

# David Santillo, PhD. Environmental Scientist, Portland, Maine

March 25, 2022

Ms. Anastasia Fischer  
Eastern Maine Conservation Initiative  
Portland, Maine

## **RE: Review of Environmental Permits for Proposed Kingfish Aquaculture Operation, Jonesport, Maine**

Dear Ms. Fischer:

The purpose of this letter is to render my professional opinion of application materials submitted by Kingfish Maine regarding their proposal to construct and operate a land-based Recirculating Aquaculture System facility growing yellowtail kingfish on an approximately 94-acre parcel of land located in Jonesport, Maine.

In my role as owner and Principal Ecologist of my own environmental consulting firm (Northern Ecological Associates, Inc), and a Vice-President of one of the largest Environmental Firms in the world (TetraTech, Inc.), I have been involved with numerous major development projects in scope similar to the proposed Kingfish project. My experience included extensive work with the US Army Corps of Engineers (USACE) in marine environments on the planning and study of navigation and coastal shoreline protection projects, and I have been involved on behalf of both project proponents, such as Kingfish, and as a regulator in third party capacity representing Federal agencies such as the USACE and the Department of Energy. I have performed numerous environmental impact analyses and biological studies involving water quality and marine biology.

It is this experience base that I draw upon to offer my opinion and thoughts on the Kingfish Marine project. I focus my opinions on natural resources, the area of my greatest expertise.

The application materials I reviewed included:

1. Application for a Maine Pollutant Discharge Elimination System Permit/Waste (MPDES).
2. Site Location Application.
3. Natural Resources Protection Act (NRPA) application.

I believe there are serious deficiencies in numerous aspects of the Kingfish application in the description of the existing environment, and in the assessment of the likely environmental impact of the project.

### **MPDES APPLICATION**

I have both general and specific concerns regarding deficiencies or misrepresentations of the water quality analyses and models. An overall red flag I perceive is that anti-degradation statements included in the permit application often are accompanied by reference to the “positive” economic report. This type of linkage often is used as a diversion from deficient assessments of existing resources and to distract from actual significant environmental impacts.

A significant concern I have is regarding the assessment and characterization of the impacts of anticipated Nitrogen discharges from the outfall pipe related to movements, concentrations, and flushing. My concerns fall within three major areas:

1. Accuracy of the Characterization of Existing Conditions (which serve as input variables for CORMIX and TUFLOW models).
2. Validity of the way the CORMIX and TUFLOW models were used and how results are interpreted.
3. Lack of detailed plan on how Kingfish will monitor Chandler Bay to determine if critical water quality parameters are exceeded and what they will do when they are exceeded.

**1. Quality of the Characterization of Existing Conditions.** It is critical that a project proponent accurately characterize the existing environment; it is the basis upon which project impacts are measured and assessed. The level of background Nitrogen in Chandler Bay is key because it is the baseline upon which the additive impact of Nitrogen discharge from the Kingfish operation will be added and related to the concentrations that are documented to harm marine organisms.

Nitrogen loading of coastal ecosystems is a worldwide problem, and when it exceeds thresholds that lead to algal blooms, it can lead to eutrophication problems. The eutrophication can result when phytoplankton (which assimilate the excess nitrogen) growth explodes and uses up available oxygen in the water.

Kingfish reports that there is a background concentration of Total Nitrogen in Chandler Bay of 0.27 mg/liter, and it bases its entire argument that its Nitrogen discharges will not exceed allowable limits on this number. It appears this figure is the result of surveys performed by Maine Department of Environmental Protection (unreferenced in the application) from 2010. ***This is dated information that almost certainly does not represent 2022 conditions.*** Increased development and land use changes surrounding Chandler Bay, as well as the rapidly changing chemistry and temperatures in the Gulf of Maine, have undoubtedly resulted in significant changes to background Nitrogen concentrations in Chandler Bay since 2010.

***Given the importance of baseline Nitrogen in the bay, it is imperative to base it upon actual current measurements. The output of a predictive model is only as good as the quality of the numbers 'put in' to the model, and in this case, these numbers are highly suspect.***

Furthermore, this concentration of Nitrogen is presented and used in the modeling as if it were an unchanging number. The reality is that the values of nutrients in tidal systems vary seasonally, in relation to rainfall events, and over the course of tidal cycles. Even if the number of 0.27 mg/liter were accurate as an average or mean, it is certain that this number varies within some range of variation. ***Accordingly, the only accurate way to present "background Nitrogen levels" is as a range.***

**2. Validity of the way the CORMIX and TUFLOW models were used and how results are interpreted.**

A major consideration is that models such as the one used by Kingfish are based upon a large number of assumptions and uncertainty. Use of words like "HIGHLY UNLIKELY" in the Kingfish application are significant red flag hedge words that hint at the uncertainty. Accordingly results need to be

interpreted with caution and with high allowance for uncertainty because of the potential to harm marine plants and animals and the entire Chandler Bay ecosystem.

In addition to the concerns with the numbers (input variables) used for the models, there also are concerns related to the results. The TUFLOW water quality model predicts the aquaculture operation will add 0.038 mg/l of Total Nitrogen, which will result in a Total Nitrogen level of up to 0.31 mg/l in the Bay. The US Environmental Protection Agency, Maine DEP, and the New Hampshire Department of Environmental Services cite a level of 0.35 mg/l of Total Nitrogen as the level that is protective of dissolved oxygen in coastal waters.

Kingfish reports that based on this, predicted levels will be within acceptable limits, however this seems unacceptably close given the following:

- They did not measure actual and current levels of baseline nitrogen, as noted above.
- Actual levels of background nitrogen more accurately vary around a mean concentration, so it's reasonable to assume that levels will exceed allowable limits at some point.
- Future background levels of TN in the Bay will likely increase as overall development in proximity to the shoreline advances and nonpoint sources of nitrogen increase.

### **3. Lack of detailed plan on how Kingfish will monitor Chandler Bay to determine if critical water quality parameters are exceeded and what they will do when they are exceeded.**

Applications for proposed developments like the Kingfish project can only be considered complete if they address mitigation and monitoring. The lack of a plan in the Kingfish proposal for monitoring and responding to violations in discharge is a glaring omission. It is critical that actual monitoring of water quality parameters be specified routinely during operation so that comparison to predicted levels can be completed. I have observed that is common for industrial polluters to exceed predicted levels and given the lack of government funding for compliance monitoring, oversight is often lacking.

Compliance monitoring would guarantee that actual levels of pollutants and water temperature are what they claimed they would be. There needs to be extremely specific and detailed planning for monitoring and a plan if they are wrong about the levels of Total Nitrogen in the Bay.

***The lack of a monitoring and action plan is a critical flaw of the Kingfish proposal.***

#### **SITE LOCATION APPLICATION**

I believe the Kingfish Application for Site Location has the following significant deficiencies:

Section 6 – Visual Quality and Scenic: The applicant proposes structures that are highly visible from offshore. Regardless of visibility of present structures, conversion to industrial use is significant. Relocation of buildings nearest to shore farther from the shoreline would allow planting and maintenance of some width of tree buffer between the shoreline and the building, which would greatly mitigate and reduce visual impacts from offshore.

Section 7 – Wildlife and Fisheries: The applicant includes information only on *known resources* based upon a single consultation from Maine Department of Inland Fisheries and Wildlife (MDIFW), and deals only with bats, the Crowberry Blue butterfly, and vernal pools. The letter from MDIFW makes it clear that the information should not be interpreted as a comprehensive review. It is routine and critical that

actual on-the-ground surveys be performed as part of data collection and impact assessments, because known rare resources represent only a small percentage of actual occurrences. Furthermore, the Beginning With Habitat Map included does not show the Significant Habitat feature located just offshore of the facility, within the discharge zone, which is Important Tidal Waterfowl and Wading Bird Habitat.

Section 9. Natural Areas: Similar to the above, Kingfish bases a conclusion that there are no unusual natural areas or rare plants based on a single agency consultation (Maine Natural Areas Program) and ignores the recommendation that actual field surveys be conducted to determine actual presence.

I note also that a portion of the development is proposed in forested wetlands, which is generally regarded as the most significant type of wetland to impact because of the difficulty in replacing these types of wetlands. The overall property contains a large percentage of wetlands; that alone makes it a poor choice for this development. Regardless, there is no discussion of avoidance or mitigation of wetland impacts. I believe that minor adjustments to the location and shape of buildings could have reduced and minimized impacts to wetlands.

#### **NRPA APPLICATION**

The NRPA application contains information similar to the Site Location application and I have similar concerns with the quantity and quality of the information presented that is the basis for assessing impacts. ***In my opinion, actual surveys should have been performed for wildlife and plants instead of just presenting information on known locations, especially since as noted in agency correspondence, there are known rarities located within 4 miles of the proposed development.***

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In conclusion, it is my overall opinion that there is insufficient data presented by Kingfish with which to evaluate actual impacts, and to be confident that acceptable levels of impact avoidance and minimization have been performed. With a project of this magnitude, an assessment of impacts and project viability can only be made using actual and current information on existing conditions. Complete assessments of impacts on Chandler Bay can only be made using actual measurements of present-day water quality and movement of water as a result due to tides and currents. Furthermore, a thorough, assessment of impacts of the land-based portion of the development can only be made if actual onsite surveys are completed for the full host of natural and cultural resources.

In addition, I believe an additional significant deficiency is the lack of a monitoring plan to observe water quality parameters both prior to and after initiation, to make sure that actual levels are within predicted limits and do not exceed levels that would have significant impacts on marine resources.

*David J. Santillo*

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