

State of Maine
Department of Marine Resources
Bureau of Public Health and Aquaculture

In Re: Bailey Coffin
Standard Lease Application

Pre-Filed Testimony of
Dr. Brian Beal

My name is Brian Beal, and I am a native of Jonesport, Maine. I have a B.S. degree in Biology (University of Maine, Machias in 1979), a masters degree in Marine Sciences from the University of North Carolina at Chapel Hill and Ph.D. in Marine Bio-Resources from the University of Maine at Orono. All my work, including as a Fulbright scholar, has focused on marine ecosystems and particularly on Maine's intertidal zone. My C.V is in evidence as Coffin Exhibit 10.

I am familiar with Bailey Coffin's proposed lease site, from my research in the summer of 2022. The purpose of my study was to characterize the benthic flora and fauna of the lease site, toward drafting a site report. "Benthic" means living on the bottom, both on the bottom and within the bottom.

I visited the site during an unusually low spring tide, minus 1.5 feet. Therefore much of the proposed lease was exposed or in very shallow water. I arrived about an hour before dead low tide, and stayed for two hours. These were ideal conditions to determine what flora and fauna exist on the site.

My methodology included transects (samples taken at equal intervals along straight line that cuts through a natural landscape, so that standardized observations and measurements can be made), sampling using sieves, and core sampling. This methodology is the commonly accepted method of characterizing benthic fauna and flora in the intertidal zone. I have done such work countless times.

When I found flora or fauna I identified them by species and quantified the species, all as shown in my report, which I specifically incorporate herein, "Characterization of bottom fauna and submerged aquatic vegetation - Proposed lease site of Bailey Coffin for a standard lease (non-discharge) located in Freeport, Maine." (Coffin Exhibit 9).

Were the hearing officer to walk across this site in a minus tide, she would find the bottom to consist almost entirely of shell hash (a mix of mud and broken shells from dead mollusks) and mud, as shown in Images 9 and 10 of the DMR Site Review, as well as in the cover image of my report and many of the photographs in that report.

As to fauna, I found a few soft-shell clams, crepidula, periwinkles, mud snails, a few quahogs, many green crabs, some juvenile rock crabs, worms, and tunicates. There does not exist a commercially valuable stock of soft-shell clams or quahogs on the site, nor of any other commercially valuable species.

Immediately after low tide, I walked the area that, despite the extreme tide, remained submerged, in an attempt to find and quantify submerged aquatic vegetation. I was unable to find any eelgrass, *Zostera marina*. I observed no living eelgrass on this site at any time.

As I testified, my site research included core sampling of the sediments. For any accurate determination of benthic flora and fauna, core sampling is essential, and this is particularly so for eelgrass. In the absence of a direct observation of a rooted eelgrass plant, only a core revealing living eelgrass rhizomes will show that eelgrass is actually growing in a location. Merely finding rhizomes on the sediment surface, as the DMR site report reports those researchers found, is not proof of eelgrass living on the site. Eelgrass blades and rhizomes frequently break off due to wave action, and the blades and rhizomes may be carried far from the eelgrass beds.

I found no living eelgrass rhizomes in my core samples, just as I found no mature eelgrass plants. I visited the site in mid-July, when eelgrass are highly visible and growing fast, and I visited at an extreme low tide, ideal for locating eelgrass. Were there eelgrass on this site, either living rhizomes or mature plants, my research would have found it.

The DMR site report states that, in the summer of 2021, living eelgrass was found, but there are three flaws in the study. First, the researchers performed no core sampling. That is on page 8 of the DMR site report:

“Sediments were categorized based on visual analysis; no sediment samples were collected . . .”

If one of my students had proposed a research project to determine whether eelgrass does or does not grow on a study site, and the project did not include core sampling, I would not have approved the methodology. In a study to determine whether eelgrass grows in a given site, is it inconsistent with good scientific method to omit core sampling, because only by core samples can the presence of living rhizomes be determined.

Second, DMR did not visit the site on a sufficiently low tide. The Site Review states (p. 3) that the first of three visits was on July 8, 2021, and that the tide was still ebbing. The second visit was on July 28, 2021, at low tide. According to NOAA data, the two low tides on July 28, 2021 were minus .23 feet (9:12 am) and plus .67 feet (9:31 pm). Judging by the photographs DMR visited the site on the morning tide, which was not low enough for accurate detection of eelgrass. The same may be said for the third visit, September 13, 2021, when the morning tide was plus .42 feet. (The second low was at 11:22 pm.) In contrast, I visited during an extreme low tide, minus 1.5 feet, when far more bottom was exposed.

Third, the dates are critical. DMR visited the site in the summer of 2021, a year before my visit. If there was eelgrass growing on the site in 2021, there was none in 2022. My research, using accepted methodology, and performed a year later in time and at an ideal tide, is far more definitive of whether there is eelgrass on this site in 2023 than is the 2021 DMR study.

There are other flaws in the DMR Site Report. On page 21 the report cites a 2018 Maine Department of Environmental Protection eelgrass survey. DMR researchers say the MDEP researchers found sparse eelgrass on the site, but that the observation for some reason failed to make its way into the GIS map the study produced. This omission, if it was an omission, the DMR researchers attempt to patch up with a footnote to a "communication", see footnote 19. Such a reference to a vaguely characterized communication is, in the scientific community, a seriously insufficient foundation on which to base an important data point.

The DMR Study also fails to provide a quantitative analysis of species found, a very serious flaw. The results are merely qualitative. If a single eelgrass blade was seen, the report states "eelgrass was observed". The report provides no average estimate of density, whether of clams, eelgrass or any other species, as for example 0-25% cover; 26-50% cover etc.

Had a student submitted this paper to me in draft, I would have required a complete reworking of both the methodology and the reporting. It does not represent good science.

I point out that DMR's own aquaculture map, which delineates the presence of eelgrass, shows no eelgrass on the proposed lease site. It does show that in 2022 a small bed existed just north of the north end of Bustins Island (Coffin Exhibit 2; see legend "eelgrass 2022 Casco Bay only"). A reasonable hypothesis is that this bed is the source of the rhizomes DMR observed, broken off by wave action and carried to proposed lease site.

I will turn now to the expert material submitted by the intervenors. I have reviewed the following: the 7/19/2021 letter from Atlantic Environmental to Alison Smith (CCBIFP Exhibit 1); the 7/6/2022 memo from Flycatcher to Peter Shepard (CCBIFP Exhibit 2); and the 3/23/2022 report by Dr. Joseph DeAlteris to Alison Smith

(CCBIFP Exhibit 3).

None of these reports provide compelling evidence for the presence of eelgrass beds within the lease site. One cannot determine whether a bed is present by taking photographs - unless eelgrass is in every shot and it appears healthy. These three exhibits mention beds, but these reports only establish, or attempt to establish, the presence or absence of eelgrass. There is no information that would allow anyone to estimate the areal extent of eelgrass at this site.

The Atlantic Environmental (AE) site visit was on 12 July 2021. DMR visited the site on 8 July 2021. AE used the same flawed techniques as DMR for sampling eelgrass. "Video transects" were performed because the water was too deep for to allow for scientifically correct characterization of flora and fauna: the tide was a neap tide (0.1 ft), there was 1-5 ft of water covering the entire site, and no core sampling or other sampling occurred. "However, based on visual observations from the boat eelgrass does not appear to be present within [the northwest portion of the lease site]." (Atlantic Environmental report, top of page 2.)

Then, in the next paragraph, the author states, "AE identified an eelgrass bed within the proposed lease area that extends in a southeast direction and covers the southeast portion of the lease site. Due to high turbidity, the quality of the imagery was poor. However, eelgrass was observed from the boat. Eelgrass was also easily observed on the sounder as the boat navigated within the site."

So, two things. First, visual observations from the boat show eelgrass not to be present within the northwest portion of the proposed lease. Second, the author says an eelgrass bed does occur in the deepest portion of the lease; however, the visual conditions were murky, with the water "turbid with visibility in the one (1) to two (2) foot range", page 2, but the "sounder" indicated the presence of eelgrass.

This is all highly skeptical to me. What evidence does the reading of a "sounder" produce? What is the signal? Has anyone else used this technique to search for and find eelgrass? I've never heard of it, and I've studied eelgrass for decades, and read dozens of eelgrass studies.

It is possible that eelgrass was present (as described in the DMR report), but, like the DMR report, the AE report cannot say whether or not the eelgrass was actually growing in place or was drifting through the site for whatever reason.

The Flycatcher report, CCBIFP Exhibit 2, is of no value to the inquiry. The author proposed a scope of services, which the client declined. The work ultimately approved by the client consisted of "reviewing project documentation" and, outside the administrative adjudication process, providing the agencies with selected information. CCBIFP Exhibit 2, page 1 ("The goal was to connect the regulators with available information so that they can make an informed decision regarding the approval of a proposed aquaculture lease in this location" and page 3 ("[f]rom March to May of this year, a Flycatcher wildlife

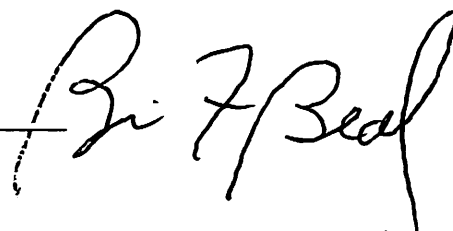
biologist corresponded with staff at the DMR, MDEP and biologists with the MDIFW regarding this proposed project and the agencies understanding of wildlife resources that may be impacted.”) No field observations occurred, just lobbying.

Dr. DeAlteris did not visit the site. The DeAlteris report, CCBIFP Exhibit 3, bases its conclusions on the DMR Site Review and on the Atlantic Environmental report, and therefore the DeAlteris report suffers from the same deficiencies in field research I have testified to above.

While there may have been eelgrass on this site in prior years, the science does not demonstrate that it grows there now.

May 18, 2023

/s/ Brian F. Beal
Brian F. Beal, Ph.D.

A handwritten signature in black ink that reads "Brian F. Beal". The signature is written in a cursive, flowing style.

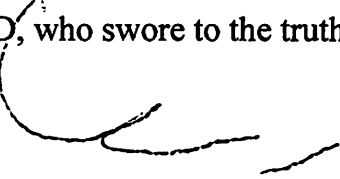
5/23/2023

STATE OF MAINE
CUMBERLAND, ss.

Jurat

Personally appeared before me Brian Beal, Ph.D, who swore to the truth of the foregoing pre-filed testimony.

May 23, 2023



Nicholas H. Walsh,
Attorney at Law
Maine Bar # 3871