Gear Trawling Project: How Long is too Long for a Trawl?

A Collaboration Between the Department of Marine Resources, the Gulf of Maine Lobster Foundation and the Lobster Industry

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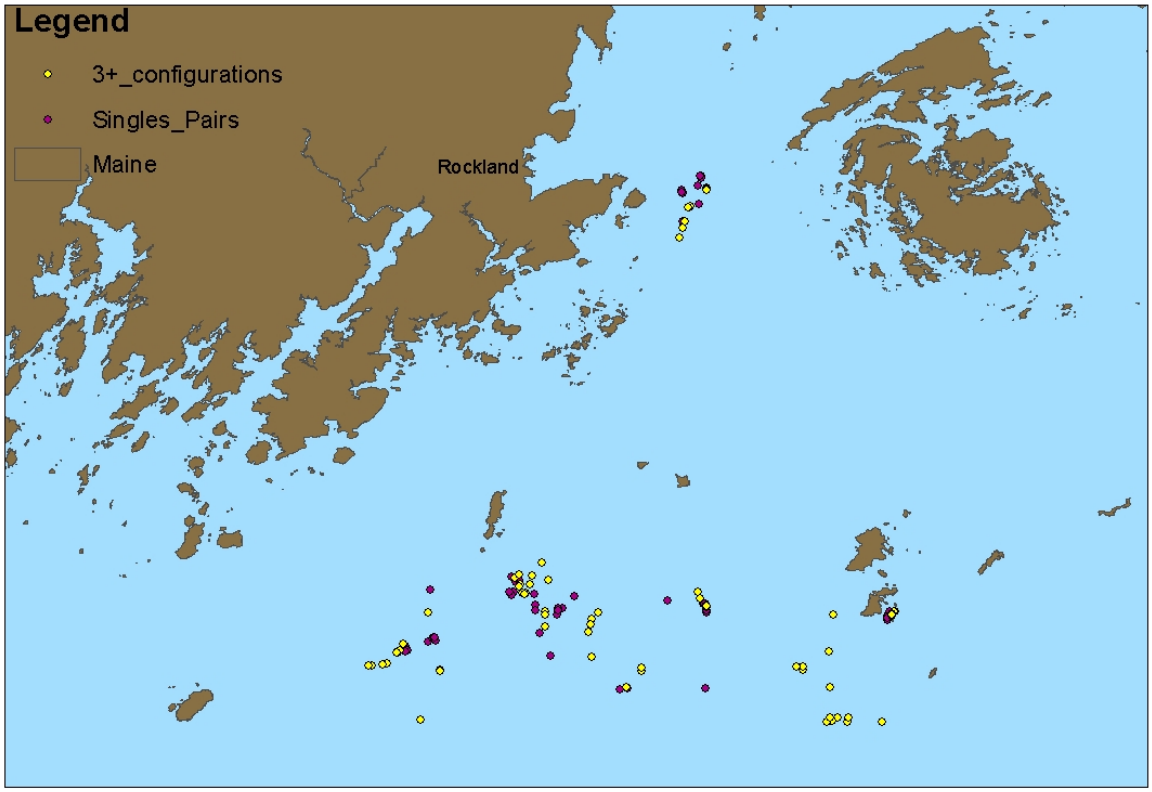
Starting in July of 2011, the Department of Marine Resources (DMR) partnered with the Gulf of Maine Lobster Foundation (GOMLF) to conduct an experiment with commercial lobstermen in response to upcoming vertical line regulations that aim to reduce the risk of entanglement to large whales in fishing gear. The project aimed to determine which trawl configurations could be successfully fished to reduce the number of vertical lines in Maine's fishing waters and document the positive and negative experiences of the participants. The participating fishermen were targeted to be those who currently fish singles and pairs in regulated state waters in dense areas of gear. Six fishermen from Zones C and D were chosen for the project. The information collected is being used to guide National Marine Fisheries Service (NMFS) and the Atlantic Large Whale Take Reduction Team (ALWTRT) in determining what the maximum trawl length can be for fishermen in areas such as these, taking into account gear loss and damage, catch rates, safety concerns and other variables recorded by the participants.

The project began in July of 2011 and participating fishermen hauled the experimental gear through the end of November, keeping a logbook every time they hauled. A sample page from the logbook is available in Appendix I. Variables included hauling time, weather and sea conditions, number of legal size, keeper lobsters per trap, gear loss, soak time, problems handling gear, etc. The lobstermen were required to switch a portion of their gear (50 traps) from their current configuration of singles or pairs to longer trawls, including 2 triples, 2 five-trap, 2 seven-trap (1 with 1 vertical line and 1 with 2) and 2 ten-trap (1 with 1 vertical line and 1 with 2) trawls. Lobstermen also selected 50 additional traps of their regularly configured gear (singles and pairs) to track as a comparison against the trawled gear. At the conclusion of fishing, staff at DMR entered all of the logbooks into databases and analyzed the data to compare how the trawls performed against the singles and pairs. Additionally, a meeting was held with all participants to document their overall experience with fishing trawls, get their feedback on what they thought would work for them operationally, discuss any concerns that they had and document any changes that they made in their fishing styles in order to make fishing trawls work for them.

The below map displays some of the locations of the gear tracked throughout the project (one control and one experimental piece of gear was mapped for each hauling day). Yellow points depict the trawls and the red points represent the singles and pairs. There are some places

where they are mixed together and others where it is apparent that trawls were fished slightly separately from the shorter sets of gear. This was done to either reduce gear conflicts or stay on softer bottom to protect sinking groundlines.

Singles/Pairs and 3+ Trawl Gear Locations



The below table shows a summary of the information taken from the logbooks filled out over the course of the project. The control column includes all gear configured as singles or pairs. The “Exp Total” column includes all trawls from triples to ten traps. The “1 VL” column includes only seven and ten-trap trawls with 1 vertical line. The “2 VL” column includes seven and ten-trap trawls with 2 vertical lines. The last column, “3’s/5’s” contains only triples and five-trap trawls. The last row, “Catch/Trap/Soak” is a measure of the number of keeper lobsters per trap divided by the number of soak days to make it comparable across all sets of gear regardless of configuration or soak time. Cells highlighted in gray depict results that differ between control (singles and pairs) and experimental (trawls) gear.

		Control	Exp Total	1 VL	2 VL	3's/5's
Hauls and sets of gear	3,139	**2,299**	**835**	**214**	**160**	**461**
% Bottom is Rock		39%	7%	2%	1%	4%
Depth (fa)		34	38	38	40	37
Vertical line length		48	51	51	54	50
Depth ratio		1.42	1.37	1.4	1.4	1.4
Vertical line diam	7/16"	23%	21%	23%	25%	18%
	3/8"	77%	79%	77%	75%	82%
	1/2"	0%	0%	0%	0%	0%
Groundline length		10.8	12.2	13.3	14	11
Groundline diam	7/16"	8%	38%	32%	41%	40%
	3/8"	64%	42%	47%	36%	42%
	1/2"	28%	20%	21%	24%	18%
Haul time (min)		3.1	7.9	10.9	12.1	5.1
Gear loss		7	21	9	2	10
Gear damage		10	16	6	9	1
Catch/Trap/Soak		0.53	0.5	-	-	0.51

There were a total of 3,139 sets of gear that were hauled and recorded throughout this project. 2,299 of these hauls were for control traps, while 835 of them were for experimental traps. Because the number of hauls or gear sets was recorded by piece of gear and not by traps, there appears to be more sets of control gear. This is due to the configurations used for the control versus the experimental traps. The same number of traps was used between control and experimental gear, however, the former were configured as singles and pairs, while the latter was configured anywhere from 3 to ten trap trawls.

It is evident from the data above and the comments received during the meeting after the conclusion of the project that not all of the participants were comfortable fishing longer trawls on the same hard bottom that they fish singles and pairs, 39% of the control gear was fished on some combination of rock bottom versus only 7% of experimental trawls. As fishermen tried different things and figured out how they needed to operate to fish trawls successfully, several of them went to longer (12 fathoms versus 10 fathoms) and thicker (38% of experimental trawls used 7/16” rope versus 8% of control gear) groundlines to both fish their traps efficiently and minimize the damage to the sinking groundline as it chafed on the bottom. The time it took to haul back trawls was understandably longer since there are more traps to get through, but there was also a higher incidence of hang-downs, which added to haul times. However, it was reported that while the trawls did hang down, those sets of gear were generally easier to retrieve because there was more gear to grapple for. The biggest impact that can be seen in the above

table is the higher amount of gear loss and damage that occurred with the trawls. This was especially evident in the seven and ten-trap trawls with only one vertical line from which to haul the gear. Additionally, the three and five-trap trawls also had a high rate of gear loss, potentially because these shorter sets were harder to grapple back for recovery than the longer ones. Lastly, one of the biggest concerns before this project started was the potential decrease in efficiency that would be seen if the configurations of traps were lengthened. It was said that with 3, 5, 7, or 10 traps on a single piece of gear would cause fishermen to be less able to work the bottom and they would have to move off to softer bottom where there are fewer lobsters and this would negatively impact their catch. However, it is evident in the table above that there was no difference in the number of legal lobsters in each trap (corrected for soak time) between singles/pairs and trawls of 3, 5, 7 and 10 traps (average of about 0.5 lobsters per trap). Additional thoughts contributed by the participating fishermen during the meeting at the close of this project can be read in Appendix II at the end of this report.

This pilot project to determine the initial success or failure of fishing longer trawls in areas of dense gear configured as singles and pairs turned out to be interesting and insightful for the regulators interested in the data and a good learning experience for the fishermen involved. DMR and the GOMLF would like to continue to pursue expanding this project to different areas of the coast that will potentially be impacted by upcoming regulations that may reduce the risk of vertical lines by imposing longer trawl minimum lengths. The fishermen that participated in this project asserted that any success that they were able to find fishing trawls is in large part due to the financial backing of the project. They knew they could try new things and any loss in gear or catch would be reimbursed to them through the GOMLF. This is a great model for the fishery moving forward as they grapple with trying to comply with regulations that make them fish in ways they have never tried before. It is for these reasons that additional funding sources will be sought to afford this opportunity to other fishermen along the coast prior to any changes in regulations in the next couple of years. Any progress that can be made to allow fishermen to continue to fish and make a living in Maine’s coastal waters while complying with ever-changing federal regulations is a step that needs to be taken.

Appendix I

Captain Initials/Date					
Zone/# of Sternmen					
Wave Height (ft)/Wind Speed (kts)					
Configuration					
Bottom Type					
Depth (fathoms)					
Soak Time (days)					
Latitude					
Longitude					
Exempt Waters?					
State Waters?					
Sinking Ground Line?					
Length of Groundline Between Traps (fa)					
Diameter of Groundline (inches)					
Diameter of Endline (inches)					
Endline Rope Length (fa)					
Number of Endlines					
Start/End of Haul Time					
# of keepers trap 1					
# of keepers trap 2					
# of keepers trap 3					
# of keepers trap 4					
# of keepers trap 5					
# of keepers trap 6					
# of keepers trap 7					
# of keepers trap 8					
# of keepers trap 9					
# of keepers trap 10					
Gear Loss?					
Gear Damage?					

Appendix II

Participant Comments:

Participants were given the chance to discuss their experiences and comment on what they thought about the project and fishing trawls. The comments are summarized below.

- Most of the participants had a positive experience trying trawls and enjoyed learning and figuring out what was going to work best. Overall, they felt trawls may be easier, faster and cheaper, reduce gear loss and could still be fished efficiently.
- One participant had a harder time with trawls than the others; he lost a lot of gear and had significant chafing. He fished his gear on the hardest bottom he could find and did not change his practices to accommodate the extra traps. Would have to add a rack on the stern.
- It is possible to fish 5 traps with 1 vertical line but trawls longer than 5 require 2 vertical lines. When one vertical line is lost, the gear can be hauled back from the second one. Also, there is no way to tell the direction that the gear is set with only one vertical line. This causes gear conflicts.
- They hated the 7-trap configurations. They said it was an awkward number to work with.
- Most of the participants said that they didn't have a problem fishing 10's with 2 vertical lines. One with a 34' boat was able to fish 10's but said because of the size of his boat it was much more comfortable fishing 5 traps on one vertical line and that's what he would prefer. Ten would have been his absolute maximum, whereas some of the other participants thought 15's or 20's would have been their absolute maximum.
- One participant had a hard time keeping things safe with the longer trawls on the boat. His sternman had a few close calls getting wrapped up in the extra line on the deck.
- There was a mixture of fishing strategies. Some participants mixed all of their trawls into the singles, pairs and triples being fished in the area by non-participants, while some mixed in the 5-trap trawls, but fished the longer trawls further away. Some fished the long trawls on hard bottom and some were more comfortable fishing those on the mud.
- Some participants agreed that fishing trawls may be less costly than pairs because you are using less buoys, less fuel to get to all of your gear, less time to haul, etc.
- They didn't see a noticeable difference in catch rates and felt like they could still work the bottom with 5 and 10-trap trawls by setting along cracks, etc. and this would get even better if everyone around them was fishing trawls.
- Thought they could actually move their gear more efficiently to chase lobsters with trawls compared to pairs. By the time you know you need to move a string of pairs because they're not catching lobster, you've already set them back and would have to haul them again. With a 10-trap trawl the traps would all still be on your boat and you could move them all at once to a new location.
- Hang-downs weren't any more of a problem than usual and gear loss didn't seem much different. Grappling to retrieve gear is actually easier with the longer the trawl (even using sinking groundline). The data reveals a different story.
- Thought that recovery is easier with trawls because there is more to grapple for.
- Thought that the heavier trawls were weighted down better for the tides than shorter sets.
- Participants were able to adjust the way they fish to accommodate the trawls, including:

- Going to ½” sink line for the groundline and the heavier the line, the better to reduce and/or withstand chafing.
- Safety wasn’t a concern because they shifted the set-up on the boat around to make space, change their work flow and accommodate the extra line and traps.
- Some lengthened out their groundlines so that the whole trawl wasn’t hanging off the block at once when being hauled.
- Tied the bridle in higher on the trap which prevented the traps from flipping and twisting (some had trouble with some of the traps in the trawl flipping over, getting dragged and coming up with mud/not fishing).
- One participant built a stern extension (rack) to accommodate the extra traps
- One participant came up with a way of stacking the traps on deck against the rail while setting the gear instead of trying to fit them all on the rail
- Participants had success talking to their fishing area neighbors to let them know where they were setting their long trawls and which way those trawls were running to reduce gear conflict.
- Many report that where they lose gear or have significant chafing on a trawl is on the first tailor (between the first and second trap). Could this be float rope?