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Redfish Vs. Menhaden: The coast of Maine bait crises and which bait the lobsters prefer most

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Redfish Vs. Menhaden: The coast of Maine bait crises and which bait the lobsters prefer most
Kestrel

Abstract

The purpose of this was to find the perfect bait that the lobsters preferred to eat in the lobster traps. The way I did the experiment was that I used lobster traps that my teacher set out and we recorded how many lobsters were in the Menhaden trap and how many were in the Redfish trap and then I transferred the data into Sheets and Codap. And using the data I came up with my conclusion Redfish are better than Menhadens.

Introduction

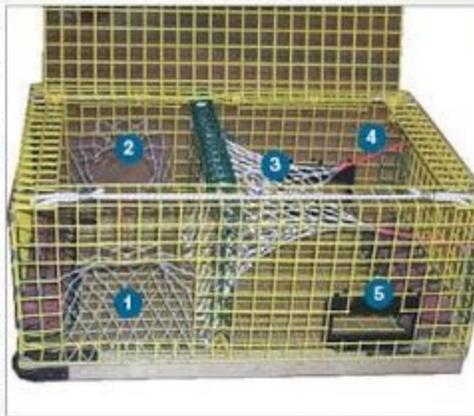
Did you know that Maine might have a bait crisis? Well it's true the Maine lobster industry has been having issues with finding the perfect bait. Some people say that redfish is the best and others argue that menhaden are the best for lobsters. No one has really proven that a certain bait is better or worse than the other one. So I decided that I was going to research the bait industry and lobster industry to figure out: What is the perfect bait?

Lobstermen have been fishing for a long time and Maine's economy depends on lobstermen. One of the things I needed to talk and learn about was how people lobster. A typical day in the life of a lobstermen is to first go and get all the traps. When they get there they pull up the traps and throw back all the lobsters that are too small. They also tag them so they can keep track and see if they catch them again they will know where they go. Then they re-bait the traps and then throw them back in. This process goes on until they have all their traps pulled then they go back to shore.

The cost of a Menhaden per trap is usually \$2-3 per pound and the cost of a barrel of Redfish is \$3-4 per pound. Other costs include gas for the boat, and the cost for equipment, but the cost of menhaden (or pogeys) has been steadily increasing over the last three years from \$75 a barrel to almost double \$135 a barrel in 2019 (Quoddy Times 7/29/19). Quotas for fishing menhaden were completed by June 2019 and the lobstermen were so angry that the government added 40 million pounds more and allowed lobstermen to catch their own bait. Because of this, I wanted to find out if redfish could be a better alternative to the pogy for lobstermen to use as bait. The price of redfish has been steady from \$180 per 400lbs in 2017 to \$210 per 400lbs. in 2019 (O'Hara Lobster Bait). That means the price of pogies is catching up with the price of redfish. Redfish is caught in cold North Atlantic waters, and only the heads are used for lobster bait.

Anatomy of a Lobster Trap

1. **Entrance Head:** Mesh opening where lobsters enter the trap.
2. **Kitchen:** This is where the bait bag is placed to attract lobsters into the trap.
3. **Parlor Head or Funnel:** Lobsters use this mesh netting as a means out of the kitchen, assuming it's a way out of the trap.
4. **Parlor:** Area where the lobsters end up after leaving the kitchen and traveling up the funnel. Most of the catch will be found in this part of the trap.
5. **Escape Vent/Ghost Panel:** Opening of designated size that allows sub-legal lobsters to escape the trap. The biodegradable materials used to attach the escape vent panel will allow the "ghost panel" to open if the trap has been lost or abandoned. This prevents the trap from continuing to fish after it has been lost or abandoned.



The class also had an assignment to figure out the perfect lobster trap. Lots of fishermen have their own kind of trap and things they prefer but we were thinking what is the ideal lobster trap and what kind of features does it have? Well one of the things that we tried is location. We thought that maybe part of Maine would be better than others. We put lobster traps at Bigelow Labs and GMR and we would wait to pull them. Another thing that we tried was one fish vs. two fish and we put them in the traps, we thought that if we could find out how many fish to put in we could help the lobstermen not use and pay as much and to make sure that none of them get overfished. The thing that interested me out of our experiments was redfish vs. menhaden because I thought that lobstermen had one bait they all used but I found out that they don't.

I went out and researched the different kinds of bait to figure out the best one. When researching redfish I found a really great article called "New species approved for Maine's lobstermen and redfish as lobster bait scientific research". It was really effective and it told me that redfish usage has gone up to 30% which is not that much but it still shows that it is increasing over time. The paper also told me that it is one of the best ranked bait in Maine so people must be enjoying the bait and the lobsters too. My overall conclusion for redfish is that it is a good bait. I didn't read anything about the price but I think that it is one of the best baits.

I also researched menhaden and I came up with a lot of info but it wasn't necessarily good info. One of the papers was called "Socioeconomic Analysis of the Atlantic menhaden commercial bait and reduction fishery" which was a good find. It said that if you reduce menhaden catch it will help not only money wise but it will help the menhaden predators come back and be able to eat and not starve because most of the menhaden are gone and they are getting overfished. (**Brendon Adams, Andreanne Melay and Alexandria Naumenko, unknown**) But one of the good things about them is their price. It is really cheap so lobstermen who can't afford this redfish menhaden are the best for them. Another thing I found out is that the money will probably increase because they are getting overfished so it's going to be a cheap fish now but later on it will be very expensive. All of these things are helping me get to my conclusion but

each bait has its ups and downs to it which leads me back to my question: what is really the best bait?

Methods & Materials

There are a lot of ways for collecting data. You can look up other people's data. You can write your own data but the way I got my data was from a school lobster trap study. In late December Aelia Russel, Sawyer Russel, Robert Russel, Nestor Powers and Glenn Powers went out to DMR and set our lobster traps with our modifications. Then every week we pulled the traps out of the water and collected the data of what we caught in those said traps. We had a control trap that contained two pogies and was set for seven days. The Redfish traps had the same amount of redfish per weight as the pogies (usually two heads) and set for seven days as well. After gathering about two months of data, I transferred it all to a spreadsheet and used CODAP and Google Sheets to analyze it.

I had a big table of all the trap modifications and I copied and pasted the data that I needed into a new Sheet Doc then I used that graph to make other graphs and also I made dot plots using CODAP. The graphs had time on the x axis and represented number of lobsters caught with colored dots.

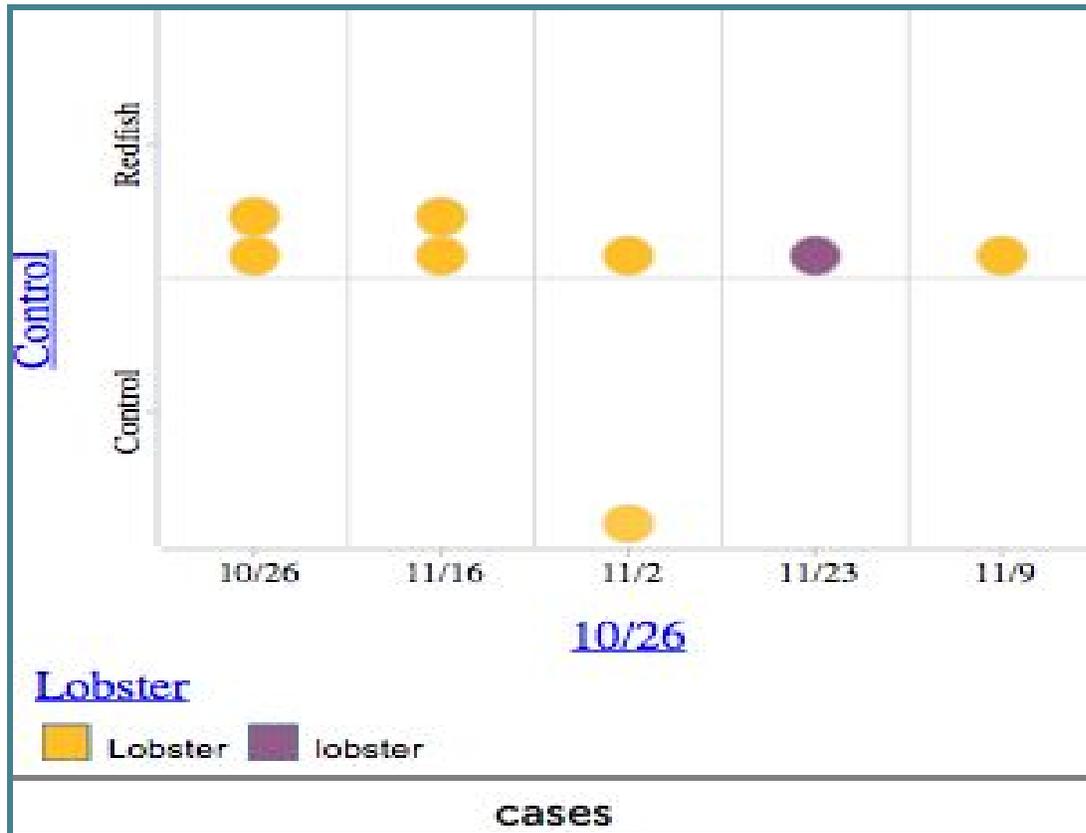
Some of the materials i used to carry this experiment out was:

- Redfish
- Menhaden
- Lobster trap
- Sheets
- Codap

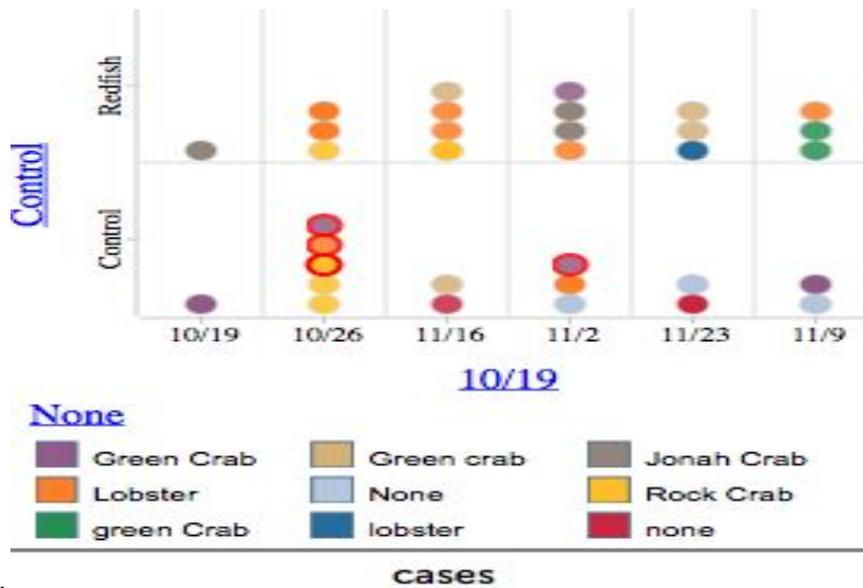
These things helped me do my experiment out well.

Results

Graph 1



Graph 1 shows the data from the control traps (with menhaden) and the redfish traps. For this graph, I put time on the x-axis so I could see how many creatures we caught on each week in a simple dot plot. I also put the different kinds of fish on the y-axis. On Graph 1 you can see that the Redfish did a way better job at catching lobsters then the control menhaden traps did. Overall the Redfish caught seven lobsters and the Menhaden (control) only caught two lobsters and the difference was five. I was a little disappointed about this graph because I thought it would be harder to see which one is better and if you looked at it not knowing anything about the Redfish and Menhaden bait crises you would think that the Redfish is better but is it money wise?

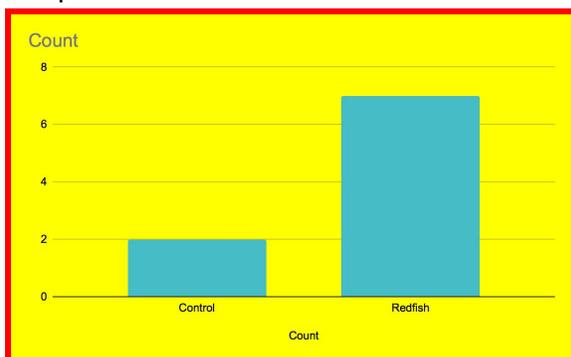


Graph 2.

Graph 2 is a dot plot showing all of the creatures that the Redfish and control traps caught. The coordinates are all different colors that represent each animal that the traps caught like purple if for the Green crab and red is for if the trap caught nothing that day. I also used time on the x-axis because I wanted to see how much they caught each day. The Redfish caught 18 creatures which is a lot. The Menhaden caught 15 creatures. There is not much of a difference between these two fish when counting all the animals that we caught but still Redfish seem to be doing the best bait wise and I think that based on this graph Redfish might be the answer to the bait crises or maybe not.

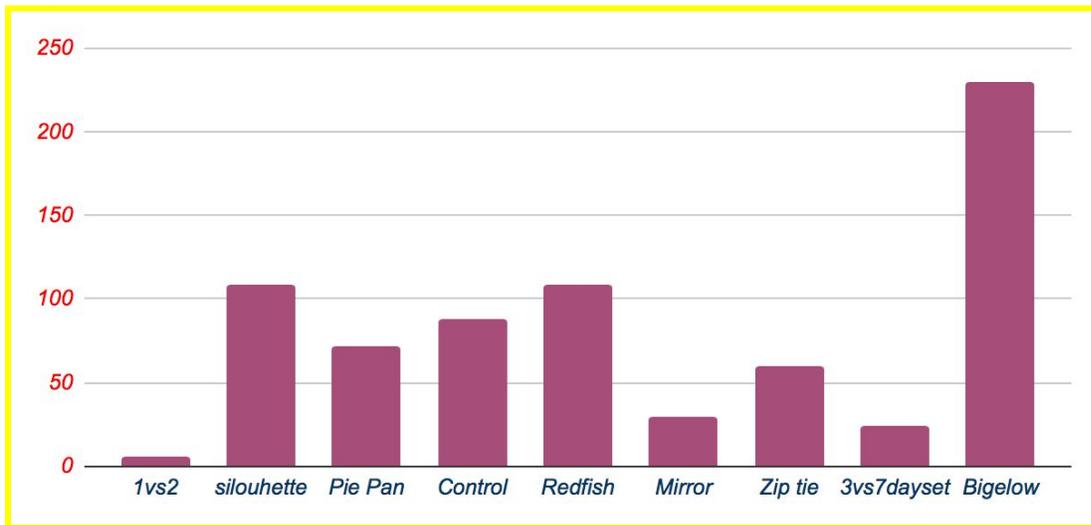
Graph 4 is the count of lobsters that we caught in the traps. You can see obviously in this graph that the Redfish is way better at catching lobsters than the control menhaden traps. The difference between the two baits on this graph is 5 more lobsters over the course of the experiment, so that is a good amount of difference in catch rates. I used a bar graph for this one because you could see what one was higher up had the most lobsters caught in the trap. The interesting thing about this graph is that it's exactly like the first graph I did but instead of time on the x it's the different baits. I know that this is right because the data from this graph is the same as the other one.

Graph 4.



Graph 5 shows all of the data from all of the trap and bait modifications that my class did. I included this graph to show how well the redfish traps caught compared to all of the experiments our class carried out. It shows the different modifications on the x-axis and on the y-axis is the number of animals caught in the trap with that modification, and the reason I did this was because I could see what trap modification did the best at catching the lobsters. As you can see the best trap variable was location, as we set a trap at Bigelow Labs far from the control traps. It caught around 23 animals. Looking at all of these, redfish caught better than control and almost better than all of the other experiments.

Graph 5.



Conclusions & Discussion

So I used all of those graphs to come up with my final conclusion but first I need to tally about each bait. Menhaden (*Brevoortia tyrannus*): When I first started writing this and finding all the information I thought that was going to be the best bait for lobsters, but I was wrong. Their cost is fairly cheap for bait but that is changing. The Menhaden fish are getting overfished and used way too much and prices are rising. In one of the papers I read when getting info, they made a survey for people to take to see what bait people want. 80% said they want Menhaden but it is a fish that is decreasing so people won't get as much any more. My overall statement about Menhaden is this: they might be a good bait now but they certainly won't be in the future. So that leaves Redfish.

The Redfish (*Sciaenops ocellatus*) is a bait that might be the new solution to the bait crises. When researching Redfish I discovered a few things: Redfish has not that much information out about it, it is one of the top baits and fishermen are using redfish more and more each year. When first researching Redfish I thought it was some random fish no one ever used about then I figured out that a bunch of people use Redfish as their bait. Another thing I noticed when researching was that Redfish are not being overfished which is a relief because then I would have no answer to this paper. One downside to the Redfish is their cost. They are definitely more expensive than the Menhadens so that is one downside which is a shame

because people might not buy the Redfish just because of their cost they might go for the cheaper bait: the Menhaden. So my overall statement with this bait is this: Redfish is the answer to the coast of Maine bait crises.

I found that redfish did catch at a better rate than the menhaden in our experiment. It caught significantly better over the course of the ten weeks our traps were in the water. But, one of the main problems was that we only had the traps in the water for ten weeks, and it was at the end of the season from September to November when many of the lobsters go to deeper water. In order to check our results, it would be great to find a lobstermen to conduct our experiment on his traps in the water during peak months of summer. That way we would know for sure if redfish is a better alternative to Menhaden. From our limited results, I think redfish would be the best bait. Redfish may be the answer to the bait crises. Even though the Menhaden is a good bait it is not as good for catching lobsters as the Redfish and the price of each is about the same. Lobstermen should try the redfish on at least some of their traps and it is widely available and not over fished. My vote is for Redfish!

Works Cited

Brendon Adams, Andreanne Melay, and Alexzandria Naumenko (2017) Socioeconomic Analysis of the atlantic menhaden commercial bait and reduction fishery

National Fishermen Jessica Hathaway (2019) **Bait abated: New species approved for Maine's lobstermen and redfish as lobster bait scientific research**