceed the costs associated with allocation to existing producers.

These costs arise from the need to evaluate bids and the inflexibility that can arise because market conditions may depart from the market conditions upon which a promised program of work was predicated.
1 Introduction

WA Fisheries commissioned ACIL Tasman to report on certain aspects of the future management arrangements for the pearling industry in Western Australia with respect to the pearl hatchery policy. The pearl oyster hatchery policy is due to expire in December 2005, and thus there is a requirement to review mechanisms to determine the method for changing the aggregate amount of hatchery quota. If it is decided to increase the aggregate amount of hatchery quota, there is a need to determine how that quota should be allocated to individuals.

The tasks consist of three components:

1. Analyse the policy framework and suitable mechanisms to support decisions to review and/or to increase overall production from hatchery shell including economic efficiency and equity criteria;
2. Outline the data and information requirements to support the mechanisms and decisions in (1) above; and
3. Outline and explore the range of different approaches that have been taken to issuing new quota in recent years in Australia in both new and established fisheries, including auctions, tendering and other allocation mechanisms.

In our view, the key public policy issues involved with these tasks comprise:

- Alternative mechanisms for setting the restriction on supply of pearls onto the international market (for example, via export taxes or quotas, quotas on production or shell);
- In the case of a quota, the basis for setting and altering the quota over time;
- If the amount of quota is to be varied, how should the additional quota be allocated or, if necessary, how should quota be withdrawn from the market; and
- If quota is to be sold rather than allocated administratively, who 'owns' the value associated with hatchery shell and, therefore, who is entitled to the sales' proceeds.

The efficiency and equity implications for different stakeholders can be expected to vary significantly depending on the approach adopted to setting and allocating quota.

This report is structured to take the reader through the issues in a logical sequence:
Pearl Hatchery Quota

- Beginning with the background issues of government objectives in regulating hatchery production, design principles in setting or altering quota, what should be regulated and by whom;
- This leads into the complexities of regulating supply including the critical issue of who might own the value that has been created by the hatchery quota – and thus who also might have valid claims to being affected by prospective dealings in those proceeds, such as by varying the quota;
- Having established this groundwork, we then address the issues of alternative regulatory (including self regulatory) mechanisms and their implications;
  - Including data requirements and the possible compromises to which these may lead; and
- Finally dealing with alternative mechanisms for allocating additional quota.
2 Background to regulating hatchery production

This Chapter establishes the parameters of the policy issues discussed in this report:

- What the government’s objectives are in regulating hatchery production;
- The principles government needs to observe in designing a hatchery regulatory regime;
- The rationale for regulating the number of shell seeded rather than the number of pearls sold; and
- Who should be the regulator.

2.1 Objectives of regulating hatchery production

Government does not regulate pearl hatchery production to achieve conservation of the stock of wild shell. This conservation objective is achieved by the total allowable catch set for the wild shell harvest along with supporting controls on fishing and pearl farming activities.

Rather, government regulates the pearl industry as a whole, and in particular the pearl hatchery industry and its output in order to maximise the economic benefit to the community of the WA pearling industry\(^1\). The pearl hatchery policy is based on the view that an unrestricted market could involve a substantially higher supply of Australian South Sea pearls relative to existing levels of world demand for South Sea pearls. To sell this higher volume of pearls, lower prices would be required. Prices may be sufficiently lowered that the aggregate profits of the industry could be reduced. This loss in profits to Australian pearl producers would outweigh the gain to Australian consumers from lower prices, resulting in an overall reduction in national welfare.

This situation arises because the supply decisions of Australian pearl producers have a considerable influence on world prices. The supply decisions of Western Australian producers influence the price of their product on world markets. This is unlike most export markets into which Australian businesses sell, where the impact on world prices of a new producer or an increase in

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\(^1\) The Government’s objectives are, as stated in the hatchery policy guidelines (page 15), “hatchery (policy) should aim to ensure as far as possible that the volume of quality Australian South Sea pearls offered to the world market does not seriously alter the pricing mechanisms currently operating”, and reinforced in the new Bill, through one of its primary objectives of “maximising the net economic, social and other benefits from pearling and pearl farming to the pearling industry and to the Western Australian community”.

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Pearl Hatchery Quota

production is minimal. World prices for Australian South Sea pearls are highly sensitive to both actual and anticipated increases in supply. If this was not the case, there would be no reason to restrict the supply of hatchery shell and through that restriction, effectively restrict the supply of pearls onto the world market.

The industry has a significant set of dual incentives to maintain its capacity to influence world prices in the form of potential profits from sales of pearls and the hatchery policy itself. The latter states that (page 15):

“Future developments, both within Australia and overseas, may result in the Western Australian pearling industry having a reduced significance on the world market. This may then lead to a change in strategy.”

It is thus in the industry's interests to maintain its influence over world prices (through for example, investment in promoting its product and increasing its qualitative edge over the rest of the market) in order both to increase profits and to demonstrate that there is good reason for the Government to maintain the hatchery policy.

In the case of setting an optimal quota, the economic efficiency objective is most relevant. Economic efficiency is concerned with maximising the value of wealth whereas equity concerns issues about how the wealth or opportunities to earn that wealth are distributed among competing interests. While there is no equity objective as such in either the current Act or in the new Bill, this exercise seeks to analyse both economic efficiency and equity considerations. Regardless of whether equity considerations are formally included in legislation, these are clearly a relevant consideration for Government.

Maximisation of economic benefits involves maximising the surplus derived from an activity or resource. That surplus consists of the value placed on the output (what people are prepared to pay) less the costs of producing that output. The value placed on the output consists of consumer and producer surplus. In the case of South Sea pearls, Australians consume such a small portion of total pearl production that it is convenient, without loss of rigour, to ignore consumer surplus. What maximising value then comes down to is maximising the collective profits of the Australian pearling industry from sales of South Sea pearls.

Profits are equal to price times the volume of sales less the costs of supplying that volume of sales. In markets where the actions of Australian producers have no significant influence on total market supply, these Australian firms are said to be price takers. Faced with a price, these price takers need only select the amount of output that it is most profitable for them to supply.
Pearl Hatchery Quota

In the case of South Sea pearls, the supply decisions of Australian producers have major implications for current and future world prices of South Sea pearls. In this situation, the industry collectively has a choice from two control variables that it could employ to maximise its profits. It can set price or it can set volumes. It cannot do both however.

Having set a quota on the amount of shell that the industry can seed, the associated supply of pearls, along with consumer preferences and the prices of substitute products will determine the prices that consumers are prepared to pay for Australian South Sea pearls. The optimal quota is that level of shell and its associated supply of pearls that maximises the collective profits of the Australian industry. The decision is the same as the decision that a monopolist takes in seeking to exploit fully its market power.

Equity is another important consideration for the Western Australian Government in the design of management arrangements for the industry. However, the notion of equity is less clear-cut than the economic efficiency objective in that there is a range of views on what equity means.

The allocation or re-allocation of any form of rights (licence, concession, franchise or quota) can have significant impacts on the distribution of income or wealth across individuals in the community. Governments have traditionally addressed the issue of equity by designing policies or allocating rights in a way that attempts to minimise the impact on the existing distribution of income or wealth of stakeholders. Governments have tried to minimise impacts on existing wealth distribution to avoid litigation.

There is another interpretation of equity involving an income distribution aspect that may also influence policy makers. This could result in a greater allocation towards lower income and away from higher income individuals or

\[\text{Equity is less clearly defined}\]

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3 According to Huppert (1987), cited by FERM (page 7), “everyone agrees that fishing regulations should entail an “equitable” distribution of benefits.” Huppert is quoted as concluding that Rolph(1983), in a study of twelve government programs that allocate property rights, found that policy makers deal with the equity issue by designing regulations to minimise any redistribution of wealth. Where established resource users enjoy benefits of a communal resource, Rolph concluded that: “the judicial, the legislative, and the executive branches have uniformly supported the claims of historic users when allocating rights”.

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Background to regulating hatchery production
Pearl Hatchery Quota

groups. Governments may place a differential weighting on the welfare of different groups in the community in reaching what they consider to be equitable decisions.

2.2 Design principles in setting and altering quota

In addition to being efficient and equitable, the hatchery policy should be designed according to the following principles:

- Flexibility and adaptability;
- Administrative/compliance simplicity;
- Transparency, consistency; and
- Minimise probability of litigation/disputation.

Because information is always incomplete and because of uncertainty, there is a need for some flexibility in setting quota. The longer the period for which quota is set, the greater is the risk that the level of the quota will move out of line with market circumstances. If quota is adjusted frequently in response to market conditions, there is less risk that the quota will be out of line with the market for anything but short periods. The trade-off, however, is the additional cost of more frequently setting quota levels and the uncertainty that this can introduce into the market.

The costs of regulation can be substantial for both the regulated and the regulator. It makes sense to design a regulatory framework that minimises the costs of achieving the objectives of the legislation. Administrative costs would include the information, analytical and monitoring costs of ensuring the quota is consistent with market developments. The regulations should not impose the costs of unnecessary uncertainty on producers.

Any increase in the amount of quota will impact on the value of existing quota to some extent, and the distribution of additional quota will have differential impacts on the wealth of existing quota holders and successful applicants for quota. The design of the regulations must take into account the prospect of appeals and litigation, from both quota and non-quota holders. The process for determining the level of quota and its allocation need to be clearly spelt out so as to reduce the possibility of appeals and litigation.

2.2.1 Lessons learned from quota allocation history

ACIL Tasman has considered the history of quota allocation in Australian fisheries’ jurisdictions and the case law of appeals against quota allocations (see Attachment A, Section A.4, Case law, and Attachment B). This history

Background to regulating hatchery production
Pearl Hatchery Quota provides a number of lessons that need to be taken into account in designing the allocation of hatchery quota, which we have set out below:

- **state objectives clearly**

  The objectives of the quota allocation must be clearly stated.

  In this case, the objectives that the Government is seeking through the pearling legislation are the maximisation of the value of the resource (economic efficiency) and equity.

- **demonstrate consistency in objectives and allocation formulae**

  It must be demonstrated that the allocation formula is consistent with the objectives of the legislation.

  Allocations by fisheries authorities have been challenged on the grounds that they are inconsistent with legislated objectives.

- **formulae must be reasonable**

  Allocation formulae need not be the best available in terms of meeting objectives, but should be reasonable.

  Quota allocation litigation has succeeded when it has been able to demonstrate that the quota allocation formula adopted was not reasonable.

- **allocation to existing producers is consistent with past practice**

  A decision to allocate the increase in hatchery quota entirely to existing pearl producers would be consistent with the past approach adopted in Australian fisheries jurisdictions.

  In all quota allocation cases reviewed, quota has been allocated solely to those with a history in the fishery. The only departure from this has been in the case of developmental fisheries, where a portion of the quota has been allocated to fishers other than pioneers. However, these fishers have normally held licences in the wider fishery in which the developmental fishery has been located.

- **efficiency comes from quota being freely transferable**

  The efficiency objective has not been sought through the allocation formula but through making quota freely transferable.

  Governments have recognised that the allocation of quota has little to do with economic efficiency. It can be demonstrated that a wide range of quota allocation formulae is consistent with economic efficiency provided that the quota, once allocated, is freely tradeable. Governments have relied on secondary markets in quota to achieve the efficiency objective.

- **allocation in proportion to existing entitlements is consistent with past practice**

  Allocation of new quota in proportion to existing entitlements (wild stock plus hatchery quota) is consistent with past practice.

  Governments have sought equitable allocations of quota by taking into account past catch history in arriving at quota allocation formulae. An
equitable outcome has been interpreted as that which has minimal impact on the distribution of income or wealth of existing operators.

The pearling legislation should eliminate arbitrary decisions by providing clear direction about how quota is to be allocated.

Challenges to allocation decisions have been more common in cases where the allocation involved the exercise of discretion by the fisheries management agency (or other government body). It is more difficult to challenge an allocation if the formula is embodied in legislation. When the formula is embodied in a lesser document, such as a management plan or a policy, the prospects for litigation tend to be greater.

Determining an appropriate allocation formula would be best achieved by statute, in order to minimise the challenges that arise when the exercise of administrative discretion is required – either in the forming of policy or delegated legislation. The statute should clearly set out its purpose and objectives, which may include social or community welfare.

2.3 Target variable: What should be regulated?

The ultimate objective is to control the supply of pearls coming onto the market. A threshold question that needs to be addressed is why not do this directly through a quota on the volume of pearls sold or a control on the quality of pearls sold, rather than restrict the amount of hatchery shell seeded?

The current hatchery policy is designed not to restrict the supply of pearls, but within the constraints of the overall quota on shell, to allow the rate of growth of supply to be determined largely by market and cost considerations. The objective is to moderate the rate of growth of supply to ensure that it will be commensurate with the rate of growth in demand.

Under the hatchery policy, producers have incentives to maximise the value of the shell used through raising the yield per shell or minimising production costs. If the restriction were on the number of pearls produced, there would be less incentive to minimise shell used. Producers could use a much greater amount of shell and forego re-seeding operations. There would also be incentives to discard lower quality pearls in an attempt to maximise the value of the quota. While this in itself would not be inefficient, under a pearl based quota system, pearl farming may require access to a much larger area of water. This raises concern with competing water users, congestion, the spread of disease, maintaining yields and quality as competition for nutrients increases, and concerns with increased difficulties of enforcing compliance with the wildstock regulations. The external costs imposed by each producer on other
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producers could be significant. The difficulty of monitoring and enforcing may also be considerably greater as shell populations on farms increase.

Of most concern under a pearl-based quota would be the difficulty of preventing smuggling of over quota pearls. The very high value to size ratio of pearls makes them highly amenable to smuggling activities (with the costs being relatively low and the rewards relatively high). The wildstock resource would still need to be protected by quotas on shells, even if there was an overall quota on pearls exported. If hatchery shell were not subject to quotas, it could prove very difficult to determine whether the wildshell quota is being adhered to because wildstock and hatchery reared shell are identical in all physical respects.

The only viable option, therefore, is to restrict the number of pearl shell seeded rather than the number of pearls supplied.

2.4 Who should regulate: Government or industry?

Is it necessary for Government to enforce the control on the supply of pearls, or could producers themselves control supply? An advantage of self-regulation is that the industry has direct financial incentives to ‘get it right’, greater flexibility and better and timelier information about the market that could not be obtained by a government regulator.

However, private supply agreements are notoriously unstable. Even if agreement can be reached by the industry concerning the total amount of quota, individual members would have very strong private incentives to cheat (if they feel that others will continue to comply). Moreover, the industry has little power to force its members to comply and to enter property to check compliance. A private cartel does not have the coercive powers of Government to enforce such a quota.

There are additional concerns with private administration similar to those that can be found where privately administered occupational licensing has resulted in the creation of barriers to entry to an industry, as well as other behaviour that can cause inefficient outcomes. Government regulation can ensure that the regulatory arrangements continue to be consistent with the community interest.

In the final event, Government would most likely still need to protect the wildstock, as it is unlikely that the community would accept its private regulation. If there were a mixed system (private regulation of hatcheries, public regulation of wildstock), there could be enormous complexity in ‘meshing’ the two systems. There would appear to be little to gain from private control of hatchery shell.
At this stage, there would appear to be no alternative approach that would achieve the objectives of the government mandated hatchery policy at less cost.

2.5 Conclusions: On regulating hatchery production

We conclude from this background chapter that:

1. Government objectives in regulating hatchery production are to maximise economic efficiency of the industry and in doing so to maximise the community's benefit.

2. The principles governing designing hatchery policy should be:
   - Flexibility/adaptability;
   - Administrative/compliance simplicity;
   - Transparency, consistency; and
   - Minimise probability of litigation/disputation.

3. The lessons learned from past allocation history that need to be taken into account are:
   - State objectives clearly;
   - Eliminate arbitrary decisions by incorporating the quota allocation method in legislation;
   - Demonstrate consistency in objectives and allocation formulae;
   - Ensure formulae used are reasonable;
   - Efficiency comes from quota being freely transferable;
   - Allocation to existing producers is consistent with past practice; and
   - Allocation in proportion to existing entitlements is consistent with past practice.

4. The only viable option is to restrict shell seeded rather than the number of pearls supplied because of the impossibilities otherwise of ensuring compliance.

5. Regulation by Government is in the community interest because of the inherent instability of private arrangements and difficulties of private enforcement, as well as the risks of anti-competitive behaviour arising from private regulation.
3 Setting the total hatchery quota

This Chapter addresses the setting of the level of hatchery quota. The issues addressed in arriving at the conclusions as to how the quota level might best be set comprise:

- The length of time a quota should apply;
- The precision with which the regulator should attempt to set quota;
- Methods of setting the level;
- Information requirements;
- Who should set the quota; and
- Monitoring the quota impact.

3.1 Preliminary remarks

The level at which the hatchery quota is set, especially if set for a number of years, is critical to the future profitability of the industry. One of the main purposes of the quota is to provide some reassurance to the market that there will not be an unlimited future expansion in supply. This is important because the expectation of large future increases in supply can cause current prices to fall substantially.

Ideally, the aim would be to set the quota at such a level that maximises the net present value of the profits of the industry. However, this may be too precise an objective. A more realistic objective would be to set a quota such that supply grows over time, broadly in line with demand, in a way that does not result in falling prices. This would allow the industry to maintain levels of profitability from sales of pearls while at the same time seeking ways to add value to pearl production.

Market uncertainties make setting quota risky

Uncertainties about how the future will unfold, about the price formation process in the market and information constraints, introduce considerable risk in setting a quota. There is a risk that the quota will be set at too low a level. This will mean that profitable supply opportunities will be foregone. Equally there is the risk of setting the quota at too high a level, driving down prices to such an extent that industry profits will fall.

There are six issues that need to be addressed:

1. The currency of the hatchery quota, or the length of time for which the quota should apply (for example, should the quota be set for, say, a ten year period or some other, shorter period);
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2. The ‘goodness of fit’, or precision, of the quota. The Government could seek to set an optimal quota that attempts to ensure supply at each point in time maximises industry surplus. Alternatively, the Government could seek to set the quota to provide reassurance to the market that growth in supply would broadly match growth in demand, thereby ensuring a relatively stable price path. In the latter case, the quota would act like a guarantee in the same way that the initial hatchery quota policy has operated.

3. The factors the Government should take into account in setting a quota. For example, is there a legitimate role for using informed or educated guesses as to changes in market forces to determine the quota; or should reliance be placed on a sophisticated model of the South Sea pearl market? There is then the follow-on issue of once the quota is set, of whether it can be varied over time, increased in response to evidence of strong growth in demand or reduced during periods when growth in supply exceeds growth in demand. That is, should there be a mopping up mechanism to be employed when the market is awash with pearls.

4. When these four issues are resolved, there is the need to identify the information required to estimate an optimal quota and to be able to monitor the performance of the quota over time (that is, its impact compared to the objective in setting it). The precision sought by the quota will dictate the information required to set the quota accurately.

5. Who should set the quota; a different issue from that of who should regulate the market.

6. Performance indicators need to be developed and monitored in order to provide the Government with a trigger mechanism enabling it to review the quota should market indicators move outside certain bounds (for example, a specified percentage change in an indicator price). Such indicators and mechanisms would further enable the Government both to explain, justify and defend the operation of the hatchery quota, and to decide if the quota is no longer in the interests of the community.

All but the first of these seven issues are addressed in the sections below. What form quota should take is a further issue requiring consideration. Should quota be defined as fixed or variable (in terms of the number of shell per quota unit), and should hatchery and wild shell quota take the same form. This question is addressed in Section 4.2 on allocation mechanisms, not in this chapter.

### 3.2 The currency of the hatchery quota

We have already mentioned the time period for which the quota should be set in terms of the trade off between the cost of varying the quota (and market
Pearl Hatchery Quota

uncertainty) and the desire for the quota to remain relevant to prevailing market conditions. However, there is an equally important aspect of the currency of the quota that needs to be explored.

The first hatchery quota involved the allocation of 350,000 hatchery options to producers that could only be converted into quota and influence pearl supplies over an uncertain, but clearly long period of time. The supply response to the introduction of hatchery options was gradual and has only in recent years neared completion. Today the technology and skills of seeding hatchery shell are well established.

Nowadays, the supply response from the release of additional quota would be much quicker. For example, if an additional 350,000 units of quota were released under a new hatchery policy, this could result in a sharp increase in pearl supplies within two years of release. This would be the case if all recipients chose to seed additional shell immediately. While the expected price implications and the availability of farm areas would moderate this response, there is still a risk of creating a market glut in the shorter term. Even if the market in ten years time could absorb the increase in supply, in the short term, there would be the risk of excess supply and a sharp drop in prices.

Those uncertainties have been resolved – so adding large quota numbers over short periods would see large increases in supply occur quickly.

– thereby warranting a more gradual quota increase
– with tranches gradually released over time

Such considerations would suggest applying a brake on the supply response. Selling the quota rather than granting it freely could achieve this. Forcing the industry to incur additional costs of investing in increased supply could induce a more considered and gradual supply response. Probably more effective, however, would be the gradual release of quota. For example, an overall figure for the increase in quota for, say, a ten year period could be set at the outset, but the quota could be released in several tranches at defined or variable periods during the ten years. We suggest below that the Pearling Industry Advisory Committee should be responsible for reviewing and advising the Government on the level of quota, and on the timing of its release (see Sections 3.6 and 3.8). In this context, we suggest it would be appropriate for the quota to be reviewed midway through the ten year period; this does not preclude more – or less – frequent release of additional quota.

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4 That is, the uncertainty of the time involved relates to successfully introducing the technology, acquiring the skills and managing the grow out of hatchery shell to maturity and seeding. Only one Australian producer had such experience when the hatchery policy (and quota) was introduced in 1992. All other producers, therefore, needed to develop the technology, skills and management expertise themselves in order to convert the options to quota (see Box 1).

5 This would be physically possible since there are sufficient shell stocks growing in the water for producers to seed quantities well in excess of current quota. There have been no restrictions on the number of shell hatched, only on the numbers seeded.
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An advantage of a gradual release is that the supply response will be more gradual. The tranches and their timing can be set in accordance with the anticipated growth in demand including a range of factors to be assessed such as the impact of marketing aimed at increasing demand for the product. Moreover, if the market is over-supplied, it would be possible to delay the release of the next tranche, or impose conditions upon its release (including no release at all).

Industry reaction to this delayed release would be mixed. For example, a number of smaller producers are seeking increased volume to strengthen their operations’ viability. These producers may have a strong desire to seed additional quota as soon as possible. While this may be the case, it is important that the Government withstand such pressure from individual interests when designing a policy to achieve a collective interest.

Objections by some to the allocation of quota per tranche could be partly overcome by trade in quota. It could also be partly overcome by allowing trade in tranches. For example, an operator could buy the tranche allocation of another producer, repaying that with quota from a future tranche. This would work provided that the total for a tranche is fixed over time.

### 3.3 Alternative approaches to setting quota

There is a range of possible approaches to setting a quota for the pearling industry. If we put our mind to it, it would be possible to come up with numerous approaches and variants. For current purposes, two approaches are discussed: the setting of an optimal quota and the setting of a quota designed to bound future growth in supply.

#### 3.3.1 An optimal quota

The Government might seek to determine quota at each point in time in a way that maximises the surplus (collective profits) generated by the industry. Such an approach is very demanding in terms of requiring a sophisticated model of the market and in terms of the information required to run the model.

Economic theory is quite straightforward about what an optimal quota is. In economic terms, profit is maximised at a level of supply where the consequent market price is just equal to the marginal cost of the last unit of production. The difference between a price taker and a monopolist is that the supply decisions of the latter will influence price. The lower the level of supply, other things equal, the greater will be the level of prices. If supply is increased beyond that, prices will fall. The trick is to choose that level of supply so that the last unit sold adds exactly as much to revenue as it does to cost. This is
Pearl Hatchery Quota

illustrated in Figure 1, which represents a simple model of a market. The supply curve shows how the unit cost changes with rising levels of production. The demand curve shows how the quantity demanded falls as the price charged rises. The marginal revenue shows the rate at which it is necessary for market clearing prices to fall as the quantities rise.

A firm acting as a price taker will ignore its influence on market prices (basically assuming marginal revenue does not fall as quantity rises) and supply up to the point where price and marginal cost are equated (at quantity Q). This results in industry profits equal to the sum of the checked and cross-hatched areas. Collectively the industry can do better than this by restricting supply. The collective profit is maximised at the quantity Q*. This is the quantity at which marginal cost is equal to marginal revenue; the plain shaded area plus the checked area illustrates profits.

6 There is a convergence between the two questions of whether supply should be regulated and what an optimal quota might be. When Western Australian producers no longer influence the price of their product (that is, pearls become like almost any other commodity sold onto world markets), the optimal quota would be infinitely large. That is, Western Australian producers' rate of production of pearls and supply onto the market should not be regulated – from an economic perspective. (This says nothing about changing regulation of the wild stock for conservation purposes.)
Pearl Hatchery Quota

**Figure 1  Defining the optimal quota**

This analysis is a simplification of, or an abstraction from, reality. In practice, markets are more complex than this, but the principles underlying the demand/supply framework still hold.

For a given industry supply function and a given industry demand function, it is possible theoretically to solve for an optimal quota, that is, the quota that maximises the community benefit. In practice, the setting of an optimal quota is likely to be very difficult because of the complex information requirements (and cost of obtaining the relevant information) and uncertainty about future market developments.

### 3.3.2 Bounding supply growth

An alternative approach to regulation of the industry would follow the approach adopted in the initial hatchery policy. This could involve making a judgement (based on varying degrees of sophistication of the analysis ranging from ‘gut feeling’ through to a detailed econometric model) about the level of supply that would be consistent with a stable (or rising) time path of future prices. The policy would seek a stable revenue flow rather than an optimal revenue flow. This approach is consistent with reassuring customers that the value of their purchases will be maintained into the future.
Analysis of future market developments might indicate, for example, that over the next ten years, given the current level of prices, demand might double as a result of increasing affluence in the major markets for South Sea pearls. The hatchery quota might then seek to limit the potential increase in supply of pearls to that anticipated growth in demand. If supply growth matched demand growth, other things equal, a stable price path would ensue. Setting the increase in quota somewhat below the anticipated increase in demand would see a time path of rising prices, other things constant.

An advantage of this type of approach is that it is less demanding of information and analytical complexity and, given its more limited aims, less prone to error than an approach that continually seeks to fine tune the quota. It may also provide goalposts for the industry in the sense that it would be aware of what growth in market demand would be required to match the likely increase in supply so as to maintain a stable price path. This would provide a strong incentive for generic promotion in an attempt to grow the market into the looseness of the overall quota.

3.3.3 Comment

In setting an overall hatchery quota, there is a need to take into account a wide and complex range of supply and demand factors as well as the expectations of buyers concerning future prices, and the marketing strategies of Australian producers and those of competing producers. Any decision to increase the hatchery quota at the end of the quota period must be based on an assessment of likely growth in demand, improvements in technology (as it affects yield and quality) and other market developments over the period of time for which any new hatchery quota would apply.

3.4 Approaches to setting the quota level

This section discusses both formal and informal approaches to setting a quota level.

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7 This view could be based upon anticipated economic growth in key markets along with a view about the income elasticity of demand for South Sea pearls. That is, the ratio of the percentage increase in demand to the percentage increase in income levels. Most luxury goods are thought to be income elastic. That is, as income rises, expenditure on these goods increases at a faster rate than the growth in income. As far as ACIL Tasman is aware, however, there are no published estimates of income elasticities of demand for South Sea pearls, and it is doubtful that sufficiently reliable data would be available for such purposes. However, it may be possible to estimate income elasticities of demand for jewellery from published sources across different countries. This could provide some guide to the likely growth in demand as incomes rise.
A model is a way of processing the available information in order to reach a conclusion about an appropriate form of action. Models vary enormously in their complexity, their information requirements and their cost. The alternative options for setting quotas range from using judgements informed by market knowledge through using more formal modelling tools to establish what might be happening in a marketplace with greater detail and perhaps precision.

The costs of sophistication can only be justified by anticipated benefits of a better understanding of underlying market processes and how markets respond to various external stimuli. The greater the number of variables involved in a model, the greater may be the probability of error (and, therefore, the greater the risk in relying on the model's output) compared to a simpler model. It is also important to take into account the feasibility of being able to find and access the data required to fuel the model, although well founded theoretical models can provide important insights.

### 3.4.1 Formal modelling

A more sophisticated model of the pearling market could inform the process of setting a quota. A formal model of pearling markets could be used in a number of ways including:

- **Forecast demand growth**
  - First, it could be used to forecast future growth in demand, based on projections of growth in income and other factors driving demand in pearl buying countries;

- **Determine supply so as to maximise industry profits**
  - Second, given this growth in demand, it could be solved to determine the level of supply that maximises collective industry profits. That is, the model could be used to determine a dynamic quota that rises over time in such a way that forecast demand is met without depressing prices. This quota could be adjusted periodically, in the light of market developments;

- **Guide investment in promotion**
  - Third, along with some analysis of the impact of promotion on demand, the model could provide some guidance as to the appropriate level of investment in and returns from industry promotion; and

- **And be used for doing 'what if' exercises**
  - Fourth, the model could be used to examine various supply scenarios and their likely impact on the profitability of Australian exporters: for example, it could look at the impact of growth in Indonesian supply of various pearl qualities and derive an optimal supply response by Australian producers.

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8 For example, in setting quotas for fisheries, fisheries' managers draw on observations about the target species and employ theories and models about what determines a sustainable fish population. The information base and theories upon which these decisions are based is often very imperfect. In setting a quota for a market, the same limitations of information and understanding apply.

9 A child's stick drawing is, for certain purposes, a workable model of a human being, just as our market model in Figure 1 is a basic model of a market.
In order to build a model of the market for South Sea pearls, we need to know about the following:

- The nature of demand for South Sea pearls and the key factors that drive that demand;
- The nature of supply and the factors that drive supply decisions; and
- The relationship between expectations about future supply decisions and their implications for current prices.

The elements of a complete market model are sketched out in Table 1. This is a realistic representation of a market and similar in structure to those commonly used in economic and business analysis. The table sets out the types of choices that a modeller would face in constructing a model of increasing sophistication. All models are centred on a demand and supply function. Complexity is introduced by disaggregating pearls into finer classifications, by disaggregating the world market into regional or country markets, by increasing the range of substitute products and by taking into account the dynamics of markets. The latter involves modelling the linkages between supply and demand decisions, and prices, across periods of time due to the expectations of market participants.

The simplest model would assume one type of South Sea pearl competing with a range of substitute pearls, only one market (the world market) and one supply source (Australia). A more sophisticated model would differentiate demand by South Sea pearl grade or classification and by country (for example, distinguishing the European from the Asian and American markets).

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10 This has a similar construct to other market models, for example, a model that one of the authors constructed on world iron ore and coking coal markets for the Korean steelmaker POSCO, or models of world commodity markets. We acknowledge that pearls are not commodities, but the structure of the market models would be similar.
Table 1  
Elements of a world pearl model

<table>
<thead>
<tr>
<th>Relationship/ equations</th>
<th>Pearl definition</th>
<th>Location</th>
<th>Substitutes</th>
<th>Supply chain</th>
<th>Determinants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do we want to look at Australian pearls in aggregate or do the analysis in terms of particular pearl grades</td>
<td>Do we look at total export demand for Australian pearls or do we distinguish between different geographic markets</td>
<td>Do we look at SS pearls alone, pearls as a group or a broader range of substitute products</td>
<td>Do we just focus on farm sales and the wholesale market or do we go through to the retail level</td>
<td>List of variables that will drive the various demand and supply functions</td>
<td></td>
</tr>
</tbody>
</table>

### Demand functions
- All SS pearls
- Categories or grades of SS pearls
- World demand
- Demand in individual markets
  - USA
  - Europe
  - North Asia
  - Other
- Other country SS pearls
- Competing products
  - Other pearls
  - Other jewelry
  - Other investment vehicles (?)
- Wholesale
- Retail
- Relative pearl prices
  - Australian SS pearls
  - Competing SS pearls
  - Competing other pearls
  - Other substitutes
- Income levels
- Other demand drivers
- Production costs
  - Operating costs
  - Capital costs

### Supply or cost functions
- All SS pearls
- Categories of SS pearls
- SS pearls
  - Australia
  - Indonesia
  - Other
- Other pearls
  - Black
  - Other
- SS pearls
- Other pearls
- Wholesale
- Retail

Stock holding, investment decisions

<table>
<thead>
<tr>
<th>Quantity demanded</th>
<th>= function of (own price, prices of substitutes, income, expectations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantity supplied</td>
<td>= function of (market price, production costs etc)</td>
</tr>
</tbody>
</table>

### A model is only as useful as its capacities to mimic the real world
- at best, they provide guidance
- at worst, they mislead

How useful a model is depends on how accurately the model replicates the actual workings of the market and the quality of the data fed into the model. Models are only likely at best to provide useful guidance as to the implications of different actions, and at worst may underpin seriously misleading policy advice. In practice, models and their predictions will be only one of a set of tools informing decision makers. In most cases, the judgement of knowledgeable and experienced industry participants and regulators must also be brought to bear. Informed judgement and the ability to alter the policy path if things go wrong are always useful supplements to model based decision making.

Setting the total hatchery quota 33
3.4.2 Informal approaches

The informal approach could encompass some basic level of modelling (for example, some concepts of income growth, income and price elasticity) but would probably draw more heavily on the consensus derived from a group of informed and experienced market participants. An informal approach was adopted to the setting of the initial hatchery policy and, more generally, is probably the dominant form of decision-making. While this may well be because of the difficulty of building reasonable models and finding the data to drive them, a consensus view of informed market participants should not be under-rated in terms of its sophistication. Informed market participants are aware of many market aspects or nuances that simply cannot be captured in mathematical form or statistically measured.

Informal approaches can:
- include basic modelling
- draw on experienced market participants

It is the dominant form of decision-making

One approach is to:
- obtain a list of factors driving pearl prices
- come to a view on how each factor might change over time

One approach would be to obtain a list of factors that are likely to be important in driving prices for South Sea pearls. These might include such things as:

- Prices for the various grades of South Sea pearls and competing products;
- Income levels in the major export markets;
- The level of supply of South Sea pearls from Australian competing producers (including factors that might constrain supply growth and investment plans by competitors);
- Supplies of competing pearls and other jewellery;
- Technological developments that might result in improved or more predictable quality and cost reductions;
- Developments in regulations overseas that have implications for markets;
- Consumer preferences and marketing campaigns by Australian producers and their competitors to influence or change such preferences; and
- Changing market structures (for example, a move away from farm gate sales towards closer contact with ultimate consumers).

It would be important to obtain a view as to how these factors might change, interact and influence the future outlook for demand and prices. This range of factors is not exhaustive. A more exhaustive list of key influences and their relative importance could be gained from a survey of producers, in Australia and overseas, as well as buyers at different levels in the supply chain. These key factors could be included in a set of indicators that would assist in setting a quota and in monitoring developments in markets over time.

For all of these factors, some information is available. For example, there are data on income levels in countries, and forecasts can be made or obtained from a range of agencies. Information about production plans and constraints in different countries is available, although inaccurate, incomplete and
sometime optimistic and deliberately misleading. Obviously the information needs to be processed by market experts to be of much use in setting quota levels.

Surveys can be used to test market reaction to different levels of quota. Participants on both sides of the market can be asked what they think will be the implications for prices of a range of quota increases. ACIL Tasman acknowledges that there are issues here in eliciting non-strategic answers and there is the danger of ‘spooking’ the market. However, these are issues that can be addressed in the design and conduct of surveys, as was the case in earlier market surveys about the response of demand to prospective changes in pearl supply.

The conduct of periodic surveys seeking views on the outlook for demand and prices may also provide useful information to a regulator tasked with monitoring developments in the market and the performance of the pearl hatchery quota.

### 3.4.3 Recommended approach to modelling

ACIL Tasman recommends that decisions concerning hatchery quota be informed both by some level of modelling and by the judgement of an informed group of market participants. The outcome of informed judgement leaves much to chance. In considering an investment decision, instinct is normally backed by a sound financial analysis. In this situation, a sound analysis of pearling markets would enhance the credibility and defensibility of a quota decision. That said, the choice of approach to setting quota would be dictated by the availability of data on the market, an issue to which we now turn.

### 3.5 Information requirements

Whatever means of establishing and varying quota might be used, the data requirements of different mechanisms and the practicalities involved in the acquisition and use of the data must be considered.

Ideally, to construct a realistic model of the market, one would require a full range of ‘observations’, or sales, of pearls across a number of years, across the different countries/markets, and across the range of pearl types, sizes and qualities. By a full range of observations, we mean price data for actual sales of Australian South Sea pearls in each year for at least 5 to 10 years, although data for just two or three years could suffice provided this was monthly data. Data on changing income levels over the same periods in the countries where Australian South Sea pearls are sold would need to be added to this.
Pearl Hatchery Quota

(recognising that some of these countries are not the places of final consumption). Data on other factors affecting pearl demand would also be required (such as prices of substitute products, income levels in major markets etc).

In addition to this demand side data, ideally one would have a full range of long-term producer costs to construct relevant supply curves. A reasonable case could be made for there being either static or falling long-run marginal costs. This would mean less need to acquire actual data on producer costs, although there would be a need to track productivity growth in the industry (through technological developments and more efficient farming methods).

Essentially there are two choices to obtain the information requirements to run a model:

- Acquire the data on actual sales of pearls, or
- Derive the data from other sources such as surveying final consumers or intermediary buyers.

The study commissioned by the WA Pearl Producers' Association (PPA) in 1998 was an example of the latter approach. That study employed a choice theory approach to obtain indications about the nature of demand for Australian pearls. The basic question to buyers concerned how they would change their decisions in terms of the quantity of pearls purchased when confronted with changes in certain conditions. These conditions included the quantity of pearls available, their quality and the general economic environment. Impacts on prices were inferred from their answers and the own and cross price elasticities of demand were derived.

Because of the considerable difficulties and the shortcomings associated with survey-based derived data (whether it be of actual final consumers or wholesale buyers), it is worth considering the first option of acquiring data on actual pearl sales because:

- Constructing a model based on actual observed data avoids the reliability and statistical validity problems of derived data;
- Some data on sales prices and volumes for various grades of pearls exist, albeit to varying degrees of sophistication and detail, in the records of each West Australian producer, and to an extent from the returns producers are required by WA Fisheries to submit annually;
- Whether the sales of Australian producers' product is to intermediaries or final consumers is irrelevant since the sales represent actual consumption, and therefore demand, from the perspective of those producers; and
Pearl Hatchery Quota

- While highly sensitive commercial data would be needed to construct the model, the uses to which the model could be put and its output need not be seen in the same light.

Clearly, the industry would need to be convinced of the safety and trustworthiness of those receiving the data and building the model, reinforced by totally reliable safeguards against unauthorised disclosure.

3.5.1 Recommended data source

ACIL Tasman has some experience in modelling the market for South Sea pearls and in collecting information to run that model. Data availability restricted our previous modelling to a very simplified model, suitable for the purpose at that time, but far from the level of detail required to set a quota for the industry. While data may be available on Australian sales of South Sea pearls, individual firms hold them closely and there is little prospect of their being released for market research. Moreover, there is little if any reliable data available relating to sales by producers in other countries and producers of competing products.

The data situation suggests that only a fairly basic level of modelling would be possible. Certainly, there are data showing the value and volume of exports of South Sea pearls collected by Fisheries WA. These provide some indication of where pearl prices have moved over the past decade or so. While there are some questions about the reliability of the data, as is the case with auction price data reported in the press, Fisheries WA data could at least be expected to reveal sharp changes in overall pearl prices.

It is critically important for decision-makers to have access to data accurately reflecting market conditions. **We recommend that alternatives to the industry and Government sources of data be used.** Given sensitivities involved here, the best option would be for a third party, acceptable to Government and industry, to be engaged to collect data. A market research group could be such a candidate.

3.6 Who should set the quota?

The information required to assess the implications of various quota levels resides more within industry than within government. Moreover, since maximising the economic contribution of the industry is largely a matter, in this case, of maximising collective industry profits, the industry has a collective incentive in getting the quota right. They also have the collective power to moderate supply if the hatchery quota prove to be too optimistic about demand growth.
One possibility is for the Government to ask the industry to recommend the appropriate increase in quota. We understand that in the early 1990s, the industry had a significant say in determining the level of the initial hatchery options set.

However, there are two critical issues to address. First, would industry be able to reach a sufficient degree of consensus on this matter? The pearling industry comprises a range of diverse producers, in terms of size and other characteristics that may make it very difficult to achieve a consensus of what is good for the industry as a whole. Moreover, a compromise position, even if agreed without undue coercion, may emerge that may be far from optimal for the industry as a whole, as well as being unsustainable over time.

The second issue is the public perception of an industry setting hatchery quota for itself. This would certainly be viewed as anti-competitive behaviour sanctioned by the Government, regardless of the reality. The Government would need to be able to defend its acceptance of this arrangement and of the level of quota chosen. The industry would need to provide a sound, detailed case to the Government as to why a given level of quota was preferred. And this may involve the sharing of information, both among producers and with Government, which industry considers too sensitive to share.

### 3.6.1 Recommendation on setting quota

We consider it is unrealistic and potentially unworkable for industry to set the hatchery quota. The corollary is that Government should do so, although this does not and should not preclude industry advice being taken into account. As we have said, much of the information required to take an informed decision resides within industry. Industry would also bear the large part of the cost of any inappropriate decisions. There is an existing formal industry advisory structure – in the form of the Pearling Industry Advisory Committee – that would be suitable for the Government to use in, at the least, acquiring industry views, and more usefully, in reviewing and advising on the range of factors that the Government will need to consider in taking quota level decisions.

ACIL Tasman, therefore, recommends that the Government should continue to regulate the industry and that it should use PIAC to review and advise it on taking quota level decisions.

### 3.7 Monitoring the hatchery policy

The regulator will require a set of indicators on developments in the market. For example, there may be a need to collect periodic data on sales volumes and prices for pearls in aggregate and for indicator pearl classes by major markets.
Information about market expectations of future movements in pearl prices may also be of use in informing the regulator. The regulator could use this information to monitor the performance of the optimal quota relative to actual market developments. As noted earlier, the use of periodic surveys about the market outlook would also provide useful information.

For the regulator to be able to use this information to fine-tune the quota scheme would require an ability to influence short-term supply movements. This may require a mechanism to withhold pearls from the market for a period of time. However, the industry itself has some incentives to do this. For example, if prices are anticipated to enter into a period of decline due to excess supply, producers have an incentive to add to their stocks. However, this depends on a producer having the finances to withhold supply for a period and also the expectation that prices will subsequently recover.

A gradual release of additional hatchery quota, discussed earlier, would allow the Government to respond to downturns in market prices by slowing the rate at which new quota is activated thereby releasing additional shell for seeding.

### 3.8 Recommendations: Reviewing and setting the hatchery quota level

**ACIL Tasman recommends** that:

- Quota levels be reviewed and set on a ten year basis, with a mid-period review after 5 years;
- Any new quota be released in tranches, the timing of which should be decided only after review by PIAC; and
- In order to avoid the dangers of arbitrary decisions to increase quota, that the pearling legislation include provision for a formal review process involving PIAC prior to any decision being made to increase or release quota.
- In reviewing the hatchery quota, the Government should commission PIAC to review and advise it, initially prior to the hatchery policy’s expiration, and then subsequent to that at least each five years, on:
  - Whether;
  - If so, by how much, and
  - When; the pearling quota should be altered and released.

**ACIL Tasman recommends** PIAC adopt a 5-step approach in undertaking such reviews, which should include using the data collected to construct a model of the pearling industry market.
Pearl Hatchery Quota

Step 1: Review the history of quota, production, marketing and prices over the past period (a decade in the case of the initial review, and subsequently five years) in order to build a clearer picture of where the market has come from in arriving at its current level of revenue from pearls. Production growth could be attributed to changes in:

- Pearl sizes;
- The number of shell seeded; and
- Yield as a result of second and third seedings or lower shell morbidity and mortality rates.

Attention should be paid to industry actions to increase demand for its product over the period, particularly in order to inform government considerations of maintaining the quota system.

The Government should maintain quota restrictions only so long as the WA pearling industry continues to exercise a reasonable degree of market power. This is why it is necessary to monitor the industry and to continue to evaluate whether or not the hatchery quota is in the national interest. As the degree of market power of Australian producers falls, the hatchery quota should be expanded until it effectively no longer limits the industry. In this way, industry can expand production in the face of expanding production from competing suppliers.

There would be a need here to take into account what has happened with respect to production and sale of substitutes for Australian South Sea pearls. This includes competitors or potential competitors, such as Indonesian pearl producers, as well as other jewellery.

Step 2: Explore potential production from the existing total quota (wild shell and hatchery quota) to produce a forecast of growth in the volume of production over the next ten years. This growth will be the result of the increase in the volume of pearls produced from the (unchanged) quota. This is necessary to understand what is likely to happen to supply if no change is made to the quota. In other words, this would be a baseline forecast.

Step 3: Model some plausible scenarios about expected future growth in demand. For example, ACIL Tasman would expect real GDP (income) growth in the US and the European Community to average about 3 percent per annum over the next ten years. Assuming demand for pearls is income elastic (that is, a higher proportion of income is spent on pearls as income levels rise), this might convert to growth in demand of, say, about 4 percent a year on average. In addition, the scenarios would need to take into account other factors that might impact on demand in either a positive (for example, via promotion) or
negative sense (such as the further growth in competitors' and substitutable products).

Market research could be used to provide a stronger basis for the plausibility of scenarios, including input to model the market. PIAC would need to commission research to collect data and other information on the range of factors set out earlier, comprising:

- Prices for the various grades of south sea pearls and competing products;
- Income levels in the major export markets;
- The level of supply of South Sea pearls from Australian competing producers (including factors that might constrain supply growth and investment plans by competitors);
- Supplies of competing pearls and other jewellery;
- Technological developments that might result in improved or more predictable quality and cost reductions;
- Developments in regulations overseas that have implications for markets;
- Consumer preferences and marketing campaigns by Australian producers and their competitors to influence or change such preferences; and
- Changing market structures (for example, a move away from farm gate sales towards closer contact with ultimate consumers).

Step 4: Compare the forecast rate of growth in projected demand to growth in the past period? The observed volume of pearls sold will differ from what is produced due to changes in stocks of pearls held. There is no separate measure of the demand for pearls in volume terms.

Step 5: Determine the state of the market at the starting point. This is important. For example, it is necessary to know if the market is currently characterised by excess supply (and stock build up). If this is the case, it may be necessary to let the market drain away this excess supply before adding to the hatchery quota (noting that this may mean no increase in quota for the entire period in question).

3.8.1 Nature of the Government’s consideration following a PIAC review

Once PIAC had completed its review and presented its advice, there are a series of key issues the Government would need to consider before determining whether a change in quota is advisable. We have set out below these issues based on a simulated (and simplified) example of what might occur before the expiry of the hatchery policy in December 2005:
**Pearl Hatchery Quota**

**What will the level of demand be in 2015?**

If we assume that demand in 2001 was equal to production of 600 kan, and if we further assume demand grows at an average annual rate of 5 percent a year over the period 2001 to 2015, then demand in 2015 will be around 1,200 kan, double its level in 2001.

**What total quota is needed to supply the level of forecast demand?**

In 2001, the total quota was around 920 units. Over the next decade, the yield from the quota is expected to increase significantly with a higher percentage of successful re-seeding and perhaps an increase in average pearl sizes. Assuming that the yield (kan per quota unit) is 0.75 in 2015 compared to around 0.65 at the moment, this means that around 1,600 units of quota would be required to meet the forecast demand. This implies an increase in the hatchery quota of around 680 units.

**What is the current state of the market?**

Over the last decade as a whole, we could assume that the growth in demand broadly matched the growth in supply. If this has been the case, then growth in demand was on average 12 percent a year over the period 1990 to 2001. But it should be noted that average prices fell over this period, indicating that the market was characterised by an excess of supply over demand for much of the period (and arguably remains so now).

**When should additional quota be released?**

Placing the assessed additional amount of quota on the water at one time would seriously undermine the market in the short to medium term. Releasing the quota in tranches would be more successful in maintaining prices. For example, the increase could be divided into 5 tranches over ten years with each tranche involving 135 units of quota.

With the market judged to be oversupplied, the release of the first (or subsequent) tranche could be delayed or not released at all. It is in these types of circumstances where the industry’s plans for promotional activity aimed at increasing demand to a level where prices could at least stabilise (if not rise) that attention would need to focus.

**What should be monitored over the 10-year period?**

In between tranche releases, the Government – through PIAC – would need to monitor industry developments including movements in prices for indicator pearls. For example, a drop in prices (or a continuing drop in prices) should be
Pearl Hatchery Quota

interpreted as the market continuing to be over-supplied and this could cause a reconsideration of the timing of, or any, release of the next tranche. It could as well be interpreted as a need for industry to increase promotional activities aimed at increasing demand to stabilise prices.
4 The allocation of quota

Over the past decade, various governments have adopted several different approaches to the allocation of quota or other rights. Of note as well are various legal challenges, some of which have been successful in overturning administrative decisions. This has been particularly the case in fisheries quota allocations where the allocation formulae adopted have been found by the courts to be unreasonable. From the recent history of fisheries quota allocations, in Australia and elsewhere, it can be seen that litigation is most likely to arise when an allocation formula causes significant changes in the distribution of income or wealth among interested parties.

It is important to explore both the literature and case law. From these it is possible to learn a number of lessons as well as to develop a set of principles that might be employed in the design of a pearl hatchery quota allocation scheme.

In the case of fisheries the issues have been well researched by Geen et al.\textsuperscript{11} ACIL Tasman has done extensive work on mechanisms for allocating spectrum, fisheries quotas, beef export quotas and in the mining and petroleum sector. Based on this work, we have produced a summary of such quota allocation mechanisms and the principles involved (see Attachment A.4).

There is a wide range of possible approaches, some of which would not be feasible and could be readily eliminated. The others would need to be carefully evaluated in terms of their efficiency and equity implications. In undertaking this assessment, we have reviewed literature on the allocation of fishing and other natural resources rights in Australia and overseas to understand better the benefits and costs of these approaches.

There is no ‘dominant’ approach because of the potential trade-offs between the efficiency objective and equity considerations. This is a common result in allocating property rights. In most instances, a degree of pragmatism has been adopted in choosing between alternatives. For example, fishing rights, where there has been a change in management arrangements, are normally allocated on the basis of minimising the impact on current income and wealth distributions. Provided rights are freely tradeable, it has been argued that an efficient resource allocation would be achieved regardless of how rights are initially allocated. However, we would question some of the assumptions

involved here in the case of the pearling industry (for example, the assumption that there are no externalities (discussed below) and the assumption that the allocation does not impact on the outcomes of past investment decisions of incumbents).

4.1 Property rights and setting quota

Because of the wealth redistribution impacts of quota allocation decisions, before considering means of varying quota, there is a fundamental factor that first needs to be taken into account: who might own the ‘property’ rights embedded in quota. The issue of how to allocate an increase in hatchery quota must take into account the historical circumstances surrounding the introduction of the hatchery policy. This has significant implications for the nature and value of the property rights being allocated by the Government.

We have set out in Box 1 the history of the 1992 initial allocation of pearl hatchery options.

4.1.1 Property rights embedded in quota

Who might own the ‘property’ rights embedded in quota and the sale of those rights is a complicated question in the case of hatchery quota. We, therefore, begin the discussion with a common property resource, such as a fishery.

Governments in Australia have claimed ownership of offshore fish stocks on behalf of the community. The rights to fish a new fishery (or additional fishing rights) have always been allocated by governments through administrative rather than market based schemes. At least part of the allocation has been based on historical activity in the fishery. This is partly because the idea of allocating rights to common fisheries’ resources came at a much later date than the establishment of fishing activity. Auctions have seldom, if ever, been used by Australian fishing jurisdictions. This has been the case even though an auction may satisfy both efficiency and equity objectives more fully than administrative methods.

Auctions not only allocate property rights, they also collect rents. That is, competitive bidding would induce bidders to offer amounts up to the net present value of any profits they expect to make in excess of a market rate of return on their investments. If there are economic rents in a fishery, the government can design an auction that will collect all or most of the rents. If these rents reflect the value of the community owned resource in the production of a marketable commodity, this would be both equitable from the community’s perspective and efficient from an economic perspective.
The initial allocation of pearl hatchery options

There were a number of motivations for the introduction of the hatchery policy. The control of the rate of growth of the industry was a primary objective. However, another important objective of the Government was to ensure that all WA producers developed a capacity to produce pearls from hatchery stock. This second objective explains why hatchery options were allocated to existing pearl producers.

Prior to the introduction of the hatchery policy, the Western Australian Government had concerns with the potential for rapid growth in the production of South Seas pearls by other countries, for example Indonesia, and the impact that this would have on the Australian industry. The Government had a desire to ensure Western Australian producers would in a minimum time, be able to compete effectively through a significant increase in production that was not dependent on limited wildstock. Industry at the time had concerns that the potentially huge increase in production that hatcheries could entail might seriously undermine markets for South Sea pearls.

In concert with the Pearl Industry Advisory Committee, in 1992 the Government introduced a system that included a requirement for all pearl producers to gain experience with, and thereby acquire expertise in, the production of pearl shell oysters from spat through a nursery grow-out regime, and up to and including first seeding. The incentive to gain this experience was in the form of an ability to convert options to quota equivalent to (but not substitutable insofar as they could be fished) wildstock quota.

At the time the policy was developed there were two important considerations. These concerned who would produce hatchery shell and who would use them. Clearly it was sensible to regard the existing industry as the ones to use the shell. While open tenders for farming of hatchery shell would have been an alternative, it is unlikely that there would have been much interest as this was a new, high-risk venture. Moreover, the Government judged that existing producers held the only pearl farming expertise.

The industry was not highly enthusiastic about hatchery based operations and saw in it a threat to the prices of Australian pearls. Basically an agreement was reached that the industry would share the development of hatchery technology by accepting hatchery options. However, producers were not directly forced to convert their full options and they could trade options or let options lapse in the event that hatchery based pearl production was not a viable option.

Because the Government wanted hatchery technology to be adopted by all in the industry, hatchery options were allocated to existing producers. However, options were made transferable and producers were given considerable flexibility as to how they would invest in hatchery production facilities. Joint ventures arose between pearl producers and those outside the industry to provide an efficient approach to the development of a hatchery industry.

The hatchery policy established a system under which pearl oysters are produced from spat, grown-out, and converted to quota. Each of the original 16 producer companies was allocated 20,000 options (with one company having 50,000). This meant that there were 350,000 shell options that theoretically could be converted (on a one to one basis) to quota, with similar rights to that of the 572,000 wildstock quota, other than having to be sourced from a hatchery.

Conversion to quota from options depended on successfully seeding at least 1 000 hatchery produced oysters in each of 3 successive years. The conversion was then on an Option Unit (1,000 shell) basis equivalent to the maximum number of units operated in any one year of that 3 year period.

Licensees were required to grow-out and seed on their own farm leases (or within approved joint ventures).

Initial option allocations were based on a set of requirements involving significant investment commitments and demonstrated outcomes, before conversion to quota; that is, quota allocation was not a gift but had to be earned. The efficiency of allocation of options and quotas is encouraged by transferability.
Pearl Hatchery Quota

However, there are several issues here when it comes to fishing. Australian fishery authorities, even where the claim of common property is legitimate, have tended not to collect rents either through the sale of rights outright or through the imposition of royalties. Where governments levy charges on fishers, these are generally based on the need to recoup management costs, rather than to compensate the community for exploitation of fish stocks. If auctions were introduced for the pearling industry and the proceeds pocketed by governments, this would raise the issue of whether a resource charge should be imposed on other fishing operators, or indeed those allocated rights to all common property resources. This issue would have both efficiency and equity dimensions.

In the case of allocating pearl hatchery quota there are some additional considerations. First is the nature of the right being allocated. On the surface, the right to use hatchery shell for the production of pearls is not analogous to a physical or natural common property resource. A more appropriate analogy is with a manufacturing production process – the bulk of which takes place on pearl farms. Even if it could be argued that the hatchery policy created the value in these rights, that is, without the hatchery policy, there would be no valuable rights to allocate (and we argue below that this is not the case), this still would not transform the shell used into a common property resource.

Auctioning quota could impose a resource charge, that is, a resource rent – which could extend to all operators allocated rights to common property.

But hatchery shell is not a common property resource.

Government and industry developed the hatchery policy together – each contributing to creating the value in hatchery quota.

The industry’s value creating production and marketing processes have produced the value in the quota – although the quota’s existence has contributed to its scarcity value.

Moving on from the nature of the right being allocated to the second question of who created the hatchery policy and the implication of this for who has the rights to the quota, it could be argued that both the government and the industry contributed to the development of the hatchery policy. The powers of government were necessary to enforce the hatchery policy, but it is also conceivable that in the absence of government intervention, the industry itself could have achieved agreement on a system of hatchery quotas. The industry was certainly heavily involved in its shaping, and thus in this part of the value creation process.

There is thirdly the question of what gives the value to the quota. Hatchery quota will be valued by pearl producers for the profit stream that their utilisation will produce. That value stream will depend upon the ability to grow pearls of certain quality from hatchery shell, the costs of doing so and the market prices that the pearls will fetch. The hatchery quota contributed to scarcity and, therefore, it could be argued that the value of pearls will be higher than in the absence of the quota. However, the industry itself could, acting collectively or individually, create equivalent scarcity by restricting the supply of pearls onto the market. The value of pearling (and, therefore, the value of

12 An up front payment or a royalty stream for pearl producers would reduce rates of return to pearling relative to other fishing and non-fishing activities and this has implications for the allocation of resources in the economy.
Pearl Hatchery Quota

quota to allow pearling) has also been influenced by the past efforts of the incumbent producers who have invested in the development of markets, image and technology. The buyer of hatchery quota would benefit from these past value creating activities.

On balance, ACIL Tasman concludes that the industry owns a substantial part of the property rights embedded in hatchery quota. Therefore, a substantial proportion of the rents are also owned by the industry. There is, therefore, a need, should the Government opt for disposal of quota by a market allocation method, to determine the appropriate distribution of the rents collected between the government and the industry. It would need to be designed so as not to collect rents that more appropriately should remain with the industry. In situations where a substantial portion of the value of the rights are owned by industry, government should not attempt to sell the quota, but rely on an administrative allocation method, leaving it to secondary markets to ensure an efficient allocation of quota over time.

The optimal quota could be expected to increase over time with growth in world demand for Australian South Sea pearls and with developments that reduce the costs of supply of pearls. However, it is conceivable that there may also be a need to reduce the supply of pearls at times where there is excess supply. For example, this may arise when, in setting the total quota, demand forecasts have been overly optimistic (such as where promotion proves insufficient or ineffective) or where there has been a higher than expected increase in industry productivity (yields).

“Mopping up’ the excess quota also requires a mechanism if the objective of the policy is to be achieved. This could be handled either by:

- Having a symmetrical quota allocation in the form of a variable quota (that is, producers are allocated a percentage of the total quota) as is common in many individual transferable quotas (ITQ) managed fisheries; or
- There is a separate mechanism for taking excess supplies of pearls off the market: this could be in the form of a central purchasing plan.

It should be noted, however, that ACIL Tasman is not suggesting that Governments should be in the business of buying pearls to place a floor under their price. Rather, it is meant as an indicator of the importance of not adding quota to an already over-supplied market, and the necessity for the Government to have a transparent and robust system in place that enables them to withstand pressures brought to bear on them from time to time to do so.
4.2 Quota allocation approaches

The government could choose from a range of approaches to allocating increased hatchery quota. Provided quota is freely tradeable, the allocation method chosen tends to have greater implications for equity issues than it does for economic efficiency. This is because secondary trade in quota will tend to result in a situation whereby the quota are bought by those who place the highest valuation on them. The reason why they place a higher valuation is that they expect to earn more from the quota than the current holder.

4.2.1 Economic efficiency through tradeability

The issues involving achieving economic efficiency through tradeability of quota and why costs do not represent barriers to entry into an industry are explained in Box 2 below.

Box 2 Barriers to entry, economic efficiency and tradeability

Transferability of quotas is important to the attainment of economic efficiency. It means that quotas can be transferred to users who value them most highly or who are able to utilise them most efficiently. Tradeability is, therefore, critical to maximising the economic benefits derived from the resource.

The ability to transfer to licence applicants also enables new entry into the industry and for firms to exit the industry. This eliminates the anti-competitive effects arising from the limitation of access to the resource. Entry will not be costless. This is unavoidable, as limitation on access is necessary to ensure sustainable management of the wildstock resource.

Licences and quota will have a value attached to them, which partly derives from the limitation on the supply of shells. The rents capitalised into the value of a licence or quota are not solely derived from the restriction on supply. The value added in the farming stage, through the development and adoption of technology and innovations, and the marketing efforts of industry participants in creating a valuable product, all influence the value that can be derived from having access to wild shell. The price paid for a licence, therefore, consists of both the value of access to the shell plus the value of access to technology and a market that has been created by the pearl industry. The differentiation of the product, in effect, creates a ‘public good’ or an unpriced externality that benefits new entrants. A large part of the value of licences represents compensation for the ‘public good’.

A key group whose interests should be taken into account by regulators is potential entrants into the industry. This is the case, since if regulatory provisions act in an anti-competitive fashion restricting entry to an industry, and if the costs of the restrictions outweigh the benefits conferred, a prima facie case would exist to alter that part of the regulatory regime.

Potential entrants need to purchase a licence to enter the industry. There is a cost of entry and this imposes a cost on entrants. However, much of the cost is a transfer to other Australians (the previous licence holder). The benefits they derive include access to the shell but also access to a market, a ‘brand’ and technology that has been developed by the industry.

The regulations do not preclude potential entrants or investors making a market rate of return on their capital. There are many other opportunities for them to invest elsewhere in the Australian economy or overseas. What is important from the perspective of the efficiency of the pearl industry and maximising its potential surplus is whether these entrants could generate a producer surplus in the pearl industry that is greater than that
generated by existing producers.

The net benefits or the surplus that the pearling industry generates will be maximised if the most efficient producers produce pearls in the most efficient way possible. Does the current regulatory regime guarantee this? That is, do the regulations allow pearls to be produced by the most efficient producers? If efficiency is below its potential, the consequent reduction in producer surplus below its maximum potential value needs to be counted as a cost to the community.

In the longer term and ignoring lifestyle preferences, pearl producers must make a sufficient return to recover operating costs and their cost of capital (including appropriate compensation for risk). Capital includes physical capital but also a return on the value of the pearling licence. Some producers have purchased licences while some have been granted licences. Some have purchased licences in addition to the original licences that were granted. This makes little difference to the market value of a licence, which is equal to the present value of anticipated profits over and above the minimum necessary to induce producers to stay in the industry.

If a potential entrant is more efficient than existing producers, it will have a higher anticipated present value of profits than an existing producer will. Efficiency dictates that the right to produce pearls will be transferred to the more efficient producer from less efficient producers by market forces. The entrant would not be deterred from entering the industry and raising the overall efficiency of the industry. This is because it could afford to purchase the licence (paying the holder an amount just higher than the present value of future rents or excess profits the existing licence holder expects to earn) and still make above normal profits. If a potential entrant is unable to generate a rate of return sufficient to recover a market rate of return on the licence cost and other capital, it is less efficient than the existing producer is. The right to produce pearls will, therefore, flow to those who value these rights most highly: that is, those who are most efficient.

Now an obvious point here is that some producers have been subsidised in that they have been freely allocated options in return for establishing hatchery technology. It could be argued that such producers are able to compete with more efficient producers simply because they can afford to have higher costs and still make profits. But a rational producer would only stay in the industry if it were able to generate a return sufficient to cover operating costs, a return on capital and a return to the licence. If the producer is not making a sufficient return, it always has the option of selling the quota (or in the past, options). A more efficient producer could offer a better deal to the licence holder. It is, therefore, not clear that the restrictions reduce the overall efficiency of the industry by reducing the potential for new low cost entrants to enter the industry. The efficiency cost of the restrictions is, therefore, likely to be insignificant.

Fisheries Management Report Number 2 (FMR2) of Fisheries WA provides a very useful discussion of the issue of the initial versus the secondary market for quota. 13 According to the authors, no matter what mechanism is used for the initial allocation, secondary market trading can guarantee efficiency of the resource allocation outcome.

‘First in time, first in right’ water allocations are often freely transferable as water entitlements. Because some of those initially allocated water rights value them less highly than others, trade in rights may produce a very different allocation of rights than that which was allocated by administrative decision. As a consequence the initial and final allocations can vary substantially.

FMR 2 notes that:

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13 Fisheries Western Australia (1998), Use of market mechanisms for the allocations of commercial fishing access entitlements in Western Australia, Fisheries Management Report No. 2, prepared by Economics Consulting Services Pty Ltd.
“Many resource management and allocation systems have placed more reliance on the secondary market than on the initial allocation as a means of securing resource allocation efficiency. Transferable quotas and water entitlements are cases in point. The initial allocation of water and fish resources has historically been by administrative rule and much of the policy work has been to define the associated property rights in terms of the subsequent right to transfer and trade. One reason for this is that the mix of social and political forces, including in many cases legal constraints, combine to influence the initial allocation process away from a strict economically efficient.”

ACIL Tasman would observe in this connection that the initial allocation of rights has more often than not been based on what is judged to be the equitable treatment of historical users rather than the pursuit of economic efficiency. This point is made in Rolph (1983) who contends that government allocation of property rights in the United States has involved the maintenance of the status quo income distribution. For economic efficiency, government have relied on the creation of secondary markets by allowing rights to be freely tradeable.

As we have argued in Box 2, freely tradeable rights will generally result in the distribution of rights converging on the economically efficient distribution of rights. This outcome depends on the existence of relatively low transaction costs, an important question to address in the design of rights and the market rules for trading those rights.

4.2.2 Setting performance criteria

The current provisions in the Act and the hatchery policy are designed to protect the wild stock and the environment on which pearling depends, and to maximise the economic efficiency of the industry. There are suggestions that performance criteria should be attached to quota, and in particular, any additional quota that might be created, in order to ensure that quota conferred is used and not hoarded. There is a danger that such provisions can encourage too rapid a rate of development compared to that which would maximise the value of the industry.

Market failures aside, market signals should provide an accurate guide to producers to develop quota at a rate that maximises their value. Producers are operating in competitive global markets and competitive markets generally result in efficient allocation of resources over time.

If the government wants to impose development conditions in the form of performance criteria on quota holders, it certainly can do so as it does with miners, for example. However, there is a danger in that it could result in a pace of development that is too fast relative to market conditions that often
Pearl Hatchery Quota

change. In fact, the quota system will work better if quota holders can slow the pace of development in times when prices are low and increase the pace when future prices are higher. This will tend to smooth out price fluctuations over time. Given the sensitivity of buyers to fluctuations in prices, this would also probably lead to higher average prices over time.

4.3 Methods of allocating quota

Three broad methods of allocating natural resource and government created rights have been adopted by governments in Australia and overseas:
• Lotteries;
• Administrative:
  – whereby the government allocates the quota among competing stakeholders based largely on non-market considerations; or
• A market mechanism.

These methods of allocating quota have a range of efficiency and equity implications that need to be assessed carefully, which we do so in terms of administrative and market mechanisms in the next two chapters.

Lotteries have been used to allocate a range of rights including airwave spectrum licences in the US. Lotteries are adopted where equality of opportunity is sought. Lotteries are only mentioned here for completeness. While appropriate in certain circumstances, we do not consider a lottery to be an appropriate way to allocate hatchery quota. Lotteries randomly allocate resources among those who apply. This method is quick but attracts frivolous applicants and speculators. Chance decides whether resources are assigned to competent users. According to the Productivity Commission (2003) resales of lottery prizes by winners can transfer resources to productive users, yet at the costs of delayed allocations and revenue losses to the government seller. Unjust enrichment of lottery winners is also a concern for the public.

14 For example, lotteries have been used to ration places in university courses where there is excess demand in the belief that this method is less likely to favour any particular socio-economic group in the community. In the 1980s the US congress replaced a cumbersome administrative method of allocating spectrum licences with a lottery. While the lotteries cleared an administrative backlog by assigning licences quickly, the prospect of windfall gains attracted 400,000 applicants for cellular licences. A group that won the rights to run cellular phones on Cape Cod almost immediately sold it for US$41 million. The value of cellular telephone licenses given away by the US Government in the 1980s is estimated at US$46 billion. See John McMillan (1994), Selling Spectrum Rights, paper prepared for the Journal of Economic Perspectives.

5 Administrative mechanisms

Under administrative mechanisms, the government allocates the rights on a non-market basis. For example, when there has been a change in management arrangements, governments have tended to allocate the rights to historical or prior users of the resource. Administrative mechanisms have also been adopted in deciding how to allocate increases in the aggregate amount of quota available or in the case of new fisheries, fishing entitlements. Normally, these allocation decisions have recognised historical usage and rights, but in a few cases, governments have allocated a portion of the rights to those with no history of resource usage.

In the current context, there are several choices if increased hatchery quota is to be allocated by an administrative mechanism:

- Allocate quota to existing pearl producers only, through:
  - Equal allocation to all licensed producers; or
  - Proportional allocation to all licensed producers; or
  - Allocation to hatchery quota holders only;
- Allocate quota to other groups in the community; and
- Allocate quota according to work program bidding (a ‘beauty contest’).

The following sections deal with each of these choices.

5.1 Allocate quota to existing pearl producers only

When the original allocations were made in 1992, all the then current producers were allocated hatchery options for free in exchange for investing in hatchery technology. Not all of these companies themselves converted the options into quota. Some sold hatchery option to others. Once converted, for seeding purposes a hatchery option becomes identical to a wild shell quota. However, hatchery quota cannot substitute for fishing wild stock, but wild stock quota can fully substitute for hatchery quota. With the conversion of the 350,000 hatchery options to quota, there would still be a need to retain the distinction between hatchery and wild shell quota. However, the mechanism for converting hatchery options into quota would become redundant enabling the Government simply to issue additional hatchery quota (once this was justified).

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16 By January 2004, 15,100 options remained unconverted. The company involved, Dampier Pearling Company, had advised Fisheries they were now in a position to convert these remaining options and would seek approval to do so.
Pearl Hatchery Quota

How should the government allocate additional hatchery quota among pearl producers? There are several possible options for allocation, including:

1. **Equal** allocation to all producers holding a pearling licence, regardless of quota held, in the same way that the original hatchery options were allocated;

2. **Proportional** allocation to all producers holding a pearling licence, that is in proportion to current total wild stock plus hatchery quota holdings;

3. Allocation only to **hatchery quota** holders holding a pearling licence, on the basis of:
   a) **Equal** allocation to all current hatchery quota holders regardless of quantity of hatchery quota held; or
   b) **Proportional** allocation to current quantity of hatchery quota holdings.

Regardless of the allocation method selected, the hatchery quota will immediately have a market value, trading at market prices close to the prices that quota are currently traded. Producers would be able to sell newly acquired quota and realise an increase in wealth.

The issue of new quota could be expected to have some impact on the market price of quota, as in most cases when the supply of something increases. This impact will need to be taken into account since it will impact on the wealth of existing quota holders.

An important question is what is being allocated. Since for seeding purposes, hatchery and wild shell quota are substitutable in the production of pearls, hatchery and wild shell quota would be expected to sell at a similar price. The total amount of quota on the market will determine the expected supply of pearls and, subject to expected demand, the anticipated future prices of pearls sold and, therefore, the current market value of quota. A decision to increase the overall amount of quota, whether through increases in hatchery or wild shell quota, will have the same impact on the market price of quota. All quota holders are exposed to the risk of a loss in the value of their existing quota holdings.

There are four broad principles or considerations against which alternative allocation methods need to be assessed. These comprise:

- Economic efficiency;
- Equity implications;
- Administrative and compliance simplicity; and
- Litigation potential.

The latter is important because litigation detracts from the effectiveness of the policy and results in substantial costs both to the regulator and the industry.
5.1.1 Option 1) Equal allocation to all licensed producers

Under this option 1/16th of the increase in quota would be allocated to each licence holder. This option would reward each licence equally but as a proportion of wealth, the reward would be far greater for the smaller producers than for the larger producers.

It would reward equally those who have undertaken the investments and borne the risks of converting hatchery options to quota with those who chose to sell their initial quota options or not to convert options into quota. It would, therefore, in effect be a significantly different approach to the intention of the original hatchery policy, which was to reward producers for their efforts in developing a hatchery based pearl production technology (see Box 1).

This suggests that all quota holders (that is, options 1 and 2), and not just holders of hatchery quota, should share in the allocation of additional hatchery quota.

If there were still unrealised economies of scale in the industry, one would expect larger producers over time ultimately to gain control of an increased share of the initial allocation of new quota, if quota were allocated initially on an equal basis to all producers. This would occur when those allocated quota that had no desire to use them would sell to other producers thereby realising a windfall gain. It could also be argued that those who did not convert options would also realise a windfall gain because they did not ‘earn’ the right to hold quota through the conversion of hatchery options (see Section 5.2 for a discussion on windfall gains).

5.1.2 Option 2) Proportional allocation to all licensed producers

Under this option, quota would be allocated to producers in proportion to their total holding of wildstock and hatchery quota. This would involve more of the additional quota being allocated to the largest pearl producers. Over the past decade, there has been trade in hatchery quota. Some producers have purchased hatchery options, hatchery quota and wild shell quota, and incurred considerable investments in utilising that quota. This has contributed to the current size distribution (by value of production) of pearl producers. A proportionate allocation would act to reinforce this size distribution of the industry.

There is also an equity argument relevant to proportional allocation. Governments have attempted to achieve equitable outcomes by seeking to minimise the impact on the existing distribution of income.
Pearl Hatchery Quota

This objective, however, could result in changes in absolute levels of income or wealth or changes in the relative position of pearl producers. In terms of the latter, an allocation of quota in proportion to existing quota holdings would have no impact on the relative distribution of income or wealth. An equal allocation would change the relative income or wealth distribution significantly, favouring smaller producers.

A proportionate allocation would be consistent with the approach that has been adopted by Australian fisheries management authorities to allocating quota in the case of changes to management arrangements for new fisheries or allocating quota for new fisheries. In the case of changes to management arrangements, governments have based their decisions on historical participation in the fishery. Quotas have normally been allocated, wholly or in considerable part, in proportion to historical catch levels. This has sometimes been modified to increase the allocation to those fishers that have invested more heavily in the fishery (through such indicators as boat size).

5.1.3 Option 3) a) and b) Allocation to hatchery quota holders

This option would maximise recognition of the contribution of the ‘pioneers’ of the technology. If quota is to be allocated on an historical basis, a decision normally needs to be made concerning the period to be taken into account. For example, if the most recent year only is taken into account, the allocation may differ substantially from that which would result if a longer period were taken into account. If quota is allocated on the basis of existing hatchery quota this is not an issue.

There is at least one difficulty associated with allocating additional hatchery quota to existing hatchery quota holders only. This option is likely to raise concerns with non-hatchery pearl producers thereby increasing the prospects of litigation. These non-hatchery quota holders could challenge the allocation on the grounds that the issue of new quota potentially threatens the value of their existing wild shell quota holdings. As noted earlier, there is a possibility that the issue of new quota could, at least temporarily, place downward pressure on quota prices across the board. The non-quota holders may feel justified in seeking compensation for this by sharing in part of the allocation of new quota. These producers may consider shared allocation to be appropriately just compensation for the risk to which they are exposed.

One way to address the compensation issue is by reverting to either option 1 or 2. An alternative, more cumbersome, solution is to divide the additional quota into two (or more) tranches. A portion of the quota could be allocated

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17 While this may appear irrelevant since all producers currently hold hatchery quota, this may not be the case in future. Therefore, it is necessary to cover the option.
Pearl Hatchery Quota

to those with existing hatchery quota holding and the other portion allocated to ‘inactive’ producers.

Such an allocation formula has been used by AFMA in the case of granting rights to fish in developing or new fisheries. However, legal challenges have arisen (for example, in the case of Cascade Plateau orange roughy) because the split between active and inactive operators was judged to over-compensate the inactive. AFMA adopted a fairly arbitrary (50:50) split between the two groups, and this proportion did not bear a close relationship to the value that the inactive operators would have placed on the option to fish in the Cascade Plateau.

5.1.4 Implications for wealth distribution

The three options involve significantly different allocations and implications for the existing distribution of wealth (see Table 2).
### Table 2  Implications for wealth under the quota allocation options (Percent of total allocation)

<table>
<thead>
<tr>
<th>Pearling Group</th>
<th>Current quota holdings</th>
<th>Percentage of new quota units allocated</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Wildshell quota</td>
<td>Hatchery quota</td>
<td>Total quota holding</td>
<td>Equal allocation to licensees</td>
<td>Share of total quota</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note b</td>
<td></td>
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<tr>
<td><strong>Paspaley Group</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paspaley Pearling Company P/L</td>
<td>250</td>
<td>80</td>
<td>330</td>
<td>25%</td>
<td>36%</td>
<td>23%</td>
</tr>
<tr>
<td>Roebuck Pearl Producers P/L</td>
<td>55</td>
<td>20</td>
<td>75</td>
<td>6%</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Pearls P/L</td>
<td>80</td>
<td>20</td>
<td>100</td>
<td>6%</td>
<td>11%</td>
<td>6%</td>
</tr>
<tr>
<td>Paspaley Pearling Company P/L (BH)</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>6%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>MG Kailis Group</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Broome Pearls P/L</td>
<td>85</td>
<td>90</td>
<td>175</td>
<td>19%</td>
<td>19%</td>
<td>26%</td>
</tr>
<tr>
<td>Exmouth Pearls P/L</td>
<td>55</td>
<td>40</td>
<td>95</td>
<td>6%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Australia Sea Pearls P/L</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>6%</td>
<td>5%</td>
<td>9%</td>
</tr>
<tr>
<td><strong>Arrow Group of Companies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SJ &amp; J D Arrow</td>
<td>40</td>
<td>40</td>
<td>80</td>
<td>13%</td>
<td>9%</td>
<td>11%</td>
</tr>
<tr>
<td>Dampier Pearling P/L</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>6%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Clipper Holdings</td>
<td>17</td>
<td>20</td>
<td>37</td>
<td>6%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Tennereef P/L</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>6%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Morgan and Company P/L</td>
<td>45</td>
<td>20</td>
<td>65</td>
<td>6%</td>
<td>7%</td>
<td>6%</td>
</tr>
<tr>
<td>BR &amp; LM Brown</td>
<td>55</td>
<td>20</td>
<td>75</td>
<td>6%</td>
<td>8%</td>
<td>6%</td>
</tr>
<tr>
<td>Blue Seas Pearling Company P/L</td>
<td>25</td>
<td>20</td>
<td>45</td>
<td>6%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td>Maximia Pearling Company P/L</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>6%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Fantome Pearls P/L</td>
<td>25</td>
<td>20</td>
<td>45</td>
<td>6%</td>
<td>5%</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total quota</strong></td>
<td>572</td>
<td>350</td>
<td>922</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Note a:** Includes 15.1 units hatchery options expected to be converted into quota before the expiry of hatchery policy in 2005

**Note b:** Assuming 350 quota units are allocated

The share of the additional quota to the smaller, single licence operator is similar under options 1 and 3, but smaller under option 2. The share of the larger operators varies significantly across the three options. The number of units of quota allocated under each of the three options is set out in Table 3. There is likely to be a degree of disgruntlement among pearl producers, regardless of which formula is adopted.
Table 3  Implications for wealth under the quota allocation options (Number of new quota units allocated)

<table>
<thead>
<tr>
<th>Pearling Group</th>
<th>Current quota holdings</th>
<th>Number of new quota units allocated</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wildshell quota</td>
<td>Hatchery quota</td>
<td>Total quota holding</td>
<td>Equal allocation to licensees</td>
<td>Share of total quota</td>
<td>Share of hatchery quota</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Note b</td>
<td></td>
<td></td>
<td>Option 1</td>
<td>Option 2</td>
</tr>
<tr>
<td>Paspaley Group</td>
<td>250</td>
<td>80</td>
<td>330</td>
<td>88</td>
<td>125</td>
<td>80</td>
</tr>
<tr>
<td>Paspaley Pearling Company P/L</td>
<td>100</td>
<td>20</td>
<td>120</td>
<td>22</td>
<td>46</td>
<td>20</td>
</tr>
<tr>
<td>Roebuck Pearl Producers P/L</td>
<td>55</td>
<td>20</td>
<td>75</td>
<td>22</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>Pearls P/L</td>
<td>80</td>
<td>20</td>
<td>100</td>
<td>22</td>
<td>38</td>
<td>20</td>
</tr>
<tr>
<td>Paspaley Pearling Company P/L (BH)</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>22</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>MG Kailis Group</td>
<td>85</td>
<td>90</td>
<td>175</td>
<td>66</td>
<td>66</td>
<td>90</td>
</tr>
<tr>
<td>Broome Pearls P/L</td>
<td>55</td>
<td>40</td>
<td>95</td>
<td>22</td>
<td>36</td>
<td>40</td>
</tr>
<tr>
<td>Exmouth Pearls P/L</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>22</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Australia Sea Pearls P/L</td>
<td>15</td>
<td>30</td>
<td>45</td>
<td>22</td>
<td>17</td>
<td>30</td>
</tr>
<tr>
<td>Arrow Group of Companies</td>
<td>40</td>
<td>40</td>
<td>80</td>
<td>44</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>SJ &amp; JD Arrow</td>
<td>25</td>
<td>20</td>
<td>45</td>
<td>22</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>Dampier Pearling P/L</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>22</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Clipper Holdings</td>
<td>17</td>
<td>20</td>
<td>37</td>
<td>22</td>
<td>14</td>
<td>20</td>
</tr>
<tr>
<td>Tennereef P/L</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>22</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Morgan and Company P/L</td>
<td>45</td>
<td>20</td>
<td>65</td>
<td>22</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>BR &amp; LM Brown</td>
<td>55</td>
<td>20</td>
<td>75</td>
<td>22</td>
<td>28</td>
<td>20</td>
</tr>
<tr>
<td>Blue Seas Pearling Company P/L</td>
<td>25</td>
<td>20</td>
<td>45</td>
<td>22</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>Maxima Pearling Company P/L</td>
<td>15</td>
<td>20</td>
<td>35</td>
<td>22</td>
<td>13</td>
<td>20</td>
</tr>
<tr>
<td>Fantome Pearls P/L</td>
<td>25</td>
<td>20</td>
<td>45</td>
<td>22</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>Total quota</td>
<td>572</td>
<td>350</td>
<td>922</td>
<td>350</td>
<td>350</td>
<td>350</td>
</tr>
</tbody>
</table>

Note a: Includes 15.1 units hatchery options expected to be converted into quota before the expiry of hatchery policy in 2005.

Note b: Assuming 350 quota units are allocated.

5.1.5 Conclusion on allocating quota to current licence holders

Any of the three methods would produce efficient outcomes – with the choice turning on equity considerations.

All three methods of allocating quota to existing producers would produce efficient outcomes, provided that the quota is transferable among producers and to those outside the industry. The choice of method turns on equity considerations. ACIL Tasman considers that all producers should be allocated some additional quota because it is the holding of both hatchery and wildshell quota that is relevant in terms of income or wealth impacts. Using this basis,
the decision then comes down to how to allocate additional quota among existing quota holders.

Equal allocation is equitable in an absolute sense because all producers are allocated quota of equal dollar value. However, this has different implications for the relative wealth, or income positions, of producers. Fisheries authorities, especially AFMA, have tended to base allocation decisions on catch history so that those with a greater historical catch are allocated more quota. Sometimes this has involved part of the additional quota being allocated on an equal basis and part allocated according to catch history.

ACIL Tasman favours the proportional allocation method, that is, additional quota being allocated in proportion to current holding of quota (wild shell plus hatchery). This method minimises the impact on the relative distribution of wealth of current producers and recognises the additional investment (and risks taken) of the larger producers. According to our interpretation of past litigation in relation to quota allocation, using a proportional basis is also less likely to be prone to litigation than using an equal allocation of quota. This is because the allocation formula would be considered as reasonable. However, this is an area that is highly unpredictable and arguments could be mounted that an equal allocation achieves the equity objective better if equity is interpreted in an absolute amount sense versus the relative amount sense.

Table 4 summarises each of the allocation options' implications for efficiency and equity objectives (with equity to be defined in terms of implications for relative wealth).
Pearl Hatchery Quota

Table 4 Allocation options’ qualitative assessments

<table>
<thead>
<tr>
<th>Allocation option</th>
<th>Economic efficiency</th>
<th>Equity implications</th>
<th>Administrative and compliance simplicity</th>
<th>Litigation potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Equal allocation to all producers</td>
<td>Efficient if transferable</td>
<td>Causes wealth of smaller producers to rise relative to larger producers</td>
<td>Simple</td>
<td>High, especially from larger producers</td>
</tr>
<tr>
<td>2) Proportional allocation to all producers</td>
<td>Efficient if transferable</td>
<td>Maintains distribution of wealth among producers</td>
<td>Simple</td>
<td>Reduced significantly compared to Option 1</td>
</tr>
<tr>
<td>3a) Hatchery quota holders equal allocation</td>
<td>Efficient if transferable</td>
<td>As with option 1</td>
<td>Simple</td>
<td>High</td>
</tr>
<tr>
<td>3b) Hatchery quota holders proportional allocation</td>
<td>Efficient if transferable</td>
<td>As with Option 2</td>
<td>Simple</td>
<td>High</td>
</tr>
</tbody>
</table>

5.2 Allocate quota to other groups in the community

There is a view that the interests of equity and competition would be served by allocating some of the quota to those currently outside the industry. As mentioned above, it is feasible for the Government to allocate a portion of the quota to existing hatchery quota holders and a portion to non-holders, including existing pearl producers and other individuals and groups in the community. However, the free allocation of quota to those outside the industry would not advance the interests of competition, economic efficiency or indeed equity.

If the quota were simply given to individuals or groups outside of the industry, this would produce windfall gains. When something of value is allocated to an individual, this could be considered to be a windfall or unearned gain. If new hatchery quota were allocated for free to those outside of the industry, then clearly this would be a windfall gain, as these people have done nothing to earn the quota. When quota is given for free to those inside the industry there is less of a windfall involved because existing quota holders have done something to earn the quota. For example:

- The industry was responsible for developing the technology of producing pearls from hatchery quota;
- The industry has created a valuable market in pearls through their production and marketing activities that have undoubtedly increased the value of the pearls;
- The existing holders of quota bear all of the downside of new quota allocations. That is, if there is an increase in quota, this may have the effect of depressing quota prices and therefore the wealth of existing quota holders.

Free allocation of quota to those outside the industry would not advance the interests of competition, economic efficiency or equity

Giving quota away can be inequitable
- because it produces windfall gains
Pearl Hatchery Quota

holders. Allocating them quota on a gratis basis could be seen partly as compensation for the risk of significant reductions in wealth from increasing quota supply; and

• The hatchery quota restricted the industry (in that many would have liked to produce more pearls but were bound by the quota).

Windfall gains would be the case whether those outside the industry chose to sell the quota to pearl producers, use the quota themselves, or lease the quota to existing licence holders. As mentioned earlier, there is a case that those in the industry have earned the value of their original quota allocations through investment, risk taking and through the development of technology. In some cases, incumbents purchased hatchery options or quota from the original recipients. There has also been new entry into the industry where part of the investment was to pay for wild shell and hatchery quota. Granting free quota to potential entrants would, therefore, be inequitable by comparison. On the surface, it would place new entrants at a competitive advantage relative to those who have had to purchase quota in that it would amount to a subsidy of a key input into the production process.

More importantly, it could be judged as a capital subsidy that would distort the allocation of resources. A capital subsidy would artificially increase the rate of return to resources employed in pearling. This would cause resources to be allocated to pearling that would otherwise have been allocated to another economic activity. From the WA economy as a whole, there would be an efficiency loss.

Thus, as well as being inequitable, free allocation to outsiders may not be consistent with economic efficiency.

Since hatchery quota and wild shell quota are tradeable, there is no barrier to entry into the industry. The cost of quota, along with other capital costs, is a cost of entry to the industry. Such a cost does not preclude an efficient allocation of resources, as we have argued earlier.

There is also the question of who should receive the free allocation? One method would be to choose those who have approached the Government in the past for an allocation of quota. This would be a form of ‘first come first served’ allocation method. However, such a choice would not necessarily be equitable and the Government could be accused of folding in to pressure from interest groups. This could undermine the credibility of the pearl hatchery policy.

There are other concerns associated with the free allocation of quota to those outside the industry including difficulty in developing criteria for the allocation of quota. A reasonable set of criteria may include the possession of the
technical knowledge and financial resources to use the shell efficiently in a manner that minimises the potential to inflict harm on existing pearl producers. If the operation of individual pearl producers did not impact on other producers, such criteria would be difficult to justify on economic grounds. However, there are important potential externalities in pearl farming such as environmental degradation, the spread of disease and the loss of reputation for producers as a group due to poor quality product undermining the quality reputation of Australian pearl producers as a group.

New entrants would be subject to the same legislative provisions governing the activities of existing producers and this would to some extent reduce the risk of such externalities arising. The Government could further reduce the risk through the imposition of an appropriate set of qualifications or criteria on all applicants for pearling licences. These would need to be demonstrated to be necessary, however, as such entry requirements could constitute barriers to entry.

5.2.1 Recommendation on allocating quota to other groups

ACIL Tasman concludes that free allocation to those outside the industry would be inconsistent with both the efficiency objective of the pearl hatchery policy and equity considerations.

ACIL Tasman recommends against allocating on a free basis a portion of new quota to those outside the industry.

5.3 Work program bidding

The Government might contemplate allocation based on a ‘work program’ bid (which could also be applied to current licence holders if the allocation methods outlined in the previous section are not adopted). This would be analogous to methods of allocating rights to explore for hydro-carbon and mineral deposits. Under such an approach, bidders would submit proposals to the government about how they plan to use the additional hatchery quota.

Competing bids are evaluated in terms of the merits of the proposed use of the resources in terms of a range of criteria set by the government. This method is sometimes referred to as a ‘beauty contest’. This might include such things as technical specifications of quota use, demonstration that the proposed use maximises the value derived from the quota, perhaps, contributing to other government objectives (for example, regional development, environmental care etc). The Government might set a range of conditions on the use of the quota, including that the proponents actually use the quota rather than selling the
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quota to a third party. Work program bidding could also include price as one of the award criteria\(^{18}\).

The need to evaluate and monitor proposed work programs can impose a significant burden on government in terms of the technical and other resources required to evaluate the competing bids effectively. Bidders also may incur significant costs in preparing proposals and the sum of the costs may be quite substantial if there are a large number of tenderers. This can result in lengthy delays between the date at which the tender is called and the time at which the subsequent decision is made.

The credibility of the approach also relies upon the planned program of work actually being undertaken in accordance with the proposal. If Governments have a tendency to be forgiving and flexible in relation to work programs, this will induce proponents to overstate their proposed work programs on the understanding that they can subsequently substitute a cheaper and perhaps more realistic, work program after the award of the quota. If Governments are firm and stand by the letter of the proposal, this can lead to wasteful expenditures since the work program may not adequately evolve in response to changing market and other circumstances.

The method can produce perverse outcomes – particularly in terms of economic efficiency. The method can involve significant transaction costs for both bidders and government – and result in lengthy delays. The method can produce perverse outcomes – particularly in terms of economic efficiency. – and it is prone to appeals and litigation – which could cause delays and impact on the industry’s value.

ACIL Tasman concludes that the costs of work program bidding do not exceed any benefits it may produce.

5.3.1 Conclusion on work program bidding

Allocation by work program bidding is likely to result in costs incurred, for a given value of production, which exceed the costs associated with allocation to existing producers or allocation by a market mechanism. These costs arise from the need to evaluate bids and the inflexibility that can arise because market conditions may depart from the market conditions upon which a promised program of work was predicated.

\(^{18}\) According to the Productivity Commission (2003) the key difference between an auction and a comparative bidding process is in the degree of reliance on explicit price comparisons, rather than the scope for defining resource rights or specifying contract terms. An auction can require bidders to fulfil certain technical or service requirements, while comparative bidding can include price based criteria. Price competition, however, is pivotal in an auction but not in comparative bidding.
5.4 Other aspects of administrative allocations

5.4.1 Flexibility of alternative allocation mechanisms

In FMR2, a number of positive and negative aspects of administrative methods of allocating quota were raised. The authors argued that administrative decisions to determine the initial allocation provide the Government with considerable resource management flexibility. The report contends that such an allocation mechanism enables the Government to determine the rules and criteria for the allocation and facilitates tight control by the regulator. It also allows the Government to take into account a wider range of community and social objectives in allocating the quota, compared to a market based mechanism. It can also ensure that the rights of existing resource users are protected by explicitly incorporating these pre-existing rights into the new scheme.

Some contend administrative mechanisms give government greater regulatory control – particularly in achieving social objectives

The allocation mechanisms discussed in the previous section would have most of these ‘advantages’. The Pearling Act already has provisions that seek to modify the activities of pearlers in such a way as to make them more consistent with social objectives. The Government can also set management and other criteria for resource use into a market based mechanism, such as an auction. For example, it is a common practice in auctioning rights to supply infrastructure services that the successful bidder must meet certain community service obligations.

Market-based mechanisms can be similarly regulated, however

All business can be subjected to regulations by governments. Regardless of whether quota is auctioned or allocated by administrative decision, in either case those wishing to use quota would be subject to the same regulations under the Pearling Act. The rights of existing quota holders would be protected under a market allocation method because they would retain their existing quota holdings, and they would be given the opportunity to tender or bid for additional quota.

5.4.2 Purchases of new quota in secondary markets

Some concerns with administrative decisions are also raised in FMR2, such as the initial allocations that are subsequently capitalised into market prices of quota. According to the authors, this raises ‘serious questions of equity’ in the sense that subsequent entrants must purchase through the secondary market without receiving any of the ‘windfall gain created for the initial allocatee’. Note that the ‘windfall’ gains referred to in FMR 2 is a generic description. Original hatchery option allocations were in exchange for significant investment commitments. The gains are, therefore, arguably not in the nature of windfalls.
Moreover, as implied in FMR2, the ability of the Government subsequently to vary the amount of the quota or the content of the quota (shell per quota unit) is compromised because of the potential loss in value to purchasers in a secondary market.

This problem can, however, be readily avoided through the use of flexible quota units – as is used for wild shell. Should there be a need subsequently to reduce aggregate hatchery quota, or wild shell, quota, this can be done through reducing the amount of shell per unit of quota. Provided hatchery quota is expressed in or converted to a share of a total quota, the right then becomes the right to a share of the total hatchery quota. (The provisions defining hatchery units and quota in the draft Bill are consistent with this approach.) Purchasers on secondary markets would take this into account when making a decision to purchase quota, and would have less of a case to pursue compensation, provided the Government decision to reduce the total quota was reasonable.

5.4.3 Rent seeking behaviour

Administrative allocations raise concerns with rent seeking behaviour. This is a situation where individuals or groups in the community devote substantial resources in an effort to influence politicians and decision makers of the merits of their case for being awarded quota. If there is sufficient compensation for the right to be allocated, it is conceivable that lobbying activities by all seeking to gain the right may cost more than the value of the right being sought. While each individual would only rationally at most spend up to the value of the right, if there are several individuals or groups seeking the right, in total they may devote resources to winning the right that have a value far greater than the right itself. This is not consistent with economic efficiency.

This problem can be overcome, or at least mitigated, if the Government has a transparent approach to allocating new hatchery quota. While an auction based system would remove most of the incentives to rent seek, an administrative approach could also embody mechanisms to reduce, but probably not eliminate, such incentives. If the provisions concerning the allocation method were embodied in legislation, this should eliminate such incentives.

Administrative allocation mechanisms may also be more likely to be seen as unfair by interested parties and therefore subject to legal challenge. This is even more likely if the approach adopted is not transparent and involves a degree of arbitrariness. A formula based mechanism, based on reasonable grounds and embodied in legislation is less likely to be challenged through the courts.
6 Market based mechanisms

We concluded in Section 4.1.1, that where the government does not own all or a substantial portion of the value of the property rights being sold, as is the case with hatchery quota, it would be inappropriate for any compensation to be paid to the community in the form of rents collected through market mechanisms such as sales or auctions. We canvass in this chapter the wide range of issues raised by using market mechanisms since they provide potentially efficient means of allocating additional quota. The equity implications are included in the discussion.

Market based alternatives for selling additional quota could include:

- A direct sale of hatchery quota whereby the government places a price tag on quota; and
- A form of auction whereby packages of quota are sold to the winning bidder:
  - There is a range of possible forms of auction and auction design rules that need to be explored in some detail if such a mechanism is to satisfy both efficiency and equity criteria.

The allocation of quota to existing quota holders is also consistent with a market-based outcome because of the option for individuals to purchase the quota on secondary markets.

While administrative allocation mechanisms, if the rights are tradeable, will ultimately produce an efficient allocation of quota through secondary market transactions, market mechanisms can in principle achieve an efficient distribution of quota from the outset. An auction will achieve an efficient outcome if the rights are allocated according to the willingness to pay of the bidders. Market mechanisms have the additional advantage of self-selection in that bidders would be ranked according to the value they place on the quota.

Market mechanisms are also important in generating revenues to the government or the community in cases where the community has a legitimate claim to own what is being auctioned. Provided certain conditions are met, a market mechanism will compensate the community according to the market value of the resource being sold.

Market mechanisms are less subjective than administrative methods of allocating resources and the results are more transparent. This is because competing applicants are compared on a single, unequivocal criterion – price. According to the Productivity Commission, an auction or other form of market allocation can produce outcomes that are consistent with government
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policy and regulatory objectives. This is because “auctions can incorporate complex allocation constraints and objectives, provided the government seller is able to express them in precise and explicit terms.”

6.1 Sale of quota

In many cases when the government is allocating rights for the first time, there is a difficulty in establishing the market value of the rights. This is why auctions can be attractive in cases where there is no reliable guide to the value that prospective buyers would place on the rights. In the case of new hatchery quota, there is an existing secondary market in quota that could be used by the Government to sell new hatchery quota. While this secondary market is somewhat thin, sales of hatchery options and wild shell quota have taken place over the past decade. The question is whether these sales have revealed a market price for quota that is similar to the current market value.

In general, the market price for quota is the current price at which quota are changing hands. Individuals will place a range of valuations on quota reflecting their internal valuations. The value placed on quota will vary over time depending on current and expected market conditions, the regulatory framework and supply side factors. Using the secondary market to value hatchery quota would give some guide to the market value of quota. However, it is some time since quota has changed hands, and the value of the quota has probably changed during that time. Moreover, there is the question of what price the quota changed hands at. Normally this is a commercially sensitive matter to both parties and prices may not be available.

Nevertheless, it is possible for the Government to obtain some estimate of the market value of quota and to use this as the basis for setting a selling price. The Government could enlist the assistance of the industry in estimating this market value. Prospective buyers of quota could buy from the government or on the secondary market from the existing quota holders. Prospective buyers could be expected to shop around and if the asking price by the Government is too high it would not expect to get any takers. If the price were too low, this could reduce the market value of existing quota. In this situation, it would be in the interests of both the industry and the Government not to set too low a price.

It can, nevertheless, be used by government

It can, nevertheless, be used by government

– if government prices are too high

– or too low

– the market will react differently

Nevertheless, it is possible for the Government to obtain some estimate of the market value of quota and to use this as the basis for setting a selling price. The Government could enlist the assistance of the industry in estimating this market value. Prospective buyers of quota could buy from the government or on the secondary market from the existing quota holders. Prospective buyers could be expected to shop around and if the asking price by the Government is too high it would not expect to get any takers. If the price were too low, this could reduce the market value of existing quota. In this situation, it would be in the interests of both the industry and the Government not to set too low a price.


20. It is understood that the market price, based on recent sales of quota, has ranged from around $3,000 per unit to a more recent sale with a price of around $1,500. This shows considerable variation in the ‘market’ price of quota.
As discussed in Chapter 2, there are several situations where it is critically important for decision-makers to have access to data accurately reflecting market conditions. Estimating the market value of quota where the regulator contemplates using a market mechanism to sell quota is one such occasion. As we suggested earlier, the alternative to the industry and Government sources of data being used would be to engage an independent third party, acceptable to Government and industry, such as a market research group, to collect data.

In selling a parcel of quota, the Government would need to decide whether to sell the quota in one lot or whether to divide it into parcels of quota. It would also need to decide whether it would allow the existing quota holders to buy the quota. This would depend on whether the Government wished to pursue other objectives through the sale of quota. For example, the Government may wish to encourage new entry into the industry (noting that in the absence of barriers to entry, there is no economic efficiency argument to underpin such an objective). In this case, it may divide the quota into parcels of 15 unit minimum quota levels set by the legislation, with each purchaser restricted to one lot and existing quota holders excluded from buying the quota.

### 6.1.1 Sale of allocation for auction price

ACIL Tasman was asked to consider a further means of establishing a selling price involving dividing the additional quota into two parts, one to be auctioned and the other to be allocated to current holders – but at a price to be determined in accordance with the price reached at the auction.

ACIL Tasman has concluded that this option is both impractical and inappropriate. To illustrate our conclusion, we have set out an example below, based on the following assumptions:

- The auction takes the form of bids involving both price and quantity:
  - that is each bidder can offer to buy so many units of quota at a certain price;
- There is no restriction placed on the volumes that bidders can be awarded:
  - The value that bidders place on quota will vary across bidders reflecting different expectations about the profits that can be earned from utilising quota. For example, unit production costs may vary with the scale of operations, experience and location of farm sites. The larger firms can be expected to bid higher amounts than the smaller firms and new entrants, whose costs would most certainly be higher until they became established at a minimum efficient scale;
- The auction involves 200,000 units of shell;
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- The following bids are received ranked in order of price bid, with the prices being for illustrative purposes and bearing no relation to market price of quota:
  - Company A 80,000 units at $10 per unit
  - Company B 40,000 units at $9 per unit
  - Company C 30,000 units at $7 per unit
  - Company D 25,000 units at $6 per unit
  - Company E 25,000 units at $5 per unit;
  - Company F 50,000 units at $4 per unit; and
  - Company G 25,000 units at $4 per unit;
- The first five companies would be awarded the full amount of the quota.

The Government could adopt a number of positions in terms of the price charged for the allocated 50 per cent:

- It could charge producers according to the amount bid.
  - This would be a reasonable allocation method and would be efficient in terms of charging willingness to pay.
- However, the Government may not consider charging different prices to different companies to be equitable and may, therefore, charge all winners the lowest winning price, that is, $5 per unit:
  - The remaining 50 percent of shell would be offered to existing producers at the auction price of $5 per unit.

The problem here is that those producers who have bid a lower price at the auction would not accept the offer, resulting in quota being passed in. Companies would have an incentive to bid the minimum amount possible to win, and so would not bid their true valuation. There would be strong incentives to collude and subsequently to obtain quota through secondary trading (since quota are tradeable). There would also be an incentive to stay away from the auction, reducing the amount of competition – and the winning bid prices – with producers knowing that they will get some allocation later at a lower price.

If prices are charged according to bid prices, other problems could arise. For example, producers will have some knowledge of the value others place on quota. Those companies that value the quota most have an incentive to stay away from the auction or to put in low bids. These companies have the ability to purchase quota from the winners at prices that are substantially less than the value they place on the quota. For example, Company A, which values quota at $10 per unit, could purchase from the other companies offering each more than the value they place on the quota. It could purchase quota from Company E at, say $6 per unit, and both companies would be better off.
The only way to prevent this happening would be to force all companies interested in obtaining quota to participate in the auction. That is, an efficient outcome would only result if all of the quota were auctioned. In this case, bidders would be more likely to bid close to the valuation they place on quota.

The auction would allocate quota according to willingness to pay and this would be an efficient outcome. However, the Government would in effect be collecting all of the rents. This may not be appropriate since the community has no clear claim to these rents. As concluded earlier, the Government should not be levying a ‘resource rent’ tax to which the community is not entitled.

We discuss the above problems encountered in using auctions further in the next section.

6.2 Auctions

6.2.1 The attractions of auctions

If the community had clear ownership of the value embedded in hatchery quota, it may be appropriate to use auctions to sell quota, and in the process collect rents for the community. However, in order to determine whether it would be appropriate, there is a need first to examine whether an auction would achieve the Government’s objectives, and in particular the efficiency objective.

Auctions have been gaining increasing popularity among governments for allocating such things as mining and petroleum exploration rights, airwave spectrum licences, water and timber rights and even quota under trade restraint policies. Auctions have long been used for the sale of government owned residential land. The Productivity Commission’s recently produced detailed report on the use and design of auctions for the allocation of government or community owned resources states:21

“The primary advantage of an auction is its tendency to allocate resources to those who are most capable of using them. Generally, only bidders with high valuations for the resources on offer are willing to bid high and thus likely to acquire the resources. Bidders are best able to assess resource values on the basis of available private and public information, taking into account their own productive capabilities and business risks.”

FMR2 also claims a number of benefits for auctions over alternative allocation mechanisms. These include that auctions are consistent with the achievement

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of economic efficiency and, in cases where an existing market does not exist, will allow the government to discover the market value of what it is selling.

Auction design involves developing a set of trading rules that determine the bidding process, prices and the allocation of the resource. Auction theory is concerned with the conduct and outcomes of competitive bidding. Bidders make strategic decisions under uncertainty based upon their own valuations but also taking into account views about the actions and reactions of rival bidders. An auction environment includes the characteristics of bidders (their preferences, valuation bases, behaviour and access to information), and the characteristics of what is being auctioned (the number and types of each good, restriction on use, etc).

There are many forms of auctions and there is a range of complex issues in auction design that must be addressed for an auction to be a successful and efficient way of allocating quota. It is important to define clearly the rights being sold, as this will determine the level of interest in the auction and the amounts that bidders are prepared to pay for the quota.

### 6.2.2 Difficulties inherent in using auctions

The theory of auctions suggests that efficient outcomes are achieved when the good is allocated to the bidder that places the highest value on the good. This will be the case under certain circumstances (known as the auction environment) but will not always be the case. Complications arise in determining if an auction will achieve an optimal or efficient outcome from:

- The need to protect the rights of existing quota holders;
- Protecting the community and social rights including the normal range of potential externalities, such as the need to protect against environmental damage and the spread of disease;
- In some cases, a lack of information about the value of the thing being auctioned;
- Lack of competition and a need to encourage a sufficient number of bidders;
- Strategic behaviour among bidders; and
- Collusion among bidders and a need to minimise such prospects.

We address each of these in the next section, with the section following that addressing other issues of a design nature to take into account when
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determining if an auction will achieve an optimal or efficient outcome, including:

- Defining what is to be auctioned;
- Determining the size and number of lots;
- Selecting the type of auction (English, Dutch etc);
- Dealing with risk aversion and uncertainty and the need to minimise their adverse effects including 'winner's curse'; and
- Issues involved in setting a reserve price.

The issues are complex, as attested to by the convoluted auctions that have been held in Australia and overseas. Our reading of the experience of auctioning rights is that there are many possibilities of getting it wrong and producing perverse outcomes.

The design of auctions is important for ensuring the outcome is competitive and efficient. Competition is sufficient, but not necessary, for ensuring that an auction delivers an efficient outcome. Where there is a lack of competition, auctions can be designed to simulate competitive outcomes. Government auctions often have too few bidders to ensure a competitive process. A lack of competition need not produce inefficient outcomes, provided that the auction is designed to take into account these market imperfections. The following section provides a summary of the rather complex field of designing actions governments can consider taking to counter the problems in using auctions.

6.3 Addressing the difficulties of auctions

Two issues need to be addressed at the outset if an auction is to result in an efficient outcome. These are the protection of the rights of existing quota holders and taking into account the social impact – or the potential externalities – of the exercise of the rights auctioned.

Protecting the rights of existing quota holders

In the case of hatchery quota, the volume of quota holdings of existing operators would not be affected. However, there is a need to protect the value of this quota. Maintaining the value of existing quota, both hatchery and wild shell, is an important objective of the method of establishing the overall quota for the industry. It is also necessary to ensure that the auction reveals a true valuation on new quota, since this quota will be transferable and perfectly substitutable with existing quota on secondary markets. If the auction results in quota being sold for less than their market value, the effect may be to reduce the value of quota across the board. It is, therefore, important to ensure that
the auction is competitive and that bidders will bid amounts that reflect the true market value of the quota.

Much of what is discussed below revolves around the difficulties in ensuring that competition operates effectively.

The protection of community and social rights

Auctions produce efficient outcomes when resources are allocated to the bidders that place the highest value on the resource and when bidder valuations reflect the social value of the resources. The latter includes the market value of the resources adjusted for any costs and benefits to the broader community that may arise from the use of the resources.

The *Pearling Act* has provisions that seek to correct for such externalities (for example, minimum distances and other regulations designed to stop the spread of disease, and for environmental protection).

A divergence between private and social valuation can arise because of a lack of competition in the market. For example, in a market where a firm can supply a market at a lower cost than two or more firms, the incumbent monopolist could outbid potential entrants.

Among the reasons that will induce bidders to understate the value that they place on the resource or rights includes a lack of competition in bidding (for example, where there are too few bidders). Other reasons extend to information advantages that bidders may have over the seller in determining market value, and attitudes towards risk and collusion among bidders. The seller needs to design auction rules to counter strategic and non-competitive behaviour to ensure competitive, efficient outcomes.

There are several factors that act either separately or in unison to endanger competition. These factors can arise either from the ways in which the auction is designed or from the bidders' incentives to maximise their gains. These include:

- Restricting the number of bidders;
- The pros and cons of using reserve prices;
- Collusive and strategic bidder behaviour; and
- Bidding and entry costs.

We focus on these dangers and some of their countermeasures in the subsections below.

**6.3.2 Dangers in restricting the number of bidders**
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While an auction may result in an efficient outcome because it awards the quota to the bidder that values the quota most highly, money may be left on the table because of the presence of rents. The Government's purpose in using an auction is important here. If the Government is seeking to maximise the revenue derived from an auction, certain auction design features would need to be avoided. We explain this below.

The price paid at an auction can be expected to exceed the seller’s supply cost. In this case there is a gain from trade that is shared between the winner and the seller. This gain from trade consists of economic rent. The seller can earn a monopoly rent by restricting supply of the good, but lack of complete knowledge about bidders’ valuations prevents the seller from extracting all the rent. The seller relies upon competition between buyers to drive the price up to the highest private valuation, but the price is normally below the highest private valuation with the winner earning an information rent that arises from asymmetric information between buyer and seller. The successful bidder can earn an information rent due to the advantage of possessing private value information.

The strength of competition among bidders will affect the auction price. Competition depends on the number of bidders and the profile of bidders' valuations, which both affect the bidder’s perception of the risk of being outbid. The less dispersed the valuations, the closer will be the price to the highest valuation. With stronger agreement about the market value of a good, the more rent the seller will extract and the less information rent buyers will extract. As the number of bidders increases, bidders need to bid closer to their true valuation to win the auction.

This suggests that were quota to be auctioned and if government wished to maximise revenue raised, there should be no restriction placed on who is allowed to bid. Restriction on entry to the auction may seriously undermine the degree of competition and result in undervaluation of quota, with serious consequences of eroding the value of existing quota holders.

6.3.3 Reserve prices - a double-edged sword

The seller may increase revenue by setting a reserve price (or the seller’s bid for the good). This adds to the risk of bidders losing by bidding too low. The reserve price may increase bidder competition, allowing the seller to capture more of the rents.

However, unless the reserve price is at an appropriate level, it can result in an inefficient outcome. If the highest bidder valuation is above the seller’s costs but below the reserve price, the good would not be sold despite the good being worth more to the buyer than the seller. There are realised gains from trade.
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If bidders are identical in their probability distribution of bids, a common reserve price would be set equal to the average of the bidders’ highest possible valuation and the seller’s costs. Normally the reserve price will exceed the seller’s cost.

Bidders hope to maximise the gain from competing in auctions, but a reserve price reduces their expected gain. This could discourage participation and reduce competition and auction prices. However, if potential buyers have a firm basis for determining valuations, the reserve price is unlikely to affect their decision to participate. Moreover, if the number of potential buyers is few and there is a large gain from trade relative to entry and bidding costs, the reserve price will have minimal impact on bidder participation. All potential bidders, under these circumstances have strong incentives to participate. A reserve price increases expected revenue and it can correct for inefficiencies that arise because of strategic price manipulation, or collusion by bidders that causes bids to be below bidders’ valuations.

If quota were to be auctioned, the balance of the benefits and costs in the case of hatchery quota suggests that the Government would probably be better off setting a reserve price for quota. For a discussion on how government might place a value on quota, see Section 6.1.

6.3.4 Preventing collusion

Collusion reduces competition among bidders and drives down price. Collusion involves the co-ordination of bids to allow a bidder to win the good at a price substantially below what other colluding bidders are willing to pay. Explicit collusion involves a prior agreement as to how to bid and divide the gains. Implicit collusion involves a tacit, mutual understanding to keep bids low. Bidder collusion is more likely to arise in repeated auctions since the increased interaction between bidders increases the attractiveness and feasibility of collusion. Examples of collusion in repeated auctions include bid rotations (such as taking it in turns to win construction contracts) and the formation of syndicates by otherwise competing firms.

Various forms of collusion and methods of dealing with these in the design of an auction are discussed in the Productivity Commission 2003 report and are summarised in Box 3.
Box 3  **Combating collusion**

According to the Commission, the presence of non-collusive outsiders reduces but does not eliminate the impact of collusive bidding on auction outcomes. To counter competition from outsiders, members of a colluding group or ring are forced to adjust their bidding strategies. As the number of outsiders rises relative to the number of bidders inside the ring, it is increasingly difficult to maintain price and the price tends to rise above the reserve price. Auction rules should be devised to enable individual ring members to gain from cheating on other members of the ring without being detected or penalised by the ring. According to the Commission, the following design features would help to prevent or undermine collusion among bidders.

- "Announce a higher reserve price, the larger the number of potential ring members. A high reserve price limits the potential gain from collusion.
- Assuming that the ring cannot disguise its operation, bidders will recognise the link between the reserve price and the extent of bidder collusion. If bidders are few, then they are better off by staying out of the ring and taking advantage of a low reserve price. The threat of a high reserve price can therefore deter collusion, especially in repeated auctions.
- Keep the reserve price secret. Ring members need to know the reserve price to determine collusive bids. Without knowing the reserve price, ring members will find it hard to coordinate their bidding strategies. In this circumstance, members are forced to communicate their intentions at auction (using bid signals, for example), which is easier to detect and address. A lack of crucial price information, coupled with the need for signalling, destabilises the bidding ring.
- Announce only the identity of the winner, not the winning bid or losing bids. This solution reduces the ring’s ability to detect deviant behaviour and disrupts collusive arrangements that entail the submission of low bids.
- Adopt a secret allocation rule that does not depend on the highest bid. This solution confuses ring members’ bidding agreements. The seller can occasionally choose someone other than the highest bidder as the winner. Provided actual bids are not disclosed, the ring would find it difficult to detect whether cheating has occurred.
- Sell several items in one auction instead of a series of auctions. This approach increases a bidder’s potential gain from trade, raising the temptation to defect from a bidding ring. It also delays or prevents retaliation against defectors.
- Choose a sealed-bid auction over an open auction. In a sealed-bid auction, the bidding ring cannot react instantaneously to prevent its members from cheating; it must rely on the threat of future retaliation, which is a less effective way of bonding ring members.
- If an open auction is used, impose a time limit on the bidding process. A ring defector would be able to bid and win just before the auction closes. An oral auction with a time limit is called a Scottish auction."

Source: Ibid., Productivity Commission 2003 page 38
The methods suggested by the Productivity Commission to prevent or mitigate collusion may conflict with other actions governments may wish to take in designing an auction, such as announcing a reserve price in order to increase revenue.

### 6.3.5 Increasing competition by reducing bidding and entry costs

An auction with too few bidders is unlikely to meet either revenue or efficiency objectives. The decision to participate in an auction depends on the costs of participating. These costs include the costs of determining valuations, the costs of preparing bids, and non-refundable entry fees imposed by the seller (for cost recovery reasons).

The costs of preparing a valuation are incurred prior to the valuation being made and tend to be the same regardless of the valuation reached. The cost of preparing bids and an entry fee eliminate the lowest valuation bidders, although the entry fee adds to revenue while the bid preparation cost is a transaction cost. Only those bidders whose valuation exceeds the costs of participation will participate. Participation costs do not generally undermine the efficiency of an auction since they do not prevent the higher valuation bidders from participating. However, the reduced number of participants may reduce the revenue from the auction.

By containing the costs of entry and bidding, the seller can attract bidders, and thereby strengthen bidding competition and increase potential revenue.

### 6.4 Challenges in auction design

There are several important and complex factors in designing an efficient quota auction including:

- Defining what is to be auctioned;
- Determining the size and number of lots;
- Selecting the type of auction (English, Dutch etc);
- Dealing with risk aversion and uncertainty and the need to minimise their adverse effects; and
- Dealing with 'winner's curse'.

These are discussed below.
6.4.1 Defining what is to be auctioned

If hatchery quota were to be auctioned, this would be assisted because quota rights and conditions were clearly spelt out in the pearling legislation. The object that is being auctioned, what it can be used for, and the conditions attached to its use, need to be specified clearly. This allows bidders to value the object accurately and reduces the risk of litigation if the value of the object does not subsequently meet expectations or the value of the object changes in response to changes in government policy.

It would be important to ensure that the quota being auctioned was identical to existing quota in all respects, otherwise distortions could be introduced into the market that may advantage or disadvantage new entrants. The Pearling Act already assists in this regard by applying the same conditions for the use of quota to all quota holders. New quota would need to have the same conditions of use and transfer, the same shell content, be valid for the same time period and have the same rights of renewal as existing quota. The specifications of new quota to be auctioned would need to be defined according to a definition in the Act. This would ensure that they involve identical rights to the rights embodied in existing quota.

The quota auctioned, along with existing quota, should be a total quota share. This would facilitate the management of the industry in response to changing market circumstances. To do this, however, would require that existing hatchery quota be converted into quota shares, or variable shell quota, whereas they are currently defined in terms of a fixed number of shell. The size of the bids for a variable shell quota will depend on the likelihood of the quota being varied up or down in the future. An advantage of a variable shell quota is that the amount of shell could be varied with less prospect of claims for compensation, provided the reasons for reducing the number of shell were reasonable and within the powers of the regulator.

6.4.2 Lot size and numbers

In the case of hatchery quota, the number of lots to be auctioned has few implications for competition. However, dividing the quota into too many lots may result in fragmentation and may make an auction unnecessarily complex. It may also subsequently add to compliance or enforcement tasks.

The Pearling Act has a minimum quota holding provision of 15,000 shell. This minimum is based on a range of considerations including minimum viable size, administration and enforcement issues. The minimum holding requirement has no justification from an economic efficiency perspective. While this is small relative to the size of the quota, and therefore not likely to be a major restriction on competition, it may still be the case that individuals may wish to...
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obtain less than the minimum amount, and therefore, are restricted from doing so. Unless the administrative and enforcement issues are sufficiently compelling, we would suggest the minimum be removed.

Since owners of new quota would need to comply with the provisions of the Act, it would seem reasonable to have a minimum lot size of 15 quota units (unless the provision is removed). Under the hatchery policy, hatchery options were awarded in lot sizes of 20,000 shell. This was largely an outcome of the number of pearling licences at the time and a hatchery quota that was judged to be most in the economic interests of the industry. If 350 units of new hatchery quota were to be allocated and 30 percent of this was to be allocated by auction, this would mean the auction of a maximum of 7 lots if it were to be in minimum sized lots. Another option, for example, would be to auction in 2 lots of 60 and 30 units plus 1 minimum sized lot of 15 units.

The size of the quota lots on offer and the total amount of quota auctioned would not affect the degree of competition for the quota. The number of bidders and the amounts they are prepared to pay will depend on the expected future earnings from the use of the hatchery quota. The lot size is less important because quota can be aggregated into viable size lots by secondary market sales either to new entrants or to existing operators. This issue may be more important in the case of a very small development fishery that could only support one viable operator. However, even in this case, if the fishery is very profitable there may be a large number of bidders for that one licence. The number of viable operators that the quota being auctioned can support is less important to competition than the number of bidders.

Other aspects to consider would be the case for limiting the number of lots purchased by any one producer, or limiting the persons who could participate in the auction. For example, would the auction be limited only to those inside the industry, to only those currently outside the industry, or would it be open to all persons? Any limitation on who is allowed to participate runs the risk of being anti-competitive, and ACIL Tasman would not recommend this be adopted. It may be necessary for reasons discussed above to have a set of eligibility criteria to reduce the risks of future damage from inappropriate farming practices.

If the approach adopted for the issue of new quota follows the tranche approach recommended by ACIL Tasman, any auction process would need to be consistent with this. This could mean a series of auctions associated with each tranche or an up-front auction for the right to receive quota in tranches. The approach adopted would have implications for lot sizes as well. If the lot size divided by the number of tranches were too small to support a viable initial scale of operations, interest in the auction from those outside the industry may be limited.
6.4.3 Selection of type of auction

Most of the choices between auction types turn on their suitability for preventing collusion between candidates, preventing wide participation or shyness (for example, by limiting candidates’ perceptions that they will suffer winner’s curse, discussed below).

There are four broad types of auctions, although there are considerable variants of each. These are:

- English auction: open outcry ascending bids with the good awarded to the last remaining bidder and the price equal to the highest bid;
- Dutch auction: prices are announced in descending order and the winner is the first bidder to accept an announced price.
- First price-sealed bid auctions: the highest sealed bid wins.
- Vickrey auction: highest sealed bid wins but pays the second highest price.

Given certain auction characteristics (known as a stylised auction), each auction form will generate on average, but not in each case, the same revenue, or price. This is the case because bidders bid according to the value they place on the good and will adjust their bidding according to the auction environment. While they pay the second highest price in the Vickery auctions, knowing this, each will bid higher. In the stylised environment illustrated in Box 4, no auction form has a clear advantage. This is largely because of the absence of circumstances that allow manipulative and collusive behaviour. Bidders bid truly, according to the value they place on the good and, therefore, the one with the highest valuation wins. Because prices reflect valuations, auction, in the stylised environment generate efficient outcomes. Complexities in design arise when the stylised assumptions are relaxed.

Optimal auction design will depend on the circumstances. For example, if the market is thin (very few bidders), a second-price rule may result in what most people would regard as unreasonably low prices (for example, parts of radio spectrum in an early New Zealand auction sold for $6). In other circumstances, first price approaches can result in “winner’s curse”, that is, a bid much higher (and unrealistically so) than the next one (see Section 6.4.5). And there may be a case to constrain an auction in various ways — for example, if the bidder market is judged to be uneven (as may be the case with Australian beef producers as instanced in Attachment B), there may be a case for limiting the bidding to avoid oligopoly developing.

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23 Ibid., Productivity Commission, pages 14-17.
Box 4  The stylised auction

According to the Productivity Commission, a stylised, least complex auction is defined by the following characteristics:

- Single good;
- Independent private valuations: the valuation of the bidder is not known to the seller and is not influenced by the views of other bidders;
- Seller knows the probability distribution of the valuations of each bidder, not the actual valuations and assumes bids to be randomly drawn from this distribution;
- Each bidder knows the probability distribution of competing bids, not the exact valuations of others and the probability distribution of bids is the same for each bidder;
- All bid with the intention of winning and know the number of bidders (that is, there is no potential for collusion among bidders).

Bidding behaviour and auction outcomes are simplified under these assumptions. Bidders would all use the same strategy based upon the payoff to themselves of winning. Each bidder knows what the good is worth to them and can readily decide how high to bid. They use whatever information (which is incomplete) they have about other bidders’ valuations to decide their minimum possible bid. There is limited scope for bid manipulation. The value that a bidder places on the good is not influenced by what it learns about the valuations of others.

There is some probability that the winner will not pay an amount equal to the value they place on the good so that there is a gap between the price paid and the winner’s valuation. The supply cost of the seller places a lower bound on the winning bid (the price). The price lies between the seller’s cost and the winner’s valuation.

This stylised auction best represents the auction of consumer goods for own use. However, the auction of quota does not meet all these characteristics and, to achieve efficient outcomes, the design of the auction becomes more complex as we depart from these stylised conditions.


6.4.4 Dealing with uncertainty and attitudes to risk

Bidders discount their bids according to their perceptions of the risks and uncertainties. These perceptions – and thus the bid levels – can be influenced by auction design.

The stylised environment assumes independent private valuations (that is, the valuation of the bidder is not known to the seller and is not influenced by the views of other bidders, see Box 4). An alternative assumption is that bidders consider each other to have similar or common valuations but each remains unsure about the value of the good. Bidders base their valuations on the information available to them and these estimates are subject to error. The factors that contribute to the valuations of bidders may be similar for all bidders (for example, market conditions, production technology etc) but bidders arrive at different valuations because they account for these factors differently or have different views on these factors. It may well be that some of these factors are the same or common (that is, they all face the same market conditions but...
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price) and others different (each has a different technology and production costs).

The design of an auction can reduce bidder valuation uncertainty; that is, distinguish between factors that affect individual valuations and factors that affect common valuations. Although their bids may change, with independent valuations, bidders cannot reduce their own value uncertainties by learning about the valuations others place on the goods. Bidders will assess the risks to their own valuations and discount their bids accordingly (for example, cost uncertainty).

Provided bidders have similar attitudes towards risk, auctions can generate efficient outcomes where bidders are uncertain about their private, independent valuations. If attitudes towards risk differ, an aggressive bidder would win an auction by setting the risk discount lower than a more risk averse bidder, even though both have the same cost and revenue conditions.

This inefficiency can be avoided by setting the price as a combination of an up front amount plus a series of payments over time. The greater the series of payments, based on a share of income generated, the lower the risk of overvaluing the good.

Pure common value auctions are rare. Normally both private and common factors will determine valuations and in this case no auction can attain full efficiency. Bids are normally influenced by what competitors think the good is worth. Bids depend on how others are expected to bid.

6.4.5 Avoiding the winner’s curse

In bidding for a good with a common value, the winner faces a risk of paying more than the good is worth. When the true value is not known, winners may overestimate its value. The winner’s curse is different from changes in valuations that arise after the auction in response to changing market conditions, or with hindsight that their estimate was too high. It arises from the fact that, having won the auction, the winner observes that it only won because others placed a much lower value on the good.

Bidders could be expected to discount their bids so as to take into account the risk of winner’s curse. If the bidder knows that others value the good similarly, this discount will be low. However, if the bidder has no idea what others are prepared to pay, the discount will be large, particularly in sealed bid auctions where they cannot observe competitor bids. This will cause them to bid substantially less than their estimated valuation to avoid the winner’s curse.
Exchanges of information among bidders can increase the auction price by
reducing the risk of over valuation relative to competitors. Information is
gathered before and during an auction. One source of information is the
seller’s disclosure about the good. Another source is other bidders’ bids.
Interaction among bidders during an auction enables them to collate
fragmented information on the good’s value. The closer the price is to the
value information held by individual bidders, the weaker is the winner’s curse.

In selling quota, the Government would need, therefore, to disclose all
available information (positive or negative), including what it knows about
market conditions and its regulatory intentions. Hidden or confidential
information raises uncertainty and reduces bids.

An open ascending bid format allows bidders to gather information. A bidder
can observe other bids and conclude that their own value estimate is not
excessive as long as others stay in the auction. A Vickrey auction only allows
bidders to observe the two highest bids. In a sealed auction, the price only
reflects the winner’s own valuation.

Attitudes toward the risk of winning can have two effects on auction prices.
Cautious bidders that choose a large risk discount to reduce the risk of
overbidding are disadvantaged in winning the auction. To avoid this
inefficiency, there is a need to incorporate design features that correct for
different attitudes towards risk (for example, the use of a series of payments
over time to lower the risk from private value uncertainties, and ascending
open bid auctions to lower the risk from common value uncertainties).

The risk of losing an auction can also introduce inefficiencies. For example
firms operating in the market can be forced out of business or can lose market
share if they fail to win an auction of an essential input. The risk of losing
encourages firms to bid close to their true valuations.

The risk of losing does not affect bidding in English or Vickrey auctions
because bidders bid their own valuations anyway. Risk aversion causes bidders
to increase their bids closer to valuation, which increases the chance of
winning but decreases the gain from winning an auction because the price will
be higher.

The effects of risk on auction outcomes (price) depend on the relative
importance of different types of risk. If the risk of losing is the main risk, the
efficiency of English or Vickrey auctions is not affected by attitudes towards
risk. In a Dutch or sealed bid auction, risk averse consumers are more likely to
win by shading their bids less than other bidders. This increases the expected
price, but results in an inefficient outcome.
If there is both a risk of winning and a risk of losing, the impact of risk attitudes is ambivalent.

To address the implications of risk for the auction of quota, in addition to full disclosure and encouraging the sharing of information among potential bidders, an English style auction (that is, open ascending bids) would be most advantageous.

6.4.6 Conclusions on auctions

This brief review of the theory and the dangers of auctions highlights the problems that can arise if an auction is poorly designed or does not take into account the circumstances surrounding the sale of hatchery quota.

There are several factors that act either separately or in unison to endanger competition when auctions are employed. These factors can arise either from the ways in which the auction is designed or from the bidders’ incentives to maximise their gains. These include:

- Restricting the number of bidders
  - Restriction on entry to the auction may seriously undermine the degree of competition and result in under valuation of quota, with serious consequences of eroding the value of existing quota holders;

- The pros and cons of using reserve prices
  - A reserve price can discourage participation and reduce competition and depending on whether the level selected is 'right', it could increase or decrease auction prices; but on the other hand it could counter strategic price manipulation or collusion;

- Collusive and strategic bidder behaviour
  - There are various ways in which bidders can collude to reduce the amount of competition and the price paid, as well as counter-mechanisms for preventing collusion among bidders by encouraging collusive participants to cheat on other colluders. Some countermeasures may conflict with other auction design actions;

- Bidding and entry costs
  - Costs determine numbers participating, so containing the costs of entry and bidding costs can strengthen bidding competition and increase potential revenue.

In addition to these inherent risks, there are several important and complex factors that would challenge governments in designing an efficient quota auction including:

- Defining what is to be auctioned
Pearl Hatchery Quota

- The quota auctioned, along with existing quota, should be a total quota share to facilitate the management of the industry in response to changing market circumstances. Existing hatchery quota would need to be converted into quota shares, or variable shell quota, whereas they are currently defined in terms of a fixed number of shell;

- Determining the size and number of lots
  - Dividing the quota into too many lots may result in fragmentation and may make an auction unnecessarily complex. It may also subsequently add to compliance or enforcement tasks;

- Selecting the type of auction (English, Dutch etc)
  - There are many choices between auction types, most of which turn on their suitability for preventing collusion between candidates, preventing wide participation or shyness (for example, by limiting candidates’ perceptions that they will suffer winner’s curse);

- Dealing with risk aversion and uncertainty and the need to minimise their adverse effects
  - Bids depend on how others are expected to bid, with bidders discounting their bids according to their perceptions of the risks and uncertainties. The design of an auction can reduce bidder valuation uncertainty, for example, by setting the price as a combination of an up front amount plus a series of payments over time; and

- Dealing with 'winner's curse' where the winner faces a risk of paying more than the good is worth, thereby encouraging discounting of bids.
  - Full disclosure and encouraging the sharing of information among potential bidders through selection of particular types of auction designs may counter this risk

There are good reasons why fisheries authorities in general – and government more widely in relation to other regulated industries – have not elected to use auctions to allocate quota or quota-like goods or services even where it is clear that it is dealing in community owned resources (which is not the case with the hatchery quota).

The high risk in using auctions or price-based systems occurs if government gets it wrong. If industry pays either too much or too little for quota, this could impact directly and adversely on industry structure as well as its long-term viability. Given that the community does not own the economic rents embedded in quota, sales or auctions of quota would ensure that governments captured that rent producing for itself a revenue raising outcome. This, of course, is an action that any government can choose to do. Appropriately, such action should be done transparently and having taken into account the full costs and benefits.
ACIL Tasman suggests that there would be much simpler and more direct ways of raising additional revenue from the pearling industry – should the government wish to do so – that would not at the same time entail the high risks, and costs, that auctions or sales-based processes would.

**ACIL Tasman recommends that administrative rather than market mechanisms be used to allocate new quota.** We consider that legislated administrative mechanisms can produce efficient market outcomes – provided secondary markets remain unimpeded. Moreover, provided the legislation is clear and decisions taken are both consistent with the legislation and reasonable, the risks of litigation can be minimised.
A Summary of allocation mechanisms

A.1 Quota allocation in fisheries

The terms of reference required ACIL Tasman to review the approaches taken to quota allocation in Australian fisheries. In most cases quota allocation has been required when there has been a change in fisheries management plans. In other cases quota allocation has involved the allocation of rights to fish in new fisheries.

Approaches to implementing quota allocation arrangement

The mechanism for setting the hatchery quota and the method of allocating additional quota could be embodied in the enabling legislation, in this case the Pearling Act. An alternative legislative option would be to include the provisions in delegated or subordinate legislation – lesser form of legislation. For example, the quota allocation formula could be included in the pearling regulations or in a management plan. Delegated legislation is still subject to parliamentary control through scrutiny by Federal or State governments.

An alternative approach would be to implement the allocation formula through government policy. Policies guide fisheries regulators in their exercise of any discretionary power provided for under the enabling legislation. In all Australian fisheries jurisdictions the enabling legislation is expressed in broad or enabling terms and considerable discretion is conferred on fisheries regulators concerning how the fishery is to be managed in a way that is consistent with the objectives and provisions of the enabling legislation.

If the quota allocation mechanism is provided for in the enabling or delegated legislation, the fisheries manager has no discretion in applying the allocation formula to those eligible to receive quota. If implemented through policy, the fisheries regulator will need to exercise a degree of discretion when applying the formula.

Circumstances under which quota has been allocated

Fully allocated fisheries

As noted in Fisheries Western Australia (1998) Fisheries Management report number 2 (FMR2)\(^ {24}\) pressures on fisheries managers to increase the total

\(^{24}\) Fisheries Western Australia (1998), Use of market mechanisms for the allocations of commercial fishing access entitlements in Western Australia, Fisheries Management Report No. 2, prepared by Economics Consulting Services Pty Ltd.
Pearl Hatchery Quota

available quota from those in the industry wanting to expand their operations and from those outside the industry wanting to gain access can be substantial.

Adjustment to total allowable catches can be either up or down, depending on changes in views on what is the maximum sustainable catch or, in this case, the optimal hatchery quota. Such variations are considered to be a normal part of fisheries management and are in response to changes in information about the characteristics of the resource and in response to changes in market conditions. Changes in quota to implement the change in the TAC are made by varying the number of quota units, if quota are defined in terms of a quota, or by varying the volume per quota unit if quota are defined in terms of a share of a TAC. Normally the adjustments would be in proportion to holdings of quota entitlements.

FMR2 make the point that because there are pressures for increases in quota, fisheries entitlements are normally allocated on a fully allocated basis. That is, the TAC is equal to the assessment of the maximum sustainable catch. In such situations, while there may be minor adjustments to a TAC, there is generally no scope to allocate quota to new entrants to the fishery. New entrants have to rely on the secondary market to obtain access to licenses and quota. The need to consider various mechanisms of allocating quota (including market based mechanisms such as tenders or auctions) does not arise in fully allocated fisheries, unless the government has entered into a buy back arrangement with current quota holders and want to re-issue entitlements.

If there were to be an increase in the maximum sustainable catch and therefore in the TAC, FMR2 argues that the existing fishers would expect to be allocated all of the increase in quota since they would bear all the costs of a decrease in the TAC.

Changes in management arrangements

Most of the cases of quota allocation discussed below have arisen where there has been a change in management arrangements. Over the past decade or so, there has been a significant shift away from input controls towards the use of ITQs to manage fisheries. In these cases, fisheries management authorities have had to consider the issue of how to convert pre-existing entitlements (based on such things as fishing license, gear entitlements and effort units) into quota entitlements. They have generally sought to allocate quota among existing entitlement holders so as to minimise the disturbance to the distribution of income or wealth among the entitlement holders.

While there have been significant variations, the allocation methods or formulae adopted generally share the following features:

- All quota entitlements have been allocated to existing entitlement holders;
• Allocation decisions have been made by delegated legislation, usually in management plans;
• Quota has generally been entirely allocated on the basis of catch history although there are differences as to how this has been done:
  – In some cases, verified catch history has been the sole basis of the allocation;
  – In other cases, the allocation has been in the form of an equal allocation to all entitlement holders, plus a component related to catch history;
  – Sometimes an additional criterion to catch history, such as boat size as an indicator of investment, has been employed.
• There has been increasing use made of independent allocation advisory panels, by AFMA but also by other fisheries authorities.

Partially allocated fisheries

There are some circumstances in which a fishery is partly allocated. This is normally in response to information that becomes available concerning a substantially larger sustainable catch of a target species than was initially identified when the TAC was set. It is also possible that the fishery managers intentionally underallocated the fishery.

How the increase in the TAC is allocated in these circumstances is more contentious? If the government has entered into an understanding with license holders about the disposition of the additional resources, then an administrative allocation to existing fishers may be appropriate. Where the existing licence holders have no reasonable claim to the additional catch, the government has a wider set of allocation mechanisms available to it, including auctioning of the additional quota units.

Forfeiture of quota

There are other circumstances when quota may become available. In some fisheries quota is non-transferable and therefore may become available when the quota holder retires from fishing. Breaches of the provisions of the Act or licence conditions could also result in the cancellation or forfeiture of quota entitlements. The Executive Director has the power to dispose of forfeited quota by any appropriate means, including an auction.

Development fisheries

There have been a number of examples of the allocation of rights to a new fishery. For example, AFMA has allocated fishing rights to the Macquarie and Heard Island Patagonian Toothfish fishery. In the case of a new species, there is generally the need for research to determine the optimal sustainable catch.
Pearl Hatchery Quota

There is generally significant financial risk in the development of a new fishery from both a catch perspective and a marketing perspective. Usually a small number of pioneers are involved in a new fishery and the government contributes to research on the fish stocks. If the government decides that there is a viable, sustainable fishery, decision needs to be made about appropriate management arrangements, a sustainable catch and the allocation of the rights to take that catch. An important issue is the allocation of shares to the pioneers and to others. The latter might include existing entitlement holders in the fishery within which the new stock is located or commercial license holders more generally. A common approach in these circumstances is to allocate a portion of the rights to the pioneers and the remaining rights allocated equally among other licence holders in the broader fishery.

FMR2 note that developmental fisheries are becoming more risky or require greater up front commitment than has been the case in the past. Such fisheries are increasingly remote from existing ports and shore-based infrastructure, are in deeper waters and involve species where there is a lack of a proven market. In this case the financial outlays and the risks can be far greater. To induce pioneers to undertake this investment (which might be in the form of larger vessels, market development and shore based processing facilities), a greater degree of certainty about access to future rewards may be required. In such a circumstance, it may be necessary to allocate rights to the new fishery up front. Governments could do this by an administrative method (such as work program bidding) or by auctioning the development rights.

A.2 Policies toward allocating fisheries quota

A.2.1 Australian experience in allocating quota

Kaufman, Geen and Sen (1999) provide an extensive summary of different methods of allocating quota adopted by Australian fisheries management agencies. This section draws largely on the material in this report, updated with information from Australian fisheries management authorities.
<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Fishery</th>
<th>Year</th>
<th>Status of fishery</th>
<th>Quota allocated to</th>
<th>Basis of allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commonwealth</td>
<td>Southern bluefin tuna</td>
<td>1984</td>
<td>Limited entry, input controls</td>
<td>Permit holders</td>
<td>Catch history plus investment</td>
</tr>
<tr>
<td></td>
<td>South east trawl</td>
<td>1992</td>
<td>Limited entry, input controls</td>
<td>Permit holders</td>
<td>Catch history and effort unit holdings</td>
</tr>
<tr>
<td></td>
<td>South east non-trawl</td>
<td>1994</td>
<td>Limited entry, input controls</td>
<td>Permit holders</td>
<td>Catch history</td>
</tr>
<tr>
<td></td>
<td>Southern shark</td>
<td>2000</td>
<td>Limited entry, input controls</td>
<td>Permit holders</td>
<td>Catch history</td>
</tr>
<tr>
<td>Bass Strait central zone scallop</td>
<td>Proposed</td>
<td></td>
<td>Limited entry, input controls</td>
<td>Permit holders</td>
<td>Equal allocation</td>
</tr>
<tr>
<td>New South Wales</td>
<td>Abalone</td>
<td>1995</td>
<td>Become a share managed fishery</td>
<td>Permit holders</td>
<td>Equal shares</td>
</tr>
<tr>
<td></td>
<td>Rock lobster</td>
<td>1994</td>
<td>Quota converted to shares</td>
<td>Quota holders</td>
<td>Catch history</td>
</tr>
<tr>
<td>Queensland</td>
<td>Spanner crab</td>
<td>1999</td>
<td>Limited entry, effort units</td>
<td>Licence holders</td>
<td>Minimum allocation to all plus portion based on catch history</td>
</tr>
<tr>
<td></td>
<td>Abalone</td>
<td>1985</td>
<td>Limited entry, input controls, closures</td>
<td>Licence holders</td>
<td>Equal allocation</td>
</tr>
<tr>
<td></td>
<td>Rock lobster</td>
<td>1993</td>
<td>Competitive TAC</td>
<td>Licence holders</td>
<td>Pots holdings or catch history</td>
</tr>
<tr>
<td></td>
<td>Blue swimmer crab</td>
<td>1998</td>
<td>Deepwater part of fishery was developmental</td>
<td>Licence holders</td>
<td>Changed to equal share</td>
</tr>
<tr>
<td>Tasmania</td>
<td>Abalone</td>
<td>1985</td>
<td>Limited entry, input controls, ITQs converted to shares</td>
<td>Licence holders</td>
<td>Equal share</td>
</tr>
<tr>
<td></td>
<td>Rock lobster</td>
<td>1998</td>
<td>Limited entry, input restrictions</td>
<td>Licence holders</td>
<td>Equal per pot plus catch history</td>
</tr>
<tr>
<td></td>
<td>Giant crab</td>
<td>1999</td>
<td>Limited entry, effort restrictions</td>
<td>Licence holders</td>
<td>Minimum allocation plus catch history</td>
</tr>
<tr>
<td>Victoria</td>
<td>Abalone</td>
<td>1988</td>
<td>Limited entry, closures, size</td>
<td>Licence holders</td>
<td>Equal allocation</td>
</tr>
<tr>
<td>Western Australia</td>
<td>Scallop</td>
<td>Proposed</td>
<td>Fishery currently closed</td>
<td>Licence holders</td>
<td>Equal allocation</td>
</tr>
<tr>
<td></td>
<td>Abalone</td>
<td>1985</td>
<td>Limited entry, zones</td>
<td>Licence holders</td>
<td>Equal allocation within catch history bands</td>
</tr>
<tr>
<td></td>
<td>Shark Bay pink snapper</td>
<td>1987</td>
<td>Limited entry, zones, input controls</td>
<td>Licence holders</td>
<td>Equal allocation within catch history bands</td>
</tr>
</tbody>
</table>


A.2.2 Commonwealth fisheries

Southern bluefin tuna fishery

The fishery was managed by a competitive TAC before ITQs were introduced in 1984. Freely transferable quota was allocated only to those with prior activity
Pearl Hatchery Quota

in the fishery and the quota allocation formula adopted was based on a combination of catch history and investment. Prior commitment to the fishery was based on either a minimum catch of 15 tonnes in any year over a specified period or evidence of a financial commitment to the fishery through the purchase or construction of a vessel. Some operators argued that the investment criteria advantaged newer entrants at the expense of the ‘pioneers’ and there was a series of appeals. Legislation was introduced in 1989 to prevent further appeals.

South east trawl fishery

An ITQ system was introduced in 1992 for a range of species caught in the fishery. Prior to this the fishery was managed under a transferable effort scheme. The quota was allocated according to effort unit holdings and catch history. There were a number of legal challenges with the Federal Court fining that the allocation formula was ‘capricious and irrational’. Subsequently quotas were reallocated according to a modified formula that involved changes to the catch history component.

South east non-trawl fishery

Prior to the introduction of fisheries this was a limited entry fishery (there was a freeze on the number of licenses issued). ITQs were introduced from 1994. Quota were allocated on the basis of catch history (log book data verified by invoices and receipts) books. The Commonwealth used an independent allocation panel to allocate quota. As far as ACIL Tasman is aware there were no appeals against the quota allocation.

Southern shark fishery

The fishery had been managed by limited entry and input controls when ITQs were introduced in 2000. An independent allocation panel recommended that quota should be allocated on the basis of catch history. AFMA is currently reviewing the allocation of quota following a decision by the Federal Court. On 24 March 2003, Federal Court today upheld a decision by the Administrative Appeals Tribunal which directed that AFMA reconsider the way it had originally allocated quota to two permit holders.

Bass Strait central zone scallop fishery

The fishery was previously managed by a combination limited entry, seasonal and area closures, minimum shell sizes and a bag limit per trip. In 1997 AFMA proposed to introduce an ITQ system to replace the bag limit and an independent allocation advisory recommended that a TAC be allocated equally across all license holders. The fishery has been closed for most of the time.
since 1999 due to poor recruitment so that the proposed change in management arrangements has not yet been implemented. In November 2002, AFMA announced that it would be proceeding with the new management arrangements.

A.2.3 New South Wales

Abalone fishery

In 1995 the fishery was designated a share managed fishery under the NSW Fisheries Management Act. Each of the existing entitlement holders was allocated 100 equal shares on a provisional basis.

Rock lobster fishery

Prior to the introduction of ITQs the fishery was a restricted access fishery, with access granted on the basis of historical participation. In 1994, ITQs were allocated on the basis of catch history. The management arrangement allowed verified catch history to be tradeable, allowing fishers to buy catch history so as to meet minimum entry requirements. In 1995 the fishery was declared a share managed fishery and fishers were granted provisional shares on the basis of their catch history. While shares are tradeable among commercial fishers, no individual can hold more than 5 percent of the shares.

A.2.4 Queensland

Spanner crab fishery

The fishery was subject to effort and output controls before the introduction of an ITQ system in 1999. An independent allocation panel recommended that a minimum allocation be made to each of the 213 license holders plus an amount based on each fisher's catch history. The allocation was made under the management plan for the fishery.

A.2.5 South Australia

Abalone fishery

ITQs were introduced in 1985. The fishery was previously managed by limited entry, seasonal closures and minimum sizes. Quotas were allocated among existing license holders.

Southern zone rock lobster fishery

A competitive TAC was introduced in the early 1990s and this was subsequently replaced with an ITQ system introduced through delegated...
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legislation. The allocation in the first year was based on greatest relative share of either pots or catch history. This was changed, following a review, to an equal share of the TAC. The allocation was unsuccessfully challenged.

Blue swimmer crab fishery

The deepwater part of the fishery was a development fishery while in the marine scalefish fishery, crabs were harvested with nets. ITQs were introduced for both fisheries by delegated legislation in 1998. Most of the quota was allocated to the deepwater pot fishery according to catch history. In the marine fishery quota was also allocated on the basis of catch history.

A.2.6 Tasmania

Abalone fishery

An ITQ system was introduced in 1985. Each diver was allocated an equal share of a TAC. In 1994, a contractual agreement was implemented that converted quota unit entitlements into shares. While quota unit entitlements are granted for a year, shares are granted for ten years and have an automatic option to renew.

Rock lobster fishery

Formerly managed by limited entry and pot allocations based on vessel size, ITQ’s were introduced in 1998 following a prolonged period of consultation. The ITQ scheme was introduced under delegated legislation. Quota was allocated on an equal amount per pot basis with a small amount of quota allocated according to catch history. The additional catch history quota was to be phased out over a three-year period. There are maximum and minimum quota holdings.

Giant crab fishery

Previously managed by limited entry and other effort restrictions, entry to the fishery was closed in 1998 and ITQs were introduced in 1999 by delegated legislation. Allocation was based mainly on catch history, although a minimum number of quota units were allocated to all licence holders. There was also a maximum allocation to an individual licence holder.

A.2.7 Victoria

Abalone

In 1988 quotas were introduced by administrative decision rather than delegated legislation. Prior to this the fishery was managed by limited entry,
seasonal closures and size limits. Each licence holder was allocated an annual quota of 20 tonnes. Minimum and maximum holdings of quota apply in the fishery.

**Scallop fishery**

The fishery was managed by limited entry, seasonal closures and size restrictions. In 1996 a buy back scheme was introduced and the fishery has since been closed. A quota management system was implemented for the fishery pending finalisation of the management plan. Quota was allocated by administrative on an equal allocation basis to all licence holders.

**A.2.8 Western Australia**

**Abalone fishery**

An ITQ system was introduced in the mid-1980s to supplement zone based management arrangements. Licence holders were allocated an equal portion of the zone for which they held a licence.

**Shark Bay pink snapper fishery**

An ITQ scheme was introduced in 1987 under delegated legislation. Class A licences were each allocated 20 units of quota and allowed to fish in the main fishing grounds in Shark Bay. These were allocated to fishers with a catch history of at least 8 tonnes per year over a four-year period. Additional non-transferable quota was allocated to licence holders with large catch histories. B class licences were allocated 10 units of quota, issued to those with a catch history of less than 4 tonnes per year and enabled them to fish in the outer areas of Shark Bay.

**South coast purse seine**

The fishery management arrangement was based on three classes of licences, depending on catch history, that variously enabled holders to fish for the whole year in King George’s Sound, on a seasonal basis fish in the Sound and only in the Albany Development Zone outside of the Sound. In 1992 an ITQ system was introduced for two zones of the fishery. All fishers operating in these zones were allocated 200 units of quota and additional quota was allocated to those who had caught more than 400 tonnes in 1989 and 1990.

**A.3 Overseas experience**

Kaufman et al (1999) provide a brief summary of ITQ systems and the method of allocating quota in a number of other countries. In all cases ITQs have
Pearl Hatchery Quota

replaced an existing input controls management regime and quota have been allocated only to those already licenced to fish in the fishery. Quota has generally been allocated on the basis of catch history. In some case there has been an equal allocation of quota.

A.4 Case law

In a number of Australian fishing jurisdictions there have been challenges successful and unsuccessful, against decisions by fisheries management agencies. These have included appeals against the introduction of ITQs, the formula adopted and the allocation of quota among individuals. Regardless of the outcomes, these disputes have proved to be expensive for all parties concerned and have undermined effective fisheries management. In designing the quota allocation mechanism for the hatchery quota it is useful to learn the lessons from the experience of fisheries managers in Australia and overseas. The lessons are of value in their own right and because these case would form an important part of the body of case law that would be drawn upon in any disputes over the allocation of hatchery quota.

Based on the case law, the possible grounds of appeal and the probability of success depend upon whether the ITQs and allocation formula were implemented via statute, delegated legislation or government policy. The following draws on discussion in Kaufman et al (1999) and FMR2.

A.4.1 Challenges to quota allocation

It is generally very difficult to mount a legal challenge to overturn allocations that have been implemented through statute. It is somewhat easier, and more likely to succeed, to appeal against a quota allocation implemented through delegated legislation than an Act. This is because the use of delegated legislation denotes a degree of discretion on the part of the fisheries regulator introducing ITQs.

Meek (1994) suggests that delegated legislation may be considered outside the power delegated by Parliament in the following situations (see Kaufman et al 1999):

- The regulator making the regulation or taking the decision has exceeded the power bestowed under the enabling Act;
- Where a regulation is inconsistent with statute or the common law; and
- Where in making the delegated legislation there is a failure to comply with a mandatory procedural requirement;
- Improper sub-delegation between administrators; and
- Where the delegated legislation is made for an improper purpose, uncertain or unreasonable.
Similarly, challenges to the ITQ system and allocation formula implemented through government policy may be based upon an administrator acting outside the scope of his discretionary powers, if a discretion is exercised inflexibly or by the application of a policy without regard to the merits of a particular case. This method of quota implementation has proved the most susceptible to challenge.

### A.4.2 Grounds for challenging a quota allocation

**Australian Fishing Industry Case Law**

There are two important Australian Commonwealth decisions involving challenges to delegated legislation where the allocation formula was found to go beyond the powers of the decision-maker. These are *Austral Fisheries Pty Ltd v. Minister for Primary Industries and Energy* ("Austral") and *Simon Crean, Minister for Primary Industries and Energy and AFMA v. Musumeci and Others.* The central issue in both cases was that the south east trawl fishery quota allocation formula was statistically flawed and consequently produced an irrational result. In the two cases the allocation formula was found to be irrational and void in both the initial decisions and appeals.

In contrast to these judgements, challenges to the allocation formula used in the South Australia southern zone rock lobster fishery, implemented by delegated legislation, were unsuccessful. The implementation of the allocation formula was held to be within the powers of the fishery administrator and therefore valid, despite the issues in the challenges being very similar to those in the south east trawl fishery cases. The judgement justified the preservation of the particular allocation formula because it had the support of the industry, it was directed at preserving the resource and it preserved the ‘economic unit’ of the fishery.

Australian case law has considered a number of appeals in the Commonwealth southern bluefin tuna industry relating to the implementation of a quota as a matter of government policy and the allocation to individuals, under the formula, through administrative decision. Unlike the previously discussed cases where there was a challenge to the allocation formula itself, these cases involved a challenge to an individual’s allocation on the basis that the decision-maker applied the quota formula too rigidly and without regard to the particular circumstances of an individual. In *Aston and Aston v. Secretary,*

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26 (1992) 37 FCR 463
27 (1992) 110 ALR 201.

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Summary of allocation mechanisms
Department of Primary Industry\textsuperscript{28}, the Administrative Appeals Tribunal found that the Astons were not unusually or specially disadvantaged by the adoption of the denominator in the formula. Nor were they specially disadvantaged by the valuation placed upon their vessel or by the fact that they had only fished for two of the three qualifying years. The Tribunal also noted that it had no authority to compensate the Astons for any loss they may have suffered by virtue of the introduction of the quota scheme.

Conversely, the AAT found in favour of the applicant in Michael v. Secretary, Department of Primary Industry\textsuperscript{29} on the basis that his quota allocation was too low due to the exceptional circumstance that he was building a boat over part of the qualifying period dictated by the allocation formula. The AAT’s decision was to remit the decision back to the Department, with the recommendation that the applicant’s quota be increased.

A.4.3 Overseas Case Law

New Zealand: snapper fishery

The primary issue here was a challenge by the commercial sector of a decision made by the Minister to reduce the total allowable commercial catch by 39 percent. The Court noted that the Act, under which the Minister was to have regard when making a decision, did not explicitly require a proportional sacrifice in allowable catch across both the commercial and non-commercial fishing sectors.

United States

In determining quota allocation, s 301 of the Magnuson Act outlines a number of national standards for fishery conservation and management:

- Fair and equitable to all fishermen;
- Reasonably calculated to promote conservation; and
- Carried out in such a manner that no particular individual, corporation or other entity acquires an excessive share of such privileges.

According to s305(f) of this Act, the Court may set aside decisions that are found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with the law; contrary to constitutional right, power, privilege or immunity; in excess of statutory jurisdiction, authority or limitations, or short of statutory right; without observance of procedure required by law.

\textsuperscript{28} AAT No. S.85/27.
\textsuperscript{29} AAT No. W85/50.
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Canada

Challenge of a quota implemented through policy (administrative decision) and allocated to fishers as a condition on their licences. The decision of the trial judge was overturned on appeal where it was held that the imposition of quota policy was a discretionary decision in the nature of legislative action. Further, discretionary policy guidelines were not subject to judicial review except in certain circumstances.

This case seems to advocate a very high threshold for challenges based upon improper exercise or application of administrative discretion based upon government policy. This may suggest that the south east fishery cases represent exceptions to the rule – where the allocation formula, implemented through delegated legislation, was held to be irrational.

A.5 Implications from history of quota allocation

The Australian experience with quota allocation has a number of implications for the allocation of hatchery quota. These implications are set out as follows.

The objectives of the quota allocation must be clearly stated.

In this case, the objectives that the Government is seeking through the pearling legislation are the maximisation of the value of the resource (economic efficiency) and equity.

It must be demonstrated that the allocation formula is consistent with the objectives of the legislation.

Allocations by fisheries authorities have been challenged on the grounds that they are inconsistent with the legislative objectives.

Allocation formulae need not be the best available in terms of meeting objectives, but should be reasonable.

Quota allocation litigation has succeeded when it has been able to demonstrate that the quota allocation formula adopted was not reasonable.

A decision to allocate the increase in hatchery quota entirely to existing pearl producers would be consistent with the past approach adopted in Australian fisheries jurisdictions.

In all quota allocation cases reviewed, quota has been allocated solely to those with a history in the fishery. The only departure from this is in the case of developmental fisheries, where a portion of the quota has been allocated to
fishers other than pioneers. However, these fishers have normally held licences in the wider fishery in which the developmental fishery has been located.

**The efficiency objective has not been sought through the allocation formula but through making quota freely transferable.**

Governments have recognised that the allocation of quota has little to do with economic efficiency. It can be demonstrated that a wide range of quota allocation formulae is consistent with economic efficiency provided that the quota, once allocated, is freely tradeable. Governments have, therefore, relied on secondary markets in quota to achieve the efficiency objective.

**Allocation of new quota in proportion to existing entitlements (wild stock plus hatchery quota) is consistent with past practice.**

Governments have sought equitable allocations of quota by taking into account past catch history in arriving at quota allocation formulae. An equitable outcome has been interpreted as that which has minimal impact on the distribution of income or wealth of existing operators.

**The pearling legislation should provide clear direction about how quota is to be allocated.**

Challenges to allocation decisions have been more common in cases where the allocation involved the exercise of discretion by the fisheries management agency. It is more difficult to challenge an allocation if the formula is embodied in legislation. When the formula is embodied in a lesser document, such as a management plan or a policy, the prospects for litigation tend to be greater.

Determining an appropriate allocation formula would be best achieved by statute, in order to minimise the challenges that arise when the exercise of an administrative discretion is required – either in the forming of policy or delegated legislation. The statute should clearly set out its purpose and objectives that may include social or community welfare.
B Beef export quotas

Context

From time to time before Australian beef exports to the USA threatened to exceed quota levels under the previous more restrictive US Meat Import Law. Under the quota US imports have an import duty of 2 percent and any further exports bear a 26.4% tariff. Various schemes have been introduced to allocate beef export quota to the US market. These schemes gave exporters entitlements to US exports based on their recent export performance. In 1986 allocation based on global performance was re-introduced and then abandoned in 1994 when controls again were no longer necessary.

B.1 Basis for controlling supply

The Australian meat industry’s access to this quota market creates an opportunity to extract some ‘rent’ from the market. This rent comes primarily, not from a concessional rate of tariff but from the fact that competitive sources of supply of US demand face a much higher tariff. If there is demand for imports in excess of the global quota, then the commodity price can expect to be driven by the tariff-inclusive cost of supply that will apply at the margin. Suppliers with quota can share in the benefits of the higher price without facing the tariff costs — and this is the primary source of the potential for rent.

Australia has monopoly rights to the quota it has been allocated. If it chooses to act as a monopolist it can seek to maximise the rent extracted. However, there are substantial impediments to the achievement of such monopoly behaviour. While only Australian suppliers can fill this block of quota, there remains substantial scope for competition among Australian suppliers to do so. Individual exporters have incentives to increase their share of the market as long as there are rents involved. There are two main ways in which this competition could be expressed, both consistent with a “race” to fill quota:

• Exporters could lower their asking price (of US importers) in an attempt to undercut other Australian exporters; and/or

• Exporters could increase their throughput and in the process either divert product from other markets or bid up the price they pay for livestock (directly or indirectly) in order to increase their ability to supply into the quota market and to reduce the ability of others to supply.

These incentives only arise where there is an expectation that the quota will be filled so that quota share is a scarce commodity worth competing for. In the absence of such expectations, there are no incentives to compete in the quota
market – only to contribute to the level of supply where it is profitable for the exporter to do so.

All the avenues lead to a loss of quota rent. The first effectively reduces the available rent created by the quota arrangements — unlike the monopoly situation, prices are not allowed to reach the tariff-inclusive rates. This could be viewed as US importers or consumers capturing a share of the rent, but the bottom line is that the monopoly power has been attenuated and lower rents have been extracted from the market opportunity. Superficially at least, this would represent an opportunity wasted.

The latter approach — bidding up the price of cattle — may look like good news for the production industry, but again substantial rent will be dissipated. The effect of these higher prices will be to alter price signals in the industry, encouraging expanded production — especially if they are expected to last for several years. The problem is that the underlying returns on extra production have not changed because of the quota — the marginal tonne of production will not be sold into the quota market. The effect of translating the quota market price premium into a general increase in livestock prices is to encourage uneconomic production (that is, the extra cost exceeds the true extra revenue), with the dissipation of rents.

These effects are subtle but real. A true monopolist in respect of the quota access would be very careful to ensure that higher prices from a quota market did not translate into incentives to expand production that would have to be sold in the non-quota markets.

The adverse incentives can be addressed through some system of allocation of quota across exporters, processors or producers. Once allocated, there are no remaining incentives to compete for share, and each quota holder is effectively able to act as a monopolist in respect of that share of the US quota market.

However, if the quota next year is considered likely to be influenced by levels of production of US exports this year, then a problem persists and indeed an additional one is created. These expectations will result in competition for the next year’s allocation of quota. Again, the way to compete is to sell to the US at reduced prices (including after the tariff is triggered) and to expand production — even though both strategies can be expected to result in industry costs that are greater than the industry benefits. Indirectly, the rents available this year could still be dissipated by competitive behaviour across the industry.

If next year’s quota is in part determined by this year’s quota exports, there is a “double” incentive to race to ship this year’s quota of eligible product.
Design of a set of arrangements that limits competition for the current quota, and returns to the industry a substantial share of the resultant rents — without posting incentives for uneconomic production or export pricing behaviour — is challenging. It can be done if the benefits are not to be returned to the industry, but are much harder where this return of benefits is to be sought.

B.2 Options

A number of options were considered as methods of allocating beef export quotas, including voluntary allocations by the industry itself. The following two options are relevant to this study:

Administrative allocations by Government

Under these arrangements:

• Each exporter would get an entitlement and the sum of the entitlements would equal the quota amount. They would still be free to export over entitlement and pay the tariff.

• The entitlement would be based on recent export performance either the previous year or, for smoothing, over the previous three years.

• The entitlements should be tradeable so that the exporter best placed to profit from the opportunity would be able to use it (however, this would mean a windfall gain to the firm getting the original entitlement).

• A small percentage would be held aside for new entrants in order to avoid ossifying the market and any unused new entrant portion would be allocated to established exporters towards the end of the year.

Beyond these basic parameters, there is substantial debate about whether the basis on which entitlements would be calculated should be Australia’s global beef exports or its US (or US plus Canada) exports.

Auctions

Auctions or tendering are often used for allocating scarce assets. In this case the Government, presumably through AFFA, would auction quota entitlements to the highest bidders with the sum of those entitlements equal to the US quota. The Government would capture the quota rents, at least initially. Auctioning has the efficiency advantage that the entitlement would be taken up by those parties best placed to use it, because they would be better placed than other bidders to pay for it.

A number of technical issues would have to be resolved before auctioning could proceed, including:
• Whether to divide the entitlements up over the year to ensure that the export patterns were similar to those that would normally occur.
• Whether to impose rules limiting how much could go to any one player (if that was a policy objective) to avoid an oligopoly developing from bidding by those with the greatest financial resources.
• Determining the type of auction and the technical process for carrying out the auction. There is extensive experience and literature to draw on. Factors influencing the design include the number of bidders, the degree of product differentiation, minimising the temptation to collude, the time available, convenience and cost.

B.3 What to do with revenues

A problem with designing auctioning of meat export entitlements is to determine where the revenue would go.

The Government (AFFA) would initially get the quota rents in the form of auction revenue. An argument could be mounted that this follows naturally from the fact that the quotas result from a Government agreement. A counter argument is that it amounts to a substantial transfer of income (compared with what would otherwise occur) from the meat exporting sector. It can be further argued that for the Government it would be a windfall gain which it might tend to spend in wasteful ways, or at least spend it in sectors of the economy divorced from the efforts to improve the quantity and quality of Australian beef production.

An argument could be made for the revenue to be handed on in some pro-rata form to meat exporters and processors on the grounds that it is they who would otherwise have obtained the rent. A counter argument is that US quota rents are windfall gains for these firms (this may also explain such firms’ opposition to auctions —that is, the risk that the rent they would otherwise get might instead be more widely distributed. However, there is an issue for them about whether to get all of a smaller “pie” or part of a larger one). An additional consideration is that some rent would not count as part of national income because of some exporting firms’ foreign ownership and repatriation of dividends.

There is a case for the Government handing auction revenue to cattle producers. In a political economy sense it could be said that this is where it “belongs”. However, payments to producers based in some pro-rata sense, for example on cattle numbers, could give a distorting price signal by encouraging additional production whose marginal costs were in fact higher than the marginal revenues (net of the auction premium).
A better variation might be for the Government to pass the revenue on to programs that:

- Benefit the beef industry as a whole (thus reducing the producer/exporter contest); and
- Are not directly tied to production, and have a more general long-term effect.
- This would reduce the incentives for uneconomic production, given that the rent is expected to be temporary (3 to 5 years). Thus the payment could be directed at schemes such as specific industry schemes, quality assurance; additional research and development; or market promotion.

A problem with auctions is that they could make the value of the quota rent too transparent. An auction would produce a defined amount of revenue that could readily be calculated as a certain percentage of base revenue. This could invite US cattle and related interest to press for it to be replaced by a US tariff or equivalent mechanism, thereby transferring the rent from Australia to the United States.