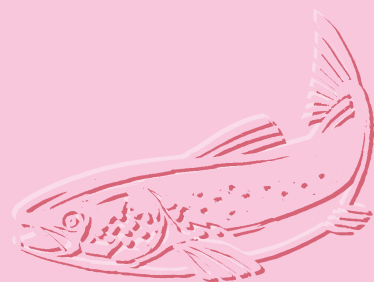


TASMANIAN FISHERIES
AND AQUACULTURE



AQUACULTURE STRATEGIC
RESEARCH PLAN

1999-2004



AQUACULTURE STRATEGIC RESEARCH PLAN 1999-2004

KEY AREA	AGENCY (FUNDING)	PRIORITY
1. Oysters		
Nursery		
Reduced mortality and improved growth of juveniles in nurseries		L
Nutrition	CSIRO (FRDC)	L
Larval rearing		
Enhance survival of larval oysters in hatcheries		L
Post-harvest technology		
Development of trace-back systems		L
Value-adding and marketing		L
Transport & packaging		L
Genetic improvement		
Selective breeding	CSIRO/TAFI/Industry (TORC/CRC/FRDC)	H
Developing sterile oyster strains	"	H
Triploidy, tetraploidy	"	H
Production systems		
Intensive land based nursery and algal infrastructure		L
Review of understanding of carrying capacity issues		L
Development and improvement of sub-tidal production systems		H
Oceanographic conditions in relation to shellfish productivity		L
Shellfish farming and the environment (cross reference to Marine Env. RAG)		
Health		
Mudworm (<i>Bocardia knoxi</i>)	TAFI (CRC)	H
Translocation (see Marine Environment Plan)		M
2. Mussels		
Nursery		
Reduced mortality and improved growth of juveniles in nurseries		H
Nutrition		L
Larval rearing		
Enhance survival of larval mussels in hatcheries		L
Broodstock management		
Broodstock management and conditioning techniques		M
Post-harvest technology		
Transport and packaging		L
Genetic improvement		
Selective breeding		L
Production systems		
Oceanographic conditions in relation to shellfish productivity		M
Longline systems		L
Health		
3. Abalone		
Nursery		
Reduced mortality and improved growth of juveniles in nurseries		L
Broodstock management		
Broodstock management and conditioning techniques	TAFI/Industry (FRDC)	H
Nutrition		
Nutrition at nursery level	CSIRO/SARDI (FRDC)	M
Development of cost effective feed	SARDI (CRC)	M
Post-harvest technology		
Export		L
Live fish transport		L
Genetic improvement		
Hybrids & selective breeding	SARDI/TAFI/CSIRO (FRDC)	H
Development of family lines	"	H
Triploidy, tetraploidy & cryopreservation	"	H
Production systems		
Water quality in land based systems		L
Open water systems	Industry	L
Health		
Mudworm (<i>Bocardia knoxi</i>)	TAFI (CRC/FRDC)	H
Antibiotic absorption and toxicity	TAFI (FRDC)	H
4. Scallops		
Nursery		
Settlement & post-settlement mortality	TAFI/Shellfish Culture (AusIndustry)	H
Nutrition	"	H
Broodstock management		
Broodstock management and conditioning techniques	"	M
Production systems		
Open water systems	"	L

KEY

Dark shading	funded	H – high; M – medium, L – low
Medium shading	proposed	
Light shading	anticipated	

AGENCY (FUNDING)	PRIORITY	99-00	00-01	01-02	02-03	03-04
SARDI/MAFRI/TAFI (FRDC)	L					
"	L					
"	M					
TAFI/CSIRO/TIAR (FRDC)	H					
TAFI (FRDC)	H					
TAFI/Uni of Adelaide (FRDC)	M					
TAFI (FRDC)	H					
TAFI/Uni of Adelaide (FRDC)	M					
TAFI	L					
TAFI/CSIRO (FRDC)	H					
TAFI (CRC)	M					
Industry	L					
TAFI/TIAR/CSIRO (FRDC)	H					
"	L					
QDPI (CRC)	L					
Industry	L					
CSIRO (FRDC)	H					
	L					
	L					
	M					
TSGA (FRDC)	H					
TAFI/CSIRO (CRC/FRDC)	M					
TAFI (FRDC)	M					
TAFI (Industry)	L					
DPIWE (Industry)	M					
TAFI (ARC)	M					
	M					
TAFI/TIAR/CSIRO (AusIndustry/FRDC)	H					
TAFI	M					
	L					
TAFI (CRC/TASSAL)	H					
TAFI/TIAR/CSIRO (CRC/TASSAL/FRDC)	M					
TAFI (CRC/TASSAL)	M					
TAFI	L					
TAFI	H					
"	H					
	M					
	H					
	H					
	M					
IFC	H					
	H					

AQUACULTURE

BACKGROUND

Aquaculture in Tasmania is a relatively new industry initiated by the introduction of Pacific oysters in the late 1940s. An oyster farming industry became established in the late sixties and took off with the opening of the first hatchery in the eighties. The growth of aquaculture was



accelerated by the introduction of Atlantic salmon in the 1980s and continues to expand rapidly. Tasmanian aquaculture production reached a value of over \$75 million in 1997/98 compared to \$27 million in 1988/89. This production is still primarily made up of salmonids and oysters, but the production of other shellfish such as scallops, mussels and abalone, is increasing. Production of flounder, seahorses and eels is still at the pilot stage and a number of other species such as striped trumpeter, rock lobster and black bream are being investigated. Tasmania's aquaculture industry has concentrated on the production of premium quality, high value products for international and domestic markets and Tasmanian Atlantic salmon regularly fetch the highest prices on the Japanese market.

There are approximately 150 separate marine farms with a total area of approximately 1,500 ha in Tasmania, although these statistics are currently being varied substantially as new zones are approved in management plans and allocated to growers. The majority of fish farms are in the south-east of the State due to the cool waters, sheltered sites and proximity to markets, airports and other facilities.

SPECIES

Salmonids

The main salmonid cultured in Tasmania is the Atlantic salmon (*Salmo salar*). The industry was established as a joint venture between Government and industry in 1985. Salmon fry are hatched and ongrown to around 70 gm in freshwater hatcheries and the smolt are transported to sea cages for ongrowing to the market size of 3.5-4.5 kg. The whole process takes around 30 months, due to extremely fast growth rates under Tasmanian conditions. The majority of salmon is now sold on

the domestic market, but a significant portion is exported overseas. The industry produced over 6,500 tonnes (HOGG, or dressed weight) in 1997/98 which at an estimated average price of \$9/kg represents a farm gate value of over \$60 million.

Although there is some freshwater trout production in northern and central Tasmania (200 tonnes), the majority of rainbow trout (*Oncorhynchus mykiss*) is produced in brackish water cages in Macquarie Harbour on the west coast. Total trout production in 1997/98 was some 600 tonnes (HOGG, or dressed weight), with a farm gate value of \$4.8 million.

Oysters

There is a small production of native flat oyster (*Ostrea angasi*) in Tasmania (0.6 tonnes), but the main production comes from the Pacific oyster (*Crassostrea gigas*). Tasmania dominates Australian production of Pacific oysters with production reaching nearly 2,000 tonnes in 1997/98 valued at around \$10.5 million. A number of specialised hatcheries around the east coast produce the spat which are ongrown in baskets hanging on intertidal or sub-tidal rack systems. The oysters reach market size at around 2-3 years old.

Mussels

Mussels (*Mytilus edulis*) are cultivated on long lines in eastern and south-eastern Tasmania. The spat are obtained from natural spat fall on collectors hung from longlines, from salmon cages as part of the cleaning process, or more recently, from hatcheries. Ongrowing to market size takes 15 months to 2 years and production was almost 200 tonnes in 1997/98 with a value of \$0.7 million.

Scallops

Tasmania is the only State culturing scallops and aquaculture production reached 32 tonnes in 1997/98 for a value of \$0.5 million. The industry was started as a joint venture with Japan in the early 1990s. Scallop spat are presently collected from the wild in mesh bags hung on long lines, but there has been recent success in hatchery production. A scallop industry based on hatchery-produced spat will be much more stable than the present industry and should increase production dramatically in the future. Ongrowing is mainly carried out in lantern cages on long lines.

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Abalone

In 1997/98, three tonnes of abalone were cultured in Tasmania for a value of \$126,000. Hatchery production of both greenlip (*Haliotis laevis*) and blacklip (*H. rubra*) is fairly well established and the remaining areas in which major advances are forecast for the industry include further development of grow-out systems, treatments for mudworm infestations in sea-based culture and a selective breeding program. Ongrowing is carried out either in raceways on land or in cages or barrels suspended in the sea and it takes 3-4 years to reach market size. Production is expected to increase rapidly over the next few years, with seed production already having doubled in the past year.

New species

There are a number of 'new' species under investigation for aquaculture in Tasmania. Two of these, seahorses (*Hippocampus abdominalis*) and flounder (*Rhombosolea tapirina*), are now the subject of commercial pilot-scale hatcheries. Clams (*Katelysia scalarina* and *Venerupis largillierti*) have been produced in oyster hatcheries and some extensive farming methods are being investigated. Two aspects of rock lobster (*Jasus edwardsii*) aquaculture are being studied – ongrowing wild caught puerulus and closing the life cycle through propagation in the laboratory. The striped trumpeter (*Latris lineata*) is the subject of an intensive research program which has managed to achieve year-round egg production and close the life-cycle. However, rearing of the larvae through metamorphosis still remains problematic. Eels (*Anguilla* spp.) are cultured from wild caught juvenile stages in small numbers mostly for export. Finally, another fish species, the black bream (*Acanthopagrus butcherii*), has proven relatively easy to culture, but appears to have fairly slow growth.

MANAGEMENT

The rapid expansion of the industry and its use of coastal waters brings with it a requirement to recognise the needs of other users of the waterways and identify how these resources can be managed on a sustainable basis.

This requirement led the Tasmanian Government to develop new legislation and to undertake the preparation of marine farming development plans for all major marine farming areas to ensure sustainable use of coastal waters.

Aquaculture in Tasmania is regulated by two Acts of Parliament: the *Marine Farm Planning Act (1995)* and the *Living Marine Resources Management Act (1995)*.

This document was produced by the Aquaculture Research Advisory Group. For further information contact the Director, Tasmanian Aquaculture and Fisheries Institute.