

From: Bar Harbor Marine Resources Committee

To: Bar Harbor Town Council

Date: November 17, 2021

**Response to Bar Harbor Town Council request for information on the potential impact of the American Aquafarms salmon-pen proposal**

In response to the Bar Harbor Town Council request for information on the potential impact of the American Aquafarms proposal, the Bar Harbor Marine Resources Committee compiled the following list of issues. We have focused on issues that we think are important for the lease application to the Maine Department of Marine Resources, although some of these concerns would also be relevant for the Maine Department of Environmental Protection. The list includes the source of the fish stock, the scale of the project and the intensity of use, the inadequate modelling of water flow and the associated pollutants released from the pens, the impact of the water use and contamination on the ecology of the bay, and the continued viability of our current wild shellfish resources and shellfish aquaculture leases. In addition, we have broader concerns about the water, air, visual, and auditory impacts of a project of this scale that is in the viewshed of Acadia National Park. Finally, throughout this process we have felt that the applicants have been very good at producing very polished presentations, but very limited in their ability to address concerns and at times incredibly unprofessional in their knowledge of the regulations, biology, hydrodynamics and aesthetics of our local marine environment. These deficits make it impossible to view their application as viable. We strongly concur with the sense of the town council that this project is not in the best interest of the town and people of Bar Harbor and for all of the residents and towns surrounding Frenchman Bay.

At the outset it is important to note that although the project(s) are being proposed for subtidal waters that are considered an extension of the town of Gouldsboro, one of the pens is much closer to the shoreline of Bar Harbor than Gouldsboro. The historical association of The Porcupine islands with the town of Gouldsboro means that at low tide Bar Harbor residents can walk to Gouldsboro (ie. Bar Island). This classification ignores the proximity of these pens to Bar Harbor, as well as the clamflats and eelgrass beds that are part of the intertidal and shallow subtidal part of the town.

Below we elaborate on many of these issues:

**The source of the fish stock**

For their fish stock, they listed a facility in Canada as a source of their stock. We do not believe that this facility is legally licensed to have the specific genetic strains that are required by the state to reduce the probability of contamination of our wild endangered Atlantic salmon that

occurs both to the east and west of Frenchman Bay. To not understand this strong regulatory restriction shows a lack of understanding of basic Maine requirements for salmon aquaculture.

### **Scale of the project/ intensity of use**

The system, including the polymer enclosure or sheet surrounding the pen nets, is an unproven technology that has never been used at this scale, and seemed to fail at a smaller R&D scale in the one experiment we have been made aware of on this continent (British Columbia). The business is a new combination of individuals that do not appear to have experience running this scale of a project or with this technology. Thus this proposal does not have a proven team nor a proven model at this scale.

The density of fish in the pens appears unusually high. We have heard multiple individuals state that this density would not be allowed in Norway or Chile (the globe's two largest salmon aquaculture producers) for their at-sea pen systems. This, along with the sheet around the outside of the pen, leads to a requirement of bubbling oxygen into the pen to account for 75% of the oxygen demand of the fish (ie. the natural water oxygen level could only support a density  $\frac{1}{4}$  of this density). There was a recent die-off in a local salmon-pen system (without a sheet encircling it) that was attributed to low oxygen concentrations that killed 100,000 salmon. We are concerned that the applicants have not made adequate allowance for potential problems and the potential ecological disaster that would be caused by a massive fish die off at this facility.

The proposal claims that the deep water input will eliminate sea lice (a parasitic copepod) larvae getting to fish in the pens. However, fish at this density ( $35\text{kg}/\text{m}^3$ ) will still have potential problems with other pathogens, particularly bacteria and viruses, that would require the use of antibiotics in the case of bacteria. The case that the applicants make that the system will reduce stress on the fish and therefore have a reduced need for any chemical treatments seems contraindicated by the high density of salmon in these pens. This leads to the possibility of pathogens being in the water that could affect natural populations of endangered salmon. One best practice of salmon aquaculture to currently reduce this possibility is by allowing pens to go fallow on a regular schedule before restocking. There is no apparent plan for this in the proposal.

### **The inadequate modelling of water flow**

The applicant's model appears to be following outflows to see how quickly they will dilute to low concentrations of nutrients. They accomplish this low concentration, in part, with extremely large flows of water, estimated at over four billion gallons of water per day. However, their model appears to have input that is always unaffected water, that is, the new water going in does not contain any of the contaminants from previous outflows. This suggests that water is flowing in one direction, always moving away from the facility, and never oscillating back to the entry point. If this return of water to any intake pipe were to happen, there would be the chance for both degraded water quality in the salmon pens (increasing the chance of disease) and increasing the concentration of pollutants in the outflows. The applicant's models don't appear to consider this possibility. We believe that there is a high probability of water coming back to the area of the pens after release. The applicant's model is a very simplified model that is only made more rudimentary from their limited data collection to establish the "forcing" for the model.

We believe that entrainment of outflow water will occur for two reasons: the oscillating tidal flow of the bay, along with our past experience that things like PSP (paralytic shellfish poisoning, a type of "red tide" that can be toxic to humans when they consume shellfish organisms that are contaminated by a bloom by a particular phytoplankton species) in the lower bay do not readily move into the upper bay, suggesting reduced water exchange across The Porcupines. Both of these factors should increase the chance for effluent from the salmon pens to re-enter the system, a condition that their model's parameters do not appear to allow. Based on all of these concerns, we are skeptical of the applicant's modelling effort.

Our intuition that this discharge water has a high likelihood of both being entrained back into pens and has a chance to concentrate due to the local gyres and retention of water in Frenchman Bay north of the Porcupine Islands is supported by two different models. The two models, one produced by Dr. Lauren Ross and her colleagues at the University of Maine in a separate research project, and a second by Dr. Chris Kincaid from the University of Rhode Island Graduate School in Oceanography, animates water flow patterns that confirm this idea, and actually increase our concern about the role these added nutrients might play in the bay.

The applicant also repeatedly makes claims that the pens are isolated from each other. For the reasons that we describe above, we don't see how that can be the case. On the surface they are isolated, but as they pump water they will surely be pumping water entrained from the plumes of other pens, leading to cross contamination of any disease or other pollutants in the pens.

The late 80's early 90's salmon pens off of Preble Island (near Sorrento) just north of Bald Rock, failed in part because of superchill events. Superchill events occur when the water gets cold enough that ice forms in the fish's flesh. That was one of the reasons why Penobscot Salmon Company (the company that started those farms, you can still see the markings on the NOAA chart) moved that operation Downeast to Cobscook. One of the reasons why salmon has been

grown so much in the Cobscook Bay area is that the tidal flushing that occurs there keeps the water temps more even, and so less risk of superchill. With Frenchman Bay, less flushing not only means more concentration of pollution or eutrophication but also a possibility of superchill-caused die offs.

The proposed pens are a very large project that requires substantial inputs (such as feed, oxygen, and antibiotics) that do not exist in other aquaculture in the bay. These inputs will lead to pollution and potentially also lead to eutrophication, or excessive nutrients which can lead to lack of oxygen that other organisms need to survive. The other aquaculture facilities in the bay, such as our shellfish and seaweed farms, on average reduce nutrient inputs like these and instead these farms tend to lead to higher water visibility. The salmon pens proposed most closely resemble a feed lot or CAFO (concentrated animal feeding operation), which is very different than our existing farms.

### **Water quality**

The proposal consultants talked about “not changing the water quality” meaning in their interpretation that it will not change the water classification (SB) of the bay, and thus the water quality would not change. We disagree with this claim for two reasons. Marine waters in Maine are classified into three broad categories: SA, SB, and SC waters. Class SB waters includes bodies of water with a wide range of water quality, with an intermediate risk of a breakdown of the ecosystem and loss of use due to either natural or human-caused events ([Classification of Maine Waters](#)). Saying that all Class SB waters are all the same reduces Maine waters into just 3 possibilities, with no variation among them that might affect the ecology of a local ecosystem. Increased nutrients will change the quality of the water. We may not know what the effects of this change will be ecologically, but nutrient levels will increase. Second, their model only describes dilution of pollutants through time and ignores the restrictive nature of the bay and potential residency time of water in the upper bay.

### **Effects on wild stocks and on current aquaculture and fishing activity in Frenchman Bay**

Bar Harbor lobstermen have come out strongly against the proposal, citing interference with fishing grounds, and the deep water areas at and adjacent to the proposed sites have a history of fishing for a variety of species including shrimp and scallops. One fisherman has said that DMR should have historical fishing data for shrimp in that area because shrimpers were required to submit these data. Bar Harbor lobstermen have gone on record by writing a [letter](#) signed by 26 Fishermen, the vast majority of the Bar Harbor fleet, outlining their concerns and unanimous opposition to the proposal. These fishermen have also expressed concerns about contaminants from the project polluting the bay and reducing their ability to fish and sell their catch.

Currently, the most common form of aquaculture in Frenchman Bay is shellfish aquaculture, including blue mussel, oysters, and scallops in both Bar Harbor and more broadly throughout upper Frenchman Bay. A major concern for this aquaculture is a shellfish harvest closure due to harmful algal blooms, most recently Amnesic Shellfish Poisoning (ASP) from the diatom *Pseudo-nitzschia*. This species has been increasing in our bay, and we do not know how increased

nutrients in the bay could affect the populations of this species. Thus, this aquaculture facility has the real possibility of negatively impacting other aquaculture in the bay.

### **Other forms of pollution generated by the project**

In addition to the many forms of water pollution, there are concerns about air, noise and visual pollution. The required amount of diesel fuel to constantly run the generators has been estimated over 1000 gallons per day. This raises the issue of pollution from small spills and a potential large spill, with diesel storage tanks with several thousand gallons on each site.

The proposed location for the pens also has the potential to impact several important wildlife species in the area. There are nearby eagle nests to at least one of the sets of pens. Harbor Porpoises extensively use the proposed pen site off Long Porcupine, seals extensively use Bald Rock, and seabirds are abundant at both locations. Our tour boat fleet (from kayaks to vessels) all use these areas to view wildlife, the tourism economy connection is important here. We were surprised to see no consideration of the light and noise pollution on these important wildlife species.

The project is within 2000 feet of Acadia National Park and would be visible from several mountain peaks in the park. The park has objected to the proposal.

### **In conclusion**

We are happy to come to town council and discuss or elaborate on any of these points. We appreciated meeting with the Conservation Commission and the Harbor Committee on November 1, 2021 and believe that they will have other important points to share with the town council.