

**TACL Submission in response to the Draft Storm Bay North Marine Farming  
Development Plan November 2017**

Planning Authority  
C/- Marine Farming Branch, DPIPWE  
GPO Box 44, HOBART,  
TAS 7001

February 9<sup>th</sup>, 2018

**Submission from the Tasmanian Abalone Council Ltd (TACL) regarding the Draft Storm Bay North Marine Farming Development Plan November 2017**

This submission is lodged by:

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The Tasmanian Abalone Council notes the following:

- Petuna Pty Ltd (Petuna) has received approval to prepare a draft Marine Farming Development Plan (MFDP) for an area of Storm Bay. The draft Storm Bay North MFDP November 2017 and accompanying environmental impact statement (EIS) is being exhibited for two months from 9 December 2017 to 9 February 2018.

The draft MFDP proposes to:

- Establish a MFDP area located approximately 5 kms south of Betsey Island.
- Provide a marine farming zone of approximately 430 ha with a maximum leasable area of 273 ha.
- Implement management controls that are coordinated with adjacent MFDP areas.

This short submission from the TACL raises the following key concern in relation to environmental monitoring of the proposed new Petuna salmon lease in North Storm Bay:

### **Environmental Monitoring of nearby rock reef systems**

The main concern that wild fishers have in relation to burgeoning aquaculture development is the potential for marine farming inputs to alter the ambient physico-chemical characteristics of the water column and the benthos. Physico-chemical changes wrought by industrial salmon farming have the potential to adversely impact on water quality and the benthos – there are a plethora of scholarly articles that acknowledge this well established fact.

The Tasmanian abalone fishery depends on complex environmental factors to replenish and maintain healthy stock levels. Many of these environmental factors are not well understood and are beyond the control of managers, fishers and researchers.

The primary risk to sections of the Tasmanian wild abalone fishery that are adjacent to open-cage salmonid farming systems relates to the medium to long-term environmental degradation of inshore abalone reef habitat caused by sustained salmon based nutrient and sediment inputs.

Abalone are grazing animals, eating marine algae using a serrated “tongue” as they move across the ocean floor. To support a healthy comprehensive age range of animals a complex assortment of feed is required. Large brown algae such as cray-weed, giant kelp and bull kelp along with some species of red algae including the encrusting corallines are necessary. Juvenile abalone graze on rock encrusting coralline algae, diatoms and bacterial films. As they grow they increasingly rely on red and brown macro-algae.

Sustained nutrient loads (organic enrichment) from salmon farms or other sources may alter the types and proportions of algae that grow within pristine and healthy marine ecosystems (Kraufvelin et al. 2010) – the type where wild abalone thrive. Sustained nutrient loads change the balance of macro algal species in the environment in turn changing reef community structure and biodiversity. Species of algae that thrive under regular and increased nutrient loads *may not* support an ecosystem with healthy populations of wild abalone, lobster and other species of marine fauna.

Abalone are localised spawners and are at their most vulnerable during the early stages of their life cycle – localized anoxic conditions due to physico-chemical changes in the sediment and/or nutrient overload in the water column (whether sustained or periodic) may have a deleterious effect on larval growth, larval settlement and the early grow-out stages of the lifecycle (James and Barr 2012) leaving abalone stunted and unfit for harvest.

Abalones have been shown to be particularly sensitive to sedimentation even at low levels, potentially affecting all life stages. Larval abalones have shown significant reductions in settlement in response to low level sedimentation (Onitsuka et al. 2008). Sediment has also been shown to indirectly increase the mortality of juvenile abalone through displacement from their cryptic refuges by sediment accumulation to seek out sediment-free exposed areas which leaves them more exposed to predation - vulnerability to predation is then increased further as sedimentation also results in a decreased ability for juvenile abalone to “hold fast” to surfaces and impedes abalone’s righting response resulting in higher abalone mortality in areas where sediment is present (Chew et al. 2013).

In short, any input that causes degradation to the health of the inshore benthic community which wild abalone and other marine fauna inhabit *must be* regarded as a risk. It is commonly accepted that benthic molluscs (such as abalone) serve as the “canary in the coal mine” when it comes to sensitivity to environmental changes within oceanic reef communities.

It is critically important for the future health of the marine ecosystem that baseline and ongoing monitoring be implemented prior to the establishment of any new salmonid leases within Storm Bay. Robust and comprehensive monitoring of the marine environment within Storm Bay will provide early warning of any adverse impacts. A timely and appropriate management response may then be initiated by the regulator and the aquaculture industry.

The key to a successful environmental monitoring program is to design it in such a way that it is sensitive to early stage “ecosystem changes” such as those wrought by excess organic enrichment (nutrient loading) and/or sedimentation above “normal” baseline levels.

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The TACL notes the following statement on page 133 and 134 of the Petuna Environmental Impact Statement for the Draft Storm Bay North Marine Farming Development Plan.

*“Petuna commits to undertaking detailed environmental monitoring at the proposed lease in accordance with industry best-practice and regulatory requirements. This commitment is evidenced by the ongoing monthly water quality sampling within the proposed lease area which commenced in October 2016 (refer section 2.6.3). These data will further strengthen the substantial understanding of baseline water quality conditions in Storm Bay from Swadling et al. (2016). In addition, Petuna supports the development of the broad scale environmental monitoring program (BEMP). A BEMP for all proposed MFDP areas in Storm Bay has been developed by the EPA in consultation with IMAS and CSIRO, with the objective of providing an understanding of interaction effects between associated environmental impacts of salmonid farming and the receiving environment. An overview of the BEMP and proposal-specific near-field environmental monitoring is provided in the Indicative Storm Bay Environmental Monitoring Program attached as Appendix 9.*

*The BEMP will employ an ecosystem based approach, monitoring water and sediment quality, and changes in reef and infauna communities. The power of this monitoring approach lies in its ability to capture cumulative nutrient emissions from all marine farming developments in Storm Bay. 59 risk based monitoring locations have been identified to form the basis of the BEMP. The location of these monitoring stations is based on the outputs of the CONNIE3 nutrient dispersion modelling which highlights predicted areas of ecological interaction.*

*Building on outputs from CONNIE3 and the BEMP, a comprehensive assessment of potential environmental impact can be undertaken using a quantitative measure of environmental impact which accounts for the nutrient discharge from fish farming activity and the resultant nutrient and phytoplankton flux in Storm Bay. This would require a calibrated and validated operational 3D biogeochemical model, which is considered an essential component of sustainable salmon farming development in Storm Bay. Petuna will contribute to the development and implementation of this model and will use outputs from the model to guide management practises.*

*This proposed development will be required to meet management controls included in the draft Marine Farming Development Plan and prescribed by the regulator in accordance with section 24 of the Marine Farming Planning Act 1995. These management controls will contain measures deemed necessary to manage and mitigate negative effects which marine farming operations may have within Storm Bay.*

*Finfish farming in Storm Bay will be regulated using a TPDNO. The suite of monitoring and modelling tools described above (CONNIE3, BEMP and the biogeochemical model) will be used to inform continual adaptive management within the region. Adaptive management via ongoing adjustment of the TPDNO informed by tools such as the BEMP is a proven mechanism to ensure that the farming activities do not adversely affect ecosystem function and productivity, and do not lead to the deterioration of rare or sensitive habitats. The ongoing adaptive management of salmonid farming in the D’Entrecasteaux Channel and Huon Estuary via a TPDNO informed through a BEMP and biogeochemical model provides an exemplar of the proposed adaptive management framework for Storm Bay.*

*Petuna's management response to adverse changes in water quality, sediment/infaunal communities or reef/macroalgal communities identified through the BEMP would be to reduce stocking density at the lease until such time that ongoing monitoring confirms recovery of the ecosystem."*

The TACL acknowledges the above statement of intent by Petuna and submits the below recommendation to DPIPW and the Tasmanian Environment Protection Authority (EPA) for consideration:

**RECOMMENDATION: The TACL recommends that a comprehensive baseline environmental assessment is conducted on rocky reef systems that lie adjacent or proximate to the proposed Petuna "Storm Bay North" finfish lease prior to any lease being granted. In the event that a lease is then granted, comprehensive ongoing environmental monitoring should occur with the results being publically available via an independently managed web portal. The TACL is also seeking two additional rocky reef monitoring sites - one at the southern end of Betsey Island and the other at Outer North Head on the Tasman Peninsula. These two locations are the closest rocky reef (to the proposed Petuna lease) that currently support the commercial harvest of abalone. The TACL also seeks direct input into the design and implementation of the environmental monitoring system developed by the Tasmanian Environment Protection Authority (EPA) for the Petuna Storm Bay lease.**

Dean Lisson: TACL Chief Executive      February 2018

#### **Bibliography:**

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Kraufvelin, P., A. Lindholm, M. F. Pedersen, L. A. Kirkerud, and E. Bonsdorff. 2010. Biomass, diversity and production of rocky shore macroalgae at two nutrient enrichment and wave action levels. *Marine Biology* 157:29-47.

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Petuna – Environmental Impact Statement accompanying the Draft Storm Bay North Marine Farming Development Plan November 2017