

I, Alexa M. Dayton, declare the following:

1. My name is Alexa Dayton. I have a PhD from the University of Maine, where my work was focused on the economics of the Maine lobster fishery and fleet, evaluating the economic impact of changing ecosystem conditions. I have performed projects as an independent contractor for the State of Maine specific to lobster and crab policy. I hold a M.S. degree in biological sciences, focused on ecology and ecosystems, and a B.S. in engineering. I am the Executive Director at the Maine Center for Coastal Fisheries, situated in the Town of Stonington, Maine, home to 1,075 people, of which ~450 derive their livelihoods from the lobster fishery.
2. The Magnuson-Stevens Act, the federal statute guiding sustainable management of our nation's commercial fisheries, established 10 National Standard which provide a basis for conservation of our fishery resources balanced with economic return to the nation. Together the 10 standards aim to achieve optimal yield, which incorporates economic return in the management framework.
3. I herewith provide an economic impact assessment of two components of the proposed regulatory approach to achieve a 90% risk reduction of the Maine lobster fishery, specifically, the removal of 75% of the vertical lines from the Maine lobster fishery in a compressed timeline, and/or full closure of the offshore fishery. These regulatory alternative proposals are based on assumptions that alternate technologies exist for immediate adaptation, such as ropeless trap fishing. I provide an economic impact assessment and discussion of the implementation realities to these assumptions, for consideration by the courts to balance with the conservation viewpoint.

4. The stakes are high for a small number of people significantly affected by this process.

Maine lobster management zones A through D are home to 67% of the Maine lobster fleet, and 71% of the vertical lines of the inshore Maine lobster fleet<sup>1</sup>. This group of 3,200 fishermen is distributed across 15 islands and 105 small coastal villages, representing upwards of 50% of the population of each village, and with minimal employment alternatives. (See figure 1.) Under NMFS’ draft risk reduction scenarios, these villages and island communities in rural Maine plus the 1,087 student license holders who represent our future, will inequitably bear the vast majority of the economic burden of the right whale risk reduction measures, despite lack of evidence of a single documented right whale death in these Gulf of Maine waters.

	% HH Income from lobstering*	\$/hr for potential alternate earnings**	Unemployment rate*	Poverty Rate*	Nominal Income*	Proportion of the fleet	Maine County
Zone A	77%	\$ 9.73	12%	21%	\$ 28,000	20%	Washington
Zone B	77%	\$ 16.65	10%	14%	\$ 38,000	10%	Hancock
Zone C	81%	\$ 13.05	10%	14%	\$ 38,000	17%	Hancock
Zone D	74%	\$ 13.64	10%	16%	\$ 35,000	20%	Waldo
Zone E	65%	\$ 16.75	6%	8%	\$ 58,000	9%	Cumberland
Zone F	62%	\$ 16.48	6%	8%	\$ 53,000	16%	York
Zone G	69%	\$ 16.22	6%	8%	\$ 53,000	8%	York
* Pre-pandemic census statistics							
** Independent survey statistics							
***Dept of Marine Resources					Zones A thru D	67%	

Figure 1. Maine lobster zone economic statistics.

5. I believe the proposed risk reduction measures in the NMFS right whale risk reduction plan pose significant risk of irreparable and irreversible economic harm to the most vulnerable communities in Maine, with significant impact on the Maine economy and social structure, such that it warrants immediate granting of an emergency appeal to

<sup>1</sup> DMR licensing statistic

provide the necessary time for review of the science underpinning the proposed regulations before a final decision is reached.

6. In 2019, the Maine lobster fishery was composed of 4,745 commercially licensed lobstermen and 1,087 student license holders. Maine's lobster fleet directly supports more than 12,000 jobs (4,745 Captains, up to 7,000 crew, 1,087 students)<sup>2</sup>, generating \$510 million in direct wages and income. These labor statistics and the ex-vessel landings value do not reflect the full economic impact of the industry; research has quantified the lobster fishery impact on Maine GDP with an employment multiplier of 1.54 and a sales output multiplier of 2.20 of indirect effect elsewhere in Maine's economy of intermediate goods and services<sup>3</sup>. The indirect effect of the lobster fishery's \$731 million in ex-vessel sales is therefore associated with 6,600 additional jobs, with \$300 million in wages plus an additional indirect effect of \$1.6 billion, for a total of \$1.9 billion in total contribution. The lobster industry therefore represents as much as 3% of Maine's overall GDP of \$61.8 billion in 2021<sup>4</sup>.
7. The Maine lobster harvester fleet is characterized by five different business operating models, roughly aligned with vessel size but also with different crew and gear configurations and operating within designated management zone boundaries. These business models operate at different efficiencies, and are unevenly impacted by changes in regulations, market fluctuations and changes in resource abundance<sup>5</sup>. I analyzed economic impact scenarios incorporating the current and proposed regulatory measures

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<sup>2</sup> Class I + (2xClass II) + (3.5 x Class III) = 12,000. Class III crew limit expanded to 4

<sup>3</sup> Jenny Sun, Bradley Franklin, Brian Kennedy and Eric Thunberg, "Economic impact of climate variability on the Maine lobster fishery and its climate adaptation options", NAREA 2018.

<sup>4</sup> Federal Bureau of Statistics

<sup>5</sup> Dayton and Tokunaga, "Economic Diversity of Maine's American Lobster Fishery", 2022.

on the differing harvester operating models, including a 75% trap reduction, which would remove 50% of rope, and second, a full closure of the federal fishery. In the first instance, density of fishing effort and increased competition will cause segments of the fleet to operate below break-even and exit the fishery; in the second instance many owners will choose not to adapt to new technology and regulations, either due to cost or due to age, and exit the fishery. The findings in both cases indicate a potential loss of 1,800 – 1,900 vessels in the fleet, associated with 3,600 jobs and a total economic loss of \$576 million per year, occurring within three of the most economically depressed counties of Maine and representing 15 islands and 105 coastal communities. The vessels and gear are further considered non-malleable capital and represent an additional \$180 million in lost equity to these communities.

8. The social and economic consequences of loss of lobstering jobs are real, and irreversible. In these rural, island, and fjord-like rugged coastal regions of Maine, lobstering income represents as much as 81% of individual household income<sup>6</sup>. Opportunity for alternate employment is constrained, with unemployment rates of 10 - 12%, and poverty rates of 14 - 20%<sup>7</sup>. In these counties of Maine, lobstering is the third largest source of income and the entire community is dependent on revenue generated from the fishing industry to keep the service and retail economies moving. The Maine inshore fishery will suffer the most impact as a result of proposed changes; these are the most vulnerable community members, with the fewest options for adaptation, leading to irreparable economic harm for these towns and islands.

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<sup>6</sup> Dayton, A. "Understanding opportunities and barriers to profitability of the New England Lobster Fishery", 2014.

<sup>7</sup> Dayton, A. and Sun, J. "An independent evaluation of the Maine limited Entry System for Lobster and Crab", 2012.

9. Maine's lobster fishery is the most sustainably managed fishery in the world and is a rare owner operator fishery that operates in rural and rugged environments. The fishery's conservation program evolved as a series of voluntary and self-enforced measures of breeding female release, minimum size and maximum harvest sizes, escape vents in pots, and whale mitigation measures. New sinking rope, break away links in the rope, and trawling up have become standardized. This is a successful business and fishing model that aims to ensure intergenerational longevity.
10. Apprenticeship program and leadership councils at a zone scale have created a co-management system that works with industry fully invested in the management of the resources that sustain them. The tight controls on entry and exit, including non-transferability of licenses and reductions in trap counts over 20 years have maintained balance of the fishery for over a century. Tight management has prevented over-fishing and fishing licenses remain within the communities to ensure affordable startup cost for new entrants into the fishery. This contrasts starkly with other fisheries where consolidation of the fleet has occurred, leading to significant startup costs that can only be borne by corporate ownerships with funding capital, which can lead to excessive pressure on the fishery resource to overcome this structural cost.
11. The inshore fishing effort in the Maine lobster fishery is constrained by spatial management zones, which prevents migratory fishing practices and creates a territorial use rights schema that is honored within the fleet and by regulators. As the biomass of the lobster fishery shifts spatially over time, the fishing success by zone will vary in catch per trap. This constraint leads to differing economic outcomes for similar fishing practices by region. The number of licenses per zone is constrained as well, and so the community

accepts the natural fluctuations in the overall fishery return and shares in this together. There are good years and bad years, and these are weathered, leading to adaptation and change over the years. This is unique to Maine and bears significant conservation value that is rarely acknowledged.

12. An estimated 1,278 Maine lobstermen have added a Federal offshore lobster permit to allow for expanded year-round fishing opportunities, representing 79% of all Federal permits issued. This has contributed to the State's economic output, expanding markets for lobster in peak holiday seasons in the U.S. and Asia, where lobster is culturally revered as a symbol of the dragon. This fishery has operated very successfully and demonstrates exceptional technical and economic efficiency.
13. Adaptation has occurred, as revealed by the different business operating models in the fishery. Increased numbers of traps per trawl for example have already reduced the vertical lines in the water, leading to a need for larger newer vessels able to handle the larger loads. The fisheries business models can adapt and sustain shocks to any number of production inputs, (i.e. bait, fuel, ice, labor, price) where a bad year or two can be sustained, but multiple bad years plus a compressed timeline for substantial change with added costs, can rapidly lead to marginal small business failures.
14. Additional rope reductions of 75%, achieved through a combination of deployment of new ropeless buoy technology, plus trap reductions, comes with significant capital cost increase to the vessels and additional on-the-water operating costs through labor time in handling. Invisible gear will lead to loss of gear for lobstermen, resulting from gear conflicts with other fisheries such as s trawls, and shipping. Enforcement will require participation and installation of GPS receivers, other fisheries will need to avoid the

invisible lobster gear through installation of GPS receivers, increasing complexity of the overall change. This level of technological investment and behavior adaptation will only be borne by those who see economic viability. Our model indicates that the larger operators have the technical efficiency and economic resilience to adapt, where other segments of the fleet do not. These rope reductions of 75% will lead to the exit of the older vessels and fishermen and result in fleet consolidation. Based on our survey of vessel age, length and HP and the age of the license holders in the fleet, many of whom are between 60 - 65 years old, I estimate that there are as many as 1,800 vessel owners who are at risk of exit, stranding boats and gear with little value.

15. Closure of the federal offshore fishing grounds will displace the offshore fishing effort into state waters, significantly increasing effective fishing effort density within spatially constrained management zones. This will have the net effect of degrading catch rates for all vessels in the fishery, and lead to reduced revenues, impacting the different lobster business models unevenly. The larger, more profitable, efficient business model will be able to withstand revenue decreases, and thereby outcompete the lesser efficient inshore business model through more efficient production economics. A 20% reduction in catch rates could trigger a cascade of small business owner failures as high as 1,900 vessels, or up to 70% of the inshore fleet. A loss of this number of jobs in these rural economically depressed counties of Maine would be devastating.
16. Lobster is food, and a sustainable source of protein, caught locally in New England, proximal to freezer capacity and rail transport into the entire U.S. These measures will acquiesce a critical national food source to Canada with what will effectively be a fishery closure. We currently import 90% of the seafood consumed in the United States, much of

it sourced from unsustainable fisheries with harmful labor practices. We export 90% of our hard-won sustainable fisheries output to the rest of the world. The health impacts of this on our population, and the dependency we develop on transported goods at the expense of national climate goals is astonishing. The lobster fishery contraction would add to this trade deficit.

17. Based on the scenarios provided for potential regulatory changes, it is my opinion that irreparable economic harm will be caused to the coastal communities of Maine, and this is without any evidence to indicate it will result in a reduction in the number of North Atlantic right whale deaths. According to NMFS, the right whale population tripled from roughly 150 whales in 1971 to a peak of 481 individuals in 2011. The lobster fishery also expanded during these years, but actually reduced its risk to the species beginning in 2010 when it removed a significant amount of rope from the fishery. Zero right whales have died in Maine, yet they have declined in numbers nonetheless. These proposed regulations sadly do not address this problem, and by misdirecting resources even go further to detract from finding real solutions to reducing whale deaths and increasing whale births.
18. Evidence does support a proposed protected Area in the Southern New England Great Channel, and the idea of further testing and scaling of ropeless fishing technologies to enable continued fishing in these specific areas with high documented incidence of whale forage activity is a motivating call-to-action for all. But the blanket adoption of this regulatory proposal encompassing all trap and pot fisheries from Maine to Florida, without the data to support this expansion, or the time for the adaptation to occur is a significant over-reach without scientific basis. It errs grossly from effective fishery

management, undermines the public trust, and creates social inequity leading to irreparable economic harm.

I declare under penalty of perjury that this statement is true and accurate to the best of my knowledge.

A handwritten signature in black ink, appearing to read "Alexa M. Dayton". The signature is written in a cursive, flowing style with a prominent initial "A".

Alexa M. Dayton, PhD