

## Aquaculture and Finfish Farming

### *Clive Monds, Environment and Conservation Organisations of Aotearoa New Zealand*

Clive Monds is a spokesperson for Environment and Conservation Organisations of Aotearoa New Zealand (ECO). ECO is an umbrella group of environmental and conservation organisations. Clive is based in Thames. He has been actively involved in land mining issues and spent more than 20 years addressing fisheries and environmental concerns. Clive has discussed finfish farming at earlier Hokianga Accord hui.

## Aquaculture reforms

### Introduction

The government and some industry representatives were concerned that aquaculture development has been held up since 2004 by an inefficient, complex authorisation process and the lack of new space allocations for marine farms.

A Technical Advisory Group (TAG) was formed in early August 2009 to provide the government with recommendations that aim to streamline the application and management processes so that greater returns are generated. Their report, recommendations and action points were released in mid-October and titled, *Re-Starting Aquaculture, Report of the Technical Advisory Group*<sup>6</sup>.

The Ministry of Fisheries (MFish) released the TAG report in early November. Submissions in response were due by 16 December 2009. There were 223 submissions in response to the proposals. A government decision was due very soon. Clive would not be surprised if most of the TAG recommendations were implemented.

\*On 27 April the Minister of Fisheries and Aquaculture, Phil Heatley, announced plans for the future management of aquaculture to enable the growth in sales to \$1 billion by 2025<sup>7</sup>.

### Major issues for non-commercial interests

One objective of the reforms was to provide consistency through national standards by appointing a Minister of Aquaculture and an Aquaculture Agency within the Ministry of Fisheries. A national standard for aquaculture sounds impressive, but there was a certain irony in that statement. Non-commercial interests have been waiting for national standards in fisheries since before the fish plan process was initiated in 2005. There is only one standard in place to date.

### Finfish Farming

There are two main aspects of the proposed aquaculture reforms that will have a major impact on aquaculture, they are:

- ⇒ Changes to enable aquaculture operations to be established outside existing approved areas; and
- ⇒ Reforms to give farmers the right to develop finfish operations within areas currently designated only for shellfish farming.

A major concern of finfish farming is the exploitation of wild stocks of food chain species such as pilchards and sardines. Mass harvesting of these species could have severe impacts on kahawai, kingfish and other populations that depend on these fish for sustenance.

Clive explained that fish cage farming of tuna in South Australia has dramatically increased the demand for both pilchards and sardines. The total catch of these two species has grown from a few thousand tonnes in the early 1990s to become the largest fishery by volume in the country – around 40,000 to 50,000 tonnes per

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<sup>6</sup> [http://www.option4.co.nz/Fisheries\\_Mgmt/aquaculture\\_reforms.htm](http://www.option4.co.nz/Fisheries_Mgmt/aquaculture_reforms.htm)

<sup>7</sup> <http://www.fish.govt.nz/en-nz/Aquaculture+Reform/default.htm>

annum. Despite this increase farmers still require importation of large tonnages of feed from overseas. These imports could pose serious risk to the local marine environment.

### **Fish feed**

The amount of wild fish required to produce one kilo of farmed fish will vary over a range of factors depending on species farmed and the percentage of fish meal/oil in feed stock.

Annual global production is in the range of 6 - 7 million tonnes of fishmeal and a little under one million tonnes of fish oil except during the periodic El Niño years. This requires an annual catch of 25 - 30 million tonnes of feed-grade fish and unwanted fish processing waste; this means that four to five kilos of wet fish yield one kilo of fish oil and dry fishmeal. [Source - IFFO, the International Fishmeal and Fish Oil Organisation.]

The food conversion ratio (FCR) varies from species to species. Aquaculture industry sources indicate that the food conversion ratio for salmon is relatively low, but it is higher for other species.

A good rule of thumb would be that 2-5 kg of feed yields one kilo of farmed fish. Multiply that by the 4-5k ratio for the fishmeal produces a range of 8-25 per kg of farmed fish.

For example:

4 to 5 kilos of wet fish = 1 kilo of fish oil and dry fishmeal (fish feed)

2 to 5 kilos of fish feed = 1 kilo of farmed fish

One kilo of farmed fish = between 8 and 25 kilos of fish product.

Information from IFFO, the industrial producers of fishmeal, shows that production is leveling off. There is a decreasing amount of fish oil and fishmeal available because the global catch of wild fisheries is declining.

There is a certain contradiction in the global situation, where countries want to increase finfish farming at a time when wild fish stocks are decreasing and demand for fishmeal and oil is growing. There is also increasing competition for fish oil from the health food products industry.

Currently MFish consider there is no sustainability risk because the feed being used for salmon farming is Peruvian anchovies. It is anticipated that these will also be the base source of feed for new finfish farms.

Moreover, the Regional Councils, who administer aquaculture, do not have the jurisdiction to deal with sustainability issues or creating a certification process for the food that will be used for farming operations.

The major issue of fish feed for any increase in finfish farming is 'falling between the cracks' with no single entity responsible for addressing any impacts.

Presently New Zealand's baitfish species such as anchovies and pilchards are under-fished, but using the South Australian example these bait species will rapidly become over-fished. This would then threaten the whole food chain, with consequences for kahawai, kingfish and other important fisheries.

These concerns have been expressed by a number of environmental organisations at meetings with MFish and their CEO, but the message seems to have fallen on deaf ears.

There is no recognition in the Technical Advisory Group's aquaculture report of this risk, nor any measures to address how a plethora of finfish farms will be sustained. This omission is a very serious sustainability threat.

## Land mining

Clive went on to discuss the application to mine sediments off the Thames township coast. The flat area of Thames is built on mine tailings from historic gold mines. Deposits of mercury, cyanide and small amounts of gold were washed into the sea and over the years these have been covered by more benign sediment.

There are concerns that any seabed mining would reactivate and bring to the surface unwanted deposits, which could eventually be ingested by marine organisms and end up in the food chain sustaining people.

Even though the Tui mine in the hills above Thames was shut down around 40 years ago large amounts of zinc, iron, manganese, arsenic, cadmium and lead are still discharging into local waterways.

Recent proposals to mine areas in the Coromandel have raised objections based on the potential environmental risk.

It was very concerning that these potential mining operations would be established at the same time that marine farming was due to expand in the Firth of Thames, one of the major aquaculture areas in New Zealand.

Submissions on the government's proposed legislative changes to enable mining on Conservation land close on 4 May 2010.

Clive encouraged people to read the information available at the hui, fill out a submission form or visit [www.watchdog.org.nz](http://www.watchdog.org.nz) to learn more and send an online submission. Both Greenpeace and Forest & Bird have information on their websites and online submission facilities.

## Hui Discussion

Clive confirmed that Environment Waikato, the regional council for Thames, has conducted consistent water quality tests and the amounts of toxins described were documented.

Aquaculture has been a feature in the Firth of Thames for many years. Clive was asked to clarify whether the tests conducted by these aquaculture farmers had shown traces of contamination.

Clive confirmed that seafood taken from the Hauraki Gulf has elevated mercury levels, but not to a dangerous level.

Essentially the bulk of land mining was occurring 80 to 100 years ago and commercial fishing around the Firth was limited during that time. Any increase in mining activity, particularly around the Thames foreshore is likely to send a pulse of mercury into the food chain. This was particularly concerning for the local flatfish (flounder) fishery, the Gulf's snapper fishery, and because the Firth was a known breeding area for sharks.

Section 12 of the Fisheries Act 1996 requires the Crown to have particular regard for Kaitiakitanga when fisheries management decisions are made. There seems to be a major disparity between the various pieces of legislation that s12 can be ignored in matters that will have an impact on fisheries, such as land or seabed mining.

Clive has discussed these concerns with MFish, but they have dismissed these matters on the basis that it is not a sustainability issue, because New Zealand's fish stocks are not currently being affected.

If there is to be a major expansion of finfish farming in Aotearoa the very least we need to do is:

- ⇒ Consider how these farmed fish will be fed; and
- ⇒ Ensure the legislation provides for a robust system that ensures there is minimal damage from this activity on other fisheries and the environment.

Any mass extraction of baitfish will severely impact on the seabird populations. Mammals such as dolphin are also susceptible to this exploitation. Coastal bird numbers had already drastically reduced due to the lack of kahawai, from bulk harvesting and purse seining.

Clive agreed that other products such as soy were being trialled as feed for farmed finfish. Those were essentially 'fillers', but there was still a fundamental requirement for the trace elements found in fish oil.

Given the relatively cheap availability of wild baitfish stocks in New Zealand these will be targeted first before importation of feed is considered. There were biosecurity risks associated with importing any feed that will be used in the marine environment.

It was worth noting the Australian example of biosecurity risks. The local baitfish population suffered massive depletion due to being targeted for farm feed. Diseases also spread from the introduced fishmeal into the local bait fisheries.

Having aquaculture around Wilson's Bay in the Firth of Thames was concerning and a cautious approach ought to be taken if there was any expansion.

Ted Howard spent 17 years commercially fishing for flounder in the Firth and is very familiar with the Wilson's Bay area. He worked with a number of researchers studying the area and they made some interesting discoveries.

Flounder were spawning in the Wilson's Bay area. To avoid the mussels growing on the seabed the flounder eggs developed the ability to go up in the water column and stay there until they were too big to be eaten by the mussels. The eggs would then sink to the seabed where they could survive.

Now it seems like the authorities are willing to place mussel farms in almost all sheltered waterways. It is likely that this will have a major impact on the productivity of many important wild fisheries like flounder, snapper, blue cod, mullet and many others. In Wilson's Bay it means flounder biomass is being converted into mussels.

Local commercial flounder fishers have expressed their concerns to MFish and the Minister about the effects of the mussel farms on their ability to catch their quota. Neither seems to be concerned that these fishers are having to fish in areas further away from Wilson's Bay.

It was notable that the Wilson's Bay Aquaculture Management Area was only partially developed, Block A is hardly used at present. They have just started farming another 700 hectares in Block B. There will be a huge increase in mussel biomass and the farmers want to grow a few hectares of kingfish in amongst the mussels.

Mussel farming was appropriate in areas where the shellfish are eating algae. Mussel farms are highly inappropriate for areas where they are eating fish spawn; that is because rows of mussels hanging on ropes act as an inverted reef. In spawning areas these mussel 'reefs' are turning valuable fish spawn into cheap mussels, which is contrary to both Ministry policy to maximise value from New Zealand's fisheries or the objective of "more fish in the water/kia maha atu nga ika ki roto i te wai".

Worldwide there were two significant areas that produced masses of anchovies, Peru and northern Japan. The Peruvian fishery had collapsed but managed to recover. It appeared that these two sites had the ideal environment and food source to sustain the anchovy population and ongoing mass extraction. Acknowledgement needed to be given to the productivity of these two fisheries.

It also needed to be acknowledged that neither New Zealand nor Australia seemed to have a fishery or productive area of this magnitude. So the available baitfish ought to be used conservatively, if at all, for farming operations.

Clive agreed that krill in Antarctica is being targeted as a source of fish oil for therapeutic products. Krill forms 80 percent of the base of the Antarctic food chain, right up to the whales. Traditionally little attention has been given to baitfish and krill because they have not been targeted en masse. Worldwide demand for fish oil is driving this exploitation.

Another outcome is that New Zealanders could eventually consume these farmed fish. It was important to ensure both ethical and environmental concerns were addressed before mass farming occurred.

Kaitiakitanga [stewardship] was the responsibility of everyone including the Minister of Fisheries. There is a clear disconnection between the behaviour on land and sea, between the mountain-to-sea approach and the lack of co-ordination of various Ministries and territorial authorities.

In South Australia finfish are farmed in cages that constantly need shifting to new areas because of the degradation caused by faecal waste.

The food conversion rate, from fish feed to farmed fish is concerning, especially the worse-case scenario of 25:1; this is not sustainable.

There are three keys to successfully managing aquaculture, they are:

- ⇒ Sustainable supply of fish feed;
- ⇒ Clear management responsibility and tools to manage environmental impacts; and
- ⇒ Robust regulatory framework to effectively manage the interface between the agencies responsible for land, sea and fisheries management.

These factors are non-existent in New Zealand.

Following dinner the hui worked collectively to draft a resolution setting out the Hokianga Accord's position on aquaculture. The draft statement would be circulated to the various constituent groups after the hui, to generate feedback and finalise an agreed statement.

On completion this statement would be distributed to the Minister and Ministry of Fisheries, other politicians and interested parties.