December 2021

LAND-BASED SALMON FARMING

- It is Huon's view that the experience and reliability of completely growing salmon entirely on land (in commercial volumes) is not yet proven. We believe that a balance of growing our salmon on land and at sea will allow us to continue to farm sustainably and employ more local people. We also believe that future salmon production methods should be seeking to reduce environmental impacts, not increase them, which would be the case if salmon farming was 100% land-based (ie power usage).
- Land-based salmon farming is not successfully happening (in commercial volumes) in any country in the world. The world's largest producer of salmon, Norway, is just taking small, tentative steps into the world of land-based farming. Norway estimates it will produce less than 1% of its total salmon production from land-based farming in the coming year.
- There is no likelihood of land-based salmon farming in Tasmania for a range of reasons including:
    - Tasmania does not allow the discharge of saltwater waste onto land OR the ocean and as salmon need to spend part of their lifecycle in saltwater, this restricts how long they can be farmed on land.
    - The natural resources (land, electricity and water) required to house enough facilities to hypothetically cease sea-based operations is not feasible nor is it financially viable. The industry would require the same energy needs as that of a city of 1.2 million people. If Huon were to hypothetically farm the equivalent volume of fish on land as we currently have at sea, we would require at least 40 additional Whale Point facilities and there is not sufficient electricity produced in Tasmania to power these facilities.
    - IF land-based salmon farming became commercially viable it would make sense to establish these facilities closer to market areas on the mainland. As a proud and fiercely Tasmanian company, we want to avoid moving our assets and employees to the mainland and keep Tasmanians employed in Tasmania.
- So, is Huon doing anything to explore land-based farming?
- Huon Aquaculture's $43.7M Whale Point nursery, which commenced operations more than two years ago, is Australia's first land-based salmon farming facility and enables fish to be grown larger on land before they are transferred to sea. This facility improves the efficiency of our production cycle by reducing the time the salmon spend at sea (from 14 months, to between 9-10 months). This also enables marine lease sites to be fallowed for longer.
- For this debate to be balanced, consideration also needs to be given to the conversion of terrestrial land to livestock farming, which is less sustainable than salmon farming due to higher conversion ratios which then generates a higher carbon footprint. How much native bushland has been cleared for agriculture compared to the size of aquaculture farms? No one has ever said that aquaculture does not have an impact – all farming does - but when compared to the impacts of terrestrial farming (land clearing, emissions, run off etc) it wins the sustainability argument, and the population has to eat.

LAND-BASED DRAWBACKS

Location:
In the event that 100% land-based salmon farming becomes commercially viable, it would make sense to establish these facilities closer to market areas on the mainland. As a proud and fiercely Tasmanian company, we want to avoid moving our assets and employees to the mainland. While we have no intention to move our operations, our Whale Point nursery allows us to continue to gain experience in this new technology. We believe a balance of growing our salmon on land and at sea will allow us to continue to farm sustainably in Tasmania and employ more people locally.

Land-based facilities would only require around 10% of the current workforce (thereby rendering thousands of people unemployed in addition to the loss of a range of other jobs which exist to supply and contract to the Tasmanian salmon industry).

Stocking Density:
A pillar of the RSPCA Approved Farming Scheme is to provide conditions where animals can be free to move and express their natural behaviours.

Salmon have evolved to migrate from freshwater to seawater and as a result, we mimic this in our farming operations. In addition, maintaining salmon in freshwater for their entire lifecycle would not be in accordance with RSPCA fundamental welfare requirements (ie this limitation could be compared with not allowing nesting boxes for chickens). Plus, for land-based salmon farming to be commercially viable, the salmon would need to be held at high stocking densities. This would be up to 15 times higher than our current maximum sea pen stocking levels (which is maximum 99% water to 1% fish) and could have implications for their health and wellbeing. Due to higher stocking densities, salmon would be unable to exhibit natural behaviours which is contrary to the philosophy that guides our farming.

In comparison, to grow 1,000 tonnes of beef 3,573 hectares of pasture is required whereas to grow 1,000 tonnes of salmon only 1.6 hectares of ocean is required.

Salt Disposal:
Theoretically, salmon can be grown on land in saltwater however, this raises an issue of how to dispose of waste collected within the facility. Current Tasmanian legislation does not permit the disposal of saltwater waste on land, nor can the waste be recycled for fertiliser or compost due to its very high salt content. Nor does current legislation permit the disposal of saltwater waste into the ocean. This would mean a halt to Huon's existing program whereby every year we recycle hundreds of tonnes of the fish poo from our freshwater facilities into compost for local farmers.

Electricity:
As the water within land-based facilities needs to be constantly moving to provide an optimal environment, a key resource needed for land-based farming is power and running costs are high. Putting aside all the drawbacks, if Huon were to hypothetically farm the equivalent volume of fish on land as we currently have at sea, we would require at least 40 Whale Point-equivalent facilities and we question whether there is sufficient electricity produced in Tasmania to power these facilities. Additionally, in a land-based salmon farm, any electrical outages can result in the stock loss of an entire production cycle.

Plus, in Tasmania, the majority of power is hydro-sourced, which is not favoured by certain political parties (the issue then becomes about more dams versus on-land salmon farming).

Greenhouse Gas (GhG) Emissions:
Supporters of 100% land-based salmon farming are ignoring the issue of GhG emissions. Significant money and effort is being invested by them to oust salmon farmers from Tasmanian marine waters, insisting with their science-deficit propaganda that growing fish in their natural environment must be replaced with growing fish in land-based tanks.

Salmon has the lowest carbon footprint of all proteins – salmon farming has lower greenhouse gas emissions than land based protein production. Salmon contributes 2.9kg of carbon dioxide into the environment per kilogram of edible product – less than a tenth of the carbon footprint produced by beef, and comparable to free range chicken. This number also factors in the fact that salmon tend to travel longer distances to markets than land-based protein.

IF salmon farming was even capable of being undertaken 100% on land (see above for reasons why this isn't the case) the GhG emissions will substantially rise on the basis of additional power requirements.

GLOBAL ATTENTION

Even using aggressive growth estimates, industry analysts believe that over the next five years only 150,000 tonnes of salmon will come from this farming method – less than 4% of the current total global salmon production. The majority of fish currently grown-out in RAS are small sized (less than 3kgs) whereas most markets, particularly international customers, require fish of 5kgs or larger.

In 2020, many countries commenced building new land-based facilities – the test will be if these facilities can farm commercially viable quantities while still meeting environmental requirements as well as the requirements of customer tastebuds (land-based facilities can face muddy or earthy flavour issues known as 'off-flavour' caused by metabolites released by microbes that grow within the land-based systems).

Even the world's largest producer of salmon, Norway, is only just taking small, tentative steps into the world of land-based farming. Just one company, Salmon Evolution, is involved in land-based salmon farming – it is still constructing a $214M facility (as at Sept 2021) which will only produce 9,000 tonnes of fish in the first year of operation hopefully rising to 36,000 tonnes. For a country that overall produces 1.7M tonnes of salmon, this is just 0.5% of total production.

UPDATE 2021

- Atlantic Sapphire harvested 166 metric tonnes HOG from its Miami facility in 2020 (compared with Huon's 25,566 tonnes).
- In March 2021, it was reported to the market that Atlantic Sapphire had lost 500 tonnes of fish (at the Miami site) but no explanation was given as to the reason.
  Atlantic Sapphire mortality "increases risk of further capital raising and likelihood of such events happening again" (salmonbusiness.com)
- In July 2021, Atlantic Sapphire reported a further 400 tonnes loss from site in Denmark.
  https://salmonbusiness.com/atlantic-sapphire-expects-3-million-hit-as-incident-causes-loss-of-400-tonnes-of-salmon/
- In August 2021
  https://seawestnews.com/atlantic-sapphires-aquaculture-woes-is-a-cautionary-tale/?fbclid=IwAR1cS9pKFZkGO41MtagJT8xFlri1-4VbyZ4CxZYR-4-u0mxUbTFXHbVaEpQ
- In September 2021
  https://www.intrafish.com/salmon/massive-fire-breaks-out-at-atlantic-sapphires-denmark-facility-all-salmon-expected-lost-in-blaze/2-1-1068325
- In October 2021
  'It wasn't selling': Atlantic Sapphire's land-based salmon dropped from key retailer | Intrafish
- Again, in October 2021, Atlantic Sapphire's "Bluehouse" farmed Atlantic salmon performed below expectations in a recently concluded US retail promotion, the largest ever for land-based salmon of any kind
  Largest-ever retail promotion of land-based farmed salmon falls short of expectations | Intrafish