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Male and Female Green Crab Populations in 2019

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Abstract:

We're investigating the invasive green crab population. To be more specific, their numbers and their sexes. To find these we used crab traps and recorded how many green crabs we caught and if they were male or female. We found that Fort Popham had the most crabs out of all three sites and they had the most females. This means the green crab's population will go up next mating season.

Introduction:

Green crabs are an invasive species. They're aggressive and excel at destroying ecosystems. As said in *Harm To Table: Turning an Invasive Species into a Delicacy*, by Laura Poppick, green crabs are "one of the ten most unwanted species in the world." Even where they're native they don't want the green crabs. When trying to trap these crabs, you wouldn't know if they were going to be in the trap, what else is in the trap, how many crabs to prepare for, or if this number is a good representation of the whole species.

Green crabs came over in the early 1800's from England on ships. Upon arrival they adjusted easily and started to take over. There have been some booms in the population since then but the most recent was in 2012, since then we have tried to come up with options to get rid of them, but nothing is working very well. This is an important problem because this influences the clamming business in our state. These crabs are putting many clambers out of jobs. How you might ask? They eat all the same things as native crabs such as clams. Clammers aren't going to have many more years with their jobs because of this. These predators eat the smaller clams before they have fully grown and thus making the clams repopulate less and less each year.

My class this year wondered how the green crab's population thrived in our ecosystems. We started collecting data in 2015, and over time, this has grown into something 7th graders have looked forward to. We did this to see how they're impacting our ecosystems. We used multiple crab traps to gather enough data between research sites to see how their numbers have changed over time.

I want to know how their numbers will grow by finding out the amount of males and females in each research site so I can tell how many can reproduce.

Methods

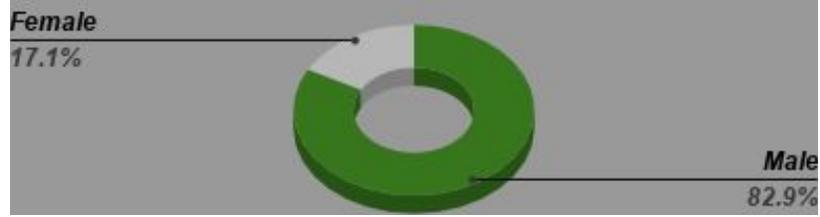
7th graders went on October 21, 22, and 24, 2019. We put trapezoid traps and cylinder traps in the water on the 20th and put them back each time after we collected the data. The 7th graders also went to Todd's Landing, Reid State Park, and Fort Popham in Maine. After each trap was brought up we put fingernail polish on each crab and put the by-catch back where we found it. We did this in hopes of catching the same crabs again. We then put the traps back after resetting them.

We did this so we could have consistent data throughout the three days. We went at low tide each day (except for the 24th) to get the most data. We also put the same amount of food in each trap so we could keep that fair as well. Another thing we did to make sure we wouldn't mess up the data was placed all the traps back exactly where we had the previous day. We couldn't go on the 23 because of rainy weather so we rescheduled for the next day.

Results

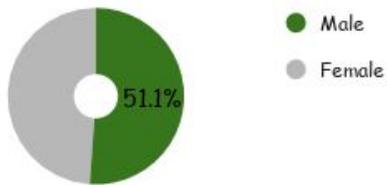
These are our results, we have graphs from all three sites and one from all combined and one showing all the numbers together. In each section, the males have relatively the same numbers, the females are very low in the second and third charts and there is a huge boom in the third site, causing the females to have larger numbers in the all sites chart.

Male VS Female at Todd's Landing 2019



Male and Female Reid 2019

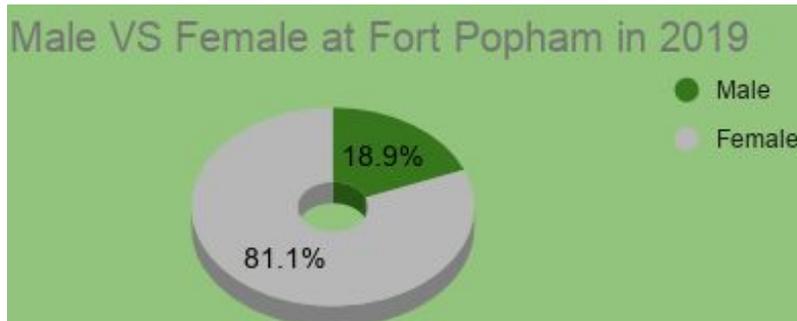
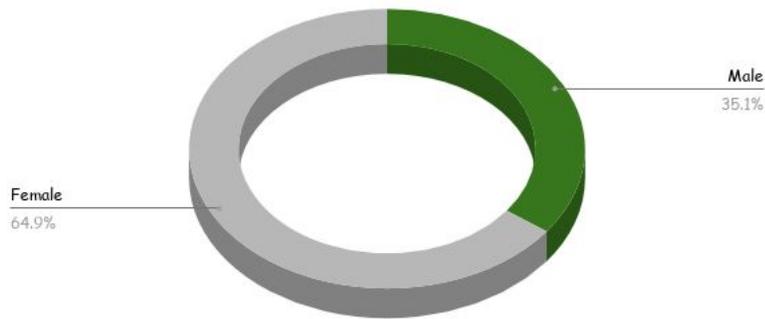
n=45



Male VS Female Crab Count from all three Sites in 2019



Male VS Female at all Three Sites



Discussion and Conclusion

I am investigating the male female ratio of green crabs. I did this so I could predict how many can reproduce next year. I found out that there are a lot more females than males in total. I noticed from my data that there are quite a few more crabs at Fort Popham than any other location. This site also has more females than the other sites. I also noticed that the numbers of males at each location stays relatively the same amount. This supports my claim because the amount of males can greatly impact the amount of baby green crabs. This doesn't take into account the ages of the green crabs that we caught.

To further my investigation I would have taken account of ages, size, and when females molt. I did not take into account that information,

so I cannot accurately predict the amount of green crabs who will reproduce. There are also some factors that may have impacted my data, such as, the depth the traps were in (like if it was fully submerged or a little above the water line), and the times they were in the water (also if the trap got washed up on shore then for a little while it was out of water not collecting green crabs.). What I do know though, is the population will go up by the amount of males next year.

Acknowledgements:

I would like to thank KELT for providing the traps we used.

References Cited:

Beem, Edgar Allen. "The Green Crab Invasion." *Down East*, 12 Feb. 2014, downeast.com/nature-2/green-crab-invasion/.

Poppick, Laura. "Harm to Table: Turning an Invasive Crab into a Delicacy." *Scientific American*, 30 Oct. 2019, www.scientificamerican.com/article/harm-to-table-turning-an-invasive-crab-into-a-delicacy/.