Commonwealth of Massachusetts

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MEMORANDUM

TO: Marine Fisheries Advisory Commission (MFAC)

FROM: David Pierce, Ph.D., Director

DATE: February 7, 2019

SUBJECT: Whelk Gauge Increase

Recommendation

I recommend the Commission approve the whelk gauge increase schedule as proposed at the January 19 and 23 public hearings.

Schedule for Whelk Gauge Increases, Corresponding Shell Widths at 50% Retention, and Percentage of Mature Female Whelks at Shell						
	2019	**2021**	**2023**	**2025**	**2027**	**2029**
Chute Gauge Width	3”	3 1/8”	3 1/4”	3 3/8”	3 1/2"	3 5/8”
Shell Width at 50% Legal	3 3/16”	3 5/16”	3 7/16”	3 5/8”	3 3/4"	3 7/8”
Percent Female Size at Maturity	0%	0%	0%	5%	20%	50%

Rationale

I make this recommendation with deep concern about the fishery’s long-term sustainability. However, as I noted in my October 3, 2018 memo to you, I will keep to the planned biennial gauge increases to reduce the impact on fishery participants. I consider this drawn-out, every-other-year schedule as risky, but more benign on the industry than other options to constrain fishing mortality and protecting spawning stock biomass, such as hard quotas and closures. This management approach of raising the minimum size is incremental and does not actually begin to protect any spawning females until 2025.

Evidence from DMF sea sampling data and anecdotal reports from fishermen and dealers suggest the range of sizes in the catch is becoming increasingly truncated, and the number of mature whelks in the catch is declining. The current minimum size is woefully inadequate to protect spawning stock given the estimated rates of removal (F-rates) are estimated to be twice as

high as they should be based on the models presented by Dr. Gary Nelson in DMF's stock assessment .

There is a great disconnect between fishery participants' and DMF's management and science staff. Correspondence received from Attorney John Markey - on behalf of some commercial fishermen - reveals deep misunderstandings about DMF's programs, past management and scientific efforts, and level of past collaborations involving cooperative research with fishery participants. Of note, repeated challenges to DMF's size-at-maturity study are unproductive. Demands to suspend the gauge increases immediately for status quo fishing and to buy time for more data collection is not an option I will consider for reasons I've provided in my memo to you detailing my responses to the letter received from Attorney Markey.

I understand the desire for alternative management approaches. However, these approaches must be practical, enforceable, and capable of being administered by DMF and enforced by the Environmental Police with finite resources. Recent incidents, reported by the Environmental Police, detailing substantial non-compliance with the current gauging rules indicates that there is still much work to be done to improve compliance even with the simple management scheme in place.

More complex management strategies such as trip limits and quotas would have to be accompanied by significant commitment and accountability from the fishery participants. These issues can be considered in the future, but for now gauge increases are the best options until a different and effective alternative exists.

Finally, I have included as an attachment a lengthy memorandum to you that addresses many of criticisms and alternate suggestions for management of the fishery set forth by industry and Attorney Markey. Much of the information and accusations conveyed by fishermen through Attorney Markey are incorrect and/or misleading.

Furthermore, the "Collaborative Management Plan" offered by Thomas Turner and Whelk/Conch Fishermen is contingent on my taking no action in 2019. My staff and I are always willing to further discussions about how best to manage and monitor this fishery. I'm sure those discussions will occur but not through a plan they suggest – a plan with an *"industry biologist who would solicit input from the fishermen and represent the fishermen in planning meetings with DMF personnel."*

Consider that fishermen's claim that DMF did not involve the industry in the stock assessment is not true because: (a) sea sampling data collected from trips aboard commercial vessels were used in DMF's assessment; (b) our maturity study was the result of a collaborative grant done with the Commercial Fisheries Research Foundation and whelk industry participation; and (c) all catch and effort information used in the DMF whelk stock assessment utilized catch and effort data provided directly by fishermen in their harvester reports to DMF.

You'll find from the attached document that DMF scientists dealing with conch and its fishery are top-notch. For example, SMAST professor/researcher and MFI collaborator, Dr. Steven Cadrin was on DMF's Steve Wilcox's Graduate Committee. He concluded Wilcox's conch research was a "solid study and strong justification for a gauge increase."

My staff continues to provide me and you with timely, high-quality scientific advice. Any industry-hired biologist is free to meet with my staff, but that will not be contingent on no action for 2019.

I look forward to discussion of these issues with you at the February 14th business meeting.

Attachment
2/7/19 Memorandum to MFAC Responding to Written Comments from Attorney Markey
Written Comments
10/3/18 Memorandum to MFAC on Whelk Gauging Schedule Proposal

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MEMORANDUM

TO: Marine Fisheries Advisory Commission (MFAC)

FROM: David Pierce, Ph.D., Director

DATE: February 7, 2019

SUBJECT: Response to letter submitted on behalf of Massachusetts whelk fishermen

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I offer these responses to points and concerns raised in the "Memorandum from Massachusetts Conch Fishermen Regarding Proposed 2019 Regulation Change." My staff has provided a detailed and comprehensive set of responses for my consideration, and I agree with their arguments and conclusions. I also am forwarding this set of responses to Attorney Markey who represents conch fishermen opposing any change in the minimum size.

1. *"DMF's proposed 2019 regulation modification presents a solution that has text book merits. However, the plan does not adequately consider the more recent catch numbers and alternative regulatory schemes for accomplishing the same goal without devastating the industry and fishermen's family's. In its proposal, DMF attempts to solve a complex multi-dimensional problem using a one-dimensional solution citing disputed underlying data."*

In crafting the proposed measures DMF has considered catch data through 2018. Our current strategy for stabilizing the whelk stock is focused on protecting and enhancing spawning stock biomass of the whelk resource. Providing a substantial portion of a population the opportunity to reproduce before they are prone to harvest is a basic tenant of fisheries management.

In 2017 and 2018 combined, 91.1 % of the female whelk harvested in the Commonwealth were not sexually mature. Under current levels of exploitation, it is evident that an insufficient number of whelk survive to sustain the population. Admittedly, our proposed gauge increases are a one-dimensional approach focused on enhancing spawning stock biomass.

During development of this approach, DMF also considered several alternative approaches to reduce fishing mortality. These included hard quotas matched to our estimates of MSY, daily trip limits, trap reductions, maximum gauge size, and season closures. It was our belief that these measures would have even less support among whelk fishermen than the minimum size increases. Furthermore, increasing the minimum size would still be necessary even if one of these additional measures were utilized to ensure long-term sustainability given that whelk are long lived and take many years to become sexually mature.

There are only a few examples of fisheries in Massachusetts where there is either no minimum size or the minimum size is set below the size-at-maturity. These include squid, redfish, bluefish, and dogfish. However, all of these fisheries utilize hard quotas and/or trip limits to manage fishing mortality rates.

Finally, there is a growing body of scientific evidence that harvesting a population prior to maturity leads to fishery-induced evolution towards maturity at smaller sizes, which greatly reduces the equilibrium biomass and total yield to the fishery (Ernande et al. 2003). The channeled whelk fishery is unique because current biological measures in place do not protect spawning stock biomass and there are no output control measures (e.g., quota or trip limits) in place to manage mortality rates.

2. *"disputed underlying data"*

We assume this refers to DMF's estimates of size and age at sexual maturity. Our initial size-at-maturity work for channeled whelk in 2010-2011 was part of DMF biologist Steve Wilcox's Masters' thesis while he was a student at UMass Dartmouth. This work was funded by a grant from the Commercial Fisheries Research Foundation and conducted under the guidance of UMass professors Dr. Steve Cadrin, Dr. Ken Oliveira, and Dr. Nancy O'Connor. Maturity determinations were made using methods similar to those described by Dr. Bob Fisher and David Rudders from the Virginia Institute of Marine Science (see Fisher and Rudders 2017). In addition, a small number of histological cross sections using standard H and E staining were used to confirm macroscopic maturity determination.

In 2015, at the request of conch fishermen, DMF repeated the size-at-maturity study. The size-at-maturity estimates for channeled whelk in 2015 showed no evidence of change from 2011 estimates; however, there were fewer large whelk available for study in 2015 due to population change.

These studies demonstrate and confirm that the minimum size of channeled whelk in Massachusetts is below the size at 1% female maturity (3.43") and well below the size at 50% female maturity (3.88"). Furthermore, another study conducted by Peemoller and Stevens in 2013, using different techniques to stage whelk maturity, estimated the size at 50% female maturity in Buzzards Bay was 89.7 mm (3.53"), which is virtually identical to the DMF estimate of size at 50% female maturity for Buzzards Bay 89.4 mm (3.52").

Like most invertebrates, size-at-maturity varies by latitude in relation to water temperatures. Channeled whelk reach maturity faster and at smaller sizes in warmer waters. For example, the size at 50% female maturity in Virginia is ~78.5 mm (3.09") and ~85.9 mm (3.38") in Maryland (Fisher and Rudders, 2017); in Narragansett Bay 77.5 mm (3.05") for females pooled from all state waters (Angel, 2018); Buzzards Bay 89.4 mm (3.52") and 89.7 mm (3.53") respectively (Wilcox 2013, Peemoller and Stevens, 2013); and 99.8 mm (3.93") Nantucket Sound (Wilcox 2013).

As you move north and east along the coast, the size-at-maturity gets progressively larger. Nantucket Sound represents the northern-most region where a fishery for channeled whelk occurs. As such, we would expect and our data supports that channeled whelk in Nantucket Sound have the largest size-at-maturity of all channeled whelk fisheries in the United States.

3. "*In recent years fishermen have repeatedly offered to assist DMF in data collection. Although DMF personnel have occasionally taken trips with fishermen, they have not made use of the limited data resulting from these trips commercial boats in the Spring of 2016. More problematic is the fact this data was misinterpreted as supporting the DMF management program".*

DMF's Invertebrate Fisheries Project conducts routine at-sea sampling on commercial whelk vessels in Nantucket Sound and Buzzards Bay. A breakdown of sampling at-sea sampling trips conducted from 2016 to 2018 is depicted in Table 1. These trips rely on volunteer commercial whelk fishermen who allow us to sample on their vessels. While we are very appreciative to the fishermen who are willing to cooperate with us, our sampling efforts are routinely hampered by fishermen refusing to take us sampling.

Nonetheless, our level of sampling on the whelk fishery is commensurate with its importance and value relative to other important invertebrate fisheries in the state, namely lobster, Jonah crabs, and horseshoe crab. Total available staff-sampling resources are distributed among those fisheries based on value as well as any interstate and or federal sampling mandates.

The lobster (#2 in value) and Jonah crab (#4 in value) fisheries are sampled at higher rates. Both of these fisheries are managed by the Atlantic State Marine Fisheries Commission (ASMFC) and have mandated sampling requirements in their respective fisheries management plans. Despite, limited staffing; a lack of an interstate or federal sampling mandate; limited cooperation with fishermen; and the relatively moderate value of the channeled whelk fishery, DMF still manages to maintain routine at-sea sampling for whelk.

Table 1. Number of at-sea sampling trips conducted in Nantucket Sound and Buzzards Bay.

	Nantucket Sound	Buzzards Bay
2016	3	1
2017	6	1
2018	3	0

We assume that the sampling referred to "in the spring of 2016" on Martha's Vineyard actually refers to the effort DMF made on Martha's Vineyard in 2017. In the spring of 2017, DMF was asked to conduct whelk sampling trips on the Vineyard. A coordinated effort between Dr. Shelley Edmundson from the Martha's Vineyard Fishermen's Preservation Trust, DMF, and participating fishermen was enacted. Four trips were schedule at the convenience of the fishermen and Dr. Edmundson with two each on both June 15 and 16. To maximize efficiency DMF sent two observers to the Vineyard the night before to share a hotel room for two nights.

On the first day, each sampler covered different trips and collected whelk length frequency data following normal sea sampling protocol. On the second day one of the scheduled participating fishermen canceled the trip and another trip which could not be scheduled. Therefore, on the second day both samplers went on the same trip and collected length frequency data following protocol.

These trips were conducted to address concerns that the change in gauge definition had caused up to a 60% reduction in legal catch, and that data collected from mainland boats were not representative of what Vineyard fishermen were observing. Data collected from these trips were analyzed and compared to other sea sampling data collected from mainland-based boats fishing in Nantucket Sound during the same period (Figure 1). The size distribution of legal size catch was similar between Vineyard based boats and mainland-based boats.

At a meeting held on the Vineyard on July 10, 2017, DMF met with fishermen and the Martha's Vineyard Fishermen's Preservation Trust to review the findings and concerns related to the sea sampling trips and the gauge. DMF concluded that the size distribution of whelk in Nantucket Sound sampled on vessels originating from the mainland was not substantially different than whelk from trips originating from Martha's Vineyard. Data from both mainland and Vineyard sampling trips revealed very few whelk above the size at sexual maturity. In fact, the data from the

Vineyard exhibited a higher degree of size truncation possibly indicating localized impacts of higher rates of exploitation.

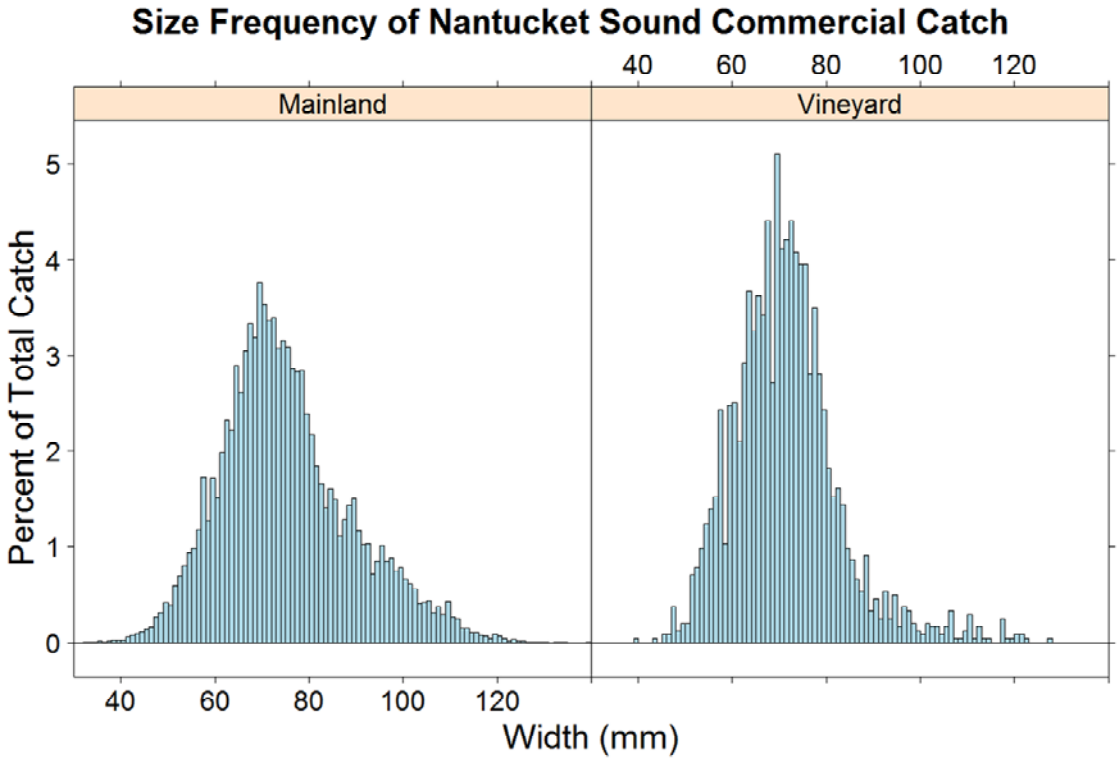

Figure 1. Size frequency of commercial catch collected aboard channeled whelk trap boats based out of the Cape (mainland) and the Vineyard.

At the end of the third paragraph the letter states that DMF has not made use of the data from the trips conducted with Vineyard fishermen. All graphs and plots used to characterize the length frequencies of the commercial catch in Nantucket Sound in 2017 use these data. As an example, the graph used at the public hearings to illustrate our concern about the declining number of large whelk observed in recent sea sampling data contained one of those graphs (Figure 2).

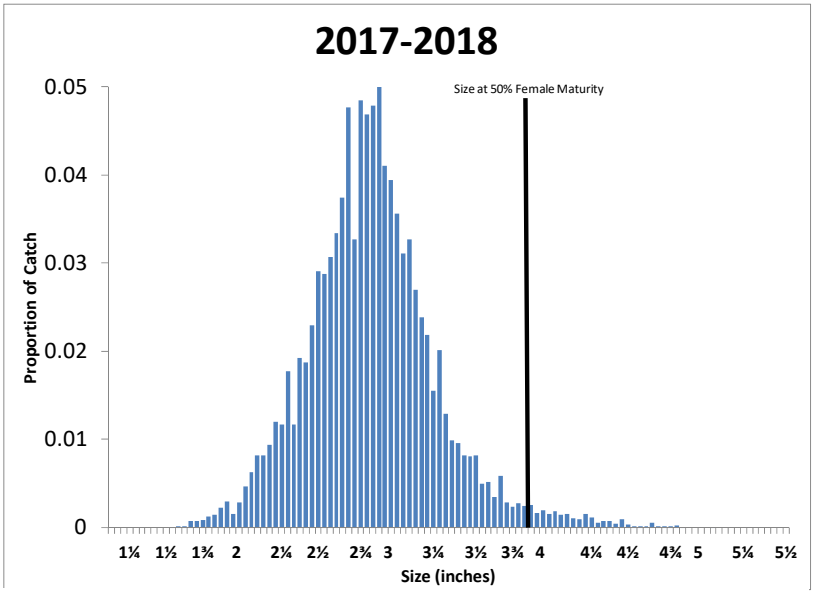

Figure 2. Size frequency of commercial catch caught in Nantucket Sound in 2017 & 2018 collected aboard commercial whelk trap boats from the Cape (mainland) and the Vineyard. Notice the lack of large whelk above the size where half of females are mature (3 7/8").

4. *"The first size change occurred in 2013".*

The start of the letter's 5th paragraph states the first size increase occurred in 2013. In 2013 a standardized gauge was used for the first time, but there was no increase in minimum legal size. There was a 1/8" increase in minimum legal size in both 2014 and 2015 which brought it to 3".

The statement in paragraph 3 that the minimum legal size has increased from 2 3/4" to approximately 3 1/4" since 2015 is incorrect for two reasons. In 2015 the minimum legal size was 3". The legal gauge currently is 2 7/8" width and uses the any orientation definition. This results in a "functional" minimum size whelk shell width of approximately 3 1/16" – a width based on almost 1,500 whelk being measured to the nearest millimeter using our slide-style whelk measuring boards and then gauging them with the 2 7/8" gauge and legal measuring definition.

5. *"The intended full study has not occurred".*

This statement is incorrect. DMF conducted a study to: (a) determine which gauge sizes corresponded to different whelk width measurements; and (b) estimate the percent at each size that would be deemed legal and sublegal based on use of different sizes of measurement gauges.

When the meeting occurred, over 900 whelk had been measured to the nearest millimeter using our slide-style whelk measuring boards. Each whelk was then passed through a series of gauges from 2 7/8" and 3 ¾", increasing by 1/16" increments, using the "any orientation" technique. The percent of whelk in each millimeter size bin that were assigned to "legal" status was determined for each gauge. An approximation of the immediate loss in landings was estimated by using the 2017 sea sampling data and first applying the previous 2016 legal size definition.

After determining how many whelk met the legal definition from 2016, total weight was estimated for these individuals. Weight was estimated using weight-at-size curves generated from previous studies conducted in Nantucket Sound.

Next, the 2017 legal definition was applied to the sea sampling data using the results from the gauge study to determine the new percent legal for each millimeter size bin. Weight was then estimated using the same weight-at-size relationship as described above.

The change in landings due to the gauge change was then estimated by subtracting the total weight using the 2017 definition from the total weight using the 2016 legal definition. That corresponded to a 15.8% reduction in legal catch weight attributable to the size increase from the Vineyard-based boats catch, and a 15.9% reduction in legal catch weight attributable to the size increase from the mainland-based boats.

The any-orientation method of measuring whelk was adopted as a regulation in 2017 in large part due to the inconsistency of proper measurement based on the previous parallel method. The calculations of percent loss due to gauge change assumed that the previous parallel method of measurement was being done correctly. Changing to the any orientation method would seem like a larger gauge size change for anyone that was misinterpreting or misusing the gauge under the previous year's parallel definition.

6. "*The landings table presented after paragraph 5 does not have the most updated data"*

A recent DMF audit picked up on a dealer that had been reporting purchases as bushels when they were actually pounds. Adjustments to landings in 2014, 2015, 2016, and 2017 are reflected in table 2 below.

7. "*After the last size increase – and prior to the start of the 2017 fishing season – DMF predicted that the increased 2017 legal size would only reduce commercial landings by 10%. Despite this prediction, landings from 2017 showed a much larger drop – a decrease of nearly 40% from the prior year and a decrease of approximately 50% from the average conch landings over the previous 10-year period. This decrease resulted in the loss of millions of dollars by the local fishermen. The financial impact was more than three times the anticipated financial loss predicted by the DMF – despite more favorable prices per pound. The proposed future increases in size could bring financial ruin to the conch fishery.*"

Table 2. Dealer reported whelk landings and value from 2005-2018. 2018 results are preliminary and subject to change after audit.

Year	Live Pounds	Est. Value	Price/lbs.
2005	1,354,821	$1,454,295	$1.07
2006	2,420,481	$3,104,430	$1.28
2007	2,496,497	$2,466,229	$0.99
2008	2,701,409	$3,212,108	$1.19
2009	2,847,042	$3,720,139	$1.31
2010	2,505,855	$3,961,252	$1.58
2011	3,042,868	$6,117,755	$2.01
2012	3,649,270	$6,274,224	$1.72
2013	2,305,408	$5,699,013	$2.47
2014	1,828,855	$4,818,000	$2.63
2015	1,698,660	$4,761,000	$2.80
2016	1,659,439	$4,848,500	$2.92
2017	1,132,393	$3,357,984	$2.97
2018*	1,337,037	$4,291,502	$3.21

SOURCE: SAFIS Dealer Reports

All landings reported in bushels were converted to whole pounds (includes shell weight), at 1 bushel = 62.8 lbs.

* preliminary data subject to change upon audits

Estimations for how a gauge change is going to impact catch the following year have several caveats. They assume: (a) the previous gauge was being used correctly; (b) the size structure observed in the commercial catch will be the same as the previous year; (c) recruitment to the fishery remains constant; and (d) fishing effort will remain constant. We cannot control for these variables in our calculations.

We estimated the percentage of catch (weight) in a fisherman's trap that had to be returned due to the gauge increase. The estimate that DMF provided used commercial sea sampling data from 2016; the proportion legal-at-size data using our gauging study; and our weight-at-size data from previous maturity studies. Of observed whelk in our 2016 sea sampling data, the difference in legal catch between the 3" parallel measurement and the 2 $^{7}/_{8}$" any orientation standard would have resulted in a 10-15% reduction in legal catch.

There are other factors such as effort, stock health, weather, temperature, and price that affect catch rates. We are not able to account for these factors in our estimates of percentage of catch that is lost due to the gauge increase. The best projection we can offer is how the gauge change would have impacted the previous year's observed catch based on size frequency data collected from at-sea sampling on industry vessels.

At no time has DMF ever provided a predicted/projected estimate of financial loss to the whelk industry. The change in gauge size and definition certainly had an effect on landings in 2017. The switch to the any-orientation definition was largely done because there were continuous issues with misinterpretation and misuse of the gauge using the parallel method technique.

Strengthening a gauging standard alone is expected to impact total catch the following year, such as 2013 when a standardize gauge was implemented for the first time in this fishery. There also was an approximate 1/16" gauge increase in 2017.

As stated previously, the calculations assumed all of the above caveats were true, and estimated that the observed catch that could be retained as a result of the gauge change would decrease by 10-15% in 2017. A retrospective analysis based on our sea sampling data in 2017 and

our gauging data, indicated the gauge was responsible for **17.3% of the reduction in catch** by weight that could be retained in 2017. The **additional 14.5% drop in landings** can be attributed to other possible factors such as improved gauging compliance, change in population size structure, reduction in recruitment to the fishery, or decreased fishing effort.

8. "*As with most commercial fishermen, the conch fishermen care deeply about the sustainability of the fishery both for themselves and for future generations of fishermen. Without involving the commercial fishermen, DMF completed its own stock survey which has not been verified by a third party regarding its procedures and its findings. This assessment suggested that the total population and size distribution has become smaller over time. However, as the numbers make evident overfishing did not occur in 2017.*"

The statement that DMF did not involve the industry in the stock assessment is not true because: (a) sea sampling data collected from trips aboard commercial vessels were used in the assessment; (b) our maturity study was the result of a collaborative grant done with the Commercial Fisheries Research Foundation and whelk industry participation; and (c) all catch and effort information used in the DMF whelk stock assessment utilized catch and effort data provided directly by fishermen in their harvester reports to DMF.

We assume that the statement that overfishing did not occur in 2017 refers to total yield being lower than the maximum sustainable yield (MSY) predicted in the various stock assessment models that were conducted. MSY is a predicted maximum level of harvest that can be sustainably removed from a healthy population without harming the stock. Given the extreme size truncation and the signs of growth overfishing apparent in the Massachusetts, channeled whelk stock harvesting at MSY levels would not be appropriate in the absence of other management measures (like an appropriate minimum size).

The stock is overfished until biomass exceeds B_{MSY}. Overfishing still occurs until fishing mortality is below F_{MSY} (see Table 3). These values will be updated every few years as updated fisheries dependent and fisheries independent data become available.

In the absence of output controls (e.g., quota) there are no management measures to ensure harvest is maintained at MSY levels. Without output controls or other measures to limit total harvest, there is substantial risk that catch will exceed MSY in subsequent years

Table 3. Biomass-based Management Metrics.

Biomass-Based Management Metrics

Method	Parameter	Value	2016 Estimate	Overfishing Occuring	Stock Overfished
Catch MSY	MSY	1,200,000	1,971,153	Y	
	B_{MSY}	21,900,000	5,726,235		Y
	F_{MSY}	0.07	0.19	Y	
Depletion-Based Stock Reduction Analysis	MSY	1,600,000	1,971,153	Y	
	B_{MSY}	20,800,000	6,178,509		Y
	F_{MSY}	0.09	0.17	Y	
Biomass Dynamics	MSY	1,300,000	1,971,153	Y	
	B_{MSY}	21,400,000	12,157,546		Y
	F_{MSY}	0.06	0.10	Y	

9. *"DMF's ultimate proposed 2029 size would result in the harvest of only female breeding size conchs."*

The statement that the ultimate proposed gauge size for 2029 would result in harvest of only breeding size females is incorrect. This gauge size would still have 50% of female whelk immature and incapable of reproducing. Current regulations protect no female spawning stock. It is disingenuous to state that more breeding stock will be harvested in the future simply because female whelk are currently being harvested when they are immature.

Whelk over-harvested when they are immature will never have the chance to reproduce. In the maturity studies conducted by DMF some male whelk were observed at or above this ultimate proposed size (Figure 3). The growth in male whelk slows when they reach maturity, which occurs around 6-7 years. As such, it takes males 2 to 3 years longer to reach the ultimate proposed gauge size than it does females. This means that male whelk are susceptible to the fishery for about twice as long as females. Thus, it will take males twice as long to get from current minimum legal size to the proposed gauge size for 2029.

Conclusion

DMF is confident in its assessment of the channeled whelk resource and fishery in Massachusetts coastal waters. We have utilized a combination of up-to-date fishery dependent and fishery independent data, as well as directed life history studies to draw these conclusions.

Without a regulatory scheme devised to protect spawning stock, there is a serious threat of stock collapse, as has happened in other unmanaged gastropod fisheries globally. The proposed schedule of gauge increases represents a bare minimum first step to protect and hopefully increase spawning stock biomass. Long-term sustainability of the whelk fishery very likely will require additional management measures to reduce fishing mortality and enhance stock resiliency.

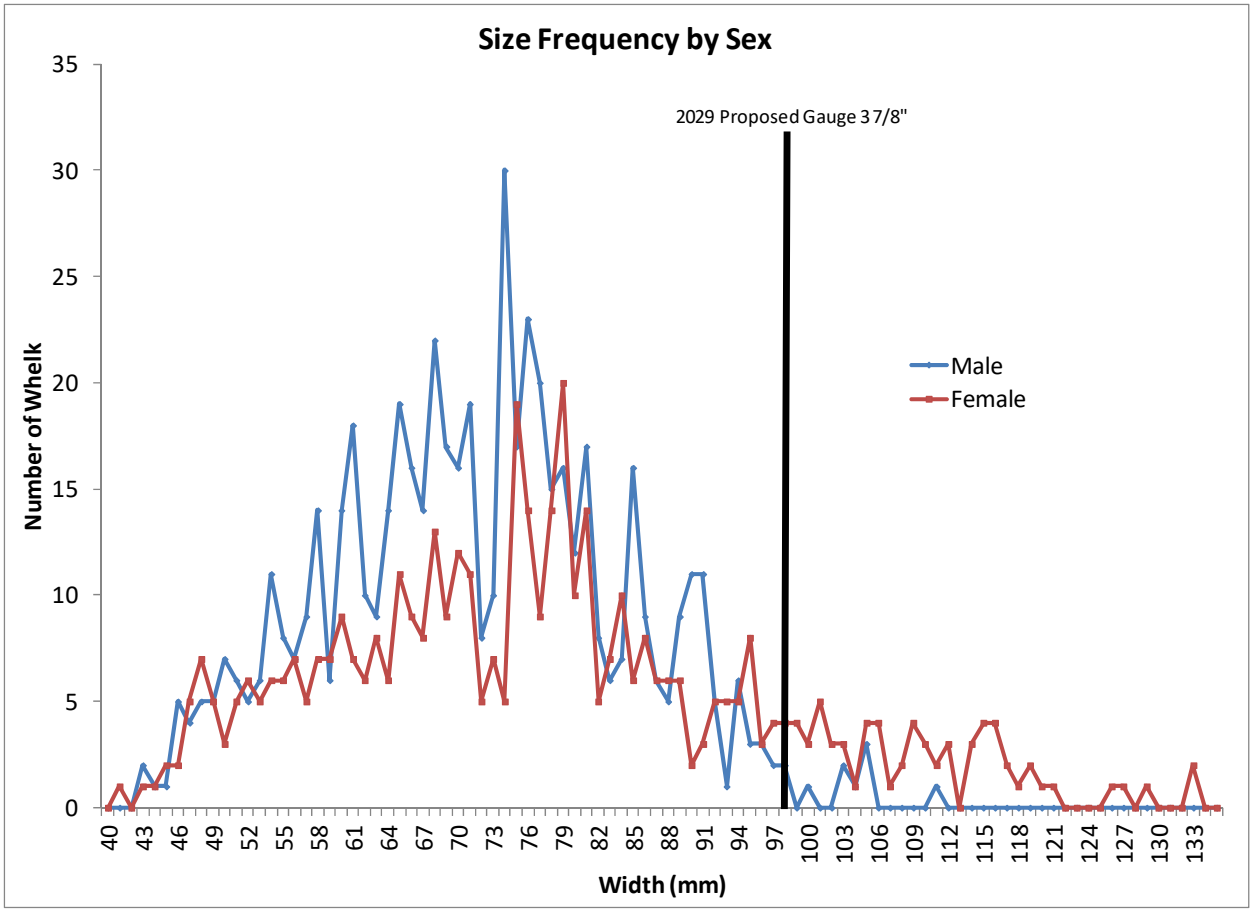

Figure 3. Size frequency of male and female channeled whelk collected by DMF for maturity studies in Nantucket and Vineyard Sounds with the 2029 proposed gauge size (3 7/8"). These data were pooled as size-at-maturity was found to be similar between sites.

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Memorandum from Massachusetts Conch Fishermen
Regarding Proposed 2019 Regulation Change

The Massachusetts conch fishery is a valuable commercial fishery that provides an income for dozens of permit holders. According to Division of Marine Fisheries (DMF) records, eighty two (82) of these permit holders fished in 2016. The conch fishery has helped these hardworking fishermen provide for their families, create jobs for their employees, and support multiple shore-side businesses. DMF has a unique opportunity to make strong management regulations since the DMF solely manages and regulates the conch fishery.

The DMF and the conch fishermen both have a strong interest in ensuring a long term sustainable population of conch and in promoting a financially viable fishery for the near and longer term future. At the present time, the conch fishermen and DMF have different views on how to accomplish this shared goal. It is important to understand that the conch fishermen are the individuals with the biggest stake in maintaining the conch as a commercially viable species.

DMF's proposed 2019 regulation modification presents a solution that has some textbook merits. However, the plan does not adequately consider the more recent catch numbers and alternative regulatory schemes for accomplishing the same goal without devastating the industry and fishermen's families. In its proposal, DMF attempts to solve a complex multi-dimensional problem using a one-dimensional solution citing disputed underlying data. Fishermen are in the best position to understand the realities of the science. They have daily contact with conchs and have years of experience in the fishery. In recent years, fishermen have repeatedly offered to assist DMF in data collection. Although DMF personnel have occasionally taken trips with fishermen, they have not made use of the limited data resulting from these trips on commercial boats in the Spring of 2016. More problematic is the fact that this data was misinterpreted as supporting the DMF management program.

To date, efforts by the DMF to promote the sustainability of the fishery has included limits on licenses, limits on the number of traps, closed fishing periods, and incremental size increases designed to protect breeding sized conchs. The focus of this memorandum is the troubling effort to repeatedly increase minimum size.

The first size increases occurred in 2013. At that time, the fishermen reluctantly agreed to accept the first two size increases based upon a promise that the DMF would delay future size increases until the DMF was able to fully and properly evaluate the affects the initial size increases on the conch population and the industry. The intended full study has not occurred. Instead, since 2015, the minimum size has further increased from 2.75" maximum shell width (MSW, as defined by M.G.L. 6.21-1c) to approximately 3. 25"MSW. A chart depicting the impact of these changes on the annual harvest is set forth below:

Year	Total Yield – Live Pounds
2013	2,305,408
2014	1.921.067
2015	1.971.478
2016	2,066,963
2017	1,300,000

After the last size increase – and prior to the start of the 2017 fishing season - DMF predicted that the increased 2017 legal size would only reduce commercial landings by ten (10%) percent. Despite this prediction, landings from 2017 showed a much larger drop – a decrease of nearly forty (40%) percent from the prior year and a decrease of approximately fifty (50%) percent from the average conch landings over the previous ten (10) year period. This decrease resulted in the loss of millions of dollars by the local fishermen. The financial impact was more than three (3) times the anticipated financial loss predicted by the DMF – despite more favorable prices per pound. The proposed future increases in size could bring financial ruin to the conch fishery.

As with most commercial fishermen, the conch fishermen care deeply about the sustainability of the fishery both for themselves and for future generations of fishermen. Without involving the commercial fishermen, DMF completed its own stock survey which has not been verified by a third party regarding its procedures and its findings. This assessment suggested that the total population and size distribution has become smaller over time. However, as the numbers make evident, overfishing did not occur in 2017.

As shown by the signatures from commercial fishermen, there is nearly unanimous opposition to a further size increase in 2019. Each size increase has created more fishing pressure on the conch the DMF is trying to protect. DMF's ultimate proposed 2029 size would result in the harvest of only female breeding sized conchs. This is <u>not</u> a sensible long term management plan.

To further conserve the conch resource and a financially possible future for its harvesters, we respectfully recommend and request that you consider the following course of action:

1. A moratorium on size increase for at least two years
    -This will allow time for the evaluation of the impact of past size increases.

2. Initiate applications for grants for independent scientists to study the conch population and the affect that size change has had to date and to predict the impact future changes to the size restriction might affect the conch population.
    -The conch industry and some marine biologists feel DMF does not have sufficient data to make informed decisions

The goals of a grant funded research project:

·Determine the actual conch population
·Determine the proportion of male to female in current harvest
·Project the proportion of male to female if size is increased to 3.75”
·Make a recommendation of a Maximum Sustainable Yield [MSY]
·Evaluate the number of conchs that actual enter baited traps vs. those that do not
    -This may be the reason the fishery has survived so many years of pressure because only a small percentage of conch will go into traps

3. A moratorium for at least two years on any license transfers

4. Consider matching the Owner/Operator requirements to the lobster industry

5. Consider reassessing and/or restricting and/or eliminating non-active permits

6. Consider eliminating and/or increasing restrictions on Letters of Authorization

To: Director Pierce
From: Thomas Turner and Whelk / Conch Fishermen
Subject: Collaborative Management Plan

In addition to the memorandum previously submitted by Attorney John Markey at the Hearing on Saturday January 19th in Hyannis, we would like to request that your group consider the following proposal:

1. The whelk / conch fishermen identify a small group (4-7) made up of active fisherman, an industry buyer/processor, and a biologist who would solicit input the fishermen and represent the fishermen in planning meetings with DMF personnel.

2. The industry group would meet with the DMF representatives on a regular basis (perhaps 4-8 week intervals) throughout 2019 to discuss creative management strategies and to collaborate on possible management plan(s) that will ensure a sustainable and profitable fishery.

During this year of collaboration, we believe that a moratorium on the proposed gauge increase is appropriate. As you know, DMF's own Maximum Sustainable Yield [MSY] goals (1.2M – 1.6M) were not exceeded in fishing years 2017 (1.1M) or 2018 (1.3M).

Given these numbers, it is evident that the harvest was sufficiently reduced by the use of the 2 7/8 inch / any orientation gauge. We respectfully suggest that a further gauge increase which will undoubtedly lead to further landing reductions is not biologically necessary. By maintaining the current legal size, DMF would adequately protect the fishery in the short run and avoid the potential for crippling financial losses to the fishermen.

As part of our group work with DMF, we anticipate proposing a research based program that draws upon some of the successes of the Rhode Island-based Commercial Fisheries Research Foundation. Alternative management plans must be based on accurate and complete data. This data can best be gathered by active fishermen throughout the entire fishing year. We firmly believe that strategies other than minimum size increases are better suited to manage the conch fishery.

Thanks in advance for your consideration of this request.

To: Director Pierce / Mr. McKiernan
From: John Markey on behalf of Whelk / Conch Fishermen
Subject: Collaborative Management Plan

In addition to the memorandum that was submitted on behalf of my clients at the Hearing on Saturday January 19th in Hyannis (attached) and the Memorandum submitted by Thomas Turner (attached), we respectfully ask that your office and the Commissioners consider the following proposal at the upcoming Commission Meeting.

1. Since the current gauge size regulation resulted in annual yields [1.1 Million pounds in 2017 and 1.3 Million pounds (est.) in 2018] which were at or below the target goals of 1.2 – 1.6 Million pounds per year set by the DMF scientists, we respectfully request that the Commission place a moratorium on further increases in gauge size while additional research is completed.

2. During the course of the 2019 Fishing Year, we propose the creation of an industry-DMF working group to discuss: (a) the best methods for setting up and implementing scientific research studies that use the shared resources of DMF personnel, fishermen, and potentially independent scientists; and (b) various options for the management of the fishery by exploring alternate methods of fishery management, in addition to gauge size limitations.

3. The whelk / conch fishermen have identified a group of active whelk fishermen (Tom Turner, Eric Moniz, Jefferson Bolin, Mike Pelletier, and Dan Pronk) along with an industry buyer/processor (Gary Yang), and a biologist (Shelley Edmundson) who are all willing to work with representatives of DMF on this important project.

4. The industry group proposes soliciting input the fishermen and presenting their ideas to DMF at regularly scheduled meetings with DMF personnel. We respectfully suggest meetings at 4-8 week intervals throughout 2019. At the meetings, we would discuss creative management strategies and scientific studies with the goal of collaborating with DMF on possible management plan(s) that will ensure a sustainable and profitable fishery.

   Thanks in advance for your consideration of this request.

Silva, Jared (FWE)

From: cape coddington <capecoddington@gmail.com>
Sent: Friday, February 1, 2019 2:57 PM
To: Fish, Marine (FWE)
Subject: Whelk guage increase

Dear Director Pierce,

Thank you for this time to add additional comment following the January 19, 2019 meeting concerning whelk gauge increase.

I am Chad Coddington and fish out of the town of Chatham. I have been involved with whelk fishing for the past 5 years as a sterman, with future interest in the transfer of this permit fished. So all future changes to fishery will affect me for the long term.

Some of the comments made at the January 19 meeting I can agree with. I agree with a guage increase for this year, but would like to see a stall in the increase for the coming years.

As mentioned by fisherman Thomas Luce a double slot shoot guage that would put the larger female whelk back in the water for future spawning. Similar to the state of Maine lobster industry; not being able to take what they consider small lobster or larger lobster. This way we are not concentrating on the harvest of mature female whelk that are known to grow larger than males.

I also think consistent enforcement is necessary to ensure compliance and reduce the industries abuse of the regulations by both the fisherman and the dealer. Evident by the fishing vessel "Haley Marie" and who ever was the dealer letting this happen.

Regards Chad Coddington

Silva, Jared (FWE)

From: Silva, Jared (FWE)
Sent: Friday, February 1, 2019 10:09 AM
To: Silva, Jared (FWE)
Subject: Fw: To Director Pierce

From: Taco Badger <badgerdukkets@gmail.com>
Sent: Friday, February 1, 2019 9:12 AM
To: Fish, Marine (FWE)
Subject: To Director Pierce

I believe the whelk size limit should remain the same and not increase as we would be taking mostly females, we need balance. I feel that a 1000lb limint would be better.

Silva, Jared (FWE)

From: Mohawk Bolin <mohawkbolin@gmail.com>
Sent: Monday, January 28, 2019 6:27 AM
To: awalsh54@yahoo.com; ray@capecodfishermen.org; charlie@quinnfisheries.com; downrivercharters@comcast.net; Lwill582@aol.com; sooky55@aol.com; Bill Doyle; tcbship874@comcast.net; Silva, Jared (FWE)
Subject: Public Comment on Proposed Whelk Gauge Increase

Director Pierce and Members of the Commission,

Because there was no public hearing on Martha's Vineyard I am writing on behalf of myself and the majority of the active commercial conch fleet with regards to the proposed gauge increase for the 2019 season.

First, I would like to make you aware that a fellow fisherman sent off a questionnaire to all Massachusetts conch permit holders asking if they were opposed or in favor of this proposed increase. As of last count, 95 of 139 permit holders have responded. Of those 95, 92 are *opposed* to the gauge increase. This tells you where the industry stands on this issue.

Because of previous gauge increases and changes in language of measurement from actual size to gauge size, both landings and effort have been dramatically reduced. 2017 and 2018 were 55% below the previous ten year average. That is below the DMF's own models of maximum sustainable yield. Mission accomplished.

Also of great concern to the fleet is that this method of conservation has shifted effort onto the large, breeding stock. These proposals will eventually make mortality in this fishery almost totally female. This is not good fisheries management.

Therefore, we strongly believe that continued size increases are unwarranted and potentially damaging to the long term viability of the fishery. We would be happy to work with the DMF on alternative methods for conservation, if necessary. However, we are strongly opposed to this one.

Jefferson Mohawk Bolin
F/V Rock & Roll

Silva, Jared (FWE)

From: McKiernan, Dan (FWE)
Sent: Tuesday, January 22, 2019 1:38 PM
To: Silva, Jared (FWE)
Subject: Fw: Whelk Comment

Daniel J. McKiernan
Deputy Director
MA Division of Marine Fisheries
251 Causeway St. Boston, MA 02114
617 626-1536; 617 626-1509 fax
dan.mckiernan@state.ma.us

From: david meservey <dmese@yahoo.com>
Sent: Sunday, January 20, 2019 12:57 PM
To: Fish, Marine (FWE); McKiernan, Dan (FWE)
Subject: Whelk Comment

Director Pierce,

Thank you for holding the public comment session in Hyannis on Saturday. As always I learned so much.

Having seen and witnessed the affects of the last gauge increase I am wondering if the Division would consider gauge increases effective on September 1st rather than the beginning of the season. Admittedly I am not a scientist and all of my data is anecdotal and from hands on experience. It seems as though there are two peaks in whelk harvest and growth spurts, spring and fall. With that in mind, pushing the gauge increase to September 1st would:

1: Allow two growth periods before fishermen are faced with the slower fishing during mid-summer months
2: Encourage fishermen to stay whelk fishing for market stability
3: Promote movement in the local HSC bait market

I feel that establishing the September 1st date would simply allow fishermen to retain more catch during the leaner time of year while allowing the Division to reach its size goals during times of better fishing and higher growth rates. Thank you again for the opportunity to comment on this important matter.

With Regards,

David Meservey

Silva, Jared (FWE)

From: McKiernan, Dan (FWE)
Sent: Tuesday, January 22, 2019 1:37 PM
To: Silva, Jared (FWE)
Subject: Fw: Conch meeting on 1/20/19

Daniel J. McKiernan
Deputy Director
MA Division of Marine Fisheries
251 Causeway St. Boston, MA 02114
617 626-1536; 617 626-1509 fax
dan.mckiernan@state.ma.us

_____

From: christopher jepsen <scam_jepsen@yahoo.com>
Sent: Tuesday, January 22, 2019 6:08 AM
To: McKiernan, Dan (FWE)
Subject: Conch meeting on 1/20/19

Hi Dan,
I have been setting conch pots since 1970 so as we all know things have changed, in all that time I have never had an EPO check my conch size. I believe there should be more enforcement there are to many people making a lot of money taking shorts. Tom Luce had a good idea about throwing back the conch that are 3 1/2" since they are the breeders. If that was implemented the gauge could stay at 2 7/8". Look how well throwing back lobsters over 5 pounds has worked in Maine.

Thanks
Chris Jepsen (F/V Blood Blistah
Chatham 508-577-2744

Sent from my iPhone

Silva, Jared (FWE)

From: Davis, Shannon (FWE)
Sent: Wednesday, December 19, 2018 8:07 AM
To: Silva, Jared (FWE)
Subject: FW: whelk regulations

From: Nelson Sigelman <nelson.sigelman@gmail.com>
Sent: Monday, December 17, 2018 8:57 PM
To: Fish, Marine (FWE) <marine.fish@mass.gov>
Subject: whelk regulations

To David Pierce:
Regarding:
Whelk Gauge Increase (322 CMR 6.21). DMF is proposing to increase the whelk gauge width by 1/8" on a biennial basis beginning in 2019 and concluding in 2029. This is being proposed to protect spawning stock biomass. The proposed gauge schedule and its anticipated protection of female spawning stock are described in the table below.

Some time back I attended a hearing in Vineyard Haven at which this proposal was discussed. As I recall, DMF said that based on surveys biologists had concluded that too many immature whelk are being removed for the fishery to be sustained. Several fishermen in attendance disputed the DMF conclusions.
As I sat in the audience the arguments all sounded familiar.
Meanwhile the overfishing will continue. Will anyone be surprised in ten years when we learn these proposed measures were too little too late?
The time to act decisively is now. I encourage DMF to accelerate the timeline for implementing the size increase.
Sincerely,
Nelson Sigelman
Vineyard Haven, MA

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Martha's Vineyard Outdoors, Fishing, Hunting and Avoiding Divorce on a Small Island
MV Times Review, Jan. 2, 2018, "Good Sports"
Vineyard Gazette, May 25, 2018, "Front Row Seat to the Natural World"
The Point with Mindy Todd, interview on WCAI: Outdoor Adventures on Martha's Vineyard
On sale now: marthasvineyardoutdoors.com

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David E. Pierce, Ph.D.
Director

Charles D. Baker
Governor
Karyn E. Polito
Lieutenant Governor
Matthew A. Beaton
Secretary
Ronald Amidon
Commissioner
Mary-Lee King
Deputy Commissioner

MEMORANDUM

TO: Marine Fisheries Advisory Commission

FROM: David Pierce, Director

DATE: October 9, 2018

SUBJECT: Increases to Minimum Gauge Width for Measuring Whelks

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Proposal

When we last addressed whelk size-at-maturity management, I indicated we should raise the minimum gauge width biennially by increments that would eventually raise the legal shell size to approximately 3 7/8" by 2029. DMF's size-at-maturity study demonstrates that at this shell width 50% of female whelks are sexually mature.

At that time, I did not have the data to determine what the corresponding gauge increase should be. These data were subsequently collected by staff and are provided in the accompanying table (Table 1). Consequently, I now propose for public hearing a schedule for future increases in the width of the gauge used to measure whelks (channeled and knobbed).

The next gauge width change would occur in 2019, increasing from 2 7/8" to 3". Gauge width increases of 1/8" would then occur biennially until reaching a terminal gauge width of 3 5/8" in 2029 (approximating a shell width of 3 7/8").

Table 1. Schedule for Whelk Gauge Increases, Corresponding Shell Widths at 50% Retention, and Percent Maturity of Female Whelks at Size

	2019	2021	2023	2025	2027	2029
Chute Gauge Width	3"	3 1/8"	3 1/4"	3 3/8"	3 1/2"	3 5/8"
Shell Width at 50% Retention[1]	3 3/16"	3 5/16"	3 7/16"	3 5/8"	3 3/4"	3 7/8"
Percent Maturity of Female Whelks	0%	0%	0%	5%	20%	50%

[1] Given the asymmetry of this animal, there is some variation in the shell width of those whelks that are considered legal (or sub-legal) when measured with a chute gauge in the any orientation method of measurement. My staff has measured a significant number of whelks and has extrapolated an approximate shell width of legal sized whelks measured at certain gauge widths. This shell width is where 50% of the whelk gauged at that gauge width would be considered legal.

Considerations

Note from the table there is 0% female sexual maturity even in 2023 – 5 years hence. In 2025, we finally protect some sexually maturity females (5%). A minimum size strategy that fails to protect significant proportions of the spawning stock must rely on other means to ensure adequate spawning stock biomass. DMF's April 2018 "A Stock Assessment of Channeled Whelk (*Busycotypus canaliculatus*) in Nantucket Sound, Massachusetts" (Nelson, Wilcox, Glenn, and Pugh) found the channeled whelk stock to be overfished. These authors stated: *"…Recent declines in relative abundance and commercial catch rates, the absence of large whelk from the population, and reports from commercial fishermen suggest the long-term sustainability of the commercial fishery is threatened…Results from most methods [assessment techniques] indicate that fishing mortality rates are high and female spawning stock biomass is declining. Based on biomass, abundance, and F-based reference points, it is concluded that the channeled whelk population in Nantucket Sound is likely overfished and overfishing is occurring."*

Despite my misgivings about waiting until 2029 to achieve 50% maturity and my now having DMF's 2018 whelk stock assessment indicating *"likely overfished and overfishing is occurring,"* I propose keeping to the planned schedule for gauge increases (Table 1). Of note, in a March 27, 2017 *MarineFisheries* Advisory we indicated: *"DMF is currently conducting additional sampling to determine a biennial gauge increase that will result in bringing the legal harvest size to 50% size at maturity (3 7/8" shell width) by 2029. Future public hearings will be held in late-2017 or 2018 to enact this gauge increase schedule."* This sampling has occurred and now we must set the schedule.

At the (to be scheduled) hearings this winter, I intend to seek comments on other ways to reduce fishing mortality in order to ensure survival of adequate spawning stock. A more aggressive gauge increase schedule may be discussed, though I suspect no change will be supported by whelk fishermen and dealers. Not surprisingly, we have heard from some industry members who support an even more gradual approach than proposed.

Consider that whelk grow about 1/4" each year. It would seem that with this expected growth, by 2021 whelks will have reached about 3 7/8" or 3 14/16" (2029 target size). However, according to the proposed schedule, we will allow conch harvest with a 3 1/8" gauge width in 2021 meaning conch at 3 5/16".

Some Management History

Around 2010, DMF became concerned about the status of channeled and knobbed whelk in Massachusetts waters. There were numerous trends, particularly in the channeled whelk fishery, that were concerning. Specifically, there were declines in relative abundance, increasing fishing effort, reductions in catch per unit effort (CPUE), and a truncation of the stock around the legal size. Based on observations in other marine snail fisheries worldwide, these trends were harbingers of stock collapse.

As we had little biological information regarding the whelk species at that time, DMF commissioned a size-at-maturity study. This study found in the primary area of harvest—Nantucket Sound—female knobbed and channeled whelk began to mature around 3 1/2" and 50% were sexually mature at 3 7/8". Similar size-at-maturity trends were found in other harvest areas (e.g., Buzzards Bay and Vineyard Sound).

At that time, the minimum size for both species was 2 3/4". This size limit was set in the 1980s based on the smallest whelks that dealers wanted to process. It had no biological basis. Due to concerns regarding the overall health and value of these whelk resources and based on DMF's size-at-maturity study, DMF began pursuing adjustments to the legal size that would protect

spawning stock biomass and eventually result in a target legal size that reflected 50% size-at-maturity.

In 2013 DMF required use of a chute gauge. Using the gauge, fishermen measured conch with the parallel method of measurement, whereby the operculum faced down and with the apex and siphonal canal aligned parallel to the sides of the gauge. Prior to the implementation of the chute gauge there was no standard method of measurement by harvesters, dealers or enforcement. Then in both 2014 and 2015 the minimum size was increased by 1/8" to 2 7/8" and 3", respectively.

The MFAC, at that time, chose not to implement further gauge increases. The Commission wanted DMF to verify results of the 2010 size-at-maturity study before approving any additional legal size increases. This study was completed in 2015 and confirmed the findings of the initial study. This prompted DMF to return to rule making to implement regulations to protect spawning stock biomass.

DMF's resulting regulatory strategy was further influenced by enforcement and compliance concerns. Despite best efforts to educate permit holders regarding the parallel method of measurement, there seemed to be lingering confusion on how to align the whelk to the gauge. Moreover, some harvesters allegedly were manipulating the animal in the gauge or the gauge itself to retain sub-legal sized whelks.

Accordingly, DMF determined it was appropriate to implement a more repeatable method of measurement that eliminated potential user error. As a result, the any-orientation method of measurement was developed. This methodology requires whelks be gauged with the operculum facing down and as flat as possible on the gauge with the siphonal canal at any angle to the side wall. With this new method of measurement, DMF eliminated the concept of a minimum shell width from its regulations and replaced it by mandating the use of a certain sized gauge and the any-orientation method of measurement.

For 2017, the minimum internal chute gauge width was 2 7/8". This corresponded to an approximate 3 1/16" shell width, representing an effective 1/16" increase in the minimum size. Due to the change from a shell size to a gauge size, DMF did not schedule additional adjustments because additional work needed to be conducted to develop a gauge increase schedule that would approximate a 1/16" to 1/8" shell width increase. This type of increase was preferred because, based on annual whelk growth rates of approximately 1/4", it would allow near legal-sized whelks to recruit into the fishery prior to the next gauge increase.

Attachments

March 3, 2017 Whelk Gauging and Minimum Legal Size Memorandum

Commonwealth of Massachusetts
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David E. Pierce, PhD.
Director

Charles D. Baker
Governor
Karyn E. Polito
Lieutenant Governor
Matthew A. Beaton
Secretary
George N. Peterson, Jr.
Commissioner
Mary-Lee King
Deputy Commissioner

MEMORANDUM

TO: Marine Fisheries Advisory Commission

FROM: David E. Pierce, Ph.D., Director

DATE: March 3, 2017

SUBJECT: **Whelk Gauging and Minimum Legal Size**

Recommendations

I recommend amending 322 CMR §6.21 to adopt regulations that will enhance the spawning stock biomass of knobbed and channeled whelks (collectively "whelks"). The recommendation follows:

Fig. 1 Any Orientation Method of Measurement

1. All whelks shall be measured using the "any orientation" method of measurement (Fig. 1). This requires that whelks be gauged with the operculum facing down and as flat on the gauge as possible, and the siphonal canal at any angle to the side wall of the chute gauge.
2. Due to the asymmetry of these animals, eliminate the concept of a minimum shell size and instead establish a minimum internal chute gauge width.
3. To increase the size of whelks that may be harvested through setting minimum internal chute gauge widths:
    a. For 2017, set a minimum internal chute gauge width of 2 7/8". This corresponds to an approximate 1/10" minimum size increase from the current 3" minimum size. Note: all female whelks at this size are sexually immature.
    b. Future internal chute gauge width increases will begin in 2019. At present, staff is developing a schedule to increase the internal chute gauge width. This schedule will approximate the biennial 1/8" size increases to a 3 7/8" terminal minimum size proposed at public hearing. We will have to go back out to public hearing to implement this gauge schedule. Note: At 3 7/8" approximately 50% of all female whelk are sexually mature.
4. For 2017, specify that all chute gauges be made of sheet metal with minimum dimensions of: 6" length; 1.5" chute gauge wall height; and 2 7/8" internal chute gauge width. All commercial fishermen will be required to possess a chute gauge that meets these minimum specifications when fishing for or in possession of whelks. This chute gauge may not be modified in any manner that may affect properly gauging whelks; this does not include modifications like fastening the gauge to a gunwale.
5. Exempt dealers from having to possess whelks that meet the 2 7/8" minimum internal chute gauge width, provided that those whelks were lawfully harvested outside of MA waters and all containers

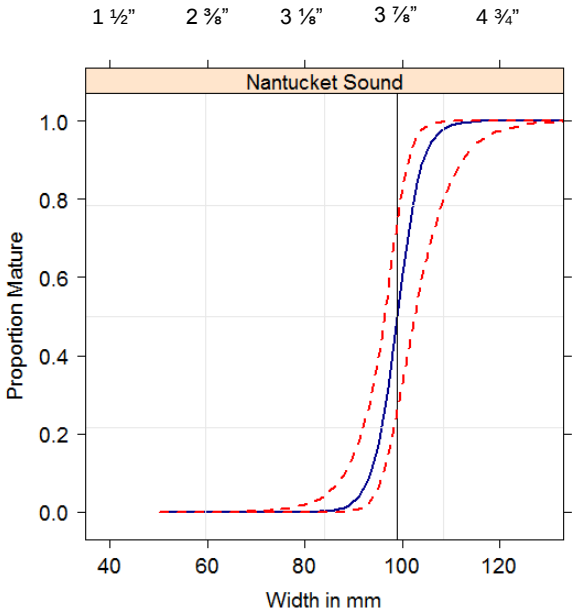
have shellfish tags demonstrating the state of origin. Also, clarify that all MA harvesters must tag containers of whelks with shellfish tags.

Rationale

Around 2010 DMF became concerned that the whelk resource was becoming depleted in Massachusetts waters. There were numerous trends (e.g., relative abundance, increased fishing effort and reduction in catch per unit effort) in the state's fishery that were similar to that observed in other marine snail fisheries worldwide that subsequently collapsed.

As we had little biological information regarding our whelk species, DMF commissioned a size-at-maturity study. This study found that in the main area of harvest, Nantucket Sound, female knobbed and channeled whelk both begin to sexually mature at 3 ½" and 50% are mature at 3 7/8" (Figure 2). Similar size at maturity trends were found in female whelks taken from other harvest areas (e.g., Vineyard Sound and Buzzards Bay).

Fig. 2 Size at Maturity for Female Whelks

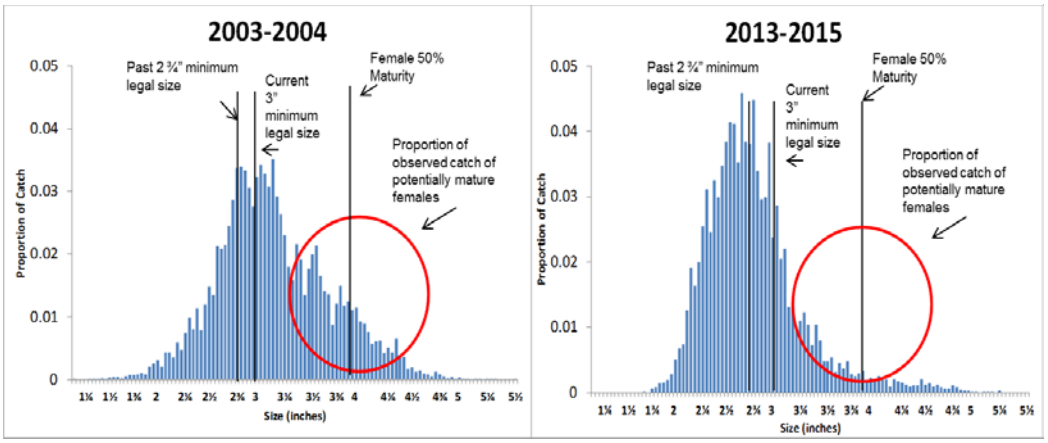


At this time, the state's minimum size for whelks was 2 ¾". This size was set in the 1980s based on the smallest sized whelks that the dealers wanted to process; it had no biological basis. Accordingly, DMF began working towards increasing the minimum size towards 50% size at maturity. In 2013, DMF developed the chute gauge and required the whelks be aligned so that an imaginary straight line between the shell's apex and siphonal canal were in a parallel orientation to the sides of the chute gauge. Then the minimum size was increased annually by 1/8" in 2014 and 2015.

The MFAC did not approve additional minimum size adjustments beyond this increase to 3". Instead they preferred that DMF sample additional whelks to verify the 2010 size at maturity study. This study was completed in 2015 and confirmed the findings of the initial study.

In the interim our sea sampling data demonstrated an issue of additional concern: the truncation of the catch (including sublegal channeled whelk) around the minimum size, demonstrating the larger (sexually mature) female whelks comprised a smaller and smaller proportion of the total catch (Figure 3). As a result of the size at maturity study and the various concerns related to the resource, I proposed to gradually increase the minimum size from 3" to 3 7/8".

Fig. 3 Proportion of Total Catch Comprised of Larger Whelks (DMF Sea Sampling Data)



Additionally, I proposed moving from the parallel orientation method of measurement to the "any orientation" method of measurement. With minimum size management being the core of our whelk conservation strategy, it is necessary to have a well-understood and repeatable gauging requirement. The parallel orientation method seemed to create confusion due to the animal's asymmetry.

Furthermore, enforcement actions show that some harvesters may have been manipulating the parallel method in order to allow them to take undersized whelks. By moving to the any orientation method of measurement the asymmetry no longer becomes a factor when gauging the animal. This any-orientation technique produces a more consistently repeatable method. To further ensure compliance with the standardized gauging technique, it is necessary to require all harvesters possess a legal gauge when fishing for whelks.

Public comment generally supported minimum size increases. However, there were concerns regarding the rate of the increase. Particularly, there were objections to maintaining the 3" gauge, but going to the any-orientation method of measurement. Due to the animal's asymmetry, this would result in an approximate 3/16" minimum size increase. DMF estimated that harvest across the fleet could be reduced by up to 30% with this adjustment. Fishermen strongly preferred a more incremental change. My staff reviewed potential options and determined that using a 2 7/8" width gauge (previously used in 2014) and the any-orientation method of measurement will result in an approximate 1/10" minimum size increase. This corresponds to an estimated 10% reduction in harvest. *For economic reasons only, I recommend the use of a 2 7/8" gauge and any orientation method of measurement in 2017. If not for our economic concerns, I would propose a much larger increase.*

My staff is developing gauge width adjustments that will approximate future 1/8" minimum size increases. We will have to go back out to public hearing in the future to adopt these gauge-width adjustments. I expect we will set the next gauge increase for 2019 and will continue forward with biennial adjustments. One important consideration when moving forward with these gauge increases is that male whelks typically do not grow to reach 3 7/8" shell width. A fishery on larger whelks will result in predominant harvest of females. In the future, this may prompt DMF to consider the development of output controls.

It is noteworthy that I am moving away from the use of minimum size. Considering the asymmetry of these animals if we were to continue to have a minimum size under the any orientation method of measurement, the minimum size would not be the same as the required gauge width. This could potentially complicate minimum size compliance and enforcement. To ensure that our rules are as simple to comply with as possible, we are going to instead determine if a whelk is legal through the method of measurement.

Lastly, my staff and I considered the potential impacts these gauge changes may have on interstate commerce. New Bedford is a major seafood hub where seafood processors accept whelks transported from states along the Atlantic coast. These states may not have the same gauging standards as Massachusetts. Therefore, to not unduly impact interstate commerce resulting in the processing of out-of-state whelks in Massachusetts, I recommend dealers be exempt from our gauging standard when in possession of whelks lawfully harvested outside of the Commonwealth. To ensure that this can be enforced, we will reinforce through regulation the statutory requirement that all containers of whelks (at both the harvester and dealer level) have shellfish harvest tags that demonstrate the products' origin. This is similar to exemptions we provide for surf clam processors.

Attachments

Strikethrough regulatory language

6.21: Whelk Conservation and Management

(1) Definitions. For the purpose of 322 CMR 6.21, the following terms shall have the following meanings:

Channeled Whelk means that species known as *Busycotypus canaliculatus*.

Chute gauge means an open top rectangular gauge made of sheet metal.

Commercial Fisherman means any person fishing under the authority of a permit issued in accordance with M.G.L. c. 130, § 80 and 322 CMR 7.01(2): *Commercial Fisherman Permits* for the purpose of sale, barter or exchange**, or to keep for personal or family use any fish or shellfish caught under the authority of the commercial fisherman permit**.

Knobbed Whelk means that species known as *Busycon carica*.

Operculum is the lid that closes the aperture of the shell when the animal is retracted.

Recreational Fishing means the non-commercial taking or attempted taking of knobbed or channeled whelks for personal or family use, which are not to be sold, bartered or exchanged.

Shell width means the diameter of the shell measured across its greatest width perpendicular to the long axis of the shell.

Standard Fish Tote means a container that does not exceed the volume of 6,525 cubic inches.

Trip means that period of time that begins when a fishing vessel departs from a dock, berth, beach, seawall, ramp or port to carry out commercial fishing operations and that terminates with a return to a dock, berth seawall, ramp or port.

~~**(2) Minimum Size.**~~

~~**(a) It shall be unlawful for any person to possess a knobbed or channeled whelk with a shell width less than three inches for a period longer than is necessary for immediate measurement and return to the sea.**~~

~~**(b) Method of Measurement. The minimum size for all knobbed and channeled whelks shall be determined by measuring the shell width with the operculum facing down and laying as flat as possible on the gauge in an orientation such that a line drawn through the shell's apex and siphonal canal would be parallel with the sides of the gauge.**~~

~~**(c) Processing. For the purpose of compliance with 322 CMR 6.21, all knobbed whelk and channeled whelk shall be landed whole in the shell and processed at a facility licensed for that purpose.**~~

(2) Possession of Legal Sized Knobbed and Channeled Whelks.

(a) Purpose. To increase spawning stock biomass of knobbed and channeled whelks, the legal harvest size limit for these species will be gradually increased to correspond to a size where 50% of female knobbed and channeled whelks are sexually mature. The asymmetry of these animals and the propensity for their siphonal canals to break during handling limits the effectiveness of managing harvest with a traditional shell width or shell length minimum size standards. Consequently, legal sized knobbed and channeled whelks shall be determined through the use of a chute gauge meeting the specifications and by applying the methodology in 322 CMR 6.21(2)(b) and (c) respectively.

(b) Minimum Chute Gauge Width and Chute Gauge Specifications. The chute gauge used to determine the legal size for knobbed and channeled whelks shall measure at least 2 7/8" internal width, by 6" length and by 1 1/2" height. No person shall modify the specified chute gauge in any manner that may affect the gauging of knobbed or channeled whelks. It shall be prima facie evidence of a violation of 322 CMR 6.21(2)(c) if a commercial fisherman is not in possession of a chute gauge meeting these minimum specifications when fishing for or in possession of knobbed or channeled whelks.

(c) Methodology of Determining Legal Sized Whelk with the Chute Gauge. Knobbed and channeled whelks shall be oriented to the chute gauge with its operculum facing down and laying as flat on the chute gauge as possible. A knobbed or channeled whelk shall be unlawful to take or possess if it can pass through the chute gauge in this required orientation with its siphonal canal at any angle to the side walls of the gauge. The required orientation of the knobbed or channeled whelk to the chute gage is depicted in the image below:

1. Exemptions for Dealers. Notwithstanding the requirements of 322 CMR 6.21(2)(c), a dealer permitted in accordance with 322 CMR 7.01(3) may obtain, possess and process knobbed and channeled whelks that are not legal sized if such knobbed or channeled whelks were lawfully harvested in the jurisdiction of another state. All containers of such knobbed and channeled whelks shall bear a shellfish tag, as required by M.G.L. c. 130 §§81 and 82.

(d) Tagging of Knobbed and Channeled Whelks by Commercial Fishermen. Because knobbed and channeled whelks are shellfish as defined in G.L. c. 130 §2, commercial fishermen who retain such whelks harvested in accordance with the requirements of 322 CMR 6.21(2)(c) shall place them in containers that bear a shellfish harvester tag as required by 322 CMR 16.03.

(e) Prohibitions. Except as provided in 322 CMR 6.21(2)(c)1., it shall be unlawful for:

1. any person to possess a knobbed or channeled whelk that is less than the legal size as determined in accordance with 322 CMR 6.21(2)(b) and(c) for longer than it is necessary for immediate measurement and return to the sea.

2. any person to modify the chute gauge specified in 322 CMR 6.21(2)(b) in any manner that may affect the method of measurement of knobbed and channeled whelks.

3. any person to manipulate the orientation of a knobbed or channeled whelk to the chute gauge so that it is measured in a manner other than the method of measurement prescribed at 322 CMR 6.21(2)(c).

4. any commercial fisherman to not possess on their vessel a chute gauge meeting the specifications in 322 CMR 6.21(2)(b) when fishing for or in possession of knobbed or channeled whelk.

5. to possess any knobbed or channeled whelk in a condition other than whole in-shell, except by a dealer licensed in accordance with 322 CMR 7.01(3) .

6. to process whelks at any location other than at a facility of a dealer licensed in accordance with 322 CMR 7.01(3) for that purpose.

(3) Possession Limit.

(a) Coastal Access Permit Holders. For commercial fishermen fishing with mobile gear under the authority of a Coastal Access Permit regulated fishery permit endorsement, issued in accordance with 322 CMR 7.05: *Coastal Access Permit (CAP)*, it shall be unlawful to take, possess or land more than 1,000 pounds of channeled whelk and knobbed whelk combined during any single fishing trip or 24-hour day, whichever period of time is longer.

(b) SCUBA or Hand Harvest. For commercial fishermen fishing with SCUBA or hand harvest gear, it shall be unlawful to take, possess or land a combination of channeled and knobbed whelk that exceeds one level filled standard fish tote.

(c) Recreational Fishing Limit. It shall be unlawful for any person engaged in recreational fishing to possess or land more than 15 channeled or knobbed whelk combined during any calendar day.