

# NSW Oyster Industry

## Sustainable Aquaculture Strategy

2006

A NSW Government Initiative

## **The NSW Oyster Industry Sustainable Aquaculture Strategy**

A NSW Government initiative of Premiers Department, Department of Primary Industries, Department of Planning, Department of Natural Resources, Department of State and Regional Development, Department of Environment and Conservation, Department of Lands and NSW Maritime Authority to encourage sustainable oyster aquaculture in New South Wales.

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## Foreword

Aquaculture is one of the fastest-growing industries in the world. More than 30 per cent of worldwide seafood consumption is produced through aquaculture.

NSW is capable of capturing a significant proportion of this dynamic growth industry.

The State Government recognises the great potential of aquaculture, as a way of generating jobs, supporting regional businesses and communities.

We remain focused on implementing measures to stimulate further investment opportunities in aquaculture throughout the State while maintaining strict environmental standards.

The NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS) is a major part of this commitment.

The NSW oyster industry accounts for nearly 70% of the value of NSW aquaculture production. With a history of over 100 years, the industry is an icon to many NSW coastal communities and provides invaluable employment and economic opportunities.

OISAS is the result of a collaborative process that included the 'whole-of-Government', the oyster industry and the community who all contributed to its development. This important industry planning document strives to facilitate community and industry confidence in oyster aquaculture and is a milestone for profitable, sustainable oyster aquaculture in NSW estuaries.

We look forward to the continued close cooperation of all interested parties in the implementation of this Strategy.



**The Hon. Frank Sartor, MP**  
**Minister for Planning**



**The Hon. I M Macdonald MLC**  
**Minister for Primary Industries**

## Executive Summary

The New South Wales oyster aquaculture industry is Australia's largest producer of edible oysters, the fourth largest Australian aquaculture industry and accounts for nearly 70% of the value of NSW aquaculture production. It is the state's most valuable fishery.

The 2003/04 production of 72,853 bags of oysters confirms a relatively stable trend for the last eight years. This stable period comes after nearly 20 years of declining production from a peak of 146,500 bags in 1976/77.

It is estimated that the sustainable production level for oysters in NSW estuaries is 120,000 bags and the principal aim of the NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS) is to establish the regulatory environment within which the industry can grow to this level.

This growth can be achieved within the boundaries of ecological sustainability and within the boundaries developed in co-operation with all relevant State government agencies, neighboring communities and the oyster industry.

These boundaries are set physically, by the identification of suitable 'priority' areas for edible oyster aquaculture. Specifying areas where commercial oyster aquaculture is a *priority intended outcome from a state perspective* is the first recommendation of the Healthy Rivers Commission in its *Healthy Oysters, Healthy Rivers* report (HRC, 2003).

Consistent with this recommendation, every current and potential lease area in the state was individually inspected and evaluated against a list of location, environmental and socio-economic suitability criteria and classified as either suitable or unsuitable for classification as a priority oyster aquaculture area.

Management and operational boundaries are established in a set of best practice standards, which are supported by a commitment to environmentally sustainable practices.

The importance of farmed oysters to healthy estuaries should not be underestimated. They are a sentinel species, in that, if the oysters are healthy and suitable for human consumption, then it is likely that the estuary as a whole is healthy too.

On average, a farmed Sydney rock oyster will filter an estimated 0.25 ML of estuarine river water in its lifetime, removing large quantities of suspended material, chiefly nutrients bound in phytoplankton. This means that oysters are important in maintaining healthy estuaries, but in performing this role they are exceedingly vulnerable to poor estuarine water quality.

In recognition of this dichotomous relationship, OISAS establishes a set of water quality and flow objectives for oyster aquaculture areas that, if met, will provide for the healthy growth of oysters that are safe for human consumption. A set of water quality protection and improvement measures are proposed to achieve the desired water quality objectives for oyster aquaculture areas.

The assessment of all environmental aspects of oyster aquaculture in this strategy, and the establishment of best practice standards, allows for a streamlined approvals process for proposals that are located in the areas identified as priority oyster aquaculture areas. Oyster aquaculture in these areas will be 'development without consent', but will require an Aquaculture Permit and lease from the Department of Primary Industries. If these areas are on the National Parks or Marine Parks estate an additional written ministerial concurrence is required.

Oyster aquaculture outside of the scope of OISAS can be undertaken, but only with development consent from the relevant local council or Department of Planning for state significant proposals. On the National Park or Marine Park estate an approval from the relevant authority and written ministerial concurrence are required.

# Table of Contents

<b>Chapter 1</b>	<b>Introduction</b>	<b>1</b>
1.1	Vision statement	1
1.2	Scope and objectives	1
1.3	The need for this strategy	2
1.4	Ecological sustainable development	2
1.5	Implementation and legislation	4
1.6	Community and stakeholder consultation	4
1.7	Performance indicators and review	5
<b>Chapter 2</b>	<b>Industry overview</b>	<b>7</b>
2.1	Industry history	7
2.2	Current profile	10
2.3	Industry management initiatives	12
	2.3.1 Department of Primary Industries	12
	2.3.2 Department of Lands	14
	2.3.3 The NSW Shellfish Program	15
2.4	Agency roles and responsibilities	17
<b>Chapter 3</b>	<b>Healthy oysters and healthy estuaries</b>	<b>20</b>
3.1	Water quality for food safety	20
3.2	Water quality for healthy oyster growth	20
3.3	Tidal range, water flow and salinity	21
3.4	Water quality and flow objectives for oyster aquaculture areas	22
<b>Chapter 4</b>	<b>Water quality protection guidelines for planners, developers and estuary managers</b>	<b>24</b>
4.1	Recognition of oyster aquaculture in land and water use planning	24
4.2	Guidelines for harvest area protection	25
4.3	Prioritising actions to address existing water quality issues	26
<b>Chapter 5</b>	<b>Priority oyster aquaculture areas</b>	<b>27</b>
5.1	Areas where oyster farming is a desired outcome	27
5.2	Oyster aquaculture area available for leasing	29
5.3	Oyster aquaculture maps	30
<b>Chapter 6</b>	<b>Commitment to environmentally sustainable practices</b>	<b>31</b>
6.1	Good neighbour policy	31
6.2	Estuarine stewardship policy	32
6.3	Commitment to comply with, and where possible exceed, regulated standards	33
6.4	Oyster industry Crown land base sites	33
6.5	Stocking density	35

<b>Chapter 7</b>	<b>Best practice standards</b>	<b>36</b>
7.1	Lease marking	36
7.1.1	Marking standards 'common' to all leases	36
7.1.2	Special marking standards	38
7.2	Keeping leases neat and tidy	39
7.2.1	Neat and tidy standards 'common' to all leases	40
7.2.2	Special neat and tidy standards	41
7.3	Decommissioning oyster aquaculture leases	42
7.4	Platforms and sheds	42
7.5	<i>Posidonia</i> (strapweed) protection	42
7.6	Threatened species protection	43
7.7	Wave barrier fencing	43
7.8	Hours of operation	44
7.9	Noise	44
7.10	Washing oysters	45
7.11	Spray Irrigation	45
7.12	Dredging and reclamation	46
7.13	Pest and disease control	46
7.14	Punt and boat mooring	49
7.15	Waste management	49
7.16	Theft of oysters and damage to oyster leases	49
<b>Chapter 8</b>	<b>Planning and approvals</b>	<b>50</b>
8.1	Approval of new oyster aquaculture leases	50
8.1.1	New lease in a Priority Oyster Aquaculture Area.	50
8.1.2	New lease in a Priority Oyster Aquaculture Area in a Marine Park	50
8.1.3	New lease NOT in a Priority Oyster Aquaculture Area	51
8.1.4	New lease in the National Park estate	51
8.2	Competitive allocation of new lease areas	52
8.3	Making Local Environmental Plans that may affect oyster aquaculture	54
8.4	Determining development applications that may affect oyster aquaculture	54
8.5	Aquaculture permits	54
8.6	Administration of existing leases	55
8.7	Maintenance dredging of oyster leases	57
8.8	Oyster aquaculture species	58
8.9	Transitional provisions	60
<b>Chapter 9</b>	<b>Complaint resolution</b>	<b>61</b>
9.1	Complaint resolution principles	61
9.2	Complaint resolution process	61
<b>Chapter 10</b>	<b>References</b>	<b>63</b>

## Tables

Table 1: Triggers for review.	6
Table 2: Historic NSW oyster aquaculture production	9
Table 3: Sanitary water quality standards for oyster harvest area classification.	16
Table 4: Water quality guidelines for oyster aquaculture areas.	23
Table 5: Assessment criteria for priority oyster aquaculture areas in NSW estuaries.	28
Table 6: Lease area for oyster aquaculture.	30
Table 7: Intermediate lease marker post spacing.	38
Table 8: Inter-estuary oyster movement restrictions.	48
Table 9: Species of oyster approved for cultivation on oyster aquaculture leases in NSW.	59

## Figures

Figure 1: Annual NSW oyster production 1938/39 to 2003/04.	8
Figure 2: The location of major oyster producing estuaries in NSW.	11
Figure 3: New lease assessment and allocation process.	53

## Acronyms

<b>Acronym</b>	<b>Definition</b>
<b>AHD</b>	Australian Height Datum
<b>AIDP</b>	Aquaculture Industry Development Plan
<b>ASQAP</b>	Australian Shellfish Quality Assurance Program
<b>ANZECC</b>	Australian and New Zealand Environment and Conservation Council
<b>CSIRO</b>	Commonwealth Scientific Industrial Research Organisation
<b>DA</b>	Development Application
<b>DEC</b>	Department of Environment and Conservation
<b>DoP</b>	Department of Planning
<b>DNR</b>	Department of Natural Resources
<b>DPI</b>	Department of Primary Industries
<b>DSRD</b>	Department of State and Regional Development
<b>EIS</b>	Environmental Impact Statement
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act, 1979</i>
<b>FAO</b>	Food and Agricultural Organisation of the United Nations
<b>ha</b>	Hectare
<b>ISO</b>	International Standards Organisation
<b>LEP</b>	Local Environment Plan
<b>NSW FA</b>	NSW Food Authority (previously Safefood Production NSW)
<b>NSW SP</b>	NSW Shellfish Program
<b>NSW</b>	New South Wales
<b>OISAS</b>	Oyster Industry Sustainable Aquaculture Strategy
<b>POEO Act</b>	<i>Protection of the Environment Operations Act, 1997</i>
<b>Ramsar</b>	Convention on Wetlands of International Importance
<b>SASC</b>	State Aquaculture Steering Committee
<b>SEE</b>	Statement of Environmental Effects
<b>SEPP</b>	State Environmental Planning Policy
<b>SIS</b>	Species Impact Statement

## Definitions

<b>Term</b>	<b>Definition</b>
<b>AHD or Australian Height Datum</b>	A common national place of level corresponding approximately to mean sea level.
<b>Aquaculture</b>	The commercial cultivation of aquatic animals or marine vegetation for the purpose of harvesting the animals or marine vegetation, or their progeny for sale, or the keeping of animals or marine vegetation in a confined area for commercial purposes.
<b>Broodstock</b>	A parent shellfish.
<b>Catchment Area</b>	A drainage area, for example for a reservoir, river or estuary (includes subject water body as well).
<b>Carrying Capacity</b>	The maximum biomass (weight) of shellfish that an area can support and remain commercially viable.
<b>Classified area</b>	An area classified under the NSW Shellfish Program.
<b>Culling</b>	The division by hand of clumps of oysters into single oysters or the removal by hand of unwanted marine organisms which attach to oyster crops.

## NSW Oyster Industry Sustainable Aquaculture Strategy

<b>Cultivation Techniques</b>	
<b>Catching</b>	The collection of wild juvenile shellfish spat - settled onto 'catching' sticks or plastic slats.
<b>Depoting</b>	The practice of using blocks of catching sticks bound together. The protection of the block enables oysters to grow to a size that can withstand predation by fish, prior to separation into a single layer of sticks.
<b>Dredge Bed</b>	An area leased for the harvest of oysters directly from the bed sediments. No oyster farming infrastructure is placed on oyster dredge bed leases.
<b>Floating Cultivation</b>	Sub-tidal cultivation of oysters, on sticks or in baskets suspended from tethered, low buoyancy systems that may include lines and/or polyethylene floats.
<b>Post supported intertidal cultivation</b>	A series of parallel vertical posts that support horizontal rails or lines on which oyster sticks, trays and/or baskets that are placed so the oysters are submerged for varying periods of the tidal cycle.
<b>Raft</b>	Sub-tidal cultivation of oysters in trays or baskets suspended from a permanently anchored, rigid, high buoyancy structure.
<b>Single seed</b>	An individual unattached oyster that is grown from small spat produced by removing wild oysters at a very early age from plastic collectors or produced as single oysters in a shellfish hatchery.
<b>Stick cultivation</b>	Growing out wild caught oysters on the sticks they are caught on. Suitable method for areas subject to significant wave action. 'Stick oysters' may be removed from sticks and fattened on trays prior to harvest.
<b>Tray cultivation</b>	Growing out single seed oysters on trays. Suitable method for sheltered areas. Often used for the final stage of growth prior to harvest.
<b>Depuration</b>	A statutory process that requires oysters to be placed in a sterilised recirculation tank for 36 hours. During this process oysters self cleanse in recirculation water, which is sterilised using ultraviolet light.
<b>Development without consent</b>	Has the same meaning as it would under the <i>Environmental Planning and Assessment Act, 1979</i> .
<b>Development with consent</b>	Has the same meaning as it would under the <i>Environmental Planning and Assessment Act, 1979</i> .
<b>Endangered Species</b>	The species is likely to become extinct in nature if threats continue, or its numbers are reduced to a critical level, or its habitat is reduced.
<b>Endemic Species</b>	A species confined in occurrence to a local region.
<b>Environmental Impact</b>	The potential biophysical, social and/or economic effects of an activity on the community or the natural environment.
<b>Environmental Impact Statement (EIS)</b>	A detailed assessment on the potential effects of a proposed development prepared in accordance with the requirements of the <i>Environmental Planning and Assessment Act, 1979</i> .
<b>Estuarine</b>	of, pertaining to or formed in an estuary (brackish water). Also relates to those soil materials, which have been under the influence of brackish water during their deposition.
<b>Fish</b>	As defined in <i>Fisheries Management Act, 1994</i> .
<b>Indigenous Species</b>	A species native to a particular region or country at the time of first British colonisation.
<b>Introduced Species</b>	A species introduced into an area where it does not naturally occur.
<b>Noxious fish</b>	A fish declared to be noxious under the <i>Fisheries Management Act, 1994</i> and the <i>Fisheries Management (General) Regulation, 2002</i> .
<b>Oyster Aquaculture Lease</b>	An area of submerged Crown land that is leased for the purpose of oyster aquaculture.

## NSW Oyster Industry Sustainable Aquaculture Strategy

<b>Oyster Aquaculture Land Base Site</b>	An area of non-submerged Crown land that is leased for the purpose of supporting oyster aquaculture.
<b>Pathogen</b>	An infectious agent capable of causing disease.
<b>pH</b>	A measure of acidity or alkalinity of a substance. A pH of 7.0 denotes neutrality, higher values indicate increasing alkalinity, and lower values indicate increasing acidity.
<b>Quarantine</b>	<p>a) The holding of aquatic animals or plants in a facility which ensures retention and destruction of said animals as well as any organisms associated with them.</p> <p>b) Disease management procedures including quarantine (sense 1) and certification (Australia).</p>
<b>Salinity</b>	The measure of salt concentration of water in ponds, tanks or hatchery expressed in part per thousand or ppt.
<b>Siltation</b>	The deposition of silt or sand in the estuarine environment.
<b>SEPP</b>	State Environmental Planning Policy as an instrument pertaining to issues of State Environmental Planning significance made under section 39 of the <i>Environmental Planning and Assessment Act, 1979</i> .
<b>Spat</b>	Small juvenile oysters.
<b>Stocking density</b>	Number of animals per given area.

## Acknowledgment

The OISAS steering group developed the strategy as an extension of the NSW State Government's Aquaculture Initiative. The Steering Group would like to thank all those who contributed to the development of the strategy by making submissions. The Steering Group will continue to liaise with all stakeholders in implementing the strategy and reviewing it from time to time.

The following have contributed through the OISAS Steering Group to the development of the strategy.

Ben Chard (Chair), Jennifer Collison,	Premiers Department
Yolande Stone, Peter Adrian, Daryl McPhee	DoP
Tim Gippel, Steve McOrrie, Ian Lyall, Damian Ogburn, Antonia Creese, Scott Carter, Francis Dorman	DPI
Estelle Blair, David Darvall, Graeme Clark, Brendan Diacano	DEC
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# Chapter 1

## Introduction

### 1.1 Vision statement

*The vision of this strategy is to achieve the sustainable production of 120,000 bags of premium NSW oyster products for domestic and export markets by 2013.*

### 1.2 Scope and objectives

This strategy applies to the NSW edible oyster aquaculture industry. This strategy does not apply to the cultivation of Akoya pearl oysters.

Oyster aquaculture is the commercial cultivation of any species of edible oyster (eg. Sydney rock oyster, native flat oyster, Pacific oyster). Oyster aquaculture includes all routine activities associated with the cultivation of oysters, including the construction and maintenance of culture infrastructure and stock management activities.

The NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS):

- Identifies those areas within NSW estuaries where oyster aquaculture is a suitable and priority outcome;
- Secures resource access rights for present and future oyster farmers throughout NSW;
- Documents and promotes environmental, social and economic best practice for NSW oyster farming and ensures that the principles of ecological sustainable development, community expectations and the needs of other user groups are integrated into the management and operation of the NSW oyster industry;
- Formalises industry's commitment to environmental sustainable practices and a duty of care for the environment in which the industry is located;
- Provides a framework for the operation and development of a viable and sustainable NSW oyster aquaculture industry with a clear approval regime and up-front certainty for existing industry participants, new industry entrants, the community and decision makers;
- Identifies the key water quality parameters necessary for sustainable oyster aquaculture and establishes a mechanism to maintain and where possible improve the environmental conditions required for sustainable oyster production; and,
- Ensures that the water quality requirements for oyster growing are considered in the State's land and water management and strategic planning framework.

### 1.3 The need for this strategy

The need for OISAS arose from concerns of both the NSW Government and the NSW oyster aquaculture industry, as to the existing and potential impact on the oyster aquaculture industry associated with the rapid development of the NSW coastline. The strategy has been developed by the government in partnership with the NSW oyster aquaculture industry and local community and other key stakeholders. The strategy sets out best practice in the identification and use by the oyster aquaculture industry of those estuarine areas suitable as priority oyster aquaculture areas and provides for the protection of water quality in these areas. The strategy is one of a suite of strategies initiated by the NSW Government for the management and development of aquaculture in NSW.

### 1.4 Ecological sustainable development

Ecological sustainable development (ESD) is not just about the environment, but also about the viability of businesses and the broader community's well being. The principles of ecologically sustainable development were adopted by all Australian governments in the National Strategy on ESD (1992) which states that we should be:

*'Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.'*

At the national level ESD is being addressed in aquaculture through the National ESD Framework. The *How to guide for aquaculture* (Fletcher et.al 2004) is the first stage in the development of this framework and documents the methods needed to enable the initial analyses of any aquaculture sector against the principles of ESD. OISAS has been developed with reference to this framework. More details can be found at <http://www.fisheries-esd.com.au/c/implemented/implemented0300.cfm>.

Since NSW adopted this strategy, ESD has become a major objective of all NSW natural resource management, environment protection and planning legislation. A key object of the *Fisheries Management Act, 1994* is *to promote ecologically sustainable development* and this object is being met in part through the development of statewide Sustainable Aquaculture Strategies. ESD is now accepted as the foundation for aquaculture management in NSW.

The relevant definition for ESD in NSW is given in the *Protection of the Environment Administration Act, 1991* (s.6), which states:

Ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:

- (a) the precautionary principle—namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

- (i) careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and

- (ii) an assessment of the risk-weighted consequences of various options,
- (b) inter-generational equity—namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,
- (c) conservation of biological diversity and ecological integrity—namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,
- (d) improved valuation, pricing and incentive mechanisms—namely, that environmental factors should be included in the valuation of assets and services, such as:
  - (i) polluter pays—that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
  - (ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
  - (iii) environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

**The principles of ESD are integrated into OISAS by:**

- Identifying areas where oyster farming is an intended outcome and implementing measures that will lead to the protection and improvement of water quality in those areas;
- Permitting oyster farming in areas only where it is ecologically sustainable by virtue of its location, for example navigation channels and environmental sensitive areas are excluded; and,
- Describing best operational and management practices for the industry that are based on ESD principles.

**For the oyster industry, adopting ESD principles will:**

- Provide a pathway to address issues affecting the industry's long-term survival;
- Put in place a systematic and recognised means of establishing the industry's resource management credentials with regulatory agencies, oyster consumers and neighbours;
- Put the industry in a stronger position to argue for the protection of the environmental conditions required for oyster growing;
- Support the industry's position as a legitimate user of public water land; and,
- Result in improved development outcomes that provide greater certainty and a simplified assessment and decision making process.

**For individual farmers the potential benefits are to:**

- Safeguard business profitability through maintaining access to existing markets, accessing new 'green' markets and reducing the cost of production;
- Gain the support of the local community and reduce the risk of conflict with neighbours;
- Understand obligations to comply with environmental and planning legislation so that the risk of breaches can be minimised; and,
- Have ongoing continual improvement that will help the business keep pace with developments in environmental legislation and community expectations.

**For the broader community the potential benefits are:**

- Improved environmental outcomes that address cumulative issues and provide effective indicators of sustainability;
- Increased certainty in the scale, nature and operation of the industry;
- Increased confidence in the environmental performance of the industry;
- Improved employment outcomes with an improvement in industry viability, and,
- Improved outcomes for regional NSW with a coordinated approach to providing sustainable oyster aquaculture investment opportunities.

## 1.5 Implementation and legislation

This strategy is as an Aquaculture Industry Development Plan for the purpose of s.143 of the *Fisheries Management Act, 1994*.

State Environmental Planning Policy 62 – Sustainable Aquaculture gives effect to revised planning provisions for the NSW oyster industry and gazettes the Oyster Aquaculture maps described in Chapter 5.

The implementation of OISAS requires effective collaboration between government, industry and the community. The strategy brings together the interests of economic development, land use planning and sustainable natural resource management to form a partnership that can lead to sustainable oyster aquaculture and employment generation in regional NSW.

DPI is the key agency responsible for delivery of the on-the-ground oyster industry management outcomes of the strategy. Local government and state agencies share responsibility for implementing the water quality measures and development assessment process detailed in Chapter 3 and Chapter 8 respectively.

The *Fisheries Management Act, 1994*, requires performance indicators to be established within an AIDP to determine if the objectives set out in the plan are being achieved. The plan must also specify at what point a review is required if these performance indicators are not being met. The indicators in Section 1.7 will be used to meet these requirements.

## 1.6 Community and stakeholder consultation

The Hunter Aquaculture Taskforce that prepared this strategy comprises representatives from the following NSW government agencies; Premiers Department, Department of Planning, Department of Primary Industries, Department of Environment and Conservation, Department of State and

Regional Development, Maritime Authority, Department of Natural Resources and the Department of Lands.

The strategy has therefore been prepared using a whole-of-government process that integrates the requirements of all state government agencies to achieve a cohesive and consistent agency position.

The Hunter Aquaculture Taskforce consulted with the NSW oyster industry in a series of sixteen estuary meetings during September to December 2005.

The draft NSW Oyster Industry Sustainable Aquaculture Strategy (Version 2.1) was approved for public exhibit by the State Aquaculture Steering Committee on the 17th of March 2006. The Strategy was subsequently placed on public exhibition on the 10th of April 2006 for six weeks.

The Strategy was made available to the general public at all DPI coastal Fisheries Offices, all relevant local Council offices and the Department of Planning Information Centre. The public exhibit was advertised in 23 local coastal newspapers and the Sydney Morning Herald during the period 5th April 2006 to 8th April 2006.

In addition, copies of the strategy and an invitation to comment on it were sent to the agencies participating in preparation of the strategy (Hunter Aquaculture Taskforce), coastal Catchment Management Authorities, relevant Councils, estuary management committees, Ocean Watch, Nature Conservation Council, Marine Parks Authority, Department of Environment and Heritage, Department of Local Government and the Peak Oyster Advisory Group.

The Hunter Aquaculture Taskforce met to consider all submissions and the final OISAS was prepared.

## **1.7 Performance indicators and review**

DPI along with other agencies will be responsible for making recommendations to the SASC on the need to review and update any aspects of the strategy as a result of cumulative impacts, technological developments or other changes in an estuary or area of an estuary.

The strategy will be reviewed in five years, or earlier if triggered by the performance indicators given in Table 1.

DPI will report annually on the performance indicators. This report shall consider the need to update or review the strategy generally or in relation to particular estuaries or particular aspects of environmental performance. New species, improved oyster farming practices and management responses to emerging issues will also be considered. All recommendations shall be referred to the SASC for action.

The indicators in Table 1 relate to performance and cumulative issues and will provide a trigger that will initiate a review of the strategy.

A review of this strategy will involve the preparation of a review report by DPI for consideration by the State Aquaculture Steering Committee and the Peak Oyster Advisory Group. DPI will consult with the relevant agencies in preparing the review report.

**Table 1: Triggers for review.**

Indicator	Justification	Trigger for review of the strategy  (Triggers calculated at June 30 every year)
1. Annual production.	Production trends indicate industry viability and development.	Five year average production drops by 3000 bags or more.
2. Lease compliance.	Indicates commitment to best practice standards.	Number of compliant leases falls by more than 10% from previous year, OR  More than 10% of current leases are not compliant 5 years after this strategy is gazetted.
3. Rainfall threshold for harvest closures.	Harvest closures are indicative of short term water quality trends and are affected by catchment land use.	Rainfall threshold that triggers a closure is reduced in more than three harvest area management plans since the last review.
4. Harvest area classification.	Classification is an indicator of longer term water quality.	More than two harvest areas have harvest classification downgraded due to water quality deterioration since the last review.
5. Leases abandoned due to water quality conditions.	Indicates sustainability of oyster farming areas and trends in water quality protection.	More than 5% of the total NSW lease portfolio abandoned due to water quality issues since the last review.
6. Number of years since review (if not triggered for other reasons).	Reflects the currency of the strategy - potential to become out-of-date with advice no longer reflecting the most sustainable approach.	> 5 years since gazettal or last review.

The report will collate historical data on the performance indicators and identify which trigger initiated the review. The report will analyse the performance of the strategy and may make recommendations for amendment.

The review will also consider amendments to the priority oyster aquaculture area on the oyster aquaculture maps for leases nominated by industry, local government or the State Aquaculture Steering Committee in accordance with Section 5.3.

Any proposed amendments will be subject to industry and community consultation in accordance with the requirements of the *Fisheries Management Act, 1994* (Section 143(8)) and *Environmental Planning and Assessment Act, 1979*. DPI will refer any proposed amendments to State Aquaculture Steering Committee prior to recommending them for gazettal by the Minister.

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## Chapter 2

### Industry overview

#### 2.1 Industry history

The utilisation of natural stocks of oysters in NSW has a long history. Oyster shells are common in Aboriginal middens along the coast, with some being carbon dated back to 6,000 BC. With the colonisation of NSW by Europeans, oysters were also gathered for food and burnt in large quantities (alive or dead) to provide lime for building mortar. As a result of these activities, wild oyster stocks were quickly depleted and in 1868 legislation was passed to prohibit the burning of live oysters for lime. This legislation and the demand for edible oysters, fostered the establishment of commercial oyster cultivation practices during the 1870's. In 1884 the *Oyster Fisheries Act* was proclaimed, which regulated the gathering of oysters and the leasing of oyster beds.

The practice of commercial cultivation of oysters accompanied the early settlement and development of the NSW coast, becoming a significant element in the history of many coastal areas and towns. As such, the industry today has a strong association with the character and community of coastal NSW. It provides employment and contributes significantly to local regional economies. In many areas, oyster leases and the industry's shore based infrastructure delineate areas of community use and are now important elements in the historical heritage of these areas.

Oyster production grew steadily, reaching its peak in the 1976/77 financial year, by which time the industry had grown to the most important sector of the NSW fishing industry with an annual production approaching 150,000 bags<sup>1</sup> (Figure 1). This is equivalent to 17 million dozen oysters, valued (in today's dollars) at the farm gate at around \$76 million. This peak was driven mainly by a peak production of 43,000 bags in Port Stephens.

Since the mid 1970's, oyster production has declined. This has been attributed to many factors. These factors include supply-side factors such as oyster disease, the effects of Pacific oyster introduction and the degradation of water quality in many coastal rivers, estuaries and lakes (White, 2001); and demand-side factors such as non-contested competition in the marketplace from oysters grown in other Australian states and the diversification of consumer tastes.

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<sup>1</sup> NSW oyster production is reported in 'Bags' to account for the variation in size between species and the various grades of oyster produced. The following conversions are used:

Sydney Rock Oysters

1 bag of Plate Grade Oysters = 100 dozen

1 bag of Bistro Grade Oysters = 110 dozen

1 bag of Bottle Grade Oysters = 130 dozen

Pacific Oysters

1 bag of Grade 1 (Select and Prime) = 76 dozen

1 bag of Grade 2 (Bistro) = 120 dozen

1 bag of Grade 3 (Mini) = 150 dozen

**Figure 1: Annual NSW oyster production 1938/39 to 2003/04.**

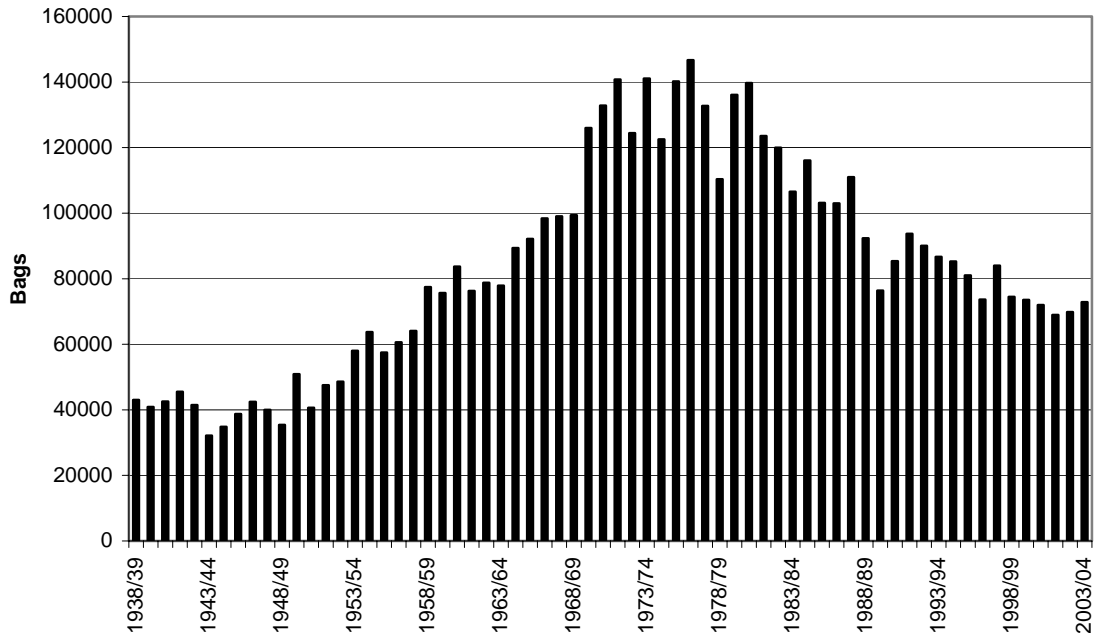


Table 2 shows peak production of oysters for human consumption from the main oyster producing estuaries and the year the peak occurred. Of note is the significant loss of production due to the effects of QX on the North Coast (Tweed to Clarence) in the early 1980's, Georges River in 1994 and the Hawkesbury River in 2004; and the reduction in production in Port Stephens as a result of the introduction of Pacific oyster in the mid 1980's. Also note that peak production has occurred only recently in Nelson Lagoon, Clyde River and Bellinger River.

Table 2 also shows the maximum 10 year moving average production from historical records. These records date back to 1932 for most estuaries and cover periods of high and low production. Ogburn (2006) uses the maximum 10 year moving average to estimate sustainable production levels. Ogburn estimates state sustainable production at approximately 120,000 bags taking into account the effects of production losses due to QX and Pacific oyster.

At the estuary level, production records do not include spat production and inter-estuarine transfers, so the actual biomass production from some estuaries greatly exceeds the data records. Spat production changed significantly with the introduction of measures to control Pacific oysters and QX disease. Prior to the closure of spat movements from Port Stephens in the early 1990's, over 70% of all oysters sold for human consumption originated from Port Stephens stock.

**Table 2: Historic NSW oyster aquaculture production  
(human consumption).**

Estuary	2003/04	Historic peak		Historic maximum 10 year moving average (bags)
	(bags)	(bags)	(Year)	
Tweed R.	*	3944	1980/81	2434
Brunswick R.	*	964	1981/82	396
Richmond R.	*	771	1940/41	510
Clarence R.	*	2106	1974/75	1560
Wooli R.	*	869	1966/67	633
Bellinger R.	*	865	2001/02	485
Nambucca R.	849	3066	1985/86	1841
Macleay R.	1308	5881	1974/75	3983
Hastings R.	3039	6942	1987/88	5124
Camden Haven	1731	3672	1977/78	2673
Manning R.	1847	6854	1960/61	4855
Wallis Lake	20828	28841	1987/88	23181
Port Stephens	10714	43130	1976/77	33973
Hunter R.	384	687	1993/94	415
Brisbane Waters	5229	13473	1982/83	8923
Hawkesbury R / Patonga	7211	21252	1969/70	16798
Georges R./ Botany Bay	*	41068	1971/72	32923
Shoalhaven / Crookhaven	1612	3339	1990/91	2294
Conjola/Burril Lake & Narrawallee Ck.	*	5679	1980/81	946
Clyde R.	7916	7916	2003/04	6104
Moruya & Tomaga	*	1195	1981/82	509
Tuross Lake	576	2205	1994/95	1392
Wagonga R.	2156	3277	1987/88	2257
Bermagui & Cuttagee Lakes	*	1000	1998/99	363
Nelson Lagoon	*	170	2001/02	111
Wapengo Lake	734	1812	1988/89	1114
Merrimbula Lake	2586	2888	1999/00	2157
Pambula R.	1124	1589	1986/87	957
Wonboyn	268	2271	1990/91	1066
Miscellaneous Estuaries	2741			
<b>State Production (Bags)</b>	<b>72853</b>	<b>146666</b>	<b>1976/77</b>	

\* A small number of permit holders farm these estuaries and data is combined and reported as 'Miscellaneous Estuaries' to protect confidentiality.

## 2.2 Current profile

Oyster aquaculture is currently undertaken in 32 NSW estuaries spread along the entire length of the NSW coast from the Tweed River on the Queensland border to Wonboyn Lake adjacent to the Victorian border (Figure 2). The industry comprises approximately 380 oyster aquaculture permit holders that hold between them 2,600 oyster leases occupying 3,100 hectares of submerged Crown lands (June 2005).

The NSW oyster industry is based almost entirely on the cultivation of the Sydney rock oyster (*Saccostrea glomerata*)<sup>2</sup>, a species native to the NSW and southern Queensland coast. The industry is supplemented by small developing industries based on the cultivation of the Pacific oyster (*Crassostrea gigas*) at Port Stephens<sup>3</sup> and the cultivation of the native flat oyster (*Ostrea angasi*) in southern NSW. Following the impact of the oyster disease, QX in the Georges and Hawkesbury rivers, triploid Pacific oysters are also cultured in those estuaries. Hatchery produced QX resistant and faster growth lines of Sydney rock oyster are also being trialed in NSW.

In recent years annual production has stabilized at around 70,000 bags (8 million dozen). Production for 2003/04 was 72,853 bags (Table 2) valued at the farm gate at approximately \$38 million.

The oyster aquaculture industry is the largest aquaculture industry in NSW by production value and accounts for approximately 30% of the State's total commercial fisheries production. The industry is the fourth largest aquaculture industry in Australia, behind the bluefin tuna aquaculture industry, the pearl aquaculture industry and the Tasmanian salmon aquaculture industry. Oyster aquaculture is also one of the State's most valuable per hectare agricultural enterprises with long term gross average production of \$8,000/ha across the state and as high as \$35,000/ha in some estuaries (White, 2001).

Approximately 1600 people are currently directly employed within the industry (White 2001). The total capital investment in the industry is estimated at \$268 million (White 2001).

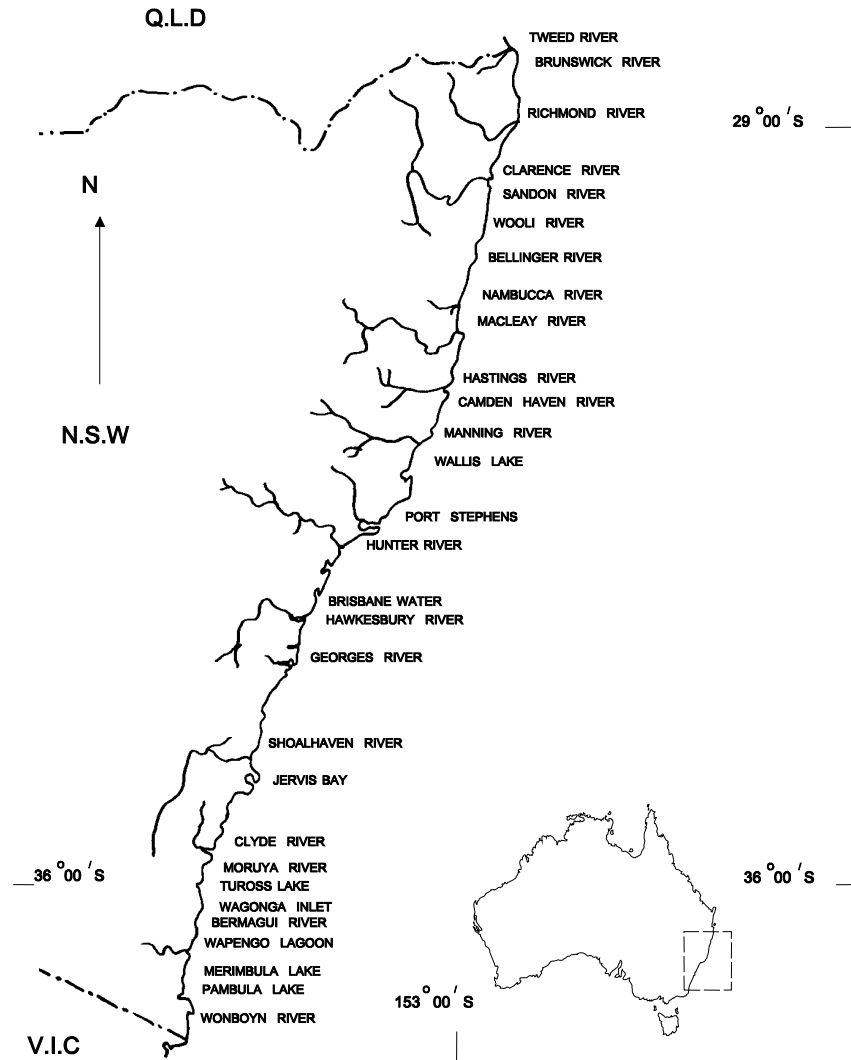
Around 75% of all oysters grown in NSW are sold within the State, the remaining oysters being shipped to interstate markets. Currently there is no significant export of oysters from NSW to overseas markets. Classification of harvest areas under the NSW Shellfish Program may open opportunities for export.

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<sup>2</sup> Previously *Saccostrea commercialis*

<sup>3</sup> The Pacific oyster is an introduced species and is declared as a 'noxious fish' in all NSW waters other than in the waters of Port Stephens, under the *Fisheries Management Act, 1994* and the *Fisheries Management (General) Regulation, 2002*. Due to the overwhelming numbers of wild Pacific oysters present at Port Stephens, permission was granted for the cultivation of Pacific oysters in the estuary in 1990.

Figure 2: The location of major oyster producing estuaries in NSW.



## 2.3 Industry management initiatives

### 2.3.1 Department of Primary Industries

#### Oyster lease bond system

In January 2001 the Aquaculture Lease Security Arrangements (bonds) came into effect in NSW. The bonds apply to all oyster farmers in New South Wales. The bonds system was introduced to ensure that the industry shares responsibility for problems arising from lease management and maintenance issues.

The bond is either a cash deposit, bank guarantee or other security arrangement to the value of \$1000 per hectare OR an annual contribution of \$40 per hectare. The lease security system was introduced in 2001.

#### Re-leasing

Leases identified as priority oyster aquaculture areas in OISAS, especially those leases that are approved for direct harvest by the NSW Food Authority will be keenly sought by the industry. Leases in these areas with derelict infrastructure on them will be re-let subject to the new lessee removing all old materials prior to placing new infrastructure on the lease.

DPI has a competitive tender process for letting vacant lease areas so that the commercial value of these areas can be realised. Leases may also be let by application, auction or ballot.

#### Aquaculture compliance strategy

A new strategy for aquaculture compliance has been implemented. The system will detect areas that are falling into a derelict condition at an early stage so that timely compliance action can be initiated. The key components provide a system that provides a consistent management, monitoring, education and enforcement process.

The strategy includes:

- Regular permit and lease condition inspections conducted by DPI.  
The standard inspection period is every three years but may be varied where required.  
Permit holders are required to complete an annual condition report detailing the condition of lease areas showing how well they meet permit and lease conditions. This is usually sent as part of the annual production reporting form.  
It is compulsory for the report to be completed and returned to DPI.
- Lease transaction condition report.  
The compliance condition of all leases is checked by DPI before being renewed, transferred or sub-let. The information obtained is considered when deciding if the lease transaction will be approved.  
Where the permit holder/lessee has a poor record of management such as non-completion of required work from a compliance notice, untidy lease/former lease areas or workplans not being followed the lease transaction will normally be refused.

Transfers of non-compliant leases will be approved if the proposed new lessee has a good management record and agrees to an approved workplan to bring the lease into compliance.

Special conditions may also be included to deal with specific local issues.

- Workplans

Oyster aquaculture permit holders and lessees may submit a workplan for approval to extend the time given in a notice to tidy and repair oyster lease areas where there is a large quantity of work, extenuating circumstances or high seasonal workloads.

Workplans are prepared by the permit holder/lessee and approved by the relevant District Fisheries Officer.

Lease marking and signs must be attended to in the time given on all Oyster Lease Inspection Reports and this work cannot be included in a workplan due to navigation safety issues.

- Complying with lease marking notices

If an oyster aquaculture lease does not comply with the relevant lease marking standards specified in this strategy (unless otherwise authorised under an approved DPI workplan or exemption) the holder of the oyster aquaculture lease will be ordered to take the following action:

In the case of an oyster aquaculture lease corner marker post,

Within 14 days from notification, bring the aquaculture lease corner marker post into compliance with the standards specified in the strategy. A penalty notice may be issued at any time for a missing corner post; and,

In the case of an oyster aquaculture intermediate lease marker post,

Within 14 days from notification, bring the oyster aquaculture intermediate lease marker post into compliance with the standards specified in the strategy. A penalty notice may be issued at any time for a missing intermediate lease marker post.

- Complying with neat and tidy notices

If an oyster aquaculture lease does not comply with the provisions of this strategy (unless otherwise authorised under an approved DPI workplan or exemption) the holder of the oyster aquaculture lease will be ordered to take the following action:

Within 30 days from notification, bring the lease into compliance with the standards specified in the strategy.

## Historic derelict oyster leases

Historic derelict oyster leases are mainly the product of catastrophic disasters such as the outbreak of oyster disease in the Georges River and the initial incursion of Pacific oyster in Port Stephens that severely impacted the financial viability of the affected growers.

Responsibility for cleaning up oyster cultivation material passes to the State (as land owner) when clean-up costs can not be recovered from the lessee. In some cases, lessees have their interests discharged under bankruptcy or insolvency legislation.

Over the last four years the State government rehabilitated 433 ha of derelict former oyster lease area in Port Stephens and 84 hectares in the Georges River. An additional 85 hectares of former derelict lease in Port Stephens was re-let for clean-up by new tenants.

The NSW Oyster Industry Sustainable Aquaculture Strategy will improve industry resilience to the factors that has previously led to leases being abandoned in derelict condition. Also, NSW Department of Primary Industries has in place an oyster lease compliance program and a lease bond system that can be called on in the event that a lease is abandoned.

DPI is working with NSW Department of Lands to plan future clean-up campaigns that will remove the remaining historic derelict oyster farming materials from former lease areas.

### 2.3.2 Department of Lands

The Department of Lands has implemented a new strategy for Oyster Industry land base sites located on Crown land.

By working in partnership with the grower the Department will promote environmentally sensitive and well managed Crown land associated with the oyster farming industry.

The strategy includes:

- A commitment to 20 year lease for each land base site;
- Five year Work Plans developed in consultation with the grower;
- A series of key principles in the Work Plan, assembled into three categories:
  1. Commitment to environmentally sustainable practices and social responsibilities;
  2. Site management and presentation;
  3. Roles and initiatives provided by Department of Lands.
- Work Plans also contain a walk-through agreement, developed in consultation with the grower;
- The walk-through agreement will detail initiatives proposed by the farmer and the department to improve site efficiencies, presentation and environmental practices;
- The 20 year lease and associated Work Plan contains no initial requirement for a security bond system. The aim here, is to work in partnership with the grower to maintain an environmentally sensitive and professionally well managed land base;
- The Work Plan will provide for the calling in of a security deposit should the grower fail to meet obligations and commitments contained in the walk- through agreement; and
- Should the grower fail to adhere to work plan and subsequent walk-through agreement the department maintains the option to terminate the lease on a breach of conditions.

Work Plans will be required when:

- A new lease is being granted;
- The lease is being transferred; and
- Work Plans are to be updated, if and when required. This option is determined in consultation with the grower and can be called for by either the grower or the department.

### 2.3.3 The NSW Shellfish Program

The NSW Shellfish Program is a compulsory, industry funded program that assists in ensuring the public health safety of oysters and other shellfish grown and harvested from NSW waters. The Shellfish Program is administered by the NSW Food Authority under the *Food Act, 2003*. A brief description of the program is given here for information only. This strategy does not affect the operation of the program. Full details of the program including water quality monitoring details can be obtained from the NSW Food Authority.

The objective of the NSW Shellfish Program is to protect the health of shellfish consumers through the administration and application of procedures described in the *New South Wales Shellfish Program Operations Manual* that:

- assess the risk of shellfish contamination by pathogenic bacteria and viruses, biotoxins and chemicals derived from the growing area;
- control the harvest of shellfish in accordance with the assessed risk; and,
- protect shellfish from contamination after harvesting.

In addition the *Operations Manual* describes administrative procedures for the operation of *Local Shellfish Programs* as specified under the *Food Production (Seafood Safety Scheme) Regulation, 2001*. The NSW Shellfish Program adheres to the principles and objectives of the *Australian Shellfish Quality Assurance Program (ASQAP)*.

#### Classification of oyster harvest areas

Harvest area risk assessment (also known as a comprehensive sanitary survey) is the cornerstone of the NSW Shellfish Program. The completion of a risk assessment for each harvest area is an objective process that is taken independently of the oyster aquaculture industry which follows the requirements of the *ASQAP Operations Manual 2002* and the *NSW Shellfish Program Operations Manual 2001*.

Each initial risk assessment is completed over a period of one to three years and results in each harvest area being classified as either approved, restricted or prohibited according to its sanitary status. The harvest area classification then determines the food safety controls to be applied to shellfish harvest from the area. Additionally, where a harvest area's classification is 'conditional' (essentially meaning it is subject to closure in prescribed conditions), a specific harvest area management plan is prepared which details harvest area closure and opening parameters as well as other requirements for the efficient and effective management of the area.

**Components of the risk assessment process**

- A shoreline survey which includes a thorough physical examination of the catchment area draining into the shellfish harvest area in order to identify the actual or potential sources of pollution that may adversely affect water quality.
- A bacteriological survey of the shellfish growing waters, which provides quantitative data to explore and develop preliminary findings of the shoreline survey, data that describes the extent of faecal contamination of the harvest area and quantitative data for the classification of the area. (see Table 3)
- A bacteriological and chemical examination of the shellfish which includes an assessment of the microbial, chemical and algal biotoxin contaminants.
- An evaluation of the meteorological, hydrographic and geographic characteristics to assist the development of a harvest area management plan.
- An algal biotoxin risk assessment to assist in the appropriate classification of the area.

**Table 3: Sanitary water quality standards for oyster harvest area classification.**

Parameter	Classification Status		
	Approved	Restricted	Prohibited (Nursery)
Faecal (thermotolerant) coliforms	90th percentile of randomly collected Faecal coliform samples do not exceed 43MPN or 21 MF/100mL	90th percentile of randomly collected Faecal coliform samples do not exceed 300MPN or 85 MF/100mL	Median of randomly collected Faecal coliform samples do not exceed 88MPN or 70 MF/100mL

**Implications for oyster cultivation and harvest**

Classification determines the management regime under which oysters are harvested. Also, oysters may only be exported from classified areas according AQIS export criteria for shellfish.

Under the risk assessment process oyster growing areas are classified into one of the following four categories:

1. **Approved.** Direct harvest for human consumption under prescribed conditions;
2. **Restricted Harvest.** Product requires depuration in an approved deputation plant under prescribed conditions or relay to an Approved area prior to sale for human consumption;
3. **Prohibited (Nursery).** The harvest of shellfish for sale for human consumption is not permitted; or,
4. **Prohibited (Closed Safety).** Identifies areas that are not suitable for growing or harvesting shellfish.

Oysters may be progressed to a higher category by relaying those oysters into the higher category waters, under prescribed conditions, for a minimum period of 14 days or translocating juvenile (nursery) shellfish for on-growing for a minimum period of 60 days.

Most oyster growing areas currently fall within the 'depuration' or 'nursery' classification and operate under interim management plans pending completion of the harvest area risk assessments.

Oysters may be harvested from Direct Harvest areas and sold directly for human consumption without the additional cost of the 'depuration' process. These areas are therefore the most valuable and sought after areas for oyster aquaculture.

## 2.4 Agency roles and responsibilities

The key agencies, and their responsibilities with respect to the NSW oyster industry, are summarised below.

### **Premiers Department**

This department manages issues and projects of significance to NSW, such as the development of this strategy. Premiers Department has provided direction and leadership to the Hunter Aquaculture Taskforce to ensure a whole of government approach to policy development.

### **Department of State and Regional Development**

DSRD works with the NSW oyster industry to assist in business development. The department has sponsored many industry initiatives in the areas of marketing, business planning and trialing new species and farming methods.

### **Department of Primary Industries**

DPI is the key regulatory agency for the NSW oyster industry. The department administers leases and permits, collates production data, develops policy and also has an industry development role. The department is also the key NSW aquatic habitat protection and compliance agency and develops policies and guidelines for the industry that are consistent with habitat protection objectives.

### **Department of Planning**

DoP's key role for the oyster industry is in ensuring that the OISAS is integrated into the state land use planning and development control frameworks. DoP ensure that strategies such as OISAS integrate the government's social, economic and environmental agendas to promote sustainability.

### **Department of Natural Resources**

DNR include a specialist estuary and coastal management team that oversees the preparation of estuary management plans and studies. DNR works with the oyster industry to provide estuary process information to help resolve issues such as dredging.

### **NSW Food Authority**

The NSW FA provides the regulatory framework for safe and correctly labelled food to be produced in NSW. Of particular importance to the oyster industry, the NSW FA has responsibility for implementing the NSW Shellfish Program that classifies and establishes management plans for oyster harvest areas. The NSW FA also licenses oyster depuration, processing and handling facilities.

### **Department of Environment and Conservation**

The Department of Environment and Conservation (DEC) has statutory responsibilities for protected and threatened wildlife throughout NSW, whether on or off the DEC estate. Of particular relevance to oyster leases is the DEC's role in the protection of marine mammals and reptiles, such as dolphins and sea turtles which may swim into shallow water, and shorebirds or waders which often forage in the intertidal zone and roost nearby.

The DEC has care and control of national parks and nature reserves throughout NSW, and these are often located in estuarine areas. Although oyster leases are granted under the *Fisheries Management Act, 1994*, any new lease on DEC estate requires the written concurrence of the Minister for the Environment.

The DEC shares responsibility for regulating pollution of waters in NSW with local government and the Maritime Authority. The DEC is responsible for regulating state and local government agencies and those premises holding an environment protection license. The Maritime Authority regulates water pollution from vessels and local government regulates most other sources.

### **Department of Lands**

The Department of Lands is the primary administrator for Crown land tenures and unallocated Crown lands across NSW. The department leases land to the oyster industry for land based activities and also gives owners consent to lodgment of development applications for new aquaculture lease areas where development consent is required.

Future management of land based sites located on Crown land will be driven by the need for both the grower and the Department of Lands to maintain an environmentally sensitive and professionally well managed land base. This will be achieved through the process of a long term lease agreement and an associated Work Plan that is developed in partnership with the grower to achieve sound environmental and social outcomes.

### **Maritime Authority**

The Maritime Authority is the state government's maritime regulator responsible for providing safe and sustainable ports and waterways. The authority helps to establish aquaculture lease marking requirements and helps to determine if a lease area will adversely affect navigation. NSW Maritime also have responsibilities for pollution from vessels.

### **Marine Parks Authority**

Marine parks are large marine and estuarine protected areas that are designed to conserve all forms of marine plant and animal species (biodiversity). The NSW Marine Parks Authority is responsible for the declaration, management, selection and zoning of marine parks and the regulation of ecologically sustainable use of these areas.

### **Local Government**

Local government has a diverse role covering town planning, building approvals, local roads, parking, public libraries, public toilets, water and sewerage, approval and inspection of septic systems, waste removal, domestic animals and community facilities. Of particular importance to the NSW oyster industry is council's part in managing estuarine water quality and resolving land and water use conflicts through estuary management planning, land use planning and development control. Council may also provide waste management services to the industry. Council's also assist the oyster industry with water quality monitoring and have a role in investigating water pollution incidents.

### **Catchment Management Authorities**

Catchment Management Authorities (CMAs) coordinate natural resource management (NRM) at the catchment scale. The CMAs are responsible for involving regional communities in management of the NRM issues facing their region, and are the primary means for the delivery of funding from the NSW and Commonwealth Governments to help land managers improve and restore the natural resources of the State. Key roles include preparing Catchment Action Plans (CAPs) and managing incentive programs to implement the plans. Implementation of the CAP in the coastal CMA areas will lead to favourable outcomes for the oyster industry.

## Chapter 3

# Healthy oysters and healthy estuaries

Estuaries (where all NSW oyster farming occurs) are essentially the confluence point for all runoff and groundwater flow yielded by their catchments. Estuarine health is therefore a good indicator of the sustainability of catchment activity.

There are numerous potential sources of pollution that may affect estuaries, including urban and industrial effluent discharges, boat discharges, contaminant transport by rivers and agricultural run-off.

Raised concentrations of pollutants can have serious effects on the health of plant and animal populations. Oysters are particularly affected because they rely on high quality water for their food. On average, a farmed Sydney rock oyster will filter an estimated 0.25 ML of estuarine river water. It has been estimated that the farmed oysters in NSW remove over 1 million tonnes of suspended material, chiefly phytoplankton, in their lifetime (White, 2001). They have therefore an important role in the ecology of estuaries.

Because oysters filter such large volumes of water they are particularly sensitive to changes in water chemistry. For this reason they are sometimes referred to as 'grey canaries', as they are excellent biological indicators of estuary health. Their feeding habits and life-style make oysters extremely valuable, integrative indicators of water quality in estuaries and coastal lakes (White, 2001).

### 3.1 Water quality for food safety

Bacteria, viruses, marine biotoxins and environmental pollutants may all impact on the suitability of oysters for human consumption. Most are a direct result of human activity with the exception of marine biotoxins.

Sources that may pose a risk to food safety include:

- Sewerage system and septic tank overflows and leaks;
- Sewage discharges from vessels;
- Re-suspension of contaminated sediments;
- Stormwater run-off; and,
- Discharges from industrial premises or agriculture.

### 3.2 Water quality for healthy oyster growth

Oyster growth and production shows a wide variation from lease to lease, season to season and year to year. The majority of this variation would be explained by natural variations in water chemistry, temperature and seston availability although, surprisingly, there are gaps in knowledge on the Sydney rock oysters basic physiology and ecology (White, 2001).

On top of these natural effects, oyster growth and production can be affected by water quality problems caused or exacerbated by human activity. This activity is predominantly catchment land use and activities close to the estuary.

The 'healthy growth' water quality parameters most likely to be affected by human activity are:

- **Suspended solids.** Silt affects the sensitive feeding apparatus of oysters and can lead to infestations of mudworm. In general, oysters feed more efficiently in relatively clear waters (White, 2001). Increased turbidity may also reduce primary production and seston levels. Suspended solids levels can be raised by any catchment land use that exposes and leaves soil bare to erosion or by excessive wave wash arising from activities such as power boating, within the estuary;
- **pH.** The optimal pH range for oysters appears to be between 6.75 to 8.75 with growth rates rapidly declining at either side of this range (White, 2001). Large areas of acid sulfate soils occur in coastal floodplains in NSW and the drainage of acid waters from these areas is a major concern to the oyster industry (White, 2001). An oyster can survive in low pH waters for a time, but eventually the shell dissolves and the oyster dies (Dove et al, 1999); and,
- **Toxic elements and substances.** Detailed knowledge of all substances that may affect oyster growth is not available, but Dove and others (1999) observed that elevated concentrations of Iron and Aluminium at low pH could cause significant mortality in oysters. Suspended iron compounds (flocs) associated with acid drainage can also smother growing oysters and clog gill structures (Dove et al., 1999).

### 3.3 Tidal range, water flow and salinity

Oyster aquaculture ideally requires a stable mean water level that varies with each tide cycle. This allows oysters to be 'set' at a height where predictable periods of inundation and drying can be achieved.

Tidal variation also drives currents that exchange water through lease areas, delivering food. In some instances stream flow and wind driven circulation may supplement tidal currents, although these are highly variable and cannot be relied upon alone.

Salinity affects oyster growth and larval distribution and therefore catchment diversions, extractions, periodic releases of freshwater or changes to estuary entrances and channels may pose a threat to optimal oyster production. Salinity is also an important parameter in the operation of the NSW Shellfish program.

Tidal range and flows are affected by the morphology (shape and depth) of the estuary and the size of the entrance. Oyster farming is situated mainly in permanently open estuaries and estuaries that close infrequently (in the order of 1 closure per century).

Estuaries are dynamic environments and the shape and position of channels and the estuary entrance has a natural pattern of variation. The state of the entrance and channels is a balance between the river and tidal flows, sediment dynamics and coastal (oceanic) process.

Entrance closures and channel movements often occur during extreme climatic conditions, but may be exacerbated by regulated river flows, abstractions and catchment land use leading to accelerated estuarine sedimentation.

When an estuary entrance closes or major flow channels become clogged there are increased periods of low salinity, higher water temperatures and poor water quality. Under these conditions, oyster aquaculture may experience:

- increased mortality, increased susceptibility to disease, reduced production and poor oyster growth,
- increased restrictions on harvest due to increased periods of low salinity,
- increased production costs as oysters may need to be moved frequently to other parts of the estuary or to different growing heights.

High water and flood levels associated with closed entrances may also adversely affect infrastructure and property; recreational and commercial fishing; recreational use of the estuary; and estuarine ecology.

The decision to artificially open an estuarine entrance or dredge a channel has to balance all potential social, economic and environmental impacts and is ideally planned well ahead of the need to undertake the work.

The social and economic cost of potential impacts on the oyster industry are relatively easy to determine, and need to be considered in the preparation of Estuary Management Plans, entrance opening strategies and estuary dredging strategies that may affect salinity, tidal range and flows in an oyster growing estuary. However, oyster aquaculture needs alone may not be sufficient to justify the artificial opening of an estuary.

### 3.4 Water quality and flow objectives for oyster aquaculture areas

#### Objectives

The water quality objective and flow objective for areas identified as priority oyster aquaculture areas mapped in Chapter 5 are:

**Protecting water quality for safe human consumption and viable production of edible oysters.**

**Maintain or rehabilitate estuarine processes and habitats.**

#### Background

The NSW Government established interim environmental objectives for water quality for 31 NSW catchments.

These water quality objectives aim to provide policy direction for local government, state government agencies and Catchment Management Authorities for the protection of the identified objectives for each catchment. Objectives identified include aquatic ecosystem protection, visual amenity, recreation, water supply and aquatic foods (cooked). (<http://www.epa.nsw.gov.au/ieo>).

Objectives are used by these agencies to guide the issuing of permits, approvals, development consents and licenses for activities that may impact on water quality. They also provide a reference, against which the state of water quality in a particular area can be assessed, and help to determine whether water quality studies and improvement strategies should be initiated.

Oyster production requires water quality that supports healthy oyster growth and results in a product that is safe to eat following harvest under the NSW Shellfish Program. The water quality guidelines (Table 4), established in this strategy, are designed specifically to meet this objective.

The most important water quality parameter in oyster aquaculture is sanitary water quality. The most relevant guideline for sanitary water quality in oyster growing areas is the internationally accepted *ASQAP Operations Manual 2002* and the *NSW Shellfish Program Operations Manual 2001*.

These two manuals use faecal coliform bacteria as an indicator of faecal pollution. The standard for *Direct Harvest* classification has been used as the objective for oyster aquaculture so that current *Direct Harvest* areas are protected and *Restricted Areas* may see an improvement in water quality that results in a future upgrading.

Five other key water quality guidelines have been set. The objectives are based on published values and are given in Table 4.

The NSW Government has also established interim river flow objectives for 31 NSW catchments. Four objectives have been set for estuarine areas:

- Maintain or rehabilitate estuarine processes and habitats
- Maintain wetland and floodplain inundation
- Manage groundwater for ecosystems
- Minimise effects of weirs and other structures

The most relevant to the protection of the environmental conditions required for oyster aquaculture, has been specifically adopted by this strategy, but achieving the other three will also assist in providing the environmental conditions required for healthy oyster growth.

**Table 4: Water quality guidelines for oyster aquaculture areas.**

Parameter	Guideline	Source
Faecal (thermotolerant) coliforms	90th percentile of randomly collected Faecal coliform samples do not exceed 43MPN or 21 MF/100mL	ASQAP Operations Manual 2002 and the NSW Shellfish Program Operations Manual 2001.
pH	6.75 – 8.75	Schumway (1996).
Salinity	20.0 – 35.0 g/L	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).
Suspended solids	<75 mg/l	
Aluminium	<10µg/L	
Iron	<10µg/L	
Other parameters	For other parameters please refer to Section 4.4 and Section 9.4 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)	

## Chapter 4

# Water quality protection guidelines for planners, developers and estuary managers

### 4.1 Recognition of oyster aquaculture in land and water use planning

The aim of this strategy is that water quality, tidal range and flow in oyster growing areas is maintained and where possible improved to ensure the long-term security and sustainability of the NSW oyster aquaculture industry.

The maintenance of existing water quality, tidal range and flow will be achieved primarily through establishing links between the requirements for the sustainable cultivation of healthy oysters and catchment land and water use planning.

Three such links are established by this strategy.

**Firstly**, when preparing statutory environmental management plans that govern activities (both upstream and downstream) that may influence priority oyster aquaculture areas the relevant agency is required to:

- Consider the potential impact of the activity or plan on oyster aquaculture areas, and,
- Include specific actions that will contribute to the protection and/or improvement of water quality for oyster aquaculture.

**Secondly**, in determining applications for consent or approval under the *Environmental Planning and Assessment Act, 1979* the consent or determining authority needs to consider the potential impacts of the activity on oyster aquaculture areas in the locality. Of particular concern is that catchment or foreshore development will reduce the suitability of an oyster aquaculture area for its intended purpose.

**Thirdly**, the NSW oyster industry is recognised as a neighbour/stakeholder and will be notified of relevant applications for approvals and consents and natural resource plan making activities.

These links are established through the planning amendments given in Chapter 8.

## 4.2 Guidelines for harvest area protection

This section lists some specific actions that will contribute to the protection and/or improvement of water quality for oyster aquaculture. Local government, state government agencies, private landowners and developers should directly implement these actions. They should be included in strategic land and water use planning as development standards and considered in determining development applications.

### Non point sources

Some specific actions include:

- Riparian zones in agricultural areas fenced to prevent access of livestock to estuary;
- Encourage establishment of riparian filters and settlement areas for run-off drainage in landscape with potential high animal faecal/fertiliser/chemical contamination (eg livestock, golf link, turf farm);
- Elevated monitoring and awareness of septic safe programs in areas adjacent to harvest zones;
- Marinas and vessel pump out facilities carefully regulated;
- Educational and advisory signs for recreational boating warning of the need to protect sanitary water quality;
- Avoid artificially attracting large numbers of birds into a harvest zone.
- Investigate the need for exclusion of recreational/private boating in specific oyster harvest area to protect sanitary water quality if required; and,
- Inclusion of buffer zones between foreshore sub-divisions and the shoreline.

### Point sources

Some specific actions include:

- Sewer systems improved, maintained and operated so that overflows do not occur as a result of maintenance or operational failure, overflows in dry weather are eliminated or occur only under exceptional circumstances and wet weather overflows are minimised;
- Identification of priority urban storm water drains and installation of suitable treatment systems;
- Priority treatment drains would include those with a catchment from large hard stand car parks and roadway car parks, caravan parks, golf links, subdivision, commercial/business and shopping centers and industrial areas; and,
- At source control of stormwater for new developments to reduce stormwater impacts.

### **4.3 Prioritising actions to address existing water quality issues**

Declining water quality trends may be detected by the routine monitoring undertaken by the oyster industry for the NSW Shellfish Program, from growing area production records and from visual impacts detected while working on leases. State government agencies and local councils also undertake water quality monitoring.

The NSW Catchment Management Authorities (CMA) have responsibility for establishing regional standards and targets for natural resource management, including water quality. These standards and targets are implemented through a Catchment Action Plan.

In setting regional water quality objectives, CMA's refer to the Statewide Standards and Targets prepared by the NSW Natural Resources Commission and any relevant water quality objectives. The water quality objectives and guidelines for oyster aquaculture, established in this strategy, will assist CMA's to set specific objectives relevant to the protection of oyster growing areas.

The relevant CMA, Estuary Management Committee (EMC) and local council have responsibility for establishing priorities for action through their planning processes. Where it is identified that water quality is degraded in an oyster aquaculture area the issue needs to be brought to the attention of the relevant CMA, EMC and local council for prioritisation.

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## Chapter 5

# Priority oyster aquaculture areas

### 5.1 Areas where oyster farming is a desired outcome

Since its inception in the 1870's, the oyster aquaculture industry has undertaken extensive and on-going commercial assessment of sites that appeared to the 'experienced industry eye' to be suitable for oyster aquaculture. Much of this process took place in an era where there were few productive uses, other than fisheries, for the States estuarine waterways and urban development on estuary foreshores was relatively limited. This process of commercial assessment was often dynamic, with the suitability of sites often changing as industry cultivation practices evolved in each estuary.

In addition to commercial considerations, however, the oyster industry recognises that a range of environmental and socio-economic factors must also be considered in determining suitable oyster farming areas.

The Area Suitability Assessment (ASA) process ensures that potential environmental impacts and the needs of the community and other legitimate users of the State's estuarine resources are taken into account in the location and allocation of oyster aquaculture areas.

Suitable areas have been designated as priority oyster aquaculture areas in line with the recommendations of the Healthy Rivers Commission in its *Healthy Oysters, Healthy Rivers* report (HRC, 2003). Identifying priority oyster aquaculture areas recognises the importance of the industry to state and regional economies and the need to implement planning reforms that facilitate the environmental sustainability of the industry.

#### Areas assessed

This strategy has restricted the assessment of areas suitable as priority oyster aquaculture areas to those that were held under an oyster lease in 1980 issued under the *Fisheries and Oyster Farms Act, 1935* and any lease issued over previously unleased area since that time either under the *Fisheries and Oyster Farms Act, 1935* or the *Fisheries Management Act, 1994*. Small contiguous areas between adjacent oyster leases were also assessed.

Areas not currently or previously leased may still be subject to application for oyster farming, but these applications will be dealt with on a case by case basis and will require development consent (see Chapter 8 Planning).

Each lease was individually inspected and evaluated against a list of locational, environmental and socio-economic suitability criteria. This process classified current and previous oyster aquaculture areas as either suitable or unsuitable. All suitable areas are mapped as priority oyster aquaculture areas (POAA) on the oyster aquaculture maps. Table 5 lists the key location, environment and socio-economic criteria used in the ASA.

Areas in the National Park estate were assessed for oyster aquaculture suitability, but not mapped as POAA as this is not consistent with the intent of reserving National Park land. Current suitable leases in the National Park estate may continue subject to the relevant park management plan.

**Table 5: Assessment criteria for priority oyster aquaculture areas in NSW estuaries.**

Assessment Issue	Standard for an area to be classified as a priority oyster aquaculture area
Navigation	Not within an identified navigation channel as marked by the NSW Maritime Authority (except dredge bed leases).
	Not directly offshore from, or 50 m to either side of any public wharf or public boat ramp. Greater distances may be required in high use areas.
	Not directly offshore from, or 50 m to either side of, any public or privately operated marina. Greater distances may be required in high use areas.
	Not within a recognised mooring area.
	Not within 50 m of an area identified by NSW Maritime Authority as a specific watercraft operation area. Greater distances may be required in high use areas.
Commercial fishing	Not within a commercial net hauling ground recognised in a Fisheries Management Strategy made under the <i>Fisheries Management Act, 1994</i> .
Recreational activity	Not directly offshore from, or 50 m to either side of, an area managed for public recreation.
	Not within 50 m of an area identified by the NSW Maritime Authority as a designated swimming area.
Conservation areas	Not within any areas mapped under SEPP 14 if oyster aquaculture is likely to have significant adverse impacts on the wetland.
	Not in an area where oyster aquaculture is likely to have a significant adverse impact on matters of national environmental significance under the <i>Environment Protection and Biodiversity Conservation Act, 1999</i> .
	Not in an area declared as an Aquatic Reserve under Part 6 of the <i>Fisheries Management Act, 1994</i> if oyster aquaculture is likely to have significant adverse impacts on the conservation values of the Reserve.
	Only within areas within a Marine Park that identify oyster aquaculture as a permitted activity.
	Not within an area if oyster aquaculture is likely to have significant adverse impacts on threatened species or habitats listed under Part 7A of the <i>Fisheries Management Act, 1994</i> OR under the <i>Threatened Species Conservation Act, 1995</i> .
	Not in the National Park estate without the written concurrence of the Minister for the Environment.
	Not immediately adjacent to a National Park or Nature Reserve if oyster aquaculture is likely to have significant adverse impacts on the conservation values of the area.
Heritage	Not within over or adjacent to any area likely to adversely affect items listed on the State Heritage Inventory eg shipwrecks.
Aboriginal heritage	Not within, over or adjacent to sites/places of regional or national aboriginal significance without consultation and endorsement by the local Aboriginal community.
Public health safety	Not within any areas classified as a Prohibited (Closed Safety) under the NSW Shellfish Program.
Miscellaneous	Not over any area deemed as commercially non-viable for oyster aquaculture or not in the public interest.

## 5.2 Oyster aquaculture area available for leasing

This strategy does not seek to achieve a windfall increase in area available to the NSW oyster industry NOR does it seek to force a sudden decrease in area that would adversely affect business viability.

Oyster lease holdings have contracted since the mid 1970's and at June 2005 were 3132 ha, down from a peak of over 5,550 ha (not including foreshore leases let on a linear rather than area basis). Chapter 1 discusses the reason for this contraction.

It is anticipated that lease area will continue to consolidate due to the advent of single seed production technology and faster growing selected lines. These culture methods do not require 'catching leases' and may require less grow out area for the same production, as fewer age classes of stock need to be held. However, some QX affected estuaries and estuaries affected by poor water quality may be able to bring non-viable areas back into production in future if QX resistant oyster lines are proven successful and water quality issues are addressed.

Demand for lease area in an estuary is driven by the cost of production, demand and price for the product, water quality, production methods, availability of land bases and supporting infrastructure, and confidence in the security of access to the water and land resources required. Supply is controlled by competition from other estuarine user groups, estuarine carrying capacity and the availability of suitable area.

This strategy therefore aims to establish an orderly process of adjusting the lease area available to industry.

The following lease area adjustment policies apply.

1. An amnesty on lease surrender fees will be established for five years commencing on gazettal of this strategy.
2. At each five year review of OISAS, all surrendered lease area will be considered for removal from the priority oyster aquaculture area identified on the oyster aquaculture maps.
3. Leases marked as 'phase out' on the oyster aquaculture maps will not be renewed at expiry or re-leased if surrendered.
4. Following commencement of this strategy, any priority oyster aquaculture area identified on the oyster aquaculture maps that remains unleased for more than 10 years may be considered for removal from the priority oyster aquaculture area on the oyster aquaculture maps.
5. The priority oyster aquaculture area identified on the oyster aquaculture maps may be increased by adding new lease area approved by development consent under Part 4 of the *Environmental Planning and Assessment Act, 1979*.
6. The priority oyster aquaculture area identified on the oyster aquaculture maps may be adjusted to facilitate the objectives of this strategy.

### 5.3 Oyster aquaculture maps

Table 6 gives the areas of each of the mapped categories of oyster aquaculture lease area, which are:

Areas identified as priority oyster aquaculture areas	coloured green
Areas that are currently leased that are not suitable for oyster aquaculture and are identified for phase-out	coloured orange
Current leases on the National Parks estate	coloured blue
Previously leased areas not suitable for oyster aquaculture	stippled grey
Oyster aquaculture areas located on the Marine Parks estate.	cross hatched

**Table 6: Lease area for oyster aquaculture.**

Estuary Column 1	Greatest area historically leased (ha) Column 2	Current leases in the National Parks estate (ha) Column 3	Area mapped as priority oyster aquaculture area (ha) Column 4	Current lease area mapped as phase out (ha) Column 5
Tweed River	41.0		27.5	0.3
Brunswick River	15.0		9.3	1.7
Richmond River	29.0		22.2	
Clarence River	37.0		13.4	3.3
Sandon River	7.0		4.5	0.2
Wooli Wooli River	32.0		18.3	
Bellinger River	29.0		24.5	0.9
Nambucca River	75.0		65.3	
Macleay River	118.0		100.0	
Hastings River	144.0		120.5	
Camden Haven	166.0	18.0	80.4	
Manning River	331.0		274.9	
Wallis Lake	414.0		358.3	1.7
Port Stephens	1705.0		861.8	3.3
Hunter River	35.0	17.8	0.9	0.6
Brisbane Waters	228.0		151.4	5.3
Patonga Creek	27.0		23.5	
Hawkesbury River	447.0		292.7	70.7
Botany Bay	297.0		109.8	
Georges River	74.0		1.8	
Shoalhaven River	21.0		12.9	0.4
Crookhaven River	260.0	35.2	101.1	1.2
Currambene Creek	13.0			
Moona Moona Creek	<1			
Conjola River	14.0		8.5	
Narrawallee Creek	12.0			
Burrill Lake	19.0		1.1	
Clyde River	236.0		187.3	3.6
Tomaga River	11.0		3.5	
Moruya River	25.0		12.5	
Tuross Lake	145.0		109.7	0.4
Wagonga Inlet	112.0		86.6	
Wallaga Lake	28.0		5.2	
Bermagui River	45.0		35.3	
Murrah Lagoon	<1			
Wapengo Lake	94.0		76.3	1.0
Nelson Lagoon	48.0		22.3	
Bega River	7.0		1.8	
Merimbula Lake*	142.5		125.8	
Pambula River	116.0		97.3	2.0
Towamba River (Kiah)	9.0			1.0
Wonboyn River	62.0		52.6	0.5

\* does not include 16.4 ha sub-let from the lessees of the Merimbula Airport.

## Chapter 6

# Commitment to environmentally sustainable practices

### 6.1 Good neighbour policy

The NSW oyster industry is an integral part of many NSW coastal communities. Oyster farming businesses not only generate economic benefits, but also make a positive and constructive contribution to the social fabric of these communities.

Oyster farmers appreciate the wider social responsibilities of their businesses and aim to be recognised in their communities as good corporate citizens and environmentally responsible, professional primary producers.

Oyster farmers recognise that the land adjacent to leased areas is either community owned public land or private land. In either case, this land is treated with respect and oyster farming activities are conducted so as to minimise any existing and potential impact on this land.

Responsible NSW oyster farmers:

- Do not abandon infrastructure and equipment as it can cause a hazard to water craft, land vehicles and the environment;
- Ascertain ownership of adjacent lands and liaise with these 'neighbours';
- Recognise that Crown land or National Park is land owned and managed for the public good, and is not vacant land;
- Acknowledge the responsibility that goes with the right of access to public waterways and infrastructure;
- Operate so as not to interfere with the reasonable peace, comfort or privacy of other estuarine and foreshore neighbours;
- Minimise noise, especially in the vicinity of residences and during the quiet times of the day;
- Treat neighbours and the community cordially and with respect;
- Actively participate in community forums;
- Give preference to purchasing local products and employing local people;
- Develop and maintain excellent relationships with their communities, building mutual trust and respect; and,
- Acknowledge community concerns and co-operate with neighbours to resolve them.
- Recognise that Aboriginal people may have occupied oyster lease areas and/or land adjacent to lease areas,
- Are committed to assessing and preserving the Aboriginal Heritage values of coastal communities.

## 6.2 Estuarine stewardship policy

Stewardship is the management of a resource on behalf of someone else. In the context of ESD, the stewardship of estuarine resources is on behalf of present and future generations. The estuarine stewardship 'team' consists of governments, the local community, local industries that are dependent on the estuary, and other industries and communities whose activities are affecting the estuary.

The NSW oyster industry is dependant on healthy environmental conditions in estuaries for healthy and productive oyster growth. The industry therefore has a vested interest in seeing estuarine ecosystems protected and restored. In turn, farmed oysters now provide the filtering of estuarine water previously undertaken by natural oyster reefs. These reefs all but disappeared from NSW estuaries in the late nineteenth century following the appearance of a parasitic mudworm that is lethal to the Sydney rock oyster. The mudworm spread between east coast estuaries and forced oyster farmers to develop intertidal cultivation practices.

The oyster industry has an intimate knowledge of estuarine processes and resources, developed over generations of 'working the water'. Estuaries would benefit from having this knowledge incorporated into land and water planning. A focused involvement may also establish a positive feedback loop for the industry that is likely to increase consumer confidence and community acceptance of a sustainable oyster industry remaining in NSW estuaries (Healthy Rivers Commission, Oysters Review, 2003).

Responsible NSW oyster farmers:

- Do not litter or pollute land or waters;
- Take all reasonable measures to minimise any existing or potential impacts on adjoining land and remove any oyster farming materials that unintentionally wash ashore, as soon as possible;
- Operate their business to minimise any existing and potential environmental impact;
- Support catchment management and land use planning processes that maintain and/or improve estuarine health;
- Get involved in local resource management planning, estuary management and land use decision making;
- Ensure that the industry's intimate knowledge of estuaries and the industry's reliance on healthy estuaries is heard and incorporated into land and water management processes;
- Continue to work with government and the community to manage pest, disease and noxious species;
- Keep an eye on their patch and report environmental changes and potential water quality problems to the relevant authority;
- Recognise and promote the public benefit of estuarine water and environmental monitoring and reporting;
- Ensure that their activities do not degrade conservation and care of unique natural and cultural resources; and,
- Act as a good example to others and actively promote responsible habitat management and estuarine stewardship.

### 6.3 Commitment to comply with, and where possible exceed, regulated standards

Government establishes minimum standards of performance in key areas of the operation of the oyster industry on behalf of the people of NSW. These standards attempt to balance potential environmental and social impacts of activities with the operational and viability needs of industry. These aims are not mutually exclusive and the oyster industry is committed to identifying and implementing improvements to their businesses that achieve a threefold effect: meet, and where possible exceed, regulatory standards; improve business profitability; and, improve environmental performance. Leading farmers have prepared environmental management systems to formally address these issues and incorporate them into their business operation.

Responsible NSW oyster farmers:

- Make themselves aware of the regulations that apply to their businesses and as a minimum standard comply with those standards;
- Seek to identify aspects of their business activities that can improve profitability and environmental performance;
- Support and participate in training programs to improve skills and knowledge on industry best practice, environmental and community issues;
- Support research and development initiatives that aim to improve the profitability and environmental performance of the industry; and,
- Get involved in the development of appropriate standards for industry regulation.

### 6.4 Oyster industry Crown land base sites

To ensure a sustainable industry which is in harmony with the surrounding environment, including the need for stewardship and accountability for land management over the leased areas it is important that:

- Activities are carried out within the lease boundaries and do not encroach onto adjoining Crown land, including the bed of adjoining waterways;
- Disposal of oyster shell and other by-products does not occur within the lease or on the adjoining Crown land, including the bed of adjoining waterways;
- Submerged land is not reclaimed by filling with oyster shell or other materials without written approval of all relevant authorities;
- Native vegetation, including riparian vegetation is not interfered with, both within and outside the leased areas;
- Disused and abandoned equipment is removed from Crown land, including the bed of waterways; and,
- Any activity on leased areas is consistent with the purpose of the lease.
- The Aboriginal heritage values of the site are assessed in consultation with DEC, the Aboriginal Community and by making reference to the Aboriginal Heritage Information Management System.

## **Definitions for Crown land base sites**

'Lease' – means lease under the *Crown Lands Act*, 1989;

'Premises' – means land and improvements within the leased area; and,

'Oyster Industry Purposes' – means depuration, spat growing (nursery) and operations directly related to the transfer of oysters to and from cultivation areas.

## **Delineation of lease boundaries and identification of structures and works**

The holder of a Crown land lease is required to undertake a program to identify the surveyed boundaries of the lease and the position of any buildings, works or uses thereon.

### **Boundary identification and marking**

Boundaries and/or corners of leases are to be clearly marked and remain clearly marked for the duration of the lease. The Department of Lands will accept, as a minimum, the positioning of white painted posts (minimum 100mm diameter) extending no less than one (1) metre above ground level, on all corners and at intervals no greater than 20 metres apart. In some instances, particularly where there is a history of continued encroachment and/or dumping of waste outside the lease boundaries, the Department of Lands may require the lease holder to fence the landward boundaries of the lease.

### **Identification of structures and works**

The holder of a lease is required to provide the local office of the Department of Lands a description of all existing works and structures (size, materials, condition, etc.).

### **Unauthorised developments**

All structures, works or uses are to be authorised and holders are required to show proof of any authorisation. Structures, works and uses without the appropriate consents are regarded as 'unauthorised developments' and the holder will need to remove the structures or cease the unauthorised use. Lease holders will need to justify why any structures, works or uses regarded as 'unauthorised developments' should not be removed or ceased. This will apply to those structures, works or uses that do not comply with the lease purpose.

## **Condition and maintenance of premises**

### **Visual amenity**

To minimise potential impacts on the visual amenity of the estuary, oyster industry land base sites should be kept in a reasonably neat and tidy condition at all times and all structures are to be kept in good repair. The visual amenity of the area is to be maintained by painting the structures in colours acceptable to the relevant local council.

Materials and equipment are to be stored in an orderly fashion and storage of chemicals and other hazardous materials to comply with Australian Pesticides and Veterinary Medicines Authority and Department of Environment and Conservation requirements.

Any redundant material or equipment is to be removed from the premises. Materials and/or equipment are not to be stored temporarily or otherwise on adjoining Crown lands (including waterways).

**Disposal of shell, disused tarred sticks and other waste material**

The deposition of oyster shell, solid waste (including tarred sticks), debris and contaminated by-products within the premises, other than on a temporary basis, is prohibited. All such materials are to be removed from the premises to a disposal site authorised to accept such materials.

## 6.5 Stocking density

Over-stocking is where oyster stocking levels exceed the carrying capacity of an individual growing area or estuary. Overstocking means that stock does not have access to sufficient food. Poor growth, increased susceptibility to disease and increased susceptibility to heat kills have been linked to overstocking in various NSW estuaries (see Ogburn, 2006).

The number of oysters an estuary, or area within an estuary, can produce is dependent on a wide range of environmental variables and there is currently insufficient data and knowledge to successfully estimate it on an environmental basis (for example using the primary productivity of an estuary). Consequently, no practical scientific tools exist to quantify optimal stocking densities.

Current projects are being undertaken to address this deficiency. Key projects include PhD. Research at the Australian National University, an FRDC funded project being carried out at the University of Sydney and the NSW Comprehensive Coastal Assessment Project 'Effect on coastal lakes of different kinds of land use'. The outcomes of these projects may be used to develop lease area management strategies in future versions of this strategy.

Stocking density varies widely between estuaries, method of cultivation and individual farmer preference. Estuary stocking levels are controlled to a large extent by lease stocking density decisions made by individual farmers. White (2002) estimated that, on average, over the period 1968/69 to 2000/01 the annual yield for NSW oyster leases for human consumption was 20.5 bags/ha. Ogburn (2006) used 2003/04 production data (for human consumption) and estimated that the average yield was closer to 50 bags/ha taking into consideration that approximately 50% of lease area was fallow or uncultivated. Taking into consideration that it takes 3 to 4 years to grow an oyster, stocking densities tend to vary between less than 100 bags/ha for some stick growing areas to over 600 bags/ha in prime fattening areas.

Experienced oyster farmers can estimate local carrying capacities based on previous production and environmental conditions. It is acknowledged however, that because oyster farmers rely on a common food resource, a conflict between individual interests and the common good may develop. DPI can prepare stock management plans to manage this issue, for estuaries or parts of estuaries, at the request of the local oyster industry. These plans would be prepared in consultation with all affected parties and would be given effect under the *Fisheries Management Act*, 1994.

The following stocking densities can be used as a guide for an average NSW oyster producing estuary:

- The minimum distance between tray or single layer non-cement coated stick cultivation is 8 metres;
- The minimum distance between multiple layer or cement coated stick cultivation is 16 metres;
- The maximum length of single strand of supported baskets/tumblers or floating cultivation on a lease is 2.5 km per ha of lease; and,
- The maximum area of raft cultivation on a lease is 540 square metres of raft per ha of lease.

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# Chapter 7

## Best practice standards

These best practice standards contain both voluntary (should) and mandatory (must) provisions. It is envisaged that oyster businesses will adopt voluntary practices as finances and maintenance schedules allow, consistent with their commitment to environmentally sustainable practices. Nothing in these standards stifles any innovation that achieves an even higher standard of performance.

Existing approved activities continue to be permissible provided they are not inconsistent with the mandatory provisions, permit conditions, lease conditions or the provisions of the *Fisheries Management Act, 1994*.

### 7.1 Lease marking

To ensure the safe navigation of oyster aquaculture areas, individual oyster aquaculture leases must be marked in a consistent and appropriate manner. In this regard all marking must be highly visible and provide navigational guidance, and in doing so, marking itself should not provide a threat to safe navigation of oyster aquaculture areas. Appropriate marking also clearly establishes the use of the area for oyster aquaculture and clearly identify individual oyster aquaculture leases.

**Compliance with marking requirements is mandatory.**

#### 7.1.1 Marking standards 'common' to all leases

The following lease marking standards apply to all oyster aquaculture lease areas identified under this strategy:

##### Marker post materials

All oyster aquaculture lease marker posts must:

- Be constructed of materials that are long lasting, pose no risk of significant environmental harm, be recyclable and made from renewable resources and/or recycled materials;
- Be white in colour above the high water mark;
- Not be constructed of steel or materials that will corrode rapidly.

##### Lease corner marker posts

An oyster aquaculture lease corner marker post is required at each point on the lease where there is a change in heading of the boundary of more than 20 degrees or the boundary point is shared with one or more adjacent oyster aquaculture leases. An oyster aquaculture lease corner post must:

- Have an approved DPI<sup>4</sup> oyster lease sign attached at least 1 metre above the high-water mark;

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<sup>4</sup> An oyster aquaculture lease sign provided by an approved DPI supplier.

- Have a minimum diameter or diagonal width of,
  - 90 millimetres where the post is constructed wholly of white plastic with internal timber reinforcing (minimum diagonal width of 80mm), or
  - 150 millimetres where the post is constructed wholly of timber;
- Be firmly placed;
- Be equal in height to adjacent intermediate posts and evenly spaced;
- Appear to be square to the water surface to the casual observer;
- Be white in colour above the high water mark; and,
- Have between 1.25 metres and 1.5 metres showing above high-water mark (spring tides).

### **Intermediate lease marker posts**

An intermediate oyster aquaculture lease marker post marks the boundary of a lease between two lease corner posts. Intermediate oyster aquaculture lease marker posts must:

- Have a minimum diameter or diagonal width of,
  - 75 millimetres, where the post is constructed wholly of white plastic with internal timber reinforcing (minimum diagonal width of 70 millimetres), or
  - 100 millimetres, where the post is constructed wholly of timber;
- Be firmly placed;
- Be equal in height to adjacent intermediate posts and evenly spaced;
- Appear to be square to the water surface to the casual observer;
- Be white in colour above the high water mark; and
- Have between 1.25 metres and 1.5 metres showing above high-water mark (spring tides).

### **Intermediate lease marker post spacing**

The oyster aquaculture maps categorise the water adjacent to each oyster lease boundary using Categories 1, 2, 3 and 4. The requirements for intermediate lease marker post spacing is given in Table 7.

**Table 7: Intermediate lease marker post spacing.**

<i>Marking Category</i>	<i>Description</i>	<i>Minimum intermediate post spacing</i>
1	High level of boating activity – i.e. adjacent to main navigation channels, ways of access, and recreational areas.	10 metres
2	Medium level boating activity.	25 metres
3	Low use areas and foreshore boundaries with public access.	50 metres
4	Minimal use areas with boundaries adjoining other oyster leases and minimal use/limited access foreshores such as bushland.	100 metres
SPECIAL	Dredge leases and other exceptional circumstances.	As directed

### **Navigation aids**

Navigation aids (e.g. directional arrows, port and starboard colours and/or visual marks) must not be placed on any oyster lease or oyster lease boundary without prior consultation and written approval of the local Maritime Authority boating services officer.

The Maritime Authority may require the installation of navigation aids in some circumstances and will advise leaseholders in writing of any such requirements.

## **7.1.2 Special marking standards**

### **Dredge bed oyster leases**

The following additional marking requirements apply to all dredge bed oyster aquaculture leases:

- Where oyster dredge beds are entirely below the Mean Low Water Mark and the depth of water precludes the placement of posts, DPI may consider a written request for exemption from normal marking requirements;
- The oyster dredge lease must be marked on the shore, directly adjacent to the lease boundary and the mark must be clearly visible from the water and land; and,
- The shoreline mark must have an approved DPI oyster lease sign attached at least 1metre above the high-water mark.

### Raft oyster leases

The following additional marking requirements apply to all oyster aquaculture leases approved for raft cultivation:

- At each corner of a raft that adjoins a navigational channel, a vertical posts must be fitted that,
  - is of a minimum height of 0.7 metres above the waterline,
  - has attached near the top, two flat white panels (attached at 90 degrees to one another) each of a dimension of 300 mm x 300 mm when sighted from any horizontal position,
  - has post and fixture painted white,
  - has reflectors fitted if required by the NSW Maritime Authority; and,
- At the end of a raft located closest to each corner of the oyster aquaculture lease, a lease sign must be fixed (between 1.25 metres and 1.5 metres showing above high-water mark),
  - such signs may form part of the corner marks of the raft, and
  - may substitute for a 'common' oyster aquaculture lease corner post and sign.

### Foreshore oyster aquaculture leases

The following additional marking requirements apply to all foreshore oyster aquaculture leases:

- Foreshore leases, being natural rock or break-walls where no cultivation infrastructure has been placed on the lease area are to be marked on the shore, directly adjacent to the lease boundary and the mark must be clearly visible from the water and land;
- The shoreline mark must have an approved DPI oyster lease sign attached at least 1m above the high-water mark; and,
- No sign may be installed on a National Park or Nature Reserve without approval from the Department of Environment and Conservation.

## 7.2 Keeping leases neat and tidy

The perception of 'neat and tidy' is affected by the design and construction of the lease infrastructure, choice of materials and colour and how well it is maintained. Neat and tidy leases are important to minimise potential effects on estuarine amenity, to ensure lease materials are safe and secure and to provide optimal conditions for oyster cultivation.

To minimise potential impacts on estuarine amenity it is desirable that lease infrastructure be designed to fit into its surroundings as much as possible. A unified appearance helps to reduce the potential impact. Contrasting elements that vary in height, angle, material finish, colour or reflectivity, draw the attention of viewers and may lead to unacceptable visual impacts.

Materials should ideally be long lasting, pose no risk of environmental harm, be recyclable and made from renewable resources and/or recycled products. The use of new tar treated timber infrastructure will be phased out as soon as practical as identified by the *Timber Alternatives in the NSW Oyster Industry* project.

The *Timber Alternatives in the NSW Oyster Industry* project is a joint industry and government program established to identify alternative infrastructure materials to traditional tarred timber. Alternatives have been identified that are durable, recyclable, economical and practical. Adoption of alternative infrastructure materials will minimise risk of leases becoming derelict because the materials (eg HDPE plastics) are more durable (up to four-fold time period) and have a salvage value. Consequently leases will have much longer depreciation cycles and will maintain higher resale values over a long time frame with minimal refurbishing and clean-up requirements. The industry has recognised the economic and environmental benefits of this program and is rapidly adopting this new technology. The program won the 2003 Sydney Fish Market Seafood Award for Excellence in Environmental Practice.

A list of suppliers of alternative oyster farming infrastructure can be accessed from the NSW Farmers Association website at:

[http://www.nswfarmers.org.au/\\_\\_data/page/4400/SUPPLIERS\\_NETWORK\\_FOR\\_ALTERNATIVE\\_OYSTER\\_FARMING\\_INFRASTRU.pdf](http://www.nswfarmers.org.au/__data/page/4400/SUPPLIERS_NETWORK_FOR_ALTERNATIVE_OYSTER_FARMING_INFRASTRU.pdf)

The Department of Environment and Conservation immobilisation approval for the disposal of tar treated oyster industry waste expires on December 2006. This approval will be reviewed prior to expiry.

### 7.2.1 Neat and tidy standards 'common' to all leases

The following oyster aquaculture lease tidiness standards apply to all oyster aquaculture lease areas identified under this strategy.

#### Visual amenity

To create visual harmony and compatibility oyster lease infrastructure should be:

- Black, dark grey or dark grey/green in colour;
- Consistent in shape and design;
- Consistent in colour;
- Consistent with the natural environmental line and form;
- Consistent and low in height;
- Consistent in line and direction;
- Matched to the scale of the surroundings; and,
- Matt finish texture.

If possible leases that are within the same visual catchment should use the same types of cultivation equipment, same spacing and alignment as this creates uniformity.

#### Lease maintenance and materials

All oyster aquaculture leases must be:

- Kept in good repair and all fallen or damaged cultivation materials must be rectified within the timeframes specified in this strategy (Section 2.3.1) or under the terms of an agreed DPI workplan;
- Free of old or unserviceable timbers, stumps and waste material;
- Free of these prohibited materials:

- continuous lengths of conveyor belting exceeding 10 metres
- glass,
- steel, steel star pickets and corrugated iron,
- tiles and bricks, and
- tyres.

All oyster aquaculture leases should:

- Be constructed of materials that are long lasting, pose no risk of significant environmental harm, be recyclable and made from renewable resources and/or recycled materials; and
- Have the use of new tar treated timber infrastructure phased out as viable alternatives become available.

## **7.2.2 Special neat and tidy standards**

### **Post supported intertidal cultivation**

- All sticks, trays and other cultivation materials fallen from supporting rails and/or lines must be re-secured as soon as tides, weather and normal work schedules permit;
- Racks and lines must be constructed to appear straight and level to the casual observer; and,
- Posts must be secure and appear square to the water surface to the casual observer.

### **Catching sticks, depot sticks and trays**

- Catching sticks, depot sticks and trays must not remain continuously on a lease for more than two years; and,
- Any fallen catching sticks, depot sticks or trays must be retrieved as soon as tides, weather and normal work schedules permit.

### **Rafts**

- Rafts may only be placed on a lease subject to DPI approval and endorsement of that lease;
- Rafts must be securely moored within the lease and must remain entirely within the lease boundaries at all times;
- Rafts must be low in height and must not be used to store infrastructure and materials;
- Plastic drums and floats must be adequately secured at all times and replaced if broken or leaking;
- The use of steel or concrete pontoons is prohibited;
- The raft must be designed and constructed to float horizontally to the water surface; and,
- Rafts must not be used to store waste or cultivation materials.

### **Floating cultivation**

- All floating cultivation must be securely fixed, taut and must remain entirely within the lease boundaries at all times; and,

- Any fallen baskets, trays or sticks must be retrieved as soon as tides, weather and normal work schedules permit.

### **Fallow leases**

- Leases may be left fallow for up to five years. Longer fallow periods are permitted if identified in an approved commercial farm development plan or with the prior written approval of DPI;
- Only sound posts and rail may remain on fallow leases. All rafts trays, sticks, supported baskets/tumblers and floatation must be removed;
- Lease marking must be maintained during the fallow period; and,
- Rails and posts must be maintained in good order during the fallow period.

## **7.3 Decommissioning oyster aquaculture leases**

Leases that are expired, cancelled or surrendered must be completely cleared of all cultivation materials, stock, equipment, wave barrier fences and marker posts before the lessee is discharged from legal responsibility for the area.

The removal of rock cultivation will only be ordered if it poses serious navigation, amenity or safety risk and can be removed without causing significant net environmental harm. Rock cultivation may only be removed with the approval of DPI.

## **7.4 Platforms and sheds**

New work platforms, culling sheds and structures for the storage of un-used culture materials (i.e. depot sticks and trays) will not be approved on oyster aquaculture leases.

A future review of existing platform and shed structures on oyster aquaculture leases will be undertaken in conjunction with the Department of Lands, to verify approval status, condition and tenure.

## **7.5 *Posidonia* (strapweed) protection**

Oyster aquaculture that is over or may potentially shade *Posidonia australis* (Strapweed) should use:

- Supported baskets/tumblers;
- Floating cultivation;
- Single layer stick cultivation; or,
- Other methods that minimise shading.

Multiple layer stick cultivation, tray cultivation, shade cloth and any other materials or culture methods that would unduly shade a *Posidonia* bed are not recommended.

No *new* oyster aquaculture areas will be approved over *Posidonia* sp or *Zostera* spp seagrass beds.

## 7.6 Threatened species protection

- Take all possible care to avoid hitting turtles with boats or propellers’.
- Do not discard any debris into the estuary or adjacent lands.
- Ensure all ropes and mooring lines are taut and design floating cultivation to prevent entanglement.
- Participate in the protected, threatened and pest species sighting program to improve knowledge of the distribution and abundance of the species.
- Become familiar in how to identify threatened estuarine species for example, Green Sawfish, Little Tern, Osprey, Pied Oyster Catcher, Sooty Oyster Catcher and Turtles.
- Take care not to disturb potential nest tree sites or nests on oyster leases.
- Take care not to disturb known or potential habitats adjacent to oyster aquaculture areas, for example, Little Tern, Osprey, Pied Oyster Catcher and Sooty Oyster Catcher.

## 7.7 Wave barrier fencing

Wind and boat generated waves may cause significant damage to oyster aquaculture infrastructure and crops. To mitigate these impacts, wave barrier fences are necessary in some oyster aquaculture lease areas.

Under the *Fisheries Management Act, 1994*, the permission of the Minister for Primary Industries is required to construct a wave barrier fence on an oyster aquaculture lease. Wave barrier fences must meet the standards defined in this strategy and can only be constructed on leases approved and endorsed by DPI for these structures.

**All wave barrier fences must comply with the following standards.**

Wave barrier fences must:

- Be wholly within the oyster aquaculture lease area;
- Not unreasonably restrict ways of access to other leases, or to other public waters;
- Not obstruct access to an intertidal shoreline;
- Must meet the requirements for lease marking in this strategy if parts of the fence constitute lease markers (e.g. corner and intermediate boundary marking); and
- Be free of these prohibited materials:
  - continuous lengths of conveyor belting exceeding 10 metres
  - glass,
  - steel, steel star pickets and corrugated iron,
  - tiles and bricks, and
  - tyres.

Wave barrier fences should:

- For floating fences, not extend more than 50cm above or below the water surface and must be fixed such that they do not drift or extend beyond the boundaries of the lease;
- For fixed (not floating) fences, not extend above Mean High Water Mark and where possible, fences should not extend more than 50 cm above the highest level of cultivation materials and must not extend more than 20cm below the lowest level of cultivation;
- Be consistent in materials, construction, design and colour;
- Be compatible in colour and materials with adjacent cultivation infrastructure; and
- A wave barrier fence should have matt finishes in black, dark grey or grey/green.

## 7.8 Hours of operation

The hours on which oyster leases can be worked are restricted by tides and weather conditions. Therefore it is important that routine stock handling operations and emergency lease and marking repairs can be conducted at all times.

The hours of operation for routine, well managed, stock handling operations, harvest and emergency lease and marking repairs are not restricted. These activities include:

- Harvest,
- Washing,
- Grading,
- Stocking and de-stocking a lease,
- Marking, and
- Emergency lease and marking repairs.

However, within 200 m of private residences programmed lease construction and unduly noisy operations should only be conducted on oyster aquaculture leases during the period from 7:00 am to 6:00 pm Monday to Friday. Emergency repairs and emergency stock management operations are exempt from this restriction.

## 7.9 Noise

Oyster farmers operate in an extremely variable noise climate. Background noise varies with wind and wave action and the activity of other boats, the sensitivity of receivers varies with the time of day, perceptions and proximity to the activity and noise propagation varies with climatic conditions.

Oyster farming is not known as a noisy activity and has not, historically, been the source of serious noise problems. The main routine noise sources, outboard motors and on-board equipment (winches and pumps) are generally less noisy than recreational power-boats and many other waterway activities. As the industry switches to modern four stroke and fuel injected two stroke motors, the noise levels of outboard motors and on-board equipment has dropped significantly. These modern engines also have reduced emissions.

The *Protection of the Environment Operations Act, 1997* and the *Protection of the Environment Operations (Noise Control) Regulation, 2000* are the primary legislative means of controlling noise on NSW waterways. The NSW Maritime Authority is the responsible authority.

In the case of an offensive noise issue the NSW Maritime Authority will help to find a compromise between being able to conduct legitimate activities that may emit noise and the responsibility to minimise noise. Where noise is identified as a problem, there is a general expectation that whoever is creating the noise should take all feasible measures to minimise it.

Noise mitigation options may require that the equipment no longer be used, that the equipment be modified or that the equipment only be used at certain times of the day.

Industry best practice for noise management includes:

- Using only four-stroke, fuel injected two stroke outboard motors or other boat motors that meet DEC standards;
- Reducing boat speed near sensitive receivers;
- Keeping all on-board motors in good repair with appropriate mufflers fitted;
- Aiming to develop amicable relations with residential neighbours and have regular contact so that potential problems can be identified and resolved at an early stage;
- Acknowledging complaints and aiming to resolve them co-operatively;
- Complying with any direction of a NSW Maritime Authority authorised officer; and
- Using courteous language in the vicinity of other waterway users and residential neighbours.

## 7.10 Washing oysters

Washing oysters is undertaken to control parasitic mud worm infection, to cool oysters in very hot conditions and to meet food safety standards. The material washed from oysters is fine silt that settles from the water column and marine bio-fouling organisms.

Washing is undertaken by pumping water from the estuary through sprays and nozzles and returning this water to the estuary. Stock and infrastructure is either returned to a land base for washing or washed in-situ on an aquaculture lease.

In-situ washing must be:

- Undertaken using equipment kept in good repair with mufflers attached to all motors;
- Undertaken to keep noise to a minimum;
- Managed and undertaken to minimise any adverse effects on water quality.

## 7.11 Spray Irrigation

Where high summer temperatures coincide with low tide periods occurring during the middle of the day, oyster lease temperatures in sheltered areas

may exceed 50°C. These conditions may result in significant oyster mortality (up to 100%). To mitigate these events in vulnerable and valuable tray finishing areas, oyster farmers have historically installed spray irrigation to cool their oyster crops. Sprays are fed by portable pumps placed on small permanent pump stands to which the irrigation system is attached. Farmers may also use portable oyster washing equipment mounted on an oyster punt to cool oysters.

In most instances heat prone lease areas are located in remote bays and inlets surrounded by steep hills that inhibit local wind cooling effects and are not usually in close proximity to residential development. Where spray irrigation is installed it may only be required to be activated for short periods (2-3 hours) on a few days per year.

Best Practice for spray irrigation includes:

- Approval must be obtained from DPI for the establishment of irrigation infrastructure on previously non-irrigated lease areas;
- An irrigation pump stand may form part of a fence but must be constructed wholly within the lease area;
- All reasonable care must be taken to ensure that irrigation pumps do not pollute the marine environment; and
- Noise provisions described in Section 7.9 apply equally to irrigation pumps and sprinkler systems.

## 7.12 Dredging and reclamation

Reclamation and dredging to maintain adequate water depth by oyster farmers and is not a routine oyster aquaculture activity and may only be undertaken with development consent. Other approvals may also be required.

## 7.13 Pest and disease control

DPI biosecurity branch prepares and implements control measures for aquatic pest and disease management.

Where there has been a significant level of oyster mortality or there is good reason to suspect oysters are being affected by a disease/organism the local District Fisheries Office must be notified immediately.

Three aquatic pest and disease control plans are particular relevance to the NSW oyster industry namely, Pacific oyster control, QX disease management and *Caulerpa* control.

### **Caulerpa control**

Best practice for *Caulerpa* control includes:

- Abide by any special permit or lease conditions relating to *Caulerpa* control and abide by the conditions of the NSW Control Plan for the Noxious marine weed *Caulerpa taxifolia* in NSW waters.
- Avoid boating near *Caulerpa taxifolia* outbreaks. Propellers cut the plant into many fragments that can drift into areas only to grow into new outbreaks.

- Inspect and clean anchors, ropes and chains before leaving an affected area.
- Inspect and clean trays and other infrastructure prior to movement out of a *Caulerpa* affected area. Fisheries Offices may inspect movements according the NSW Control Plan for the Noxious marine weed *Caulerpa taxifolia* in NSW waters.
- Collect fragments of *Caulerpa* and seal the pieces in a plastic bag and dispose of them in a bin where they can not re-enter a waterway.
- Report sightings of *Caulerpa taxifolia* to the Aquatic Pest Taskforce on (02) 4982 1232 or email [pests@dpi.nsw.gov.au](mailto:pests@dpi.nsw.gov.au), or to DPI 24hr reporting hotline on (02) 4916 3877.

### **QX disease management plan**

QX disease (caused by *Marteilia sydneyii*) is a declared disease under the *Fisheries Management (Aquaculture) Regulation, 2002*. The movement of oysters between certain estuaries is prohibited in NSW.

### **Pacific oyster control**

Pacific oysters are a declared noxious fish under the *Fisheries Management Act, 1994* in all NSW waters except Port Stephens.

The Pacific Oyster Control Program must be complied with when moving oysters between estuaries in NSW. Cultivation practices must include every effort to eradicate Pacific oyster overcatch in all estuaries other than Port Stephens. Where Pacific oysters are not controlled by the permit holder the control work may be done by DPI and costs recovered from the permit holder.

### **Oyster shipment zones**

Shipment of oysters between estuaries, permitted under the Pacific Oyster and QX Disease closures, is summarised in Table 8. NSW oyster estuaries have been split into 14 estuary groups. There are restrictions on sending oysters between different groups because of QX and/or Pacific oyster concerns. Oyster shipment restrictions are shown in Table 8. Permitted movements are shown with a '✓'; illegal movements are shown with an 'X'. All movements of oysters between estuaries must be recorded in an Oyster Shipment Log Book. No oysters may be removed from a lease subject to a noxious fish order, and placed on any other lease, unless the oysters are first inspected by a fisheries officer and comply with the inspection criteria prescribed in the Pacific Oyster Control fishing closure.

### **Oyster shipment log book**

All shipments of oysters (except those being moved within the one estuary or those being harvested directly for human consumption) MUST have shipment details recorded in the permit holders Oyster Shipment Logbook prior to shipping.

48 hours PRIOR notice must be given to the local District Fisheries Office before any oysters are shipped to another estuary (this notice may be left on the Fisheries Office voicemail). The notice to the local District Fisheries Office must include the Oyster Shipment Logbook permit number and details of the shipment.

The original copy of the Oyster Shipment Logbook sheet must accompany the shipment of oysters to another estuary. This copy must be kept by the receiving permit holder.

Copies of all completed logbook forms must be sent monthly to DPI Aquaculture Management.

Inspections of shipments can be conducted by fisheries officers at any time and may include inspection of the logbook. In certain circumstances an inspection is compulsory.

Where the correct procedures have not been followed fisheries officers can detain and/or seize the shipment.

**Table 8: Inter-estuary oyster movement restrictions.**  
(Current at 9 November 2006)

		TO ESTUARY															
		Tweed	Richmond Clarence	Brunswick	Wooli	Bellinger Kalang Sandon	Macleay Nambucca	Hastings**	Camden Haven Manning	Wallis Lake	Port Stephens	Hunter	Brisbane Water	Hawkesbury	Patonga	Georges River	Crookhaven/ Shoalhaven south to Wonboyn ***
FROM ESTUARY	Tweed	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Richmond Clarence	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Brunswick	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x
	Wooli***	x	✓	✓	✓	x	x	x	x	x	x	x	✓	x	✓	✓	x
	Bellinger Kalang Sandon	✓	✓	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Macleay Nambucca	✓	✓	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Hastings	✓	✓	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Camden Haven Manning	✓	✓	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Wallis Lake	✓	✓	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Port Stephens *	✓	✓	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Hunter	✓	✓	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Brisbane Water	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Hawkesbury	x	x	x	x	x	x	x	x	x	x	x	x	✓	x	✓	x
	Patonga	x	x	x	x	x	x	x	x	x	x	x	x	✓	✓	✓	x
	Georges River	x	x	x	x	x	x	x	x	x	x	x	x	x	x	✓	x
Crookhaven/Shoalhaven south to Wonboyn	✓	✓	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
<b>This table does not over-ride the closures published in the NSW Government Gazette.</b>																	
✓ movement of oysters permitted x movement not permitted * Shipping from Port Stephens is restricted to culled single oysters larger than a ten cent piece. No stick culture can be moved from Port Stephens. ** No stick culture can be moved into the Hastings from any estuary south of the Manning River. *** Wooli is permitted to ship to Wonboyn until 30 November 2006.																	
<b>NOTE: Inter-estuary oyster movement restrictions are regularly reviewed. For the latest details please contact your local DPI Fisheries Office.</b>																	

## 7.14 Punt and boat mooring

Punts and boats should not be permanently moored on oyster aquaculture leases if alternative arrangements are available. The preferred alternative is for punts and boats to be moored at work sheds, private jetties or on NSW Maritime Authority registered moorings.

## 7.15 Waste management

Wastes generated from activities on oyster leases include culture infrastructure that is no longer serviceable and bio-fouling. Best practice is:

- Reduce, re-use and recycle waste materials where possible;
- No waste is to be deposited on lease areas;
- All lease infrastructure removed from a lease must be returned to shore for processing or disposal;
- All wastes from culling activities conducted on leases should be returned to shore for processing or disposal;
- Bio-fouling on the lease superstructure (post, rail etc) should be collected and returned to shore for processing or disposal if possible; and,
- Residual materials that cannot be re-used or recycled must be disposed of to an approved waste management facility.

## 7.16 Theft of oysters and damage to oyster leases

All thefts should be reported to local police for investigation in the first instance.

DPI local fisheries officers should then be informed so that patrols can observe any suspicious activity and liaise with the police and farmers to reduce further theft.

The aquaculture lease/permit holder owns all oysters cultivated on the lease area. It is an offence under the *Crimes Act*, 1900 to steal oysters and under the *Fisheries Management Act*, 1994 to remove oysters or other cultivated species.

It is also an offence under the *Fisheries Management Act*, 1994 to interfere with aquaculture infrastructure on an aquaculture lease without the consent of the lessee.

Reports of illegal or suspicious activity should be made to your local Police Station or Crime Stoppers (1800 333 000) and your local DPI Fisheries Office.

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## Chapter 8

# Planning and approvals

### 8.1 Approval of new oyster aquaculture leases

DPI Aquaculture Administration should be contacted for current advice and information BEFORE any formal application is made to lease any area for oyster farming.

New applicants should consult the Oyster Aquaculture maps and determine if the area they wish to apply for is in a Priority Oyster Aquaculture Area, a National Park or a Marine Park. Different assessment and approval process apply to each of these areas as detailed below.

#### 8.1.1 New lease in a Priority Oyster Aquaculture Area.

1. An application for a new lease in a Priority Oyster Aquaculture Area (POAA) must be accompanied by a Review of Environmental Factors that addresses potential impacts of the new lease.
2. DPI will advertise for objections and competing interests as required, if the area is potentially available.
3. DPI will consider any objections in deciding to proceed with processing the lease application.
4. If there are multiple interests DPI will administer a competitive allocation process that will be either public tender, auction or ballot (See Section 8.2).
5. The application from the preferred applicant will be processed by DPI and assessed under Part 5 of the *Environmental Planning and Assessment Act, 1979*
6. The new lease will be gazetted by DPI if approval is granted.

#### 8.1.2 New lease in a Priority Oyster Aquaculture Area in a Marine Park

1. An application for a new lease in a Priority Oyster Aquaculture Area (POAA) in a Marine Park must be accompanied by a Review of Environmental Factors that addresses the potential impacts of the new lease on the Marine Park. New leases in a Marine Park need to be consistent with the objects of the *Marine Parks Act 1997*, the objects of the zone within which the proposed lease area is situated and must be a permissible use within that zone.
2. DPI will liaise with the relevant Marine Park Manager.
3. DPI will advertise for objections and competing interests as required, if the area is potentially available.
4. DPI will consider any objections in deciding to proceed with processing the lease application.
5. If there are multiple interests DPI will administer a competitive allocation process that will be either public tender, auction or ballot (See Section 8.2).

6. The application from the preferred applicant will be processed by DPI in consultation with the Marine Parks Authority (MPA) and assessed under Part 5 of the *Environmental Planning and Assessment Act, 1979*. If an environmental impact statement is required, the concurrence of the relevant MPA Ministers is required.
7. The new lease will be gazetted by DPI if approval is granted.

### 8.1.3 New lease NOT in a Priority Oyster Aquaculture Area

1. An application for a new lease outside a Priority Oyster Aquaculture Area (POAA) must be accompanied by:
  - a. a suitability assessment using the assessment criteria given in Table 5, AND
  - b. a Review of Environmental Factors that addresses the potential environmental impacts of the proposed new lease.
2. DPI will liaise with the NSW Maritime Authority and the Marine Park Authority if required.
3. DPI will make a preliminary assessment of the application, and determine if the area appears to be available for aquaculture.
4. DPI will advertise for objections and competing interests as required, if the area is potentially available.
5. DPI will consider any objections in deciding to proceed with processing the lease application.
6. If there are multiple interests DPI will administer a competitive allocation process that will be either public tender, auction or ballot (See Section 8.2).
7. The preferred applicant will prepare and submit a development application to the relevant local council for assessment under Part 4 of the *Environmental Planning and Assessment Act, 1979*. The development application will need to be supported by a Statement of Environmental Effects, or for designated development an Environmental Impact Statement. A Species Impact Statement is required if a threatened species is likely to be significantly affected.
8. If the proposed lease area is in a Marine Park and the consent authority intends to grant consent to the lease, the concurrence of the relevant Ministers will be sought.
9. The new lease will be gazetted by DPI if consent, and concurrence if required, are granted.

### 8.1.4 New lease in the National Park estate

1. An application for a new lease in the National Park estate must be accompanied by
  - a. a suitability assessment using the assessment criteria given in Table 5, AND
  - b. a Review of Environmental Factors that addresses the potential environmental impacts of the proposed new lease, the consistency of the activity with any management plan for the area and an assessment of the impact the activity may have on the National Park area. An Environmental Impact Statement is required if the proposed new lease is likely to significantly affect the environment.

2. DPI will liaise with NSW Maritime and the Department of Environment and Conservation and make a preliminary assessment of the application and determine if the area appears to be available for aquaculture.
3. DPI will advertise for objections and competing interests as required, if the area is potentially available.
4. DPI will consider any objections in deciding to proceed with processing the lease application.
5. If there are multiple interests DPI will administer a competitive allocation process that will be either public tender, auction or ballot (See Section 8.2).
8. The application from the preferred applicant will be assessed by the determining authority under Part 5 of the *Environmental Planning and Assessment Act, 1979*.
9. The written concurrence of the Minister for Environment will be sought if the determining authority intends to approve the lease.
10. The new lease will be gazetted by DPI if approved and the written concurrence of the Minister for Environment has been granted.

## 8.2 Competitive allocation of new lease areas

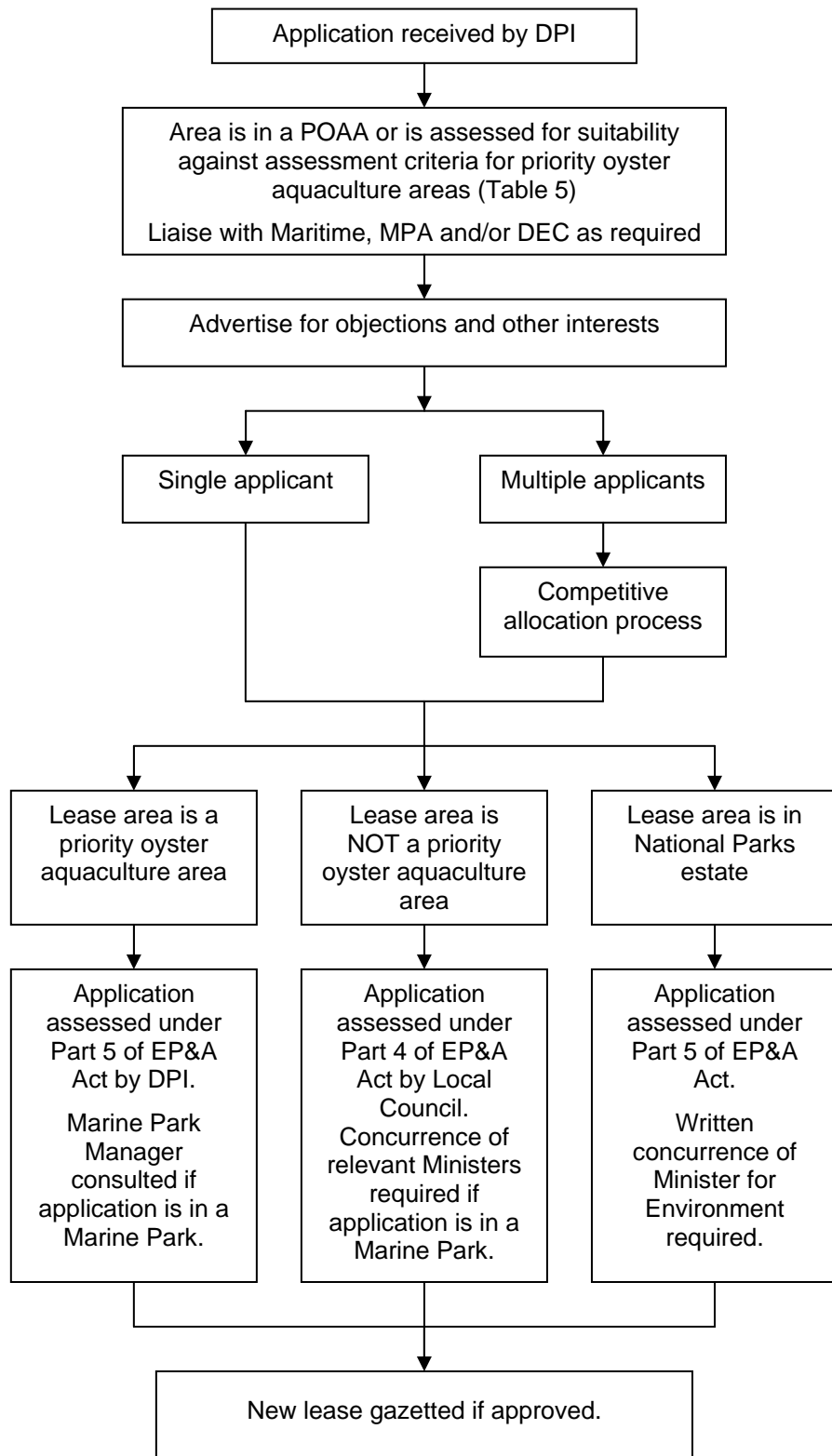
Where an interest is shown in an unleased area for oyster farming, DPI is required under the *Fisheries Management Act, 1994* to advertise for objections to the leasing of the area. DPI also advertises for other interest in leasing the area in most circumstances. Where a lease of the area is to proceed and other interest has been shown DPI may offer the lease by public tender, auction or ballot.

Should the lease be offered by tender, an independent committee assesses tenders against the following criteria:

- The net return to government and community being offered;
- Extent to which the proposal is consistent with this strategy;
- If applicable, the tenderer's record of managing one or more other leased areas; and,
- The public interest in granting the lease to the tenderer.

The new lease assessment and allocation process is outlined in Figure 3.

**Figure 3: New lease assessment and allocation process.**



### 8.3 Making Local Environmental Plans that may affect oyster aquaculture

As a result of the impacts of development of estuarine catchments (e.g. stormwater, septic seepage, sewerage outfalls), there has been a deterioration in the environmental conditions required for oyster cultivation in some estuaries.

To address this issue the priority oyster aquaculture areas will be shown on Local Environmental Plans and Council must have regard for these areas in preparing a new LEP. The Director-General of DPI may object to the terms of a draft local environmental plan on the grounds of deleterious effects on an oyster aquaculture area.

### 8.4 Determining development applications that may affect oyster aquaculture

When considering an application for development that, because of its proposed location, may affect a priority oyster aquaculture area or oyster aquaculture outside such an area, the consent authority must:

1. Give the Director-General of the Department of Primary Industries written notice of the development application and take into consideration any written submissions made in response to the notice within 14 days after notice was given, and
2. Take into consideration the provisions of the *NSW Oyster Industry Sustainable Aquaculture Strategy*.
3. Consider any issues that are likely to make the development incompatible with oyster aquaculture and evaluate any measures that the applicant has proposed to address those issues. Examples of potential land use incompatibility issues include access to oyster leases being limited by the development or the risk of adverse impacts of the development on water quality and, consequently, on the health of oysters and on the health of consumers of those oysters.

The consent authority may refuse to grant consent to development if, in the opinion of the consent authority, the development is likely to have an unreasonable impact on a priority oyster aquaculture area or on oyster aquaculture outside such an area.

### 8.5 Aquaculture permits

Aquaculture permits are not transferable and remain in force until cancelled at the request of the permit holder or by DPI.

The permit holders listed on a permit CAN NOT be changed. If there are changes to a business partnership, business name or group of farmers working under the one permit, then a new permit must be applied for and assessed by DPI.

The permit, as well as the lease, will specify the species allowed to be cultivated on a lease area.

### Applying for a permit

DPI Aquaculture Administration should be contacted for current advice. Information regarding aquaculture permits is also provided on the DPI website. Applications for oyster aquaculture permits will be assessed by the Department of Primary Industries against the Best Practice Standards in OISAS.

A new entrant to the industry will normally be required to demonstrate access to an approved land base site (work area) and have an aquaculture permit or preliminary approval, prior to obtaining any leases.

### Commercial farm development plan

All new class 'A' Aquaculture Permits (includes oysters) must submit a Commercial Farm Development Plan (CFDP) that is assessed and by DPI.

A CFDP may be reviewed by DPI where farm management and/or compliance issues arise.

### Suspension and cancellation of permits

Aquaculture permits can be suspended and/or cancelled under s.159 and s.160 of the *Fisheries Management Act, 1994*. Some reasons for suspension or cancellation given under these sections of the Act are:

- The permit holder dies or requests the permit be suspended or cancelled;
- The permit application contained false or misleading information;
- Permit conditions, including compliance notices and workplans, are not complied with;
- The permit holder has been convicted of stealing fish (includes oysters) or marine vegetation;
- Aquaculture is not being carried out in line with the Commercial Farm Development Plan; or
- Other circumstances consistent with the *Fisheries Management Act, 1994* or the *Fisheries Management (Aquaculture) Regulation, 2002*.

In cases other than when the permit holder dies or asks for the permit to be cancelled, the permit holder is given an opportunity to explain why the suspension/cancellation should not go ahead before this action is taken.

The permit holder can request an internal review of a permit suspension or cancellation. If still not satisfied, application can then be made to the Administrative Decisions Tribunal to review the case.

Permit suspension and cancellation may also lead to the cancellation of leases held under the permit.

## 8.6 Administration of existing leases

An oyster aquaculture lease gives the leaseholder the exclusive right to farm the species listed on the lease within the lease area.

Other community members still have rights of access to the area for fishing and boating, however, it is an offence for a person to interfere with or damage lease structures or stock on the leased area. There are severe penalties for theft and/or damage to stock or infrastructure on aquaculture leases.

### **Transfer, subdivision, consolidation and sublet**

On application, leases can be transferred, subdivided, consolidated or sublet. Certain conditions have to be met for each of these transactions and DPI Aquaculture Administration should be consulted.

Potential lessees are warned not to exchange a payment or enter into an agreement to take over a lease from a current lessee until they have consulted DPI Aquaculture Administration to obtain current information about the lease and lease transfers. NOTE: The transfer of a lease is NOT automatic.

The assessment of the application will consider financial and compliance records, use of existing leases by an applicant, the condition of the lease area and ensuring that the area remains or is brought into a tidy condition.

Lease transactions will not be approved unless the lease(s) is in a compliant condition or the person taking over the lease agrees to an approved workplan that addresses compliance concerns (eg marking, clean-up).

### **Surrenders, cancellations, renewals and expired leases.**

Leases surplus to oyster farmer's requirements may be surrendered on application. A lease will not be accepted for surrender unless the lease is in a compliant condition and completely free of cultivation materials.

The *Fisheries Management Act, 1994* makes provisions for aquaculture leases to be cancelled in certain cases. Should a lease be cancelled, the previous lessee remains legally responsible for removing any cultivation materials, infrastructure or stock on the lease.

Aquaculture leases are issued for a maximum 15 year term with the leaseholder being entitled to the first renewal for a further maximum 15 year term. Leases are renewable subject to the area remaining available for aquaculture and taking into consideration the lessee's compliance record. The *Fisheries Management Act, 1994* gives preferential rights to the current lessee, on renewal.

Leases that are not otherwise tenanted prior to their expiry date revert to public water land. However, the previous lessee remains legally responsible for removing all cultivation materials from the lease area.

### **Changes to activity on a lease**

The permit holder/leaseholder must obtain written approval from DPI BEFORE commencing any activity that is not consistent with the permit and lease conditions. This may include the introduction of different cultivation methods, new materials, a new species or other significant change in activity. Changes in activity that are not consistent with the OISAS Best Practice Standards may require development consent.

In particular, written approval from DPI must be obtained BEFORE constructing on an oyster lease:

- Raft cultivation,
- Fences,
- Irrigation,
- Platforms, or
- Pumpstands.

### Annual production reports

All permit holders must complete an annual production report and return it on a form approved by DPI.

### Public liability insurance and indemnity

Aquaculture permit holders must have public liability insurance cover over all leased areas. Public liability insurance cover must be to a minimum of \$10 million dollars for property owner's and occupier's liability. As this figure is updated periodically you should contact DPI Aquaculture Administration section for the current figure.

Aquaculture permit holders must also indemnify the NSW Government and their officers and agents in respect to any activities carried out on the aquaculture lease area for the purpose of aquaculture. This includes all action, suits, claims and demands, in respect of accident or injury to any person or property arising from the use of the public water land.

The permit holder's public liability insurance and indemnity must remain current at all times and apply to all leases listed on the permit and include terminated/surrendered leases where improvements remain on the lease.

Sub-lessees must list lease details on their permit and must provide public liability insurance and indemnity cover for the area.

## 8.7 Maintenance dredging of oyster leases

Dredging to maintain adequate water depth on an oyster aquaculture lease situated on Crown submerged land will require a licence issued under the *Crown Lands Act, 1989*. The provisions of the relevant local environmental plan and/or the *Environmental Planning and Assessment Act, 1979* may require development consent to be obtained. Development applications will require land owner's consent from the Department of Lands prior to lodgement.

The Department of Lands will give written notice to the Minister for Primary Industries and consider any matters raised by the Minister concerning the proposed work within 28 days of giving the notice. The Department of Lands and the relevant consent authority should be consulted for further advice.

A permit may also be required from DPI under Section 201 of the *Fisheries Management Act, 1994*. DPI will not issue such a permit unless the following best practice standards are observed.

- The material to be dredged is clean marine sand;
- No potential or actual acid sulphate materials will be disturbed;
- Maximum dredging depth is 1.0 metres below mean low water mark;
- There is no *Posidonia australis* sea grass present in the dredge area;
- The dredging activity will have no significant adverse impact on any threatened species or habitats;
- An approved spoil disposal site is available;
- The activity will not result in any significant water pollution; and

- An aquaculture lease maintenance dredging plan has been prepared in consultation with the DoP, DNR, the DPI and the relevant local council.

DPI, the Department of Lands and the consent authority should be consulted for further advice.

## 8.8 Oyster aquaculture species

### Species currently approved

There are three main species of edible oysters in NSW, the Sydney rock oyster (*Saccostrea glomerata*), the native flat oyster (*Ostrea angasi*) and the introduced Pacific oyster (*Crassostrea gigas*). Both the Sydney rock oyster and the Pacific oyster belong to a group of oysters known as 'cupped oysters', while the native flat oyster belongs to the 'flat oyster' group. World wide, the vast majority of oysters harvested for human consumption are 'cupped oysters'. This is a recent trend and has been driven largely by the translocation and cultivation of the fast growing Pacific oyster. In the past, flat oyster cultivation has been a major industry in Europe and wild flat oyster fisheries have been important in the past in southern Australia. It is believed that a disease (bonamia) that wiped out the European industry during the late 19<sup>th</sup> and early 20<sup>th</sup> century was also responsible for a significant decline in wild flat oyster populations in Australia in the 19<sup>th</sup> century. The impact of over fishing of flat oyster populations may have also contributed significantly to this decline.

The NSW oyster industry is based almost entirely on the production of the Sydney rock oyster. While the geographic range of this species extends from Wingham Inlet in eastern Victoria north along the eastern Australian coast, across northern Australia to the West Australia coast, wild populations of the oyster are most prolific in southern Queensland and NSW estuaries. In these estuaries the Sydney rock oyster is often the dominant intertidal species.

A small industry with considerable potential for expansion is developing around the cultivation of the native flat oyster in southern NSW. This species is endemic to southern Australia and is the major oyster species found in aboriginal middens in these areas. This species is primarily a sub-tidal oyster commonly found in the marine dominated areas of estuaries and has a low tolerance to fresh water runoff. While self-sustaining wild populations of this species are usually only found south of the Clarence River, individuals have been found as far north as Morton Bay in southern Queensland.

The Pacific oyster was introduced in to southern Australian states in the late 1940's and early 1950's by the CSIRO in an attempt to establish a cupped oyster industry in these states in lieu of a suitable indigenous cupped oyster species. At that time the importation of Pacific oysters into NSW was prohibited by the NSW Government. However, by the 1970's the Pacific oyster had found its way into a number of NSW estuaries. The Pacific oyster is now found in most NSW estuaries south of Port Macquarie.

Recently, farmers in several estuaries have begun trials of farming functionally sterile triploid pacific oysters (Port Stephens, Georges and Hawkesbury Rivers). These oysters are not affected by the oyster disease QX which decimated local Sydney rock oyster populations in these estuaries.

The species of oyster selected for cultivation will affect the design of the aquaculture facility as well as the viability of the aquaculture business. An

aquaculture business may cultivate more than one species. In designing the facility, flexibility of design and layout allows switching of species to meet opportunities created by changing markets, supply or production technologies.

Factors in the selection of species include:

- Constraints on translocation of species – see below;
- Genetic factors;
- Availability of seed stock (reliability, quality, quantity, seasonality);
- Documented performance of the species in the aquaculture system proposed;
- Site specific attributes eg scale required, flood liability, temperature and water quality requirements;
- Cost of production and business viability;
- Market demand and price;
- Potential disease; and,
- Other management factors.

In some situations, ‘polyculture’ (ie two or more species farmed simultaneously in the one area) may increase returns to industry and provide a more productive use of an oyster aquaculture lease area. A potential example of this is Sydney rock oyster and flat oyster farming on the one lease. Table 9 lists the edible oyster species approved for cultivation on NSW oyster aquaculture leases by estuary in 2005.

**Table 9: Species of oyster approved for cultivation on oyster aquaculture leases in NSW.**

Estuary	Sydney rock oyster	Flat oyster	Pacific oyster
Tweed River	✓	X	X
Brunswick River	✓	X	X
Richmond River	✓	X	X
Clarence River	✓	X	X
Sandon River	✓	X	X
Wooli River	✓	X	X
Nambucca River	✓	X	X
Macleay River	✓	X	X
Hastings River	✓	X	X
Camden Haven River	✓	✓	X
Manning River	✓	X	X
Wallis Lake	✓	X	X
Port Stephens	✓	✓	✓ Diploid and Triploid
Hunter River	✓	X	X
Brisbane Water	✓	X	X
Hawkesbury River	✓	X	✓ Triploid only
Georges River System	✓	X	✓ Triploid only
Crookhaven Shoalhaven	✓	✓	X
Clyde River	✓	✓	X
Moruya River	✓	✓	X
Tuross Lake	✓	✓	X
Wagonga Inlet	✓	✓	X
Bermagui River	✓	✓	X
Wapengo Lagoon	✓	✓	X
Nelson Lagoon	✓	✓	X
Merimbula Lake	✓	✓	X
Pambula Lake	✓	✓	X
Wonboyn Lake	✓	✓	X

✓ = Approved

X = Not currently approved

### **Protocol for assessing a new species for commercial oyster aquaculture**

One of the potential risks of aquaculture is the inadvertent introduction of live species into natural waters beyond their natural range or to areas within their natural range that have genetic stocks or populations that are distinct from the aquaculture stock. This is called translocation (AFFA, 1999).

Translocation of non-indigenous species is sanctioned in some catchments. In other circumstances, it may occur accidentally or deliberately.

Translocation of live aquatic organisms has a number of inherent risks for the receiving aquatic habitats as well as for endemic organisms.

The Ministerial Council on Forestry, Fisheries and Aquaculture (1999) developed a national translocation policy to meet the needs of Australia's aquaculture and aquarium industries for the translocation of live aquatic species within jurisdictions and across jurisdictional boundaries. The policy sets out a risk assessment process for considering translocation issues and identifies potential risks under the headings of escape/release, survival and establishment.

An example of illegal translocation occurred in Port Stephens when the Pacific oyster was introduced in 1984. The Pacific oyster has now established in the majority of the estuary, and significantly reduced the harvest of Sydney rock oysters.

Movement of Sydney rock oysters from one estuary to another is practiced widely in NSW to take advantage of changes in temperature and growing conditions that promotes oyster growth and condition.

On application, DPI may consider approving new edible oyster species for culture on oyster aquaculture leases. When proposing new species for cultivation on an oyster aquaculture lease, the proponent needs to submit to DPI an assessment of potential environmental effects on:

- Any critical habitats, threatened species, populations ecological communities and their populations;
- Any community of aquatic plant or animal;
- Existing commercial oyster cultivation;
- The visual, scientific, cultural or recreational amenity;
- Any cumulative effects with other existing or likely future activities; and,
- Any necessary modification to the commercial farm development plan.

DPI may impose special conditions on the approval of new species and may require a trial period of farming to monitor and assess potential environmental impacts. If critical habitats, threatened species, populations ecological communities and their populations are likely to be affected a Species Impact Statement may be required and if the proposal is likely to significantly affect the environment an Environmental Impact Statement may be required.

## **8.9 Transitional provisions**

Current oyster aquaculture activities that are lawfully approved may continue despite the provisions of this strategy.

## Chapter 9

# Complaint resolution

Complaints and grievances by residents and community groups near oyster farming areas are best dealt with at the local level with compromise and agreement between the affected parties.

The key contact for industry information is the DPI Oyster Manager who can be contacted at the Port Stephens Fisheries Centre on 4982 1232.

### 9.1 Complaint resolution principles

- Complaints will be treated seriously and dealt with promptly and, if requested, confidentially;
- All parties to the complaint will be kept informed of relevant developments and actions;
- Both parties will be encouraged to participate in all stages of the complaint resolution process; and
- The complaint resolution procedure emphasises mediation and co-operation.

### 9.2 Complaint resolution process

#### Initial response

- All complaints relating to oyster aquaculture will be directed to the Oyster Manager;
- The Oyster Manager will inform the complainant of the broad process to resolve the matter;
- An inspection of the lease or activity subject to complaint may be undertaken by a fisheries officer or the Oyster Manager;
- A fisheries officer or the Oyster Manager will discuss the complaint with the relevant lessee and/or aquaculture permit holder;
- If the lease condition and/or activity that is the subject of the complaint is found to be inconsistent with this strategy or the *Fisheries Management Act, 1994*, then appropriate action will be initiated by the relevant fisheries office or Oyster Manager; and,
- An initial written response will be provided to the complainant by the fisheries officer or Oyster Manager within 15 working days.

### **Mediation**

For complaints that can not be resolved by the initial response then:

- The complaint will be referred to DPI Manager Aquaculture;
- The Oyster Manager will meet the complainant and the relevant lessee and/or aquaculture permit holder and will attempt to mediate a resolution; and,
- Mediated resolutions will be sent to each party for confirmation within three weeks of the meeting.

### **Referral to DPI Director of Fisheries Conservation and Aquaculture**

For complaints that can not be resolved by mediation then:

- The complaint will be referred to Director, Fisheries Conservation and Aquaculture;
- The Director will review the complaint and make a determination; and,
- The Director's determination will be sent to each party within one month of the referral.

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## Chapter 10

## References

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