



## FARMING IN MACQUARIE HARBOUR

- While the marine environment in Macquarie Harbour is complex and unpredictable, growing conditions are conducive to finfish production provided production limits are well controlled and scientifically based.
- Huon has always maintained a strong commitment to sustainable production in MH as evidenced by a plethora of information available on the public record and the unprecedented action of taking both Federal and State governments to court on this issue.
- As early as February 2014, the Tasmanian Salmonid Growers Association (TSGA) established the MH Dissolved Oxygen Working Group (MHDOWG) in response to concerns over an already evident significant declining trend in dissolved oxygen levels in MH.
- Despite the mounting scientific evidence, maximum permissible biomass limits were increased by the regulator (in October 2015), peaking at 20,020 tonnes.
- However, in response to severe deterioration of seabed conditions, marked decline in dissolved oxygen (DO) levels, mass mortality events associated with environmental conditions, and impacts on the World Heritage Area, the regulator subsequently decreased the maximum permissible biomass limit over several decisions back down to 9,500 tonnes in May 2018 (14,000 tonnes in January 2017, a further reduction to 12,000 tonnes in May 2017).
- The low water exchange characteristics of MH also have relevance to fish health and biosecurity. Huon firmly believes this must also be an important consideration in determining biomass limits.
- Given all the available science, Huon is supportive of the EPA's decision in May 2020 to set the biomass limit back down to 9,500 tonnes until 2022.
- Biomass limits should not be designed to squeeze every last tonne of production out of MH. To be truly sustainable there must be element of precaution in the biomass limits to acknowledge the well-known complex and unpredictable environment of the Harbour.
- It is critical that we learn the lessons from the last few years. This is not only for the sake of sustainable production MH, it is also important for the reputation of both the industry and regulator so that public confidence can be rebuilt.
- While Macquarie Harbour has had environmental issues due to its very unusual and unique hydrodynamics, it cannot be compared to areas such as Storm Bay which has completely different and high energy hydrodynamics.

## IMPACT ON HARBOUR FROM OTHER INDUSTRIES

Both the King River which cuts through the West Coast Range and the Gordon River empty into Macquarie Harbour. The narrow entrance to Macquarie Harbour has hazardous tidal currents and is called Hell's Gates. The sheer volume of fresh water that pours into the Harbour through the rivers, combined with the narrow exit result in barometric tides. When there is rain in the mountains surrounding the Harbour, the tide rises, and it falls when the atmospheric pressure reverses and results in less rain.



The Queen River, King River and Macquarie Harbour were all polluted by mine waste from the Mount Lyell Mining and Railway Company until its closing in 1994. It is estimated that 100 million tonnes of tailings were disposed of into the Queen River.

MH is a most unusual waterway having unusual current patterns, various bottom sediments, unusual metal distribution in the sediments, varying Gordon River current flows, negligible tidal rise and fall, high flood rises - all these variables cause further variability in water temperature acidity and oxygen levels.

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## TIMELINE OF SALMONID FARMING IN MACQUARIE HARBOUR

- Salmon and trout farming begins in 1987. Production steadily increased over the years reaching approx. 9,000 tonnes in 2011.
- In September 2011 industry sought to increase production in MH, including extending the maximum leasable area from 564 Ha to 926 Ha. As part of this process, biogeochemical and hydrological modelling was used as a guide to determine what a sustainable maximum carrying capacity of farmed salmonids in MH might be expected to be. The modelling at the time indicated this to be 35 tonnes/Ha, which equated to an increase in production from approx. 8,000 tonnes/annum to 29,500 tonnes/annum. Unfortunately, this initial modelling proved to be inaccurate, which is always possible with modelling. However, a failure to recognise this early based on the scientific evidence becoming available led to an unfortunate series of events over several years.
- In May 2012, the proposed expansion of lease area in MH was approved by the Tasmanian Government (ALP). The proposed expansion was subsequently referred to Australian Government Minister for Environment under the EPBC Act, with a decision received in Oct 2012 that the proposed expansion was “Not a Controlled Action if undertaken in a Particular Manner” (NCAPM), meaning that as long as the activity is undertaken in accordance with the particular manner requirements stipulated by the Federal Government, the proposal did not require further assessment and approval under the EPBC Act.

The Minister’s letter stated that the following measures were to be undertaken to ensure no significant impacts on Maugean Skate populations or the Tasmanian Wilderness World Heritage Area.

Measures included (but were not limited to):

- Several measures and management actions to prevent substantial benthic visual, physico-chemical or biological changes attributable to marine farming operations at, or extending beyond, 35 metres from the boundary of any lease area.
  - Several measures and management actions to prevent unacceptable dissolved oxygen (DO) levels.
  - The total biomass held across all lease areas must not exceed 52.5 per cent of the modelled maximum sustainable biomass (ie. 15,643 tonnes) until limit levels are reviewed in mid-2013 and must not exceed any such altered levels as may be identified thereafter by the Tasmanian Government.
- As early as Feb 2014, the TSGA established the MHDOWG in response to concerns over an already evident significant declining trend in DO levels in MH. The Report of the MHDOWG (Aug 2014) stated among other things that: “*There is a clear downward trend in the DO levels of the deep-water (> 15m) of MH over the period 2009-present (Aug 2014)*”, and “*DO levels less than 2 mg/L are now very common below 20 metres, and occasionally come to within 12 metres of the surface*”.
  - In Sep 2014 both Huon and Petuna strongly asserted to the Tasmanian Government (including DPIPW) that the existing biomass limit set by the Commonwealth of 52.5 per cent (15,643 tonnes) should be maintained until further information was available to demonstrate increased biomass was sustainable.



Despite this concerning trend in DO, DPIPWE removed the 52.5 per cent (15,643 tonne) biomass limit in October 2014. At the same time, DPIPWE requested information from all three salmon farming companies to support a review of factors important to the sustainability of salmon farming in MH – “DPIPWE MH Status Report”.

- In Feb 2015, DPIPWE contracted the Cawthron Institute (NZ) to undertake an external review of the MH monitoring program and related research including the “DPIPWE MH Status Report”.

Again, despite ongoing concerning trends in DO, DPIPWE wrote to all three companies notifying of its intention to increase the biomass limit to 20,020 tonnes in April 2015.

For much of 2016, DO levels were 0 mg/L or very close to 0 mg/L below 20 metres across large areas of MH.

- On 30 November 2016, the EPA advised of its intention to reduce the biomass limits in MH following an assessment of the most recently available scientific data from IMAS.
- On 18 January 2017, the EPA released its latest biomass determinations for MH, lowering the maximum permissible biomass to 14,000 tonnes per hectare. The reasons for the reduction in biomass related to the very low DO levels in deeper waters, the extent of the presence of *Beggiatoa* species in the harbour at that time and its increase over the previous six months, as well as a decline in benthic fauna in the vicinity of the marine farms.
- On 5 May 2017, the EPA advised that the maximum permissible biomass limit of 14,000 tonnes would be reduced to 12,000 tonnes. The reasons for the further reduction related to EPA’s assessment of the latest monitoring results provided by the salmon companies, the most recent surveys and research conducted by IMAS, and EPA’s analysis of nutrient data for the Harbour over the previous three years and environmental impacts in the World Heritage Area. Specifically, the reasons included among other things that *“The January compliance monitoring provided by the companies showed an increase in both the level of non-compliance and the extent of Beggiatoa mats – a key visual indicator at compliance points adjacent to the salmon leases”*.

*“In relation to additional monitoring by salmon companies and IMAS “Variable results are concerning ... as they show the Harbour is under a level of stress that may not be sustainable in the longer term if current production levels exceed or are maintained at 14,000 tonnes”.*

*“The EPA’s analysis of the available data and potential environmental impacts on the World Heritage Area, suggest we should proceed with precaution”.*

- On 31 May 2017, the EPA formally reduced the maximum permissible biomass limit to 12,036 tonnes.
- On 29 May 2018, the EPA advised that they had further reduced the biomass limit from 12,063 tonnes down to 9,500 tonnes for the following two years, a reduction of 21 per cent. The determination was based on consideration of the current environmental status of MH at the time, of which of which the EPA believed there were several areas of concern, including sub-surface dissolved oxygen conditions.
- In July 2019, the FRDC Report, “Environmental Research in Macquarie Harbour”, encompassing results from IMAS and CSIRO research was publicly released. The report provided an ongoing update on the status of DO and benthic conditions in MH.

The report states in the Executive Summary:

*“Each year since the major deterioration of benthic conditions observed in spring 2016, we have reported improved benthic conditions in the following autumn-winter and a subsequent deterioration during the following spring. This response pattern appears to be well aligned with the decline in oxygen concentrations on middle and bottom waters each spring and subsequent replenishment of oxygen due to oceanic and wind driven recharge through late spring to autumn.*

*In 2019, the improved benthic conditions compared with previous years is consistent with the less severe decline in DO in the preceding spring of 2018 relative to that observed in spring 2017 and*



2016. There may be a trend developing of less severe DO declines in spring each year, which is in turn associated with improved benthic conditions – certainly the signs are encouraging. However, it is important to remember that oxygen levels in the middle and bottom waters of the harbour are still lower than observed historically, and as such, the capacity to return to very low levels in spring remains.”

The Report contains a chart that shows the long-term trend in DO within several depth ranges at EPA site 12. Consistent with the Executive Summary above, the DO levels in deeper waters are still clearly lower than those observed historically. While there may be encouraging signs in that the DO may have stabilised to some extent, it is very clear that the DO in deeper waters has not recovered.

- Throughout the latter part of 2019, Huon’s monitoring of DO throughout the water column at its leases in MH showed that DO from 20 metres to 45 metres deep had been consistently less than 20 per cent saturation. Many depths were consistently less than 10 per cent saturation and some at 0 per cent saturation.
- The Executive Summary of a report released by IMAS and CSIRO in July 2019 outlined an apparent stabilisation of environmental conditions within MH. However, it went on to caution that oxygen levels in the middle and bottom waters of the harbour were still lower than observed historically and had the potential to return to very low levels in Spring 2019.
- The situation forewarned in the July 2019 report further indicated that the DO levels were far from a certain and sustained recovery in the Harbour.
- In March 2021, IMAS released an [updated report](#) of the results of a January 2020 benthic survey of 5 leases and 24 external sites. Results showed encouraging signs of recovery, with many fauna returning to pre 2016 levels, a reduction in *Beggiatoa* levels and better DO conditions. However, DO levels in some areas, particularly in the middle of MH, remained lower than historically recorded.

## SALMON HEALTH IN MH

It is important that the basis for determining production limits in MH are not limited to environmental considerations, albeit that these are extremely important. The low water exchange characteristics of MH also have relevance to fish health and biosecurity.

Low water exchange means that disease organisms have the capacity to build up within the system, thereby increasing the opportunity for disease spread and outbreaks. The potential consequences of disease in MH have been clearly demonstrated with the well-publicised mortality of over 1.3 million salmon due to an outbreak of Pilchard Orthomyxovirus (POMV) (2017), and mass mortalities associated with turnover events bringing poorly oxygenated water from depth to the surface and within the confines of the salmon pens. While measures have been undertaken by industry to improve biosecurity around POMV and there are encouraging signs that a newly developed POMV vaccine will be effective, the factors leading to large scale mortality still remain for new or emerging disease issues.

Therefore, production limits need to consider disease epidemiological factors such as population numbers in individual pens and in total across MH, proximity of leases and year classes of fish, and inability to fallow the whole harbour effectively with current stocking regimes.

## FUTURE PRODUCTION LIMITS IN MH

Huon has always maintained a strong commitment to sustainable production in MH. There is a plethora of information on the public record to attest to this commitment.

Huon took the unprecedented action of taking both Federal and State governments to court over concerns about production in MH (2017). As a result of this action, there is a large amount of information publicly available through court records for those interested in the details of Huon’s efforts over several years to



maintain biomass limits at sustainable levels (in addition to links on our website <https://www.huonaqua.com.au/our-approach/our-operations/macquarie-harbour>).

It is extremely clear from historical experience that the environment in MH has the potential to severely deteriorate and crash at production biomasses of around 14,000 tonnes. Regardless of the reasons this is clearly evident from actual events.

There is often debate about whether the environmental deterioration that has been seen is due to mother nature or salmon farming impacts. The reality is that industry, government and the community have little or no control over mother nature. Therefore, regardless of whether the contribution of salmon farming to environmental deterioration is 10 per cent or 50 per cent, salmon production is one of few factors that can be controlled. Clearly the contribution of salmon farming is on top of all other natural factors and ultimately the straw that has the potential to crash the system over a tipping point.

Therefore, salmon production must be managed at a level that fits within the naturally complex and unpredictable system that is known to be characteristic of MH.

## CONCLUSION

Huon is of the firm view that the maximum permissible biomass limit in MH should remain at no more than 9,500 tonnes for a sustained period until environmental conditions have been shown to have fully recovered and that the recovery is sustained. It is critical that we learn the lessons from the last few years.

There is still the possibility that production limits may need to vary further, particularly considering the impacts climate change may have on future weather conditions on the West Coast of Tasmania. For example, increased rainfall on the West Coast would increase river flows. This may have the impact of reducing the number and scale of oceanic influxes of water into MH which are important in recharging the DO levels in deeper waters. See the following link to the CSIRO Report [http://tchange.com.au/climate/climate\\_change.html](http://tchange.com.au/climate/climate_change.html).

