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SUBMISSION NO. 33
Inquiry into the Role of Science
for Fisheries and Aquaculture

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To The House of Representatives Standing Committee on Agriculture, Resources, Fisheries and Forestry,
 The following is my submission regarding the Inquiry into fisheries and aquaculture science.

Current salmonid aquaculture issues in Tasmania and imperative for increased research efforts.

The Atlantic salmon industry was set up in the 1980's with assistance from the state government and has proceeded with a pro-industry bias. Expansion has proceeded without a proper knowledge of the hydrodynamics of the waterways, their carrying capacity or proper consideration of many issues raised by the community, and problems continue to simmer.

Atlantic Salmon farms now dominate the famously beautiful waterways of the Huon Estuary, D'Entrecasteaux Channel and Port Esperance, as well as having a significant presence in Macquarie Harbour. The impacts are many and varied - on one hand they provide jobs and contribute to economic activity, but on the other, are a major source of externality effects including noise, loss of amenity, reduction in property values, deterioration in water quality, boating and navigational hazards, and a much reduced and less diverse recreational fishery.

Science can begin to quantify some of these impacts with a cost benefit analysis. Many concerns have been ignored by both fish farmers and the D.P.I.P.W.E., and opportunities have been lost.

The impact of Atlantic Salmon farming on the ecosystems is only to be imagined - estuaries provide a diverse range of habitat for many species of fish and are important fish nurseries, and in the case of waterways to the south of Hobart, for the conservation dependent school shark, as well as other rare and threatened aquatic organisms, and migratory birds.

Sustainable development relies on good knowledge of environmental parameters. Environmental Impact Assessments must contain sufficient baseline data and mitigation measures for waste streams. Adaptive management is inadequate when production of scale is concerned and where sensitive systems are involved. More sophisticated management will be necessary in order to maintain current production levels and any future expansion should proceed with a consideration to the social impact of a potential bust should environmental impacts render the waterways unusable for fishfarming.

Inadequacy of current research

System wide Impacts of Salmonid Aquaculture

Harmful Algal Blooms [HABs] are now regularly occurring in waterways south of Hobart where around 70% of the state's finfish production occurs. The most recent Harmful Algal Bloom [HAB] notification was issued for the Huon Estuary, D'Entrecasteaux Channel, Port Esperance, Hastings Bay and Southport on 12/5/12, and was accompanied by a warning not to eat wild shellfish. Shellfish farms have been closed. Frequent and prolonged HABs were predicted by the Huon Estuary Study [Butler et al 2000] with increased nutrients - especially nitrogen - entering the waterways from Atlantic Salmon farms as production increased. Widespread monitoring has been promised with expansions since 1996 and yet only 15 sites are now tested [monthly testing only began in 2009] for water quality and the results are not publicly available. Testing will not necessarily reflect the contribution of any particular farm. The nitrogen cap needs to be assessed. With HAB warnings now regularly issued, the usefulness of this method must be evaluated.

The Fisheries Research Development Corporation [FRDC] paper No.2004/076 "A whole of ecosystem assessment of impacts of the salmonid industry" notes that plankton communities in the Huon Estuary and D'Entrecasteaux Channel were predicted to change from 91% oligotrophic in 2002 to 54% mesotrophic in 2009, and impacts could be expected on the food chain as well as on the dissolved oxygen [DO]

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status of the waterway. This paper notes that a low DO event could take years to recover from. These impacts need to be researched and understood for improved management of the resource.

More scientific research into the sustainability of salmonid aquaculture operations in Tasmania needs to be undertaken as receiving environments are impacted to a point where they can now be described as stressed ecosystems. An improved understanding of the assimilative capacity of receiving environments is required to inform a shift from adaptive management to sustainable development. Current and historical monitoring of essential water quality parameters is very limited and, as the industry plans to double production by 2015, this information is essential and required urgently. Inadequate baseline data was presented in the Environmental Impact Assessment accompanying the recent proposal to dramatically increase and intensify production in Macquarie Harbour [Draft Amendment to expand production and lease area currently under consideration]. Insufficient data regarding nitrogen species or the accepted proxy chlorophyll a, and other omissions mean that confident predictions of impacts on the waterway cannot be made.

The FRDC paper No. 2004/076 recommends research into the impacts of the Atlantic Salmon Industry on threatened, protected and rare species, yet this research has not been forthcoming.

The fate and impact of escaped Atlantic Salmon should be a research priority. The single study undertaken in Tasmania [TAFI, Macquarie Harbour] showed that some escaped fish had native prey in their guts. Escapes in low level "leakage" of fish from cages as well as major escapes - sometimes involving tens of thousands of fish, are having an as yet unquantified effect on native fish species [including shellfish] around Tasmania where fishfarming is occurring. In Macquarie Harbour the Maugean Skate and Australian Greyling are not properly addressed in terms of being impacted by escapes and very little is known about the skate.

In the D'Entrecasteaux Channel the extremely rare *Parvulastra vivipara* - a tiny seastar which occurred in only two known small populations - has not been seen for two years. Its habitat is consistently covered by thick mats of rotting algae that decomposes after it washes up. Locals blame the fish farm west of Soldiers Point for nutrient input into the Channel for the appearance of the algae. This impact was not considered in the EIA.

Localised impacts requiring research

- impacts on bays and embayments from wastes generated by farms close inshore;
- The fate, extent and impacts of waste streams must be known and mitigation measures developed for the waste stream from netwashing. Deposition at depth of netwashing products including copper from antifoulant paint and organic detritus is having unknown impacts on both the water column and the benthos.
- impacts of change in environmental flows due to siting of fish cages;
- impacts on water column stratification from towing fresh water and fish cages;
- impacts on receiving environments from fresh water bathing, including quality of fresh water used, PEVs, governance issues.
- Impact of fish farm boat wakes on clay bank erosion including increased turbidity; change [reduction] in substrate particle size and impacts on benthic habitat.
- Assessment of fallowing regimes.

Governance Issues

Amoebic Gill Disease and fresh water Use

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Salmonid Aquaculture is the largest user of fresh water in Tasmania. Fresh water is used as a treatment for Amoebic Gill Disease which is caused by an organism ubiquitous to estuarine and marine sediments in Tasmania. The water is used to bathe the fish to remove amoeba from their gills. The fish in the Huon are bathed every 25 days in winter and every twenty days in summer. Enormous quantities are towed to leases.

Protected Environmental Values and fresh water use

- Fishfarmers have been using water for fish bathing without having the licence transferred as required under Tasmania's Water Management Act; e.g. Tassal and Huon Aquaculture Company are currently using water of known and "decidedly inferior" quality from the Kermadie River, a tributary of the Huon. This water is taken from below a sewage treatment plant which experiences frequent and varied operational problems which result in the discharge of elevated levels of thermotolerant faecal coliforms. Other water quality concerns with the Kermadie include high levels of suspended particulate matter and nitrogen. Waste water plumes may have limited dilution for a considerable distance from cages e.g. CSIRO [2005] found that plumes may be 200 m wide and 500m long. This is particularly concerning when some fish farm leases are close to shore and beaches, see e.g. the Tassal lease [no. 186] at Brabazon Point. Although Protected Environmental Values [PEVs] have been identified for fish farms leases and include Recreational water Quality, the lack of testing means that PEVs are not assured.

Noise Impacts and fish bathing

Bathing the fish is a very noisy activity and many residents are affected by machine noise and water towing. Noise emissions have not been set for marine farms in Tasmania. The limited regulations are not policed. Acoustic mapping of impacts would be a step toward reducing impacts in fish farming areas.

Other research

- Cumulative [system wide] and long term impacts on waterways where aquaculture operations are located.
- Actions in regard to trigger levels. Are trigger levels set appropriately ? Are actions taken when they are triggered ?

Your sincerely
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