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Response to "Economic and Fiscal Impacts of a Proposed Recirculating Aquaculture Facility in Jonesport, Maine

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Introduction

Jonesport, Maine is considering a proposal for a recirculating aquaculture facility (RAS) submitted by Kingfish Maine in November of 2019. The company commissioned a report from the Margaret Chase Smith Policy Center at the University of Maine. The researchers implemented an input-output model to assess the potential economic benefits of Kingfish entering the community. The commissioned report errs on favorable assumptions towards the incoming industry and omits important considerations for the existing economy and environment. The primary focus of this report is to provide alternative considerations and empirically-based recommendations for the Jonesport and Washington County voters. This report will consider three main shortcomings and relevant considerations: multiplier assumptions, employment potential, and environmental externalities. Before permitting a large economic shock, such as the development of a 94-acre oceanfront property, it is imperative that the voters and policymakers be well-informed of the relevant costs and benefits because once environmental damage is done it can be prohibitively expensive or near impossible to reverse.

Multiplier Assumptions

The previous report estimates a 2026 state multiplier of 2.21 and a Washington County multiplier of 1.8 for the ongoing operations of the RAS facility (Bailey and Green, 2020). The multiplier is estimated based on assumptions on how money flows through the economy. The more money that stays within the economy of interest (Jonesport versus Washington County verses Maine), the higher the multiplier. Intuitively, this is why the state multiplier is higher than the Washington County multiplier. The report doesn't estimate a Jonesport multiplier, but we can provide some statistics to help with estimating the decline in the potential employment multiplier for Jonesport.

Another approach to use in an attempt to value to decline in the local multiplier versus the county multiplier is through other empirical estimates. A well-known review article by Bartik (1991), estimates that local multipliers can vary by region, with local employment multipliers being 25% lower than the estimated regional multipliers. This would suggest that the Jonesport multiplier would be approximately 1.35, compared to the Washington County multiplier of 1.8. Additionally, a study looking into the impact of farm fishing on employment in Ireland estimated an employment multiplier of only 1.38 (Grealis et al., 2017).

A second assumption the multiplier exercise requires is the movement of workers between labor and leisure activities. Jonesport jobs are 80% filled by commuters, according to the Bailey and Green study. Provided this information, we will assume that 80% of the new workers at the Kingfish facility will be commuting into Jonesport. The true multiplier effect will be smaller than the one estimated by Bailey and Green (2020) due to the fact that a majority of workers will be spending their income outside of the economy where they have earned it (Bartik, 1991), thus the power of the recirculating income will be diluted. Further, these commuters will pay local property taxes to other governments, increasing public goods funding outside of Jonesport.

Overall, estimates in the empirical literature on employment multipliers are on par, or lower than the estimate provided in the Bailey and Green study. It is our recommendation that voters should consider the Bailey and Green estimates as an optimistic upper bound. To make an optimal decision, local policymakers should carefully consider a reasonable multiplier impact. The discrepancy in the multiplier impact may be due to assumptions made regarding leaky wages and a high proportion of commuting workers for the area, or the spatial scope of the multiplier being computed. Washington County's multiplier is not the same as Jonesport's multiplier, and should not be treated as such.

Employment Potential

While the commissioned report provided estimates for the employment that Kingfish would bring to the area, the authors failed to consider how the construction and operation of the Kingfish recirculating aquaculture facility (RAS) may be detrimental to the local Jonesport economy and workers. Through specifically examining the impact of the RAS facility on the lobster-fishing industry and other fishing industries, the effectiveness of employment multipliers, the distribution of new jobs during the operation of the facility, and the Jonesport tourism industry, this section will consider the potentially harmful effects of Kingfish's aquaculture facility and the overly optimistic claims of its positive promises.

Lobster fishing in Jonesport employs a significant proportion of Jonesport residents. In 2021, there were 7,384 lobster-fishing permits issued in Jonesport, of which, 200 of permit holders are Jonesport residents ("2021 Lobster Permits"). Lobster-fishing is an industry in which the job itself requires the fishers to spend money in Jonesport to conduct their business. Lobster business indirectly supports many other businesses, such as the sale of bait, traps and pockets, rope, weights, buoys, boats, and fuel for the boats and cars fishermen use to commute (Aishton, 2020). While the lobster-fishing

industry brings in thousands of workers, it is reasonable to assume that a significant amount of the lobster-fishing business money used for production is put into the local economy of Jonesport.

Unfortunately, the same cannot be said for the people who would be working at the Jonesport RAS facility. In Kingfish's "But For" Letter, they claimed that the operation of the RAS facility would provide more than 100 new jobs that would pay a *median* annual wage of $60,000. In addition to this, a survey of RAS facilities found that 27% of the jobs pay $100,001-$250,000 including benefits (Bailey and Green, 2020). While high-paying jobs appear beneficial to the local economy, these jobs would most likely not be going to residents (Bartik, 1991). Empirically, it has been estimated that approximately 70% of jobs created in rural areas will be captured by in-migrants, thus the new jobs number stated by Bailey and Green (2020) of 136 job during construction and 70 jobs in perpetuity will result in 41 and 21 jobs, respectively for existing residents. While, 18% of Jonesport residents over the age of 25 have a Bachelor's, graduate, or professional degree, the jobs paying above $100,000 are generally targets to applicants with at least a 4-year degree. It is more than likely that these jobs are fit for either new residents or commuters into Jonesport (Bailey and Green, 2020), and the below median (i.e. less than $60,000) salaries would be for applicants with less than a bachelor's degree.

While the commissioned paper considers the positive multiplier effect of an RAS facility, we encourage local officials to analyze the potential job losses due to employment impacts from negative RAS externalities. For instance, other fishing industries in Jonesport may experience job loss because of the RAS facility due to increased competition, environmental degradation, and harm to the fish population. A related study conducted by Just Economics (2021), shows that the growth of the fish farming industry may lead to the loss of jobs in both the traditional fishing and food preparation sectors. Increases in fish farming may crowd out traditional fishing in the regions, leading to job losses in that sector, or negative externalities may impact traditional fishing success rates. In this case, we may be simply analyzing a zero-sum game. One in which the benefit of the new industry is being offset by losses from existing employment.

For instance, Naylor et. al. (2000) finds that salmon farming causes "damage to the ocean and coastal resources through habitat destruction, waste disposal, exotic species and pathogen invasions." All of these avenues of destruction deplete wild fish reserves. Expected losses in this case of salmon farming arise from the environmental degradation from the farming facilities themselves, and the introduction of diseases which arrive from mutations within the farms' fish populations (Naylor et al., 2000).

Environmental changes to Chandler Bay, and the potential introduction of disease will detrimentally affect the wild fish and lobster population. Fewer fish to catch will bring increased lay-offs, directly impacting the number of workers demanded by the traditional fishing market. Less fish being caught will also decrease the number of jobs in the preparation industry. Taken together, it appears that the estimates and impact reported by the commissioned report appear to again be an upper bound of economic benefits for the local area. With a focus on general equilibrium focused on the entire Jonesport economy, instead of partial equilibrium focused on just Kingfish Maine's economic activity, leads us to conclude that the impact on the lobster and other fishing industries, coupled with the effectiveness of employment multipliers proposed in favor of Kingfish's proposed facility, and the distribution of new jobs, it is clear that this RAS facility will likely bring a smaller employment benefit than estimated by the commissioned report.

Conclusion

Steady jobs and real wage increases are essential to a community's economic health and the overall well-being of its citizens. Each community is different, with different needs and approaches to its individual economic system. Some communities specialize in manufacturing, others in technology, and others specialize in their abundance of a given natural resource. Jonesport has an economic foundation in the resources provided by Chandler Bay, and risking that for a company that is promising economic benefits without properly assessing and disclosing costs should be done with caution.

Many rural communities struggle with population declines, and bringing well-paying jobs is one way to incentivize families and young professionals to migrate to the area. Simply having a high-paying job will not require workers to live in the community. Super-commuting is on the rise (Salviati & Warnock, 2021), and unless there are other amenities and community social networks in place, the workers with the high-paying jobs will be living and spending their salaries outside of Jonesport. While we acknowledge a desire to diversify jobs in Jonesport, it is imperative that the new jobs work as complements to existing well-paying jobs in the area. From the research completed by other scientists and scholars, it is more likely that the RAS industry works in opposition or as a substitute to the current lobstering, clamming, and fishing industries that call Jonesport home.

At a purely narrow economic level, the Kingfish RAS facility may appear to be largely beneficial, however, upon taking a deeper look at the potential secondary economic impacts of the facility, it is clear that costs are not fully accounted for in the commissioned report. The economic

analysis conducted by Kingfish suffers from bias and lacks the in-depth rigor required for a general equilibrium analysis. The multipliers do not apply directly to Jonesport, and the outcomes are subject to assumptions chosen by the researchers without any robustness discussion provided. We caution the local policymakers that the multipliers estimated in the commissioned report should be viewed as an upper bound for Kingfish's impact on the local Jonesport economy.

Kingfish would be free-riding off of an ecosystem that is integral to the Jonesport community. Like ecosystems, economies are complex networks and while we acknowledge the true economic impacts of the proposed RAS facility are unknown, voters need to be well-informed of the significant negative externalities that may result from the construction of this facility. These impacts may be difficult to account for in an economic analysis, but we stress that diligent analysis would use modeling to report on sensitivity and explicitly convey the assumptions used by the authors. While this exercise may be cumbersome, it is important the external impacts *are* taken into consideration before irrevocable actions are undertaken.

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