# Atlantic States Marine Fisheries Commission

## Tautog Management Board

*January 31, 2017*
*9:45 – 11:45 a.m.*
*Alexandria, Virginia*

## Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order (*A. Nowalsky)* 9:45 a.m.

2. Board Consent 9:45 a.m.
   - Approval of Agenda
   - Approval of Proceedings from October 2016

3. Public Comment 9:50 a.m.

4. Tagging Trial Report (*A. Harp*) 10:00 a.m.

5. Technical Committee Harvest Reduction and Projection Analysis (*J. McNamee*) 10:15 a.m.
   - Methodology
   - Harvest Reduction Analysis for Massachusetts-Rhode Island, Long Island Sound and New Jersey-New York Bight
   - Projection Analysis to Achieve Spawning Stock Biomass Threshold for All Regions

6. Plan Development Team (PDT) Report on Regional Working Groups 10:45 a.m.
   (*A. Harp & A. Nowalsky*)
   - Overview of Topics and Working Group Input by Region
   - PDT/Working Group Recommendations on Harvest Reduction Options for Draft Amendment 1
   - Board Guidance to the PDT on Draft Amendment 1

7. Other Business/Adjourn 11:45 a.m.

The meeting will be held at the Westin Alexandria; 400 Courthouse Square; Alexandria, VA; 703.253.8600

# MEETING OVERVIEW

**Tautog Management Board Meeting**
**January 31, 2017**
**9:45 – 11:45 a.m.**
**Alexandria, Virginia**

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|---|---|---|
| Chair: Adam Nowalsky (NJ)<br>*Assumed Chairmanship: 05/15* | Technical Committee Chair:<br>Jason McNamee (RI) | Law Enforcement Committee Representative:<br>Jason Snellbaker |
| Vice Chair:<br>David Simpson (11/15) | Advisory Panel Chair:<br>VACANT | Previous Board Meeting:<br>October 25, 2016 |
| Voting Members: MA, RI, CT, NY, NJ, DE, MD, VA, NMFS, USFWS (10 votes) | | |

**2. Board Consent**

- Approval of Agenda
- Approval of Proceedings from October 2016

**3. Public Comment –** At the beginning of the meeting public comment will be taken on items not on the Agenda. Individuals that wish to speak at this time must sign in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

**4. Tagging Trial Report**

**Background**

- The Law Enforcement Sub-Committee developed objectives for a commercial harvest tagging program, selected tags to test and reviewed the design of a tautog tank trial to test the feasibility of applying tags to live tautog.
- The tank trial, led by New York Division of Marine Resources and Stony Brook University, began on September 28, 2016 and lasted 30 days. In total, 15 tautog received tags and 6 were untagged for controls.
- The Final Tagging Trial Report is in **Briefing Materials**

**Presentations**

- Presentation of the tagging trial by A. Harp

**5. Technical Committee Harvest Reduction and Projection Analysis**

**Background**

- The TC analyzed multiple harvest reduction options related to minimum size, bag size and seasonal closures. In addition, the TC estimated the year at which a regional stock would reach the SSB threshold if harvest reductions are implemented.
- PDT memo on the harvest reduction and projection analyses in **Supplemental Materials**

**Presentations**

- Overview of TC analysis by J. McNamee

**Board Guidance**

- Based on the TC analysis, the Board can provide input on the harvest reduction management options related bag size, minimum size and seasonal closures that should be included in Draft Amendment 1.

**6. Plan Development Team Report on Regional Working Groups**

**Background**

- Regional working groups (WGs) were created to discuss 1) differential sector reductions, 2) commercial harvest tagging program / commercial quota, 3) regional management (consistent within a region or state-by-state). The WGs met via phone twice to discuss the topics and suggest options to be included in Draft Amendment 1.
- The three WGs include: 1) Massachusetts-Rhode Island, 2) Long Island Sound and New Jersey-New York Bight, 3) Delaware-Maryland-Virginia.

**Presentations**

- Regional working group feedback by A. Harp

**Board Guidance**

- The PDT is seeking guidance on the options that should be included under the following issues within Draft Amendment 1: 1) differential sector reductions, 2) commercial harvest tagging program / commercial quota, 3) regional management (consistent within a region or state-by-state). The Board can continue to work regionally when suggesting management options.

**7. Other Business/Adjourn**

# DRAFT PROCEEDINGS OF THE

# ATLANTIC STATES MARINE FISHERIES COMMISSION

# TAUTOG MANAGEMENT BOARD

**The Harborside Hotel**
Bar Harbor, Maine
**October 25, 2016**

These minutes are draft and subject to approval by the Tautog Management Board
The Board will review the minutes during its next meeting

**TABLE OF CONTENTS**



**INDEX OF MOTIONS**

## ATTENDANCE

### Board Members

Dan McKiernan, MA, proxy for D. Pierce (AA)
William Adler, MA (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)
David Borden, RI (GA)
Mark Gibson, RI, proxy for J. Coit (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
Rep. Melissa Ziobron, CT, proxy for Rep. Miner (LA)
Lance Stewart, CT (GA)
Dave Simpson, CT (AA)
John McMurray, NY, proxy for Sen. Boyle (LA)
Steve Heins, NY, proxy for J. Gilmore (AA)
Emerson Hasbrouck, NY (GA)
Russ Allen, NJ, proxy for D. Chanda (AA)
Adam Nowalsky, NJ, proxy for Asm. Andrzejczak (LA)
John Clark, DE, proxy for D. Saveikis (AA)
Craig Pugh, DE, proxy for Rep. Carson (LA)
Michael Luisi, MD, proxy for D. Blazer (AA)
Joe Cimino, VA, proxy for J. Bull (AA)
Peter Burns, NMFS
Wilson Laney, USFWS

**(AA = Administrative Appointee; GA = Governor Appointee; LA = Legislative Appointee)**

### Ex-Officio Members

Jason McNamee, Technical Committee Chair
Jason Snellbaker, Law Enforcement Representative

### Staff

Bob Beal
Toni Kerns
Ashton Harp
Katie Drew

### Guests

The Tautog Management Board of the Atlantic States Marine Fisheries Commission convened in the Stotesbury Grand Ballroom of the Bar Harbor Club, Harborside Hotel, Bar Harbor, Maine, October 25, 2016, and was called to order at 1:40 o'clock p.m. by Chairman Adam Nowalsky.

**CALL TO ORDER**

CHAIRMAN ADAM NOWALSKY: I am Adam Nowalsky; I'll be chairing the meeting, Ashton Harp from staff next to me. This is the Tautog Board.

**APPROVAL OF AGENDA**

CHAIRMAN NOWALSKY: We'll start out with the approval of the agenda as provided. Are there any changes to the agenda as it's been provided? Is there any objection to approval of the agenda? Seeing none; the agenda is approved.

**APPROVAL OF PROCEEDINGS**

CHAIRMAN NOWALSKY: The proceedings from the August, 2016 board meeting were provided in the meeting materials. Is there any objection to approval of those proceedings as provided? Seeing none; those proceedings are approved.

**PUBLIC COMMENT**

CHAIRMAN NOWALSKY: Next agenda item is public comment. Is there any public comment for items not on the agenda? Seeing none; we'll move along. Next order of business will be to review the 2016 stock assessment update. For that we'll turn to Jay, thank you.

**2016 STOCK ASSESSMENT UPDATE REVIEW**

MR. JASON McNAMEE: My name is Jason McNamee. I work for the Rhode Island Department of Environmental Management. I will be going through the regional and coastwide update assessment results for tautog. There is a lot here; so I tried to keep it pretty formulaic for each region.

I've got the same set of slides, so when we go through the first time I'll take my time on the graphs and kind of explain what you're looking at; but then I'll speed up or else we'll be here all afternoon. Just before I get going I just wanted to make a quick comment. This got turned around really quick, and I just was really impressed.

The assessment team, there were a whole group of us that worked to get all this stuff done in time for you to take a look at; so very impressive to get a full update assessment done in a couple of months. Just a quick overview of the presentation, we'll go through region by region with the assessment results.

I'll go south to north just to shake it up a little bit, probably confuse everyone; sorry. Then we'll end up with the coastwide, and we're just showing that. I actually kept that section really brief and we did it for continuity and for context. That is in there as well. For each region I am going to hit data, the time series that we're working with.

We'll look at harvest and fishery independent and dependent index information results, and then the biological reference points and stock status. That is kind of the formula that we'll go through for each region. A couple more general comments, once the regional structure was determined, which you all did I think at the last meeting. We basically followed the format and the structural elements that were approved through the benchmark; so not a lot of surprises here. You've seen all the stuff, it was an update so we didn't veer too far from the benchmark assessment that we had put together a few months back. These approved elements were all applied to the appropriate regions and we were consistent with a couple of the metrics; specifically natural mortality, the plus group that we used, the selectivity functional form, and the discard mortality rate that was consistent across regions.

All right, just a look at the regional structure. You can see the different regions are colored here. The blue is Mass and Rhode Island; that is the M-

A-R-I or the MARI region. The green is the Long Island Sound Region, so that is New York, the Long Island Sound inside section of New York, and Connecticut.

The orange is now the New York/New Jersey; I guess what are we calling it, the New Jersey/New York Bight Region that is the orange color and then DelMarVa is in maroon down below; just to give you kind of a look at where the regions break out. Okay jumping right in, DelMarVa.

This had the shortest time series. It went from 1990 through 2015. Recreational discards was also 1990 through 2015; and this is the same for all of the regions. The recreational discards are based on the B2s from MRIP, and then only 2.5 percent of those are assumed to die. Just so you know it is not the entire released portion it is only 2.5 percent of those that end up being a removal.

Commercial harvest from 1990 through 2015, again consistent across the regions, commercial discards is not included in the assessment. We did some sensitivities with that during the benchmark and it was found to not have a significant effect, so we stayed with that for the updates.

For the DelMarVa Region there was no fishery independent survey data, so what we are relying on to tune the model in this region is an MRIP CPUE, and it is not a simple calculation of taking the harvest divided by recreational trips. There are other forms of this; Jacquard Index is another form of this. But you basically try and look at all of the species that are caught on a tautog trip kind of consistently. You look at it not just directed tautog trips, but any trips that caught your suite of species that routinely get harvested with tautog.

The idea there is to get some zero trips in your calculation. That is what the MRIP CPUE is. Each region has an MRIP CPUE specific to that region, but DelMarVa that was the sole source of kind of tuning information for the model. Then there is also FI is fishery independent, FD is fishery dependent biological samples that are used in the stock assessment.

The first chart here that you're looking at is just some harvest information. I am going to laser beam the screen over on my left so, sorry folks on that side of the table. What you're looking at here, this is total removals up on the top; metric tons along the Y axis, year along the X axis. The big kind of lighter blue color is recreational harvest.

Up above that you can kind of make out a darker blue; that is recreational discards, and stacked on top of that that you can barely see is the commercial harvest. Down below is just a proportional representation of the same information. What you can see is as the harvest declines the proportional contribution of these different fishery elements becomes more significant, more important. Here is the MRIP CPUE that we were talking about just a moment ago. This is kind of your abundance index through time. Again, fish per angler trip along the Y axis, year along the X axis, the dark line with the open circles is the actual point estimate year to year, and then it is bounded by the dotted lines; which are the 95 percent confidence intervals.

You can see kind of a period of high abundance, but also high variability, and then in the most recent years kind of declining. Here are model results, so top left is information on fishing mortality. The gray line is the actual point estimate as determined by the model and then superimposed on top of that is what we use to actually determine stock status; and that is the three year running average.

We do that. We have a high component recreational fishery with tautog. There is high variability in the harvest estimates from year to year, and so we get wild swings in F because of that. In an effort to kind of dampen that a little bit, what we've done is superimposed a three

year average; and we talked about that during the benchmark process.

But that is what the black line is; it is just a running three year average of fishing mortality. You can see fishing mortality in that 2010 period of time was pretty high, but has declined dramatically since then. Just to the right but still on the top – sorry Ashton, I just laser beamed your head – is information on spawning stock biomass.

Spawning stock biomass in metric tons along the Y axis, year along the X axis; again same set up, the line with the open circles on it is the actual estimate bounded by the 95 percent confidence intervals, and this is kind of a consistent signal. But you've got a period early in the time series of higher abundance and a period of lower abundance; and you can see for DelMarVa it is actually declining in the most recent years.

Then this very bottom graph here is recruitment, and so this is millions of Age 1 fish along the Y axis, year along the X axis; same setup as above, the point estimate with 95 percent confidence intervals. You have a really big recruitment event here early in the time series, dropped off, then you've got a period of decent recruitment in the middle of the time series, dropped off again and some recovery in the most recent years.

Just another important note is, you can see for recruitment as you get into that terminal year estimate, there is less information for the model to work with when it is estimating that recruitment estimate. The confidence intervals get wider, sort of common amongst statistical models.

Biological reference points, so for the DelMarVa Region MSY based reference points were deemed unreliable. There was steepness estimated at for all intents and purposes 1. There was a poor fit to that spawner recruit relationship. For this region we defaulted to SPR based reference points.

We set the target and the threshold, the target at 40 percent SPR, for F or SSB threshold at 30 percent. These are all consistent with the benchmark determinations as well. What you see in the table here is your F value at the threshold is 0.24; there is your threshold spawning stock biomass level and the same information for the target down below. Here are a couple of charts that show you stock status on the next slide. The red on both graphs, so up above you have fishing mortality, down below you would have spawning stock biomass. Your threshold in both graphs is the solid red line, target is the dotted line, and then here is your F estimate. We saw that already.

You can see it is right on top of that F target for the DelMarVa Region. That is F on the Y axis year, down below SSB on the Y axis, year along the X axis; and you can see the trajectory of SSB. There is your threshold there is your target. SSB is well below that on the bottom, and so the result of that the terminal year estimates for F is 0.16.

Again that is right at that target level. SSB however in the terminal year, is about 621 metric tons. Stock status in DelMarVa is overfished, but overfishing is not occurring. That is the same setup for each of these. I'll do less pointing on this one so we can move through this in a timely fashion.

For the New Jersey/New York Bight Region, recreational harvest we've got a little bit longer of a time series here; not much. But this one goes from 1989 to 2015 for the harvest, the discards, and the commercial harvest. Here we have a couple of fishery independent sources of information. We have a Western Long Island Sound Seine Survey and the New Jersey Ocean Trawl. Those are our two indices.
The seine survey is an index of recruitment and the New Jersey Ocean Trawl represents adults, so it is sort of a full population set of information for that one. Western Long Island Sound, you're going to see that twice here and you might

wonder why. We are able to kind of break Western Long Island Sound Survey into two of the regions, and so I'll talk more about that when we get to the next area.

But this is the portion of the Western Long Island Sound Seine Survey that is outside of Long Island Sound. Again we have fishery dependent information here, MRIP CPUE, and we have fishery independent and fishery dependent biological samples. Harvest information again, pretty variable year to year. But again I think the take-home points for these graphs are by way of removals the recreational fishery is the vast majority of all the removals; and you've got this trend across the regions of higher removals early in the time series and lower removals later on.

Here is a look at the Western Long Island Sound Seine Survey. Again this is a recruitment index. You can see there are these periods of good recruitment, kind of followed by periods of lower recruitment. Good news is in the later part of the time series you've got a couple of good years of recruitment in there. Here is the New Jersey Ocean Trawl, pretty variable relative to some of the other trawl survey datasets we have in here.

It starts off kind of high, drops down then jumps back up in the early 2000s, and then I don't know, it is variable but trending down slightly since then. Then here is the MRIP CPUE; same sort of thing, it is kind of high in the very earliest part of the time series it is low, and then it jumps up there in the late 80s, and then it has been kind of a on a downward trajectory but pretty shallow trend there.

Okay result information. Again, fishing mortality top left, your left if you're facing the screen. You can see that fishing mortality was kind of low in the middle of the time series there and has risen in the most recent years. The past two years it was kind of lower, and then went up a little bit; a decent signal there at the end of the time series, some lowering of fishing mortality. SSB starts off high and then drops down to this kind of stable low; maybe a little bit of recovery there at the tail end of the time series. Then recruitment, you can see that good recruitment event at the end of the time series.

Biological reference points, again this region there was no good fit for the spawner recruit relationship, so we defaulted to SPR based reference points; same target and threshold levels here. Here the F at the threshold is 0.34. SSB at the threshold is 2,351 metric tons and the target is 0.2 and 3,154 metric tons.

Stock status, the terminal year estimate, this is the three-year-smooth average is 0.54 for the New Jersey/New York Bight Region; well above both the threshold and the target for fishing mortality. Overfishing is occurring, and then the bottom graph there is the SSB information. That is below both the threshold and the target, so overfished and overfishing is occurring for New Jersey/New York Bight.

Long Island Sound, so as we kind of go up the coast here the time series of information that we were able to use gets a little longer. This one goes from '84 to 2015, and I think the constraint here was the length of the Connecticut Trawl Survey. The '84 through 2015 was what we used for all of the fishery dependent information; recreational and commercial.

Now we've got a few more fishery independent sources of information, so this is the portion of the Western Long Island Sound Seine Survey that is inside the Sound, and they broke that out by stations and where the stations kind of fall. Their trawl survey in this region is the Connecticut and Long Island Sound Trawl Survey; that is a full age spectrum.

Then the New York Peconic Bay Trawl is also used for this region. That is not a full age spectrum though, it is only Age 1s, and we kind of peeled out the Age 1s from that survey. This also has an MRIP CPUE index in it. Harvest information, again looks pretty similar to what you've been looking at.

Higher harvest early in the time series drops down. Here in the Long Island Sound Region it has jumped back up; highly variable year to year, but it has jumped back up starting in the 2000s. But again, I mean it oscillates pretty dramatically from year to year. Here is the Western Long Island Sound Seine Survey.

The gaps are years when survey stations inside Long Island Sound weren't conducted, so those drop out of the index. But you can see that information. You had some good recruitment events early in the time series and then maybe a good recruitment event there in 2015. It looks a little bit above average there. The Connecticut Long Island Sound Trawl Survey starts high, kind of drops down.

You get a little recovery in the early 2000s, but then it is dropped down to a low stable level at the tail end. Then Peconic Bay again, remember this is an Age 1 only, and you can see that series of good recruitment events there at the end of the time series. MRIP CPUE, high early on and then declines to a pretty stable and low level in the most recent years. Model results, so fishing mortality, from '84 to about the mid '90s, fishing mortality kind of increased and then it dropped back down in the early 2000s, and it has risen again starting in about 2008. It got pretty high. It has been variable year to year, but it is kind of in this stable-high area. SSB, high in the beginning, drops down. There is a period of recovery there in the middle, but since it has dropped back down and is sort of stable; slowly increasing in the most recent years.

Then recruitment, again there were some high recruitment events early and then some decent recruitment events at the end of the time series. Long Island Sound, we had a decent fit to the spawner recruit information. What the Technical Committee chose to do with this region was to use the MSY based reference points.

The estimated steepness I think for Long Island Sound was around 0.5, maybe a little lower than that. But the fit seemed reasonable and the estimated steepness also seemed reasonable, so we used the MSY metrics as our preferred. But we're also presenting, because this question came up the last time we talked about this, we're also presenting the SPR based reference points; just for context, and so that you all can discuss that later.

The MSY threshold is 0.49. The SSB threshold, these are the MSY reference points, the SSB threshold is 2,148. The MSY target for F is 0.28, for SSB it is 2,865. Then down below is the SPR calculations, so the threshold 30 percent SPR threshold; F at 0.46, SSB at 2,238, and the target at 0.27 SSB at 2,980. For the Long Island Sound Region there is not a big disparity, certainly some differences between the MSY calculations and the SPR calculations, but not that big of a disparity.

Here is a look at stock status. Our terminal year estimates F, the three-year-average F is 0.51. SSB is 1,603 metric tons. If you look at the top graph there for fishing mortality, you're just up above the threshold and well above the target. SSB down at the bottom, and so important note on these graphs, I'm only showing again, I was trying to be efficient with the presentation.

This is the MSY calculations. In your documents that you all have, you can look at we created these charts for the SPR as well. You can look at those if you're interested, but I'm just presenting the MSY reference points in this slide. Sorry, I'll jump back. Fishing mortality is above the threshold. SSB is below the threshold, so this region is overfished and overfishing is occurring. Okay last of the regions. Here we have the longest time series, 1982 through 2015 for recreational and commercial fishing information. We also have a couple of fishery independent sources of information. We have the Narragansett Bay Seine Survey, which is an index of recruitment. We have the Rhode Island Trawl, we use the fall Rhode Island Trawl information.

Then we have the Massachusetts Trawl, and for the Massachusetts Trawl we use the spring information. These are both seasonal surveys. Again we have an MRIP CPUE, and fishery independent and fishery dependent biological samples. Harvest, so you can see some really high spikes, which kind of skews the graph on the top of total removals.

That really high spike kind of skews your eye a little bit away from the fact that harvest is pretty high early in the time series, and has been lower since then with variability year to year; and again, proportionally you can see. One kind of interesting note here is the recreational discards have increased beginning in the '90s more or less through time. You can see that in the proportional chart. Here is the Narragansett Bay Seine Survey. You had some, I'll call them above average recruitment events, early in the time series and then in the early 2000s we had a decent set of recruitment events. They since have tailed off with perhaps an average recruitment event in the very last year.

Here is the Rhode Island Trawl Survey, again some large spikes in the beginning kind of doesn't allow you to see this trend very well, but it is high early in the time series and kind of declines; probably not shockingly. The Massachusetts Trawl Survey same thing, some high very variable years in the beginning and then drops down kind of low and stable; and then the MRIP CPUE, same sort of thing, so three sources of fishery independent information all kind of indicating the same thing.

Model results, so you've got a period of increasing fishing mortality early in the time series, kind of peaks in the '90s, and then has been declining since then. Spawning stock biomass starts off high, declines pretty quickly and has been low and stable since about 2000, and then recruitment. Again you can see there were some decent, good recruitment events early in the time series. A couple of potentially average recruitment events, but the model is not estimating that big spike of recruitment that you'd see in that Rhode Island Index in that last year.

The Mass/Rhode Island Region, again we preferred the MSY based reference points; but I'm again showing the SPR reference points for a reference. Here if you look at the threshold and the target, F is 0.28 for the threshold, 0.14 for the target; a pretty big spread between the target and the threshold based on the MSY calculations.

The SPR calculations just below that the target is 0.28, so the target is where the threshold is for the MSY calculations. Then 0.49 is the threshold for fishing mortality, and then the SSB metrics to go along with those. For MSY you've got 2.7 thousand metric tons, for the threshold 3,631 metric tons for the target.

If you look down below that the SPR, the threshold is at 2,000 metric tons more or less and 2,684 for the target. Here is a look at stock status. The three-year-average F for the Mass/Rhode Island Region is at 0.23, tucked right in the middle there between the target and the threshold. Then the SSB is down below.

You can see we are and have been below the SSB threshold since 1996. Stock status in this region, overfishing is not occurring but it is overfished. An important note, I should have said this when I was talking about Long Island Sound. The stock status for Long Island Sound does not change if you switch from MSY to SPR calculations, but it does change for the Mass/Rhode Island Region.

Again, I wanted to hit a couple of slides here on the coastwide model results. If you remember back years ago, it wasn't that long ago. We were assessing the stock on a coastwide basis, despite all of the biology and the things that we knew about it but we didn't have much of a choice. We wanted to just show you for context and give you some continuity with what we used to do in the past, but not a lot of shocking information here.

Top left, fishing mortality, you can see fishing mortality kind of rose early in the time series;

dropped down to kind of a median level in the middle there and then rose back up later in the time series with potentially some lowering of fishing mortality in the most recent years. Spawning stock biomass declines down to a low stable level, and recruitment seemed to be good early in the time series and less so later in the time series. Here we were able to calculate both MSY and SPR based reference points. For Fmsy, the target is at 0.17, the threshold is at 0.24.

SSB targets at 14,900, SSB threshold is at about 11 thousand metric tons, and then the SPR calculations are below that. The threshold is at 0.43, the target is at 0.25 for fishing mortality. It is at 9,448 for the target, 7,000 more or less for the SSB threshold. The graph will go look at stock status.

Where we were looking at this along the entire coast again, F in the terminal year is 0.38, SSB is about 6,000 metric tons; so on the graph you can see F is well above both the target and the threshold, and is well below on the bottom there the target and the threshold for SSB. Overfished and overfishing is occurring if we looked at it as a coastwide stock unit.

Overfishing status changes the way that the SPR calculates for this coastwide view of this as well. Here is a table of the overall conclusions. I think what I'll do is I won't dwell on this for long, but I can come back to it. Maybe I'll hover on this as you begin your deliberations. In any case, we can always come back to it. But it just gives you the overall view for the four regions.

All of the regions are overfished. That is with regard to spawning stock biomass. Then for the fishing mortality information, DelMarVa and Mass/Rhode Island is not overfished, New Jersey/New York Bight and Long Island Sound are overfished. One thing I didn't put in any. We did some sensitivity testing. I did not put any retrospective charts or anything in here.

They are in your document, but just kind of two high level thoughts. The smaller regional scale continues to hold up with the updates, so it worked for the benchmark. We all cheered, and it held up for the update, so we cheer again. It seems to be working. We have enough information to run these regional models, which is good news; and the models are robust to input data and model configuration, based on some of the sensitivity analyses that we did.

I'm going to conclude here with some projections. The Assessment Team performed some short term projections. We projected into 2016 through 2020. We wanted to do this to provide the board with some additional information for your deliberations. We ran three scenarios, we didn't go crazy here.

We wanted to just give you some ones that we had heard you talk about in the past, and then for context we did status quo. We did a 50 percent and a 70 percent probability of achieving the F target in 2020. Then we ran what would happen at status quo if we ran that out to 2020. The biological parameter assumptions that we made was for maturity, natural mortality, weights at age; those are all the same as were used in the model.

The one difference is for the weights at age that goes in as a time-varying matrix, so we used the average of the latest selectivity block for the weights at age. That is how that went into the projection model. A couple more things, a couple other assumptions, empirical recruitment drawn from the model estimated observed recruitment was used for the SPR calculations. Then for the MSY calculations we used a Beverton Holt Model, and the parameters were those as predicted by the model. That is how we kind of informed the projection model. Those parameter estimates came right from the model and we used a log normal error distribution for the projections. Fishery selectivity was input, as that estimated by the model in the most recent selectivity period, so that last selectivity block was carried forward. The harvest for 2016 and 2017 was assumed equal to the most recent

three-year-average harvest, so that's an important point.

I'll get into more of that when I jump into the tables, but the tables will make more sense to you if you keep that in the back of your head, so 2016 we don't have that number yet. We assumed that we wouldn't be able to get management in place for 2017 either, and so what we did was we used a three-year-average harvest for those two years; based on the previous three years where we had information.

Then we used an iterative process to determine what the constant harvest rate in 2018 to 2020 would need to be that would result in a 50 and then a 70 percent probability of achieving the F target. Here are the projection results. This is the DelMarVa Region, so that again I'll explain this table a little bit.

You've got your scenarios here on the left hand side. Probability of being at or below the F target in three years, so that 2020 year that is this middle column. Then we also put in the probability of being at or above the SSB threshold in three years as well, so you've got all of that information for context.

Again, status quo is 77 metric tons for the DelMarVa Region. That has 100 percent probability of being at the F target in three years and an 18 percent probability of being at or above the SSB threshold. This is where it gets weird and why I wanted to make that point on the last slide; so 139 metric tons would give you a 50 percent probability of the F being at or below the F target.

The way that works is this 77; there is a lot of variability in the harvest in the DelMarVa Region. The average is 77, so that harvest can actually go up from that average amount. Hopefully that makes some sense. We can talk about it more if not. Then here 125 metric tons has that 70 percent probability of being at the F target, and 12 percent probability of being at or above the SSB threshold.

Same table for the New Jersey/New York Bight, here status quo is 461 metric tons. That status quo has a 45 percent probability of being at or below the F target by 2020, and then 85 percent probability of being at or above the SSB threshold in three years. Those terminal year estimates were pretty close to the reference points. That is why that information is that way.

The 50 percent probability would allow for a 450 metric ton constant harvest, and then 410 to be at a 70 percent. You can kind of judge there from status quo you would need some level of decrease to meet those 50 and 70 percent probabilities of being at your F target. Here is Long Island Sound. There are now two tables, I'm showing you both MSY and SPR here.

The status quo harvest for the Long Island Sound Region is 500 metric tons, here you get now some pretty severe decreases needed to be at the F target; 264 metric tons. Roughly a little more than half of the harvest that you had from that status quo calculation to get to your F target with a 50 percent probability, more than half to get to a 70 percent chance. It is not much different for the SPR reference points. The Mass/Rhode Island Region, again even more severe. You have your status quo amount of 390 metric tons. To get to a 50 percent probability of being at or below the F target in three years, you would need to have 151 metric tons, to be at 70 percent, 148 metric tons. If you drop down to the SPR reference points those decreases are less severe than the MSY calculations. That's it from me. I'm happy to take any questions. I can flip back to any of the information, but that is all the information from the update assessments for the regional assessments for tautog.

CHAIRMAN NOWALSKY: Those last couple slides were almost as rosy as Shanna's South Atlantic update on funding, so thank you for that. Let me frame the conversation for where we go from here; as Jay gave the presentation on the update. What we need to get through as a board

today is provide the PDT with guidance on how to use the information contained herein.

Some of the items we need to discuss, for example include choosing potentially between the MSY and SPR reference points for Long Island Sound and Mass/Rhode Island. The next presentation we go through we'll have those issues. I believe there are seven issues that we'll go through that we need to get comment on.

That is the bulk of what we need to get through today. If we have technical questions for Jay about the information that he just presented, we'll go ahead and take those. But I think the sooner that we go ahead and get into the decision points the better. Questions, I had Bill Adler and then Dave Simpson and Mark Gibson, Emerson and we'll start there. All right so go to Bill first.

MR. WILLIAM A. ADLER: Just a quick question. Climate change and the tautog, I know they basically stay put; that is one of the things about this fishery. But do you see or does anybody think that with all the other fish moving north that these things might migrate that way too?

MR. McNAMEE: It is a good question. We haven't talked about that much as far as some kind of movement of the population center northward. What we talk about with regard to climate change and effects on this species is that it is a period of lower productivity. I think you saw that in some of the recruitment indices further north. There has been a period of lower recruitment in the most recent time period. We haven't talked about a shift like we talk about with black sea bass or something like that.

But we do think there are affects here and potentially – I hesitate to even use the word, but I'm going to use it anyways – a regime of lower productivity in the most recent years. That is kind of what we talk about with tautog. I'm trying to search in the memory banks here if there is information like we have from Maine picking up black sea bass up in the Gulf of Maine. We don't hear too much of that about tautog, so I don't have much to offer there.

CHAIRMAN NOWALSKY: I'll just add that I can't comment on the productivity element, but unlike a lot of species we deal with, this species is known to be active across a very wide range of temperatures, up to 30 degrees in any area up and down the coast between 40 and 70 degrees they are known to be active. I can't speak about the productivity element that Jay just spoke to; next on my list, Dave Simpson.

MR. DAVID G. SIMPSON: Great summary, it was very helpful. I resolved my first question while Bill was talking; it is 0.6 percent probability of being above the threshold, not 60 percent. I was having trouble with that but I resolved it. In the report I could not find for Long Island Sound the stock recruitment plot. If you could just add that that would be great, Eric provided it for me via e-mail, but I think those are really helpful. He went to the extra step of labeling each point by year, which helps me with how variable recruitment might be at a given biomass. That would just be a really helpful addition, thanks.

MR. MARK GIBSON: I also noticed that the Long Island Sound information was missing, so I support Dave Simpson's request to include that; given that there was some determination of reliability. My question is about the multiple methods of calculating reference points, the SPR based ones and the MSY based ones.

I don't know if you have the stock recruit plot for Mass/Rhode Island, but it is a pretty unusual one. I am intrigued by what Mr. Adler said, because it looks like a stock that could be undergoing a change in productivity. There is a period of time in high recruitment and then a fairly smooth change trajectory downward to a cluster of a shot gun scatter at the end of the trajectory downward.

But it looks to me like there would be strong time residuals in this stock recruit pattern. I am interested in how the determination is made as

to what is reliable or not within the catch-at-age model, but I may have more to say after Jason answers. I may have more to say about it when you get into the issues for the PDT development of the document. I guess the question is, what's the basis at the Technical Committee for determining what's a reliable stock recruit component in this model or not?

MR. McNAMEE: I'll offer that this was a topic of pretty intense discussion, as you can imagine. For the MSY calculations it was kind of an accumulation of a couple of things. First, just the statistical look at it from the model was able to estimate a reasonable steepness, and we judged reasonable based on the value that came out of the steepness estimation along with what that value is for other similar species, and it seemed again reasonable in that regard.

The other thing that we noted was the MSY information seemed to get more statistically reliable for the areas that had a longer time series. When you had that fishery independent information back early in the time series that was the other, kind of indicator. You had that for Long Island Sound and Rhode Island/Massachusetts, and you didn't have it further south that time series truncated.

I guess it was an accumulation weight of evidence kind of approach that we use, but again I think you haven't actually said anything. The implication is this was not a no-brainer for us. We talked about it a lot, and so that's where we ended up was relying on those kinds of pieces of information and saying it looks like a reasonable curve. I will acknowledge though that we did not talk about that temporal aspect of it and didn't review that in our deliberations.

DR. KATIE DREW: Just to add to Jay's answer, we also did some sensitivity runs with the model and a lot of times what you'll see is that steepness estimates will jump around a lot, and the model won't have a good ability to fit the steepness. But we didn't see that with the Massachusetts/Rhode Island that the estimates of steepness were coming out in roughly the same spot for different sensitivity runs. We had more confidence in the model's ability to actually pick up some kind of relationship there.

MR. EMERSON C. HASBROUCK: My question was similar to the one that Mark had, but kind of to follow on that. When you were able to have confidence in the stock recruit relationship, the TC is recommending an MSY approach. Is that correct? Then when there is low confidence in a stock recruitment relationship, the TC is recommending the SPR relationship. That's part one of the question.

MR. McNAMEE: That's exactly right. There is a parameter that estimates called steepness, and so it was kind of able to give reasonable, it was I think in the vicinity of 0.4 for the Mass/Rhode Island, 0.5 for Long Island Sound. But then when you went south that steepness parameter ends up being 1, so basically saying there is no relationship that the model is able to determine. That's exactly it. Because there is no stock recruit relationship, you're not able to calculate MSY for those other regions.

CHAIRMAN NOWALSKY: Emerson, you had a second question or a follow up to that?

MR. HASBROUCK: Yes, follow up, thank you. Then if I understood your response to Mark as well then, the TC speculates that the reason that you don't have confidence in a stock recruitment relationship for those two areas that don't have it is because of the time series of the data. Is that correct?

CHAIRMAN NOWALSKY: That was a nod of the head, Jay for a yes answer?

MR. McNAMEE: No, I was just waiting for the okay to answer. That is not the entire reason. That is, in fact I will say that is conjecture from me personally. We didn't actually talk about – we did, okay.

DR. DREW: Yes, I think that is. One of the things that we noticed about the time series is that the two more southern models with the shorter time series don't really cover that early part in the early eighties where we think that exploitation really started to peak. It covers what we think is maybe a more lightly exploited part of the population, and thus you have better contrast between the high SSB and the low SSB, and therefore the high recruitment and the low recruitment.

That gives the model a better ability to fit a relationship, if a relationship is there. With the short time series you're not really seeing what we think would have been the peak of biomass in that region if it had been available for us to model. We think that is why the relationship isn't coming across as strongly in those two southern regions as it is in the regions with the longer time series that cover more of the contrast in the population.

CHAIRMAN NOWALSKY: Okay, so we've got about 45 minutes. Are there any other questions on the presentation, or are we ready to delve into the issues we need to get some feedback from the board on? Okay seeing non hands on questions, we'll turn to Ashton to begin the presentation.

Again, we've got seven items here. After each item we'll stop, get feedback from the board; with the exception of one item with regards to the tagging program where we've got a few extra slides. We'll just bring that up but we'll hold off on feedback until the end of the other items, when we've got some more information for the board.

**PROVIDE PLAN DEVELOPMENT TEAM GUIDANCE ON DRAFT AMENDMENT 1**

MS. ASHTON HARP: The PDT has been working hard over the last year in developing the background sections in Draft Amendment 1. We have those together and now we want to move forward with developing the regional management options based on the stock status in the stock assessment update.

I am going to walk through seven issues today, and as Adam mentioned, I am hoping we can stop after each issue, and have a discussion; and hopefully come to a decision point at the end of each one. The first three, the reference points, projections to reduce F, and the rebuilding plan; you can refer to your guidance document for more information. I've given background information and you can already see the pointed question that I'm going to ask.

For the latter four, the commercial and recreational split, the commercial harvest tagging program, commercial harvest quota, and management within a region. These were brought up at the February meeting earlier this year, but I know it will sound like new information today, so I'm just going to ask some pretty pointed questions related to these topics.

The first topic is reference point, as show in this busy table. It shows the four regions as well as the coast, and it shows the MSY and the SPR reference point's right next to each other; so you can see them as a guide. The TC is recommending as we just discussed in detail, MSY reference points for Massachusetts/Rhode Island, Long Island Sound, and the the coast.

SPR reference points are shown for New Jersey/New York Bight, and the DMV. I've tried to simplify this table a little bit, just to show what it would look like and how it would look to the public if we went out with just the TC recommended reference points. This is what they would see. They would see simply the reference points that the TC has recommended, in turn this is a cleaner way to present reference points to the public.

The PDT would prefer not to go out showing MSY plus SPR reference points, because it is quite confusing. In addition it poses challenges because the PDT would have to develop sub-options for each alternative. That gets to the

question. Does the board approve the reference points as recommended by the TC, meaning the MSY reference points for Massachusetts/Rhode Island, Long Island Sound and the coast, as well as SPR reference points for New Jersey/New York Bight and the DelMarVa regions?

CHAIRMAN NOWALSKY: Okay, well I think we've jumped to the big one pretty quick. Let's get right down to it. Questions, discussion, we need to provide some guidance to the PDT on what they would like in the draft amendment. Dave Simpson.

MR. SIMPSON: Yes it is a tough question. Fortunately for Long Island Sound there isn't really much difference at all, in terms of what it means. But there is a significant one for Rhode Island and Mass, and I think it will be up to them to find a comfort point. It is basically how much you believe that there is a stock recruitment relationship, and it looks like this; versus periods of high and low productivity.

I personally think there were signals in all of those assessments that recent recruitment is improving. I think there is an environmental element to this that may be more important. I'm also looking ahead to, I think it is a shared concern but it is the last point that Jim Gilmore made, which is when we start to put these pieces together we want to try to look as seamless as we can between regions, have as similar rules as we can between regions. That's again where we may want to try to smooth some of this stuff out. I guess I would want to hear more from Rhode Island and Mass what they think about the differences, because the biggest difference is there. Is that just because – well why is that? I'm just very skeptical of stock recruitment relationships.

I think well, it sort of goes back to Mike Sissenwine's work on yellowtail flounder. He published his thesis just in time to have the stock recruitment relationship hold, and then the next year it fell apart. They are elusive. My inclination coming into the meeting was I did want to defer that decision until after the public had had a chance to see it. We've had a chance to look at what it would mean for management, so there is a little bit of a practical element rather than a pure objective process that I'm looking for.

CHAIRMAN NOWALSKY: Before I go to Mark, who I had next on my list, the goal for each of these would be to try to develop some consensus around the table for how to proceed. In the event that we can't develop a consensus, the default would be to include them both; at least on this topic and that might change as we go through each other topic.

It might be some different outcome by no consensus. But that is essentially what that would mean, unless some board member had some specific motion on one of these matters that they wanted to bring forward. But that is the course that we would be going here as we go through these speakers. Mark, I had you next.

MR. GIBSON: I guess in answer to the question, I would answer no. I hate to do it, but I don't approve either reference point at this point for – I'll stick to the Mass/Rhode Island Region, although my concerns may apply to the other regions as well. It looks to me that there is evidence of non-stationarity in the population dynamics; that is we have a period of time with relatively low recruitment going on.

That challenges both MSY reference points, because as a stock recruit calculation it is not stable with respect to time; but also the SPR since you're drawing randomly from the recruitment distribution, you're giving equal likelihood for the big ones occurring if the small one's occurring. That may not be the case.

I'm concerned that we have estimated biomass targets and thresholds that are unattainable in either calculation; the differences in stock perception in Mass/Rhode Island notwithstanding between the two methods. I don't know where to go with that from here, because putting them both out there for public

comment under those criticisms. I just have a concern about that. But I don't know what the alternative is at this point. The horse seems to be out of the barn relative to the technical merits of either one of them.

CHAIRMAN NOWALSKY: Where we go is we hopefully provide guidance today, then the PDT comes back with a draft amendment at February, or would it not be until May? February, most likely, at which point we would then decide whether or not to keep the horse out of the barn; or some other action at that point, next up, Dan McKiernan.

MR. DANIEL McKIERNAN: I agree in large part with Mark. My question is, how negotiable is the rebuilding timeframe, because we may find that there are real benefits to creating some common measures among the areas, if it meant extending the rebuilding timeframe for one of the areas a little longer than another? If we're all in the same timeframe and it drives us to have different management measures, it could be problematic, especially I'm thinking – and I talked to David Simpson earlier.

A Montauk based boat coming to Block Island is going to have to comply with the Mass/Rhode Island rules, so it would be really beneficial to the extent that we can make these rules as common as possible; if it means the negotiable part is the rebuilding timeframe.

CHAIRMAN NOWALSKY: To date I believe what we've looked at is just the date selected arbitrarily. I'll turn to Toni though for specifics on what we might need to do with this stock.

MS. TONI KERNS: This is an amendment document, so the board has the ability to change the rebuilding timeframe from what was in the original document to the degree that you want. I don't even know if the original document had a rebuilding timeframe; off the top of my head. It is the pleasure of the board to develop a rebuilding timeframe.

MS. HARP: The rebuilding plan is Issue Number 3, and so I was going to get to that one. The reason why I brought up the reference points first is because everything builds upon that. I have two presentations that divert based on the Boards initial decision for reference points.

There is no rebuilding plan in the original FMP from 1996. There is nothing that says if the stock was overfished that you must do X. It is not in there. The PDT would like to propose something like that; and I am going to ask some pointed questions under Issue 3 regarding that.

CHAIRMAN NOWALSKY: One option right now would be to leave all of these options in here, MSY and SPR for the coast; or take one out for the coast if you wanted to, as opposed to leaving it in Long Island Sound; Mass/Rhode Island obviously creates more work for the PDT. But when we see those options come back in the draft amendment, we would then have the ability to decide if we wanted to take them out. We would have a second chance to potentially take options out before they go out to public.

Obviously in deference to the workload of the PDT, they would provide we take out anything that we can here. Let me phrase it at that point. Is there anyone who supports not having the PDT move forward with working with all of the options that are here, which would be MSY and SPR for Mass/Rhode Island, Long Island Sound and the coast, and SPR for DelMarVa and New York/New Jersey. Okay, I'm not seeing anyone who supports taking any of those out, so that would be the current direction to the PDT; leaving them all in. Ashton, follow up to that?

MS. HARP: Just to clarify, if one region, lets say Long Island Sounds wants to include the SPR and MSY reference points, it does not mean that the other regions have to do that. They could choose one or the other at this meeting. Every region doesn't have to have multiple sub-options. I just want to bring that to their attention.

CHAIRMAN NOWALSKY: Yes I'm not seeing anybody jumping at trimming that workload, unfortunately.

MR. JOE CIMINO: Just to put this out there for the discussion. As Jay mentioned, the coastal was there to show continuity runs. Going back further than reference points, do the coastal options have to be there at all? That's my question. We did a lot of work to move past that. Does that have to be part of the public document? I'm just going to put the question out there.

CHAIRMAN NOWALSKY: Well, I certainly think it is a good question given this board did vote to move forward with the regions. Jay, do you have any other thoughts about the merits of including those options?

MR. McNAMEE: Yes, I do. We did the work for the coastwide again to provide that continuity, but I would suggest that all of the reason why we did this whole exercise with the regions is because none of us are very comfortable. The assessment for this species should not be smeared across the entire coast.

It should be as regionalized as possible; I think we've done that and so I would suggest that going with the regionals and not the coastwide would be the preferred way to go. We've got the information there we could carry forward to coastwide; but I don't see a lot of value in it from a technical standpoint.

CHAIRMAN NOWALSKY: Ashton, do you have anything else to add? Okay, is there any objection to not having the PDT develop management options based on coastwide reference points?

MR. SIMPSON: I don't have an objection, because I don't think that's where we'll go. But don't we need a status quo option for the amendment, and whether we could satisfy that with one of the two reference points for the coast? I'm not sure, well that is my question. Could we get away without having that default coastwide?

EXECUTIVE DIRECTOR ROBERT E. BEAL: There doesn't necessarily have to be an explicit status quo option in there, because essentially don't approve the amendment and you revert back to the current management program, and that's your status quo. It just depends how you want to illustrate the effects of not moving forward with the amendment; but it doesn't have to be in there.

CHAIRMAN NOWALSKY: All right so again I'll ask, is there any objection to not having the PDT move forward with management options for the coast? Okay so we can remove a couple options from the PDT workload.

MR. McNAMEE: I'm sorry; I thought I was tracking this. I just wanted to clarify for DelMarVa and New Jersey/New York Bight. Was there a request to add back in MSY calculations for those regions or are we comfortable with the SPRs; given that we can't estimate a stock recruit relationship for those two regions? I just wanted to clarify, because I thought I heard both things.

CHAIRMAN NOWALSKY: I haven't heard that specific request. Where I believe we are right now is SPR for all four regions and MSY for Mass/Rhode Island and Long Island Sound, and seeing no objection to that from the board. All right let's move on to the next set of options.

MS. HARP: Now we're moving on to Issue 2, which are the projections to reduce F. As Jay presented in the stock assessment update, the TC did perform two analyses, the 50 percent probability of achieving F in 2020, and a 70 percent probability of achieving F in 2020. I have two slides on this.

The first slide shows just the MSY reference points and the second slide will show the SPR reference points. The two columns on the right are the maximum removals if the 50 or 70 percent probability is chosen. The two columns

on the left show just for comparison what were the landings using the three year average, and what were the 2015 landings.

We can just move to the next slide to show just the SPR reference points as well. There is not too much of a difference between them. There is actually not too much of a difference between a 50 and a 70 percent in most cases. Does the board have a specific opinion on choosing either a 50 percent probability of achieving F in 2020 or would they be more comfortable using a 70 percent probability of achieving F in 2020?

CHAIRMAN NOWALSKY: That's the question. Do we want to include 50, 70 or both or potentially something else that we haven't been presented with; which I don't think the PDT is looking for. Those are the options; 50, 70 or both in the document, discussion, Emerson.

MR. HASBROUCK: In order for me to have a response to this, I think we need to have some discussion about timeline; because if the timeline changes to something different than 2020, then a response to a 50 percent or 70 percent probability, at least in my mind may be different.

MR. McKIERNAN: I would prefer the more liberal value, and the reason is there are other sources of mortality that I don't think we're going to be able to measure very well that we want to resolve in this fishery. As you know there is a tagging program being talked about for the commercial fishery.

When our law enforcement finds instances of poaching tautog they are spectacular numbers of fish. The fear is that there really is an unknown amount of landings that a lot of people are very interested in resolving and are willing to put a lot of work into it. I really don't want this to be measured by legitimate landings as to whether we're going to succeed or not, because success in conserving tautog is going to come not only in the measured catch, but the unmeasured catch.

I would also like to point out that in an experiment that we ran in Buzzards Bay with ghost lobster traps, tautog was the Number 1 fish that was captured and were probably killed in abandoned lobster gear. We need to resolve those. Granted there is less lobster traps going on in southern New England than there was in the past, but that is another source of mortality that hasn't been measured.

We need to work on better ghost panels. We need to find ways for a lobsterman to be losing less gear. We have a regulation, actually an obscure statute in Massachusetts that in some areas around the Elizabeth Islands lobstermen have to fish single traps; which probably results in more lost gear. Those are two sources of mortality that I want to resolve going forward that aren't going to be necessarily measured if the metric is documented landings. I want the more liberal target.

CHAIRMAN NOWALSKY: You're saying tautog needs to be considered in other boards as well. All right so when you say you want the more liberal, you're looking for the more liberal landings number; which would be the smaller percentage of F target. The 50 percent is what you would be looking at. Okay, got thumbs up for that one. Okay so we've got one comment in favor of including the 50 percent only; any other comments? Joe, I'm sorry I had Russ first, Joe. Go ahead Russ.

MR. CIMINO: Well I don't know it may help us all, because I just had a question for Jay, actually. On the projections, is this where that assumption that 2016 and 2017 are playing into this? Is that correct, Jay?

MR. McNAMEE: Joe, I didn't catch the very end, but I am going to assume you were asking about; so 2016 and 2017 we put in assumed harvest that is equal to that average that three-year-average harvest from the last three years of known information.

MR. CIMINO: Then I guess my question would be, since the MRIP estimates are so variable. If 2016 turns out to be very different, by the time this document hits the public is it possible that these projections would be off? Would it impact the projections greatly; we're assuming 2016 is going to be like 2015 if I'm correct. If we realize by the time this document hits the public that that is not the case. Am I following that and is that going to have an impact?

CHAIRMAN NOWALSKY: Well I think it is going to be at the discretion of the board how quickly they want to move with the draft amendment itself. We'd have the timeline that allowed for this last round of an assessment update, to give us these numbers. If we wanted to wait for further landings and request this type of update again, I think it's just going to further push back the timeline. Good? Okay. Russ.

MR. RUSS ALLEN: I understand Dan's concerns and I agree that that is something that should go out for public comment. But I believe since the work's already been done for both of these, they should both be considered in the document. As we talk about the timeline and how everything is going, and as the landings come in for 2016 we'll have a better idea of where that fit into all this. I'm comfortable with both of those, since the work is already done, going out for public comment. I don't think we should have any more options than that.

CHAIRMAN NOWALSKY: Okay so we've got one comment for 50 only, one for both. Dave Simpson.

MR. SIMPSON: I think I would still like to see both and extend that projection out to see when we get to the place we want to be with SSB. You have it out to 2020, but if you strung that out to 2025, are we there in ten years or that sort of thing? Is that much more difficult to do?

DR. DREW: I think we would just want some guidance in terms of, do you want to see a set timeline; like where would we be in 2025, and do you want like a 10 year rebuilding, a 15 year rebuilding. Do you want to get to 50 percent probability of being above the SSB threshold? These are all different options that we could show you, so I think having some guidance in terms of what exactly are you looking for, would reduce the workload on us a lot.

CHAIRMAN NOWALSKY: What we're looking at with these numbers here, in terms of removals, is based on achieving the target by 2020 right now. That was the projections that have been worked on so far. The PDT can work with a different date if we give that to them here today.

MR. SIMPSON: Right thanks. For the Mass/Rhode Island area, holding landings constant at 257,000 257 metric tons; different fishery, gives you a 50 percent probability by 2020 of reaching your target F. I guess what I'm looking for is, and given that if we held those landings constant. I guess I would just like to see it out to where SSB stabilizes.

The population has adapted to that lower level of F and what is the timeline to get there? The public would have this sense of, if we fished at this level of removals for the next 10 or 15 years, this is where we'll end up; 2020 is kind of an interim look, but where will it take us long term I think is what people would want to know.

CHAIRMAN NOWALSKY: I think if I recall the presentations correctly, for most all of the regions we're at a stable or in some cases slightly increasing SSB at our current level of removals. But that is far below our target SSB. Correct. I'm not sure; we're pretty much there now at stability, so the next level would be?

DR. DREW: The target and the threshold have been set up so that if you fish at the target over the long term with our assumptions about recruitment, you would get to the SSB target eventually. I think your question then would be, when do you get to that target? We can figure that out.

Again assuming you would want maybe a 50 percent chance of being at your SSB, the SSB threshold, you'd probably hit the threshold obviously before you'd hit the target. If that is what you're interested in, we could provide those projections. It's obviously a different set of projections to say, in 10 years where will we be versus going through kind of the iterative process of where would we end up with a 50 percent probability.

CHIARMAN NOWALSKY: I think Dave's request is, whatever we wind up choosing here for projections, you would like it projected far enough out to show it when it would reach the SSB target.

MR. SIMPSON: I think so, but I don't want to ask for more work than is necessary. I'm not sure how much work I'm asking for. Sort of that re-stabilized, as you say, you might be able to just answer it. It will be 15 years before you re-stabilize at a new number given the age structure and so forth; and that might be the answer the public needs.

DR. DREW: We can't tell you that now, because we stopped the projections in three years and you saw where you ended up. But that is something that we could do. It is not a ton more work for us, I just want to be careful that as we go down these lists and start adding things on top of that can you prioritize some of these tasks for us, and give us really clear guidance in terms of you want to see.

Obviously if you fish at the 50 percent probability of reaching F target that may give you a different timeline than the 70 percent target. You're going to also have different timelines if you're fishing at the SPR and MSY reference points, and we'll have to do those. If you give us a firm timeline of, we want a 50 percent chance of being above SSB threshold in 10 years. Then that is additional work to go through the iterative process to figure out this is the amount of landings you need to maintain to get to your threshold in a set time, which is different than the projections to do.

If we keep at this level of landings with the F target value, then where do we end up in the long term? It is not to say that we can't do these, it is just that the more specific we can be that will really cut us down on the amount of work that we have to do.

MR. MICHAEL LUISI: Forgive me, I'm trying to process what was just said there, it was a lot. Let me ask my question then maybe I'll think that through. This is to either, I guess Katie or Jay. Am I understanding the connectivity between timeline and percent probability in such a way that – I'll just refer to the DelMarVa 50 percent probability of achieving F at 139 metric tons. If we were to harvest at 139 metric tons we have a 50 percent probability of achieving the target by 2020.

But if we were to change that timeline and make it 2025, would that same catch level because of the downward trend that catching 139 metric tons has on F target. Does that ultimately turn into more like a 70 percent probability, if you extend the period of time for which you're fishing at that level? Are they connected in such a way that that is how it would go? Are you increasing your probability at fishing at a constant level that is an attempt to achieve the target if you extend the period of time for which you're doing so?

MR. McNAMEE: I think the most direct answer, Mike is, we would have to run it and see. In particular for DelMarVa when we're using an SPR calculation it is just kind of after a certain amount of time you kind of hit this equilibrium, because it is just sampling out of that recruitment vector that is in there.

Eventually everything just kind of stabilizes. But I am trying to think back to these plots. I think the 139 does increase, so if you then took and stretched the time period out, I think it would in fact create a more optimistic probability. But

how optimistic, we would have to do it to tell, but I think in general you can make that statement.

It is a little less clear with the MSY regions, because now there is a relationship in there that is at play. I think as a general statement I think keeping things with these numbers that you're looking at up on the screen. If you then stretched it out, it would probably increase the probability that you reach your goals.

MR. ADLER: I was watching that myself; as far as everybody else is reducing and DelMarVa is going up. I was just curious as to why they go up, everybody else goes down. That is fine if it works, but I was just thinking in terms of even if it just stayed status quo. Wouldn't it be without any increase at all down there, wouldn't that improve the probability higher than 50 or 70? What I got stuck on here was that they had 77, they caught 41, and they get to go up to 139; which is fine, I'm not against that. But that just caught me right there; and I don't know why.

CHAIRMAN NOWALSKY: One of the things we talked a little bit about status quo earlier. The first two columns in this table would likely be included in the draft amendment, or one of them, or that would be – I think you want to at least include that information for public consumption.

MS. HARP: There is no reason why you can't include the two left columns in there; it is just historical information for comparison purposes.

CHAIRMAN NOWALSKY: Then it would come back to the board whether or not the DelMarVa Region actually wanted to pursue an increase in landings, and it would be up to the board how to address that request. We're still at the question of 50, 70 or both. Dan, let me ask you at this point. I've got two in favor of both. Do you remain opposed to both?

MR. McKIERNAN: Okay I have a no. Where that would leave us is including the 50 and the 70 percent, and again we would have the four regions but not the coastwide projections, and that would include SPR for DelMarVa and New York/New Jersey, and both MSY and SPR for Mass/Rhode Island and Long Island Sound. Okay moving on to the next topic.

MS. HARP: Okay so Issue Number 3 is a rebuilding plan, and we've already kind of touched on this a little bit. How long will it take for SSB to reach the threshold? Right now as you can see, and for actually quite some time, all the regions, except the SPR reference points for Massachusetts/Rhode Island are overfished; as you shown in the red numbers.

Then the question is does the board want to establish a spawning stock biomass rebuilding plan? It is not currently in the FMP. As Katie said, if you do want to task the TC with this work, we have some pointed questions for you; specifically should we build to SSB target or SSB threshold?

What would the rebuilding timeframe be, should it be 10 years, should it be 15 years? What should the probability of achieving SSB threshold or target be? Would it be 50 percent, 80 percent 100 percent? These basic questions will need to be asked before the TC can begin work on a rebuilding plan; if that is the will of the board.

CHAIRMAN NOWALSKY: Ashton, if the answer to the first question of establishing SSB rebuilding plan is yes, you need answers on all of these today before you could complete a draft amendment to bring back to the board. Okay. You know what's before us now. Thoughts on a rebuilding plan, at present there is none specified in the Tautog Management Plan; which gives the board quite frankly a lot of flexibility on how to proceed. Mark Gibson.

MR. GIBSON: I would argue against establishing a rebuilding plan at this time, given the remarks I made earlier about my concerns about the stability of productivity. I think we could get trapped into a place where we can't get to.

We've had a lot of experience with rebuilding plans at the New England Council, many of them we can't get to; we can't get there from here. I would argue against that at this time. Perhaps in another action following a benchmark we might want to reconsider, but I would argue against it now.

CHAIRMAN NOWALSKY: In terms of actions moving forward, a rebuilding plan would require another amendment, or could that be done through some other type of shorter timeline management action? Toni? In the event that the board does not move forward with initiating a rebuilding plan in this amendment, can a rebuilding plan only be initiated through an amendment or is there some other management process the board could pursue; an addendum or something, to initiate one in the future?

MS. KERNS: If you include a rebuilding timeframes in the items that are frame workable or adaptive management in this document, then you could do a rebuilding timeframe through an addendum. But currently I do not believe that that is an addend-able issue, so we would need to make sure we included it in the amendment.

CHAIRMAN NOWALSKY: Okay so that actually adds a third option here, in addition to yes or no to the rebuilding plan the include the ability to initiate a rebuilding plan through adaptive management; if I heard you correctly.

MR. SIMPSON: Yes I think that's a good idea, it would make it easier to do if we decide down the road we want to do that. But I'm kind of with Mark that we're better off focusing on getting F to the target and keeping it there, and then nature gives you what it gives you rather than the speculation that goes into where we can go with SSB with changing productivity of stocks.

CHAIRMAN NOWALSKY: The two options then that would be in the amendment would be status quo, no rebuilding plan and the other option would be a rebuilding plan could be an option under adaptive management. Any objection to that; okay great, we'll appoint Number 4.

MS. HARP: We're making some progress here. Item Number 4 is commercial and recreational split. The recreational sector contributes a large portion of the harvest when looking at the data over the entire time period.

However, if you were to slim that down and only show data from 2010 through 2015, you would have pretty much the exact same numbers. It has been this way for quite some time. The board could consider having one sector take a greater harvest reduction than the other, and if they want the TC to look at this and include it as a management option, then you can let us know.

CHAIRMAN NOWALSKY: Okay do we want to differentiate in reductions between the recreational and commercial sector, or would the reductions come equally?

MR. SIMPSON: You know or potentially alternatively leave it to the jurisdictions how they want to achieve their target F in their package of management actions.

CHAIRMAN NOWALSKY: Where would that fall as an option here? If we didn't specify in the amendment, would that not be the default way for the states to proceed?

MS. HARP: That's the last item that I was going to address with the board. Does it want to be state-by-state or does it want to treat it like one region where all states within a region take the same cuts. So we could fold this discussion into more of a regional management discussion, if you want to take it out by region.

CHAIRMAN NOWALSKY: You're suggesting holding off on completion of the discussion of this item until we get to Number 7?

MS. HARP: Right.

CHAIRMAN NOWALSKY: Any objection to that? We are going to temporarily skip 4 and move on to 5, which we're going to temporarily skip also after Ashton just gives a brief overview of it.

MS. HARP: Item Number 5 is the commercial harvest tagging program. I just want to go through the options with you. I also want to say the tagging program is underway. That took a little bit of time, because we are working with Stony Brook University, which is very nice of them to work with us on this project, as well as New York DEC.

The team had to establish ethical handling protocols for dealing with live animals which delayed the project, but it is underway now. The fish are tagged. I am going to present a separate presentation that will show the tags on the fish. I know everyone kind of wants to see what that looks like and how they're doing.

Just note that the full project report will be presented at the February meeting, so I know it is a little preemptive for me to be asking you these next questions, given that you haven't seen the full project report; but I'm just going to give them to you anyways, and then we can kind of have a discussion about it.

For Draft Amendment 1, the Board can request the PDT to include text in adaptive management that allows a commercial harvest tagging program to be developed at a future date via an addendum. Or the board can ask the PDT to develop management options for a comprehensive harvest tagging program.

Even though we're not sure if we want to move forward with that the board can just say, let's just develop management options for it or the board can say that they don't want to include the commercial harvest tagging program. We've had second thoughts and we don't want it to be in our adaptive management, we no longer want to consider it. With that we're not going to have a discussion now, I'll have the presentation at the end of this presentation and then we'll come back to it.

CHAIRMAN NOWALSKY: Okay let's move on to 6.

MS. HARP: This is the reason why I put the tagging program kind of in the middle of the document is because it relates to a commercial harvest quota. One could say that this might be a regional decision as well. The question is should each region and/or state have a commercial quota.

A commercial quota may be useful if the tagging program is implemented; then we would know how many tags are needed. The options to consider if a quota is considered regionally are you could have a regional quota, which is common pool. If you have three states and all three states are going after the quota, and whenever the quota is hit the fishery would shut down.

You could divide the quota equally between the states in a region or the regional quota could be allocated to states based on state shares. How we do that if it's historically, if it's politically, if it is all the ways that were discussed yesterday. There are many ways to allocate the quota. That would need to be discussed by the board as well.

CHAIRMAN NOWALSKY: Thoughts about a commercial quota.

MR. McKIERNAN: I can't imagine this plan finishing up and not having a commercial quota. What is the vision of this fishery at the end of the day, especially with the very involved and possibly expensive tagging program? It seems to be that you only need a tagging program if you're trying to constrain catch to a level and make it accountable. We have to have a quota.

MR. STEPHEN HEINS: I agree we need a quota, and we're probably going to end up with state specific quotas. But I also think that that has been a little bit problematic for us in the past. In

order to get at the quota, it is almost like a Catch-22. I think if we implemented a tagging program without a quota, you would wonder how many tags you're really going to need. But if you implement a tagging program I think you're going to eliminate a lot of the illegal commercialization. I don't know. I do believe we need a quota overall on the coast, but it is just going to be problematic for us I think.

CHAIRMAN NOWALSKY: Any other hands? All right I've got a bunch here, so let me see a bunch of hands that want to speak. Okay, we'll start with Eric.

MR. ERIC REID: As far as tagging goes, I think we absolutely have to have tagging. But as far as the methodology there, I'm uncertain whether or not it should be dealers who are tagging the fish or if fishermen are tagging the fish. I have some reservation about that. As far as quotas go, if it is a regional basis, New York will get two quotas. Is that correct? Because you've got the Sound and you've got the coast.

MS. HARP: That's a good question.

MR. REID: I have some concern with that; because it is not very far from the south side of Long Island to the north side of Long Island.

CHAIRMAN NOWALSKY: All right I know your question is not answered. We'll go to Dan and then John Clark.

MR. McKIERNAN: Yes just for the record, Rhode Island and we have quotas already.

MR. JOHN CLARK: We just have standard regulations for commercial or recreational, and I believe that's similar to Maryland. If we do go to a quota system, if that was kept as an option to just maintain recreational, well universal regulations for recreational and commercial catch.

MR. DAVID V. BORDEN: Don't we have a fourth option that states within a region could by mutual agreement share the quota, in other words come up with whatever the sharing formula is? Isn't that another option?

CHAIRMAN NOWALSKY: We have the regional quota there. How is that different than the sharing?

MR. BORDEN: Well, the second part of this, the way I understand it, it is how you share, right?

CHAIRMAN NOWALSKY: The first option would say the region has a quota. When the region's quota is hit all states stop fishing. The second option would say, give a region a quota but then divide that quota amongst the individual states to then fish as they so desire.

MR. BORDEN: The second one, maybe I'm reading this or not understanding it properly. The second one says equally.

CHAIRMAN NOWALSKY: Correct so if there were three states in a region.

MR. BORDEN: They all get one-third.

CHAIRMAN NOWALSKY: Correct.

MR. BORDEN: Okay.

CHAIRMAN NOWALSKY: Which is different than the last bullet point, which would be some other allocation formula.

MR. BORDEN: Okay so Number 3 covers my point then.

MR. LUISI: Well I understand why there would be certain states and certain regions; I feel that there is a need for a tagging program. In DelMarVa as Mr. Clark just mentioned, our commercial limit is the recreational limit. We don't have a commercial fishery. It is just one more thing.

A tagging program would just be one more thing, another permit, another coordination to try to

get tags to folks who are going to bring two fish home during the summer months, and four during the winter months. I just wonder if moving forward there could be some form of an exemption to the tagging program.

If a state has the same bag and size limits for its commercial fishery that it does for its recreational fishery; almost like a de minimis as it relates to the tagging program. I feel like it's going to be more effort on the states part to implement that program then it will be to benefit the resource.

CHAIRMAN NOWALSKY: Let me pose this question to staff, input from the PDT. I believe that as with most of these issues, the board is going to want to see what each of these bullet points potentially mean for my state. If we just gave you an answer today of, we the board wants to institute a commercial quota. What additional guidance would be needed to start developing some of these options; to bring something back to the board in February? Is that enough information, or do we need to delve deeper into these today?

MS. HARP: Well it would need to go back to the commercial and recreational split, to see if there needs to be a greater reduction from recreational versus commercial. That question would definitely need to be answered, and then just the third bullet item. If we're going to allocate a regional quota, which could be an option in the management document, it would be helpful to have some kind of thinking on how you would like to allocate that. Do you just want to use historical landings and the PDT can come up with different years to show historical landings or is it some other way that would like to allocate a regional quota?

CHAIRMAN NOWALSKY: Okay so I'm trying to keep us on track here. We've kind of taken two items, 4 and 6, and there is certainly an understandable need to consider them both together. But it is making it a bit difficult to answer either question, so let me go to Joe; who had his hand up.

MR. CIMINIO: I also want to remind everybody that through Addendum IV and V, we had to come back with Addendum V because certain states were saying their commercial fisheries were also – excuse me, going back further – Addendum IV was saying that we were going to reduce F in this fishery by only taking cuts in the recreational sectors coastwide.

Then coming back and saying some states needed to do something with their commercial fisheries. I have a concern, I guess, and it may not even be part of our region. But with allocations being based on years where certain states knew that their commercial fishery was part of a problem, and maybe that wasn't the case for other states.

CHAIRMAN NOWALSKY: Pretty much every speaker I've heard, I've heard no one speak against a commercial quota. I think we'll direct – all right so we'll hold up on that – Roy, you had your hand up.

MR. ROY W. MILLER: I think the DelMarVa Region is kind of in unanimity that a commercial quota is not needed for our region.

CHAIRMAN NOWALSKY: An option to move forward with would be a commercial quota in only certain regions, which is part of Item 7, which we would discuss next; correct?

MS. HARP: We can include the commercial quota option. I can take it out to public comment in that region; and then if it overwhelmingly comes back that you do not want one then it can just be stricken from the record and then that region would not have a commercial quota.

DR. WILSON LANEY: Just a question. This relates to the tagging program and to, if I'm remembering correctly, law enforcement concerns that prompted consideration of that in the first place; even if you do have a situation

where you don't have commercial fisheries in place within a given region.

If you don't put a tagging program into place coastwide, does that leave you open to the possibility that then you've created a loophole in your enforcement program? I would defer to law enforcement to answer that question, but it does seem like that would then create a potential outlet for continuing some of the illegal harvest issues that we're trying to address in the first place.

CHAIRMAN NOWALSKY: Dan, I had your hand again.

MR. McKIERNAN: I agree with Wilson's comments. I want to recall the discussion of that Law Enforcement Subcommittee we had about the need for tagging, and I believe there were some Delaware enforcement officers who did express concern that fish were being harvested and sold, and they weren't being accounted for. It seems to me another option should be, and to satisfy Mike's concern, if a state has the same commercial limit as their recreational limit, then maybe they are talking about no commercial sale.

Because if you're going to condone commercial sale that are going to be untagged fish, it completely undermines our concerns that there are a lot of fish leaving our states and going over state lines into these markets; especially in New York. We just have this fear that is a big sink hole of mortality. If you're really going to manage this thing with a common limit, then you essentially have game fish, which maybe ought to be an option up here; to have no commercial fishery.

CHAIRMAN NOWALSKY: Let me turn to law enforcement for a moment regarding the discussion about a commercial quota in one region, but not others; or in all but one region. Let me get their comments first.

MR. JASON SNELLBAKER: The way I see it, if you don't have a quota that's fine, but every fish that goes to a commercial market, if you're going to have a tagging program needs to be tagged for consistency. The tagging program is going to flesh out the black market fish. With there being a potential for fish to get to market that don't have to have a tag, because they're from one of the states that doesn't participate in the tagging program.

That defeats the whole purpose. The idea is you have people who are not commercial fishermen who are selling large quantities of fish. The idea is they will not have access to the tags, so the fish that are in the market are all going to come from a commercial source; and that is going to protect our commercial fishermen.

CHAIRMAN NOWALSKY: The comment from law enforcement is that a quota would not need to necessarily be instituted in all regions, but there would need to be a uniform tagging program.

MR. SNELLBAKER: That's correct.

MR. CLARK: Yes, the problem we've had in the past with the tautog mostly has been from recreational fishermen. I think if markets can only sell tagged fish, obviously fish that a commercial fisherman in Delaware catches, for example, wouldn't be able to go out of state without the tag. But we could also institute something perhaps dealer tagging in the state; where we could track the tags that way. I think there are options we could do, where we still don't go to a quota and just have our recreational possession limit for our commercial fishermen.

MR. LUISI: I appreciate the comments. I was thinking a little selfishly just about the administration of a program that would require more resources than the benefit, but not thinking outside of our region. I certainly understand the need and we would be committed if a tagging program is ultimately determined to be something that this board wants to put in place. We'll figure something out in order to make sure that we're doing our part to help with the problems that exist.

MR. THOMAS P. FOTE: I couldn't let the comment go by. It is not recreational fishermen, it is poachers. We keep saying that it is not recreational. Anybody that is hook and line selling fish illegally is a poacher, not a recreational angler.

MR. CLARK: I'm sorry Tom, I misspoke. I meant poacher.

CHAIRMAN NOWALSKY: Let me do this right now. Let me ask Ashton to give us some guidance on what answer she specifically needs from us on this today. The goal was to bring back a draft amendment for the February meeting. The timeline for 2018 implementation could have that draft amendment back in May, and still meet 2018 implementation; but we would need to find some way to get through these issues.

One way would potentially be to take them all back, think about them and just bring them back up for discussion again at a February board meeting. I'm not sure we would make tangible progress. Another option would be some type of working group to address it. But let me ask Ashton what answers she would need to go back to the timeline here.

MS. HARP: Just thinking about the next issue, which is management within regions, and really starting to manage this fishery within regions. It seems like maybe three regional working groups might be helpful. I'm saying three, not four, because I'm thinking of Massachusetts/Rhode Island as one working group and then the Long Island Sound and New Jersey/New York Bight as one working group working together; at least in the beginning on how we manage that fishery and the DelMarVa working group kind of working together as well.

I realize we don't want to have the same management coastwide. That's not really the goal; there is different stock status coastwide. Maybe working together in small groups might help us get to where we want the regional management measures to be within each region, and they can be different across regions; and that's fine.

CHAIRMAN NOWALSKY: I mean clearly the New York/Long Island Sound commercial issue is a large one in how they would deal with a commercial quota that would potentially pull from two regional quotas. Let me hear thoughts about regional working groups. I saw some heads nodding that I think were in an up and down yes direction.

I'm getting some thumbs up. I think we're getting consensus. What those regional working groups would specifically work on would be Items 4, 6, and the one we haven't seen yet, which was 7. If you could just pull 7 up for a moment so we could take a look at that. That would be the management within regions.

I'm still seeing heads nodding. Now if we pulled that together we would then get input from that; discuss it in February here at the board, and then give that to the PDT for further development. In the meantime the PDT could, if they so choose, work on the items we've passed on so far for development. I saw Joe's hand up, and then I'll come to Bill Adler.

MR. CIMINIO: I just had one question; well I guess a two-part question. One has the AP weighed in on any of this, and are we envisioning them as part of these working groups?

CHAIRMAN NOWALSKY: Who we put on the working group would be at our discretion. Typically I think the AP would get the draft amendment when we send it out for public comment, and we would get their formal report at that point.

MS. KERNS: We actually do engage the AP before the draft goes out for public comment. But we would need at least a substantial draft to engage with them on, and I don't think we're there yet. You could either include them in the working group, or wait until we have a little bit

more meat on the bones; and then we can engage the AP as a whole.

CHAIRMAN NOWALSKY: What I will offer, Joe is with some of the tagging work we did reach out to them at that time to get some feedback as we were going through that process. They have been engaged on parts as we've moved forward and that would be a good suggestion.

MR. ADLER: First of all, in the process, the development of a draft if it's an amendment, would it not be development of a PID first as amendments usually go that way? A PID that goes out and then comes back and then we do the draft amendment and proceed from there. I think that is the process.

The second thing is I just wanted it noted that I don't know if quotas are adopted. If there is a provision in or there would be a provision in an amendment for a transfer of quota; if we go that route, if there is a quota. Because I know some of the plans have transferability others don't; and I just would think that if something in the document would allow for transfer of quota if there are quotas. Then at least it is in the document and we wouldn't have to come back and say whoa, we can't do that if quotas. Those are my two comments.

CHAIRMAN NOWALSKY: Yes and you're 100 percent, and the PID that had gone out for tautog helped get us to this point so far to keep us focused on these issues as the ones that we need to develop in the draft amendment. We're good with going ahead with some regional working groups. Do we want to get members here today, or do we want to form those afterwards? What's the thought of staff?

Okay so what will happen is staff will follow up with the individual states, and we would focus on the three regions; Mass and Rhode Island, Connecticut, New York and New Jersey, because we've got to deal with the Long Island Sound issue, and then DelMarVa; and we would discuss those three issues with regards to the commercial quota, how to deal with potentially splitting it recreational and commercially within each region. All right we've got consensus there.

EXECUTIVE DIRECTOR BEAL: Yes I just think controlling expectations a little bit; I think it is going to be hard to get a final draft for February, given the working group structure. I think where we'll carry it as far as we can at the staff level, the working groups will take some more time, MSY and SPR still being in there is additional options.

I think we'll work with you if that is okay with you, Mr. Chairman, and decide what the best use of the board's time will be in February. Is there enough meat on the bones to come back in February and talk about that and refine it some more or should we skip a February board meeting altogether and just wait until May? We'll just have to see where we are as the early winter progresses and we get toward February, if that works for you.

CHIARMAN NOWALSKY: The goal I think at this point would be to have the draft amendment in May, not February. I think the question becomes, can the regional working groups provide enough information that the board wants that information to go right into the document or does the board want that regional information to come back to the board.

That would be the meat on the bones potentially in February; to meet a May draft? Do we have any thought about whether we want that regional working group information to go right into the draft amendment, or do we want to hear it back and discuss it at the board level potentially in February? Dan?

MR. McKIERNAN: I suggest it come back to this board; just so the regions can look over their shoulder and see what the other region is doing and see if we can mesh things up. Otherwise, it sounds reminiscent of the Lobster Conservation Management Teams, which has created some pretty wicked chaos in lobster management.

CHAIRMAN NOWALSKY: Okay so assuming that we can get those working groups to meet, get the information back; that would be the goal to discuss that in February. Let's go back to 5 with the tagging trial, and the question that we want to answer is, do we want to in the amendment similar to the previous discussion we had.

Do we want to have the amendment clearly specify and have the PDT develop what the tagging program looks like or do we just want to initiate a tagging program, and then have it further developed in a future addendum? I'll turn to Ashton for the presentation on the update of the tagging trial. Then we can try to answer that question as our last item of business today.

**UPDATE ON TAUTOG TAGGING TRIAL**

MS. HARP: I've brought pictures and videos, so it will be fairly quick. I just kind of want to put some pictures to this. The tagging trial began on September 28th. There were three tags we were looking at. I mean originally we started with like 20 tags. LEC looked at them, we narrowed it down to three tags, and now as with any project it has been narrowed down further to one tag.

That is the tag; it is the national band strap tag. This is actually the one that the LEC preferred as well. When you put it on the fish it seems to be relatively easily put on with the use of an applicator. We'll have a full project report at the February meeting that will go over that.

You cannot take it off the fish and salvage that tag; it is 100 percent not possible. That is the main thing that we wanted, and it also allows us to put a numbering schematic on it; as well as the year and the state. We'd have to give these out every year and they would be specific to that state and that year.

Now you can see the fish actually being tagged in its opercula. There you see now the tag is on. The last slide is these are the tanks that the tautog are in, so there are 15 tautog that have tags on them, and there are six that are untagged for control purposes. Now I just wanted to show a quick video of the tautog with tags on them. I just want to thank New York DEC and Stony Brook University for putting this together. You know they've been great to work with and to get this underway. We can replay it like two times, because it is kind of a quick video.

MR. ADLER: Just a question as to where are you planning to put the tag, in the gills that you said or somewhere and is there any mortality of that fish that you've seen so far?

MS. HARP: The tag was placed on the opercula, you know right here in the bony part. That's the whole entire purpose of the study is to gauge mortality. I have not heard of any mortality, but I'm not going to say that there is not; because the full project report will be presented in February. But from what I've heard, they are taking the tags relatively well. There are no issues to report.

CHAIRMAN NOWALSKY: Eric, I'll come to you in just a moment. I think what we'll do is we'll just send that video around to anybody who wants it if we can't get it up. If we can get it up before we get done here, otherwise we'll just send it around.

MR. REID: Are the tags FDA approved?

MS. HARP: I'll have to check if they're FDA approved. I was not aware that tags had to be FDA approved; but I will look into it.

CHAIRMAN NOWALSKY: It looks like we've got the video going there a bit. That brings us to the question of, what do we want to put in the amendment. No tagging, tagging and we want the PDT to develop all of the specifications for the tagging program, or do we want to have tagging but just allow for future development of that?

We did hear from law enforcement that they would want that tagging program to be consistent up and down the coast. I don't think that would be a topic that we would want to allow the individual regions to come up with the individual ways to go about doing so. I don't really want to push that off to the individual working groups; thoughts on those three options, no tagging, tagging fully developed by the PDT as options or to be developed down the road.

MR. BORDEN: I support Option 2. There has been a lot of discussion for a long period of time about the need to solve the poaching problem. We've got to be proactive about it and take steps to resolve this, I think.

CHAIRMAN NOWALSKY: That would be fully developing the options as part of the amendment. One of the things that we have, what we've talked about now is putting that off to May. Let me turn to Mike first, and then I'm going to come back to the PDT to ask what guidance they would need to start developing what that tagging program might look like.

MR. LUISI: I'll simply just say I think Option 2, which would be, have the PDT develop the program would be the way to go. I think we need to kind of learn from our experiences with striped bass; where states kind of took their own direction on how they were going to apply tags, only to find that years later we were doing Addendum III, which made everything consistent throughout the coast. I would be supportive of Option 2.

CHAIRMAN NOWALSKY: Okay, so I'll turn to the PDT for what additional advice would they need from the board today to work on those management options.

MS. HARP: I don't think we need additional advice from the board today. I need to circle back with the research team and just kind of see how the tagging process went, before we could come up with the options; so no other questions today.

CHAIRMAN NOWALSKY: Yes, I think it would be contingent on the tagging team deeming the trial program a success. We won't have that report until February.

MS. HARP: I will also share this with the LEC Working Group that we've already created, so that will be shared within the coming months with them. That will be prior to the board meeting, so they'll have feedback on it as well.

CHAIRMAN NOWALSKY: Okay so we've got tasks for the PDT, not all of their questions answered, but I think we've at least given them some. Katie would like to add something.

DR. DREW: Can I ask for some clarification for a couple of the TC related tasks, or issues that were brought up?

CHAIRMAN NOWALSKY: Please do.

DR. DREW: I think Dave had requested the long term projections of the SSB, so I think what the TC then would go back and do is for those projections that currently end at three years, we would take that metric tonnage that achieves the F target in the specified time and run that out; and then report. It would say like DelMarVa can fish at 139 metric tons to have a 50 percent chance of achieving the target, and that would achieve the SSB threshold in X years for all of those options. Is that what you're looking for?

MR. SIMPSON: Yes, I think that does it. It's a constant harvest strategy basically projecting that out. I think it will be helpful for DelMarVa, because I look at the prospect of tripling your current landings. You can get away with that in three years, but can you in ten? I think the public is going to want to know about that.

That is what I'm asking for, and if that's the simplest thing. The other thing is that I would be happy with just an SPR projection for Long Island

Sound if that's okay with New York. I was concerned about eliminating MSY out of a sense that that would put more pressure on Rhode Island and Massachusetts, sort of being the odd ones out.

But I think it is easy enough for us to explain for Long Island Sound, they look the same. They are so close to the same numbers you could expect the same result with MSY if we ultimately adopted that. I would be okay with taking that one little task away from the TC.

DR. DREW: Just one other, I guess related back then to Massachusetts and Rhode Island had expressed some reservations about all of the options, reference points, and options on the table. I was wondering are you looking to have the TC develop additional options to address those concerns. I mean you need to pick something and what would you like us to do about that?

CHAIRMAN NOWALSKY: Where we were before was we had the 50 and the 70 percent options, SPR for all four regions, MSY for Long Island Sound and Mass/Rhode Island. What I'm hearing now is a request to remove the MSY calculations for Long Island Sound. Where is the board on that? Is there any objection to removing the MSY calculations as reference points for Long Island Sound? Okay, I see no objection to that.

DR. DREW: To clarify, just for the projections or all across the board SPR only for Long Island Sound?

MR. SIMPSON: I think at this point just the projections, and we can say I think fairly that the outcome is similar at least in the short term. Again, my only basis for saying I don't like MSY is I just don't believe we're getting greatly informed by the stock recruitment relationship. I am just skeptical of that. I would just as soon keep it simple and use an SPR. God knows we've moved our reference points around enough on tautog over the last 15 years.

CHAIRMAN NOWALSKY: Does that answer your question, Katie?

DR. DREW: Yes, for that specific question and then back to, I guess Massachusetts/Rhode Island.

CHAIRMAN NOWALSKY: Then we have the second question of additional projections for Mass/Rhode Island. We're dealing with the 50 and 70 percent by 2020; is the two that we have right now.

DR. DREW: Prior to that to the reference points specific. Which reference points do you want at all? It sounded like Massachusetts and Rhode Island didn't want either of the ones as they have been calculated or presented today. I was wondering if there was anything the TC could do to help them make this decision, in terms of what reference point they want to see.

MR. GIBSON: Well, if I could have my wish list, but I'm concerned about the workload. I would like to see reference points on the SPR side computations that perhaps only drew from the most recent 10 years, 12 years of recruitment strength; what that would do and some thought about the stability.

The MSY side more analysis of the stability of that SR relationship and what productivity might be now, as opposed to averaged across the entire stock assessment data stream. But that is my wish list. I'm concerned about the workload that that would require, and the timeline impacts on the action. But that is what I'm concerned about right now is the attainability of those reference points with either calculation.

CHAIRMAN NOWALSKY: Well I'll take it one step further in suggesting that if we open it up to Mass/Rhode Island, where do we stop opening it up at that point? Do we start recalculating reference points based on other timelines? I think we have an assessment. I think the TC has already done the work with what we have.

I think we, after a lot of debate earlier today, chose to keep the MSY and SPR reference points in as calculated; as the two options that would go in the draft amendment. I'm inclined, unless the board feels strongly otherwise, to stay the course at this point. Seeing no objection that's what we'll do. But thank you for that. Is there any comment from the public on anything that we've discussed here today regarding development of the draft amendment? Okay seeing none; is there any other business to come before the Tautog Management Board this afternoon?

**ADJOURNMENT**

CHAIRMAN NOWALSKY: Seeing none and having completed the business on the agenda; we stand adjourned. Thank you all very much.

(Whereupon the meeting adjourned at 2:06 p.m. on October 25, 2016.)

NEW YORK
STATE OF
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Department of
Environmental
Conservation

# 30 Day Commercial Tagging Trial for Tautog


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## Background and Purpose

Tautog (*Tautoga onitis*) is an important and valuable commercial and recreational fish species throughout its range from Massachusetts to North Carolina. Since 1996, the Atlantic States Marine Fisheries Commission has coordinated interstate management of tautog. Despite increasingly restrictive management measures, the stock continues to be overfished and overfishing is occurring throughout most of its range (2016 Stock Assessment Update).

Law enforcement officials have evidence that indicates there is a significant illegal harvest of tautog, primarily in the live market. Reports of illegally harvested fish have been documented in cases against fishermen, fish houses and at retail markets and restaurants. In Massachusetts there have been a number of large cases made against licensed commercial fishermen, whereas in Delaware, New Jersey and New York illegal harvest seems mostly concentrated in the recreational fishery. Regardless of source, most undersized, out-of-season or illegal quantities of live tautog are associated with the demand for tautog at ethnic food markets or restaurants. These markets are often found in large cities such as New York City and Philadelphia. To a lesser degree illegal activity does occur among individuals and small groups harvesting fish for personal consumption or subsistence. This latter group may not even be aware they are violating specific regulations.

A commercial harvest tagging program has been recommended to increase accountability in the fishery and curb illegal harvest. The tagging program would accommodate both the live and dead commercial markets. To evaluate the merits of such a program a Law Enforcement Subcommittee (Subcommittee), comprised of Tautog Board members and law enforcement officials, was developed in 2015. As agreed upon by the Subcommittee, the tag should be easy to attach, secure and have minimal to no impact on the appearance or condition of live fish for the amount of time that live, tagged fish are maintained until consumption. The Subcommittee evaluated multiple tag types and fishermen were interviewed to describe the handling process from catch to market. The purpose of the tautog tag trial is to investigate the efficacy of a commercial tag that serves as a tool for law enforcement, while minimizing impact to the resource.

## Methods

*Fish Collection and Holding Facilities*

Fish were collected using 41 ventless fish traps placed along the south shore of Long Island Sound from Mattituck Inlet, New York to Rocky Point, East Marion, New York. The traps were made of one inch square 14 gauge black mesh and were 40.5 inches long x 21 inches wide X 12 inches high and were ballasted with concrete runners (Figure 1). Each trap has a side entrance and is divided into two compartments with a twine mesh funnel between each compartment. Opposite the trap entrance is a 5" x 5" escape panel fastened with biodegradable hog rings on

top and stainless steel hog rings on bottom—if the trap was lost, the bio-rings would degrade and the panel would open. The unbaited traps were checked weekly, as weather permitted.

Twenty-one tautog were collected on September 23 and 26, 2016 and placed in one of two live wells on board the vessel with flow through ambient sea water (Figure 2). The fish were transported back to Mattituck Inlet and placed in a live cart hung off the dock of the NYSDEC Mattituck Creek Waterway Access Site. The cart was placed where sufficient depth and tidal flow existed to maintain oxygen levels to support the tautog. The live cart was constructed of PVC pipe approximately 5 feet long by 3 feet wide and 30 inches high and covered with 1 inch by 1/2 inch plastic mesh (Figure 3).

The fish were held in the live cart until September 28 when they were transported to the holding facility at Stony Brook University, Flax Pond Marine Laboratory in Old Field, NY (Figure 4). The fish were split into one of three tanks for the trial period. Each tank was a 6 foot diameter cylindrical tank equipped with a viewing window, a standpipe in the center for drainage and 2 airstones to aid with oxygenation of the water. Each tank held 2 feet of flow-through seawater from a salt water well at approximately 55°F (12.8°C).

*Tagging and Transport*

The research team was sent four different types of tags by the Law Enforcement Subcommittee for consideration. Upon examination, the National Band strap tag was selected for the tag trial because of its low profile and compact size (Figure 5). Compared to the other tags, the National Band strap tag was small enough that we felt it would not severely interfere with the fish's gills and would be easiest to apply due to the small size of the hole required to place the tag through the operculum.

Prior to handling and transport on September 28, each fish was randomly assigned to be either a tagged or a control fish. Tagged fish and control fish were separately assigned a tank number (1-3) so that each tank would contain 5 tagged fish and 2 control fish resulting in a total of 15 tagged fish and 6 control fish.

Seven fish at a time were netted out of the live cart and placed in a common fish tote filled with ambient sea water (Figure 6). Each tag was loaded into the applicator (Figure 7) prior to removing the fish from the tote. Fish were randomly removed from the common fish tote one at a time and tagged if it was not a control fish. The tag was placed on the left operculum bone (Figure 8) and then placed into another one of three ambient water filled fish totes according to its tank assignment (Figure 9). A stopwatch was used to measure the handling time of each tagged fish from removal from the common tote, tagging and placement into its assigned tote. After fish were removed from the live cart and tagged or assigned as control, each group of fish was separately placed in a plastic mesh bushel basket and transferred to a pickup truck equipped with coolers filled with ambient water (Figure 10). Each tote of fish was placed into one of three water filled coolers corresponding to its tank assignment (Figure 11). Once the fish were placed in the coolers (Figure 12), the temperature, salinity and dissolved oxygen of each

tote was measured. A two-liter bottle of salt water ice was placed into each cooler to start the process of cooling the fish prior to departure.

The Flax Pond Marine Laboratory is 35 miles away from the Mattituck Creek Waterway Access site. The estimated transport time was approximately 1 hour and 15 minutes depending on traffic to drive to Flax Pond from Mattituck. After 45 minutes of driving time, we stopped to measure the temperature, and oxygen of each cooler and to replace the two-liter bottle of salt water ice in each cooler with a second bottle of ice kept in a separate cooler. The fish arrived at the lab approximately 1 hour and 9 minutes later. The total time from departure from Mattituck to arrival at Flax Pond was 1 hour and 55 minutes.

*Acclimation and Monitoring*

Upon arrival at the lab, the temperature, salinity and dissolved oxygen of each cooler was measured again and compared to the levels in each holding tank. Each cooler was adjusted to tank water by using small diameter flow lines over the course of 1.5 hours. Once each cooler was adjusted to its corresponding tank water, the entire fish contents of each cooler was transferred to its assigned holding tank.

The tanks were monitored daily to ensure adequate water flow and air were maintained and the water temperature of each tank was measured. The condition of the fish was noted and the tanks inspected for lost tags.

At least once a week, the fish were offered either live Asian shore crabs or previously frozen clam, squid, or crab. Any uneaten dead food was removed after 30 minutes to prevent fouling the tanks. The fish were monitored for 30 days. At the end of the trial, the fish were netted out of each tank, measured, weighed and the tags were removed with a pair of cutters. The gill tissue was examined to determine if there was any abrasion or scarring resulting from the placement of the tags. The fish were then placed in coolers with water from the holding tanks, transported back to the Mattituck area and released into Long Island Sound.

**Results**

*Tagging and Transport*

The average handling time of each fish was around 15 seconds with the exception of the second fish tagged. The initial tag applied to the second fish did not engage properly and fell out of the fish. We discovered the orientation of the tag in the applicator was important to ensure the tag properly engaged the locking mechanism. Upon application of the second tag, the fish began thrashing around during removal of the tag applicator. This thrashing caused the applied tag to be torn out of the operculum bone. This was due to the tag remaining in contact with the retaining tab on the lower jaw of applicator designed to hold the tag in place and ensure that the locking mechanism was properly closed. The fish was placed back into the common fish tote and the applicator reloaded. The third tag applied to the opposite operculum bone engaged and held firm. This increased the overall handling time of that fish to around 3.8 minutes, the majority of which, the fish spent in the common tote between tag applications.

All 21 fish arrived at the holding facility in good condition (Figure 13). The fish were observed to have a slightly labored breathing rate indicating lower oxygen conditions in the coolers compared to when leaving Mattituck. All fish were acclimated and transferred to their assigned holding tank in good condition, with evidence of some stress from handling and transport (Figure 14).

*Monitoring*

Water flow and air delivery were constant throughout the 30 day trial and temperatures remained between 13 and 14°C (55.4-57.2°F). Water testing revealed slightly elevated ammonia (< 0.25 mg/L) and iron levels in the water as evidenced by orange precipitate in the tanks.

During the first week of the trial, the fish didn't swim around much and generally laid along the side of the tanks and around the standpipe, sometimes in groups (Figure 15). Observations of operculum movements suggested that the fish were not overly stressed and were not having difficulty breathing. On day 3 and 6, the fish were offered previously frozen clam and squid, but none ate. On day 7, the fish were offered live Asian shore crabs. A few of the tautog immediately took interest and began feeding on them. After 30 minutes, we left any live crabs remaining in the tank. By the next day, all of the Asian shore crabs had been consumed. The second week of the trial, the fish appeared more adjusted to being in the tanks, evidenced by increased movement around the tanks. Live Asian shore crabs were again offered on day 13 and were accepted by the fish. During the third week, the fish were moving around the tank even more, particularly when food was offered. They continued to be in good condition with relaxed breathing rates. The fish were offered chopped pieces of previously frozen rock crabs and lady crabs on day 20 which was readily accepted. On days 26 to 29, the fish were fed chopped, previously frozen clam and squid. Most fish ate every day that food was offered.

All of the fish survived the 30 day trial and appeared to be in good condition (Figure 16). There was one tag loss noticed on October 4, 2016, day 7 of the trial. Tag number 008 fell out of the fish and was found at the bottom of the tank. Upon inspection, it was found that the tag had not engaged properly upon application.

The control fish ranged from 349 mm (13.7 inches) to 406 mm (16 inches) and the tagged fish ranged from 358 mm (14.1 inches) to 427 mm (16.8 inches) (Table 1). There appeared to be no significant difference between the length and weight of the control fish verses the tagged fish (Figure 17). Besides tag number 008 that fell out of the fish on October 4, we found that tag 007, which had been applied to a fish immediately prior to 008 had also not engaged the locking mechanism of the tag. However, the tag remained in the fish for the entire 30 day trial. All other tags were properly engaged and remained in the fish.

Properly applied tags caused some damage to the operculum from the tag being inserted through the bone (Figures 18 and 19). All tagged fish showed some degree of abrasion of the gill tissue, ranging from some minor discoloration and abrasion of the lamella to partial erosion of the gill filaments compared to those of the control fish (Figures 20-22). In all cases, the damage to the gill was localized and isolated to the area of the gill directly interior to the tag.

Based upon the fish behavior, feeding and rate of respiration, the presence of the tag did not significantly hinder or harm the condition of the fish.

**Discussion**

After completion of the tag trial, the research team believes the National Band strap tag would be an appropriate tag for a commercial harvest tagging program. The tags are low profile, easy to apply, relatively inexpensive, do not injure or degrade the meat quality of the fish, did not corrode after 30 days in sea water and would be very difficult or impossible to re-use.

The majority of the fish remained calm and did not react when the tag was applied. The exception to this was if the tag did not properly disengage from the tag applicator. This resulted in the fish feeling pressure or pulling of the operculum bone when the handler tried to remove the applicator. When this occurred, the fish tended to thrash and rip the tag out of the bone. This scenario was easily avoided by pushing the applicator slightly in and down to disengage the tag from the applicator.

When applying a tag, the following measures should be considered:

- The tag number should be facing out when applied to the fish.
- The applicator should be loaded with a tag prior to removing a fish from a holding pen/tank.
- The orientation of the tag in the applicator is important to ensure that the tag properly engages with the locking mechanism.
- Once in the applicator, the tag is very sensitive to pressure on the applicator to close so care must be taken to not prematurely squeeze the applicator and tag shut.
- Placing the fish on a wet towel tends to keep them calmer than a hard surface.
- It helps to hold open the operculum bone when applying the tag to the fish.
- Once the tag is engaged, to disengage the tag from the applicator requires the handler to slightly push in and downwards. If the tag does not disengage from the applicator, pressure on the operculum is very likely to cause the fish to thrash and rip out the tag.
- Overall, careful, deliberate application of the tag should result in a properly engaged tag and non-injury of the fish.

The tags were applied into the left opercular bone of the fish because the person applying the tags is right-handed and it is more natural and efficient to apply the tags with the right hand. Also, we typically measure fish with the fish oriented to the left because measuring boards and devices are read from left to right. This resulted in the tag numbers being upside down. Given that the majority of people are right-handed, the research team believes that most would also apply the tags in the left opercular bone with the applicator in the right hand. If possible, the tags should be made to read left to right when applied to the left opercular bone of the fish.

The fish remained in good condition and appeared to experience minimal stress throughout the trial. By week 3, all of the fish were exhibiting normal behavior, no signs of disease, low

respiration rates and readily and eagerly accepting food when fed. Given the good condition of the fish, all were released back into Long Island Sound near the areas of initial capture.

**Acknowledgement**

NYSDEC would like to thank Steve Abrams from the SUNY Stonybrook Flax Pond Marine Laboratory for his assistance with setting up the holding tanks and helping to make sure everything was running throughout the trial.

**Tables**

Table 1. Lengths (mm) and Weights (g) of tagged and control fish

| Tag | Length | Weight |
|---|---|---|
| 001 | 427 | 1431 |
| 004 | 380 | 934 |
| 005 | 367 | 994 |
| 006 | 432 | 1450 |
| 007 | 400 | 1214 |
| 008* | 405 | 1259 |
| 009 | 432 | 1452 |
| 010 | 395 | 1126 |
| 011 | 374 | 903 |
| 012 | 375 | 945 |
| 013 | 384 | 996 |
| 014 | 391 | 1191 |
| 015 | 367 | 909 |
| 016 | 360 | 918 |
| 017 | 358 | 915 |

| Control | Length | Weight |
|---|---|---|
| control | 360 | 819 |
| control | 360 | 821 |
| control | 359 | 793 |
| control | 406 | 1271 |
| control | 385 | 1147 |
| control | 349 | 909 |

* Tag 008 was lost on October 4, 2016

**Figures**

Figure 1. Ventless fish frap used to catch tautog for the fish tagging trial.

Figure 2. Tautog being transported in a live well on board the vessel.

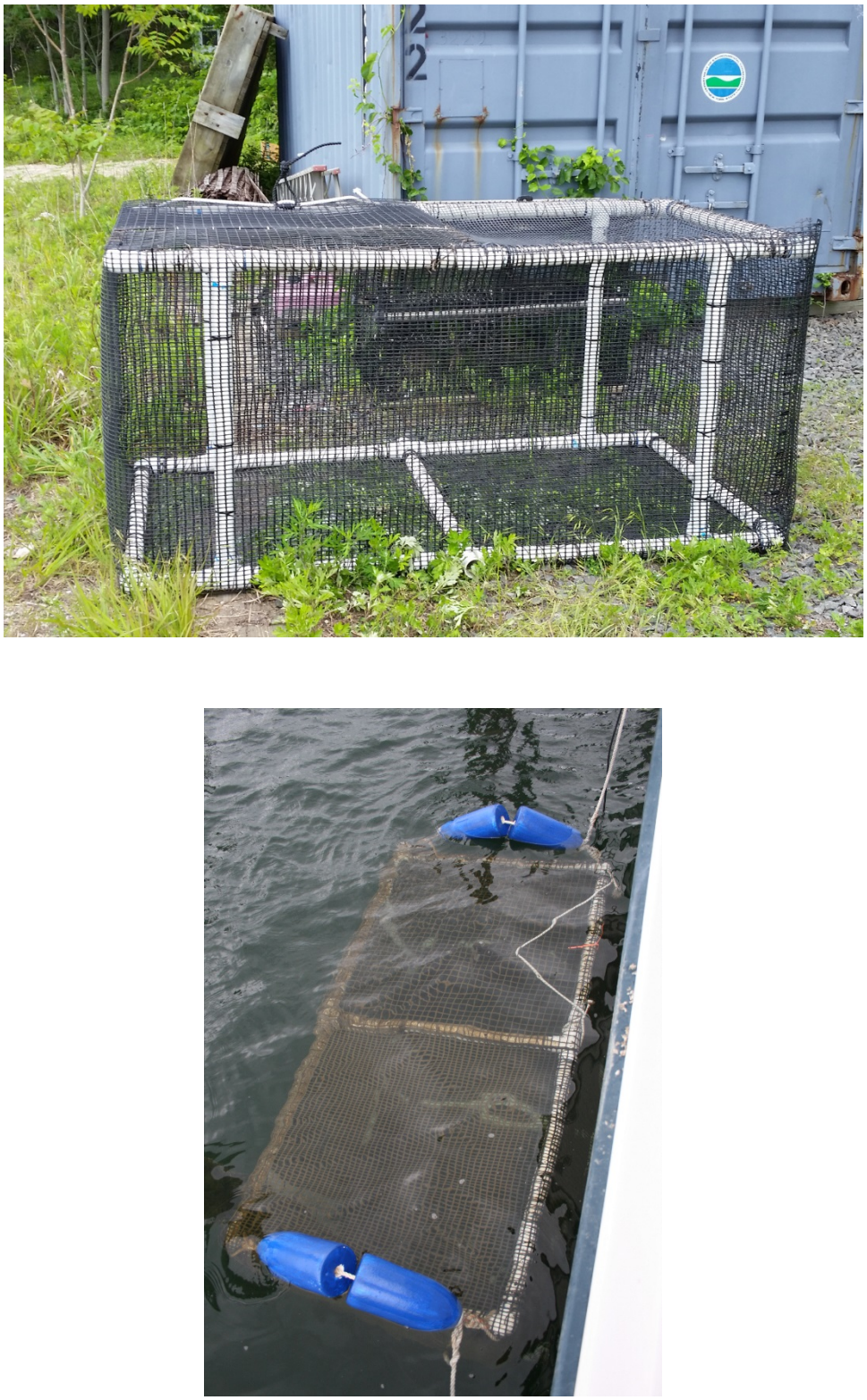

Figure 3. Top: Fish holding cart used to hold tautog at the dock in Mattituck. Bottom: Holding cart hanging in the water at the dock in Mattituck Creek.

Figure 4. Holding tanks at Flax Pond Marine Laboratory.

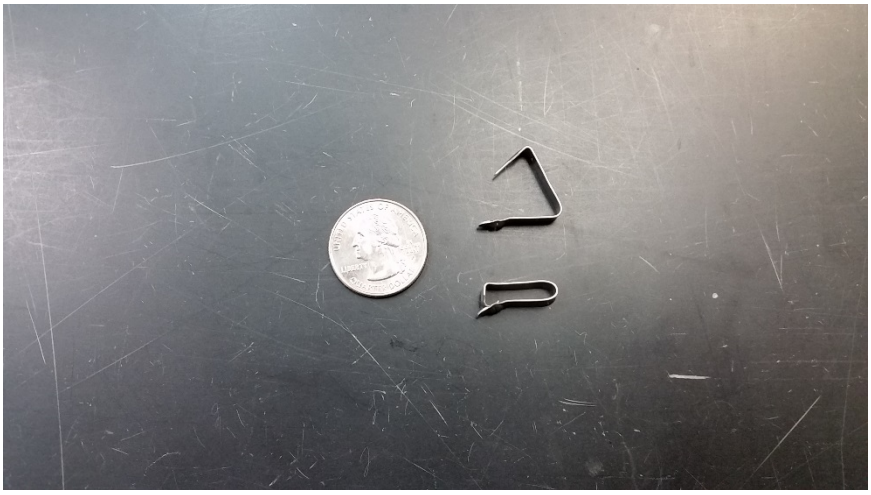

Figure 5. National Band Strap Tag used in the tagging trial.
Top: Open tag, prior to application on a fish.
Bottom: Tag after compressing and engaging the locking mechanism.

Figure 6. Tagging area set up with common fish tote to hold fish into after being netted out of the holding cart and milk crate with wet towel to place the fish on for tagging.

Figure 7. Applicator with tag loaded prior to tagging tautog.

Figure 8. Tags being applied to tautog operculum.
Top: Tag just prior to application.
Bottom: Tag as it is being compressed, pushing through the operculum and engaging locking mechanism.

Figure 9. Control and tagged tautog in their assigned fish totes.

Figure 10. Tautog being transferred from their assigned fish tote to a pickup truck for transport to the laboratory.

Figure 11. Tautog being transferred to their assigned cooler for transport to the laboratory.

Figure 12. Tautog in their assigned cooler prior to transport to the laboratory.

Figure 13. Tautog after arrival at the laboratory and prior to acclimation.

Figure 14. Tautog being transferred to its assigned holding tank at the laboratory.

Figure 15. A control and tagged tautog laying along the side of their holding tank at the laboratory during the tagging trial.

Figure 16. Picture of tagged tautog at the end of the 30 day trial showing overall condition of the fish.

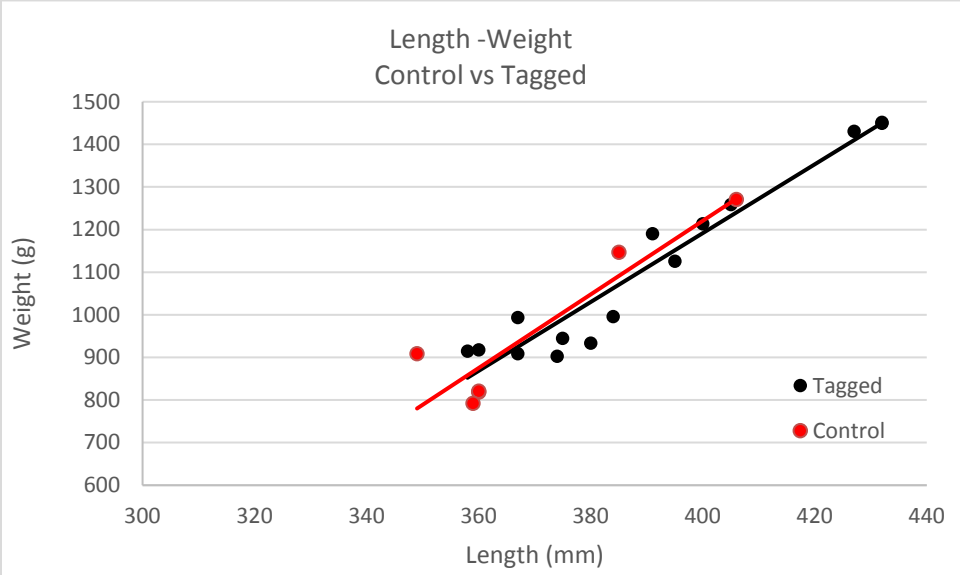


Figure 17. Length-Weights of tagged vs control fish at the end of the trial.

Figure 18. Tagged fish at the end of the 30 day trial showing tag placement and condition.

Figure 19. Operculum damage and scarring from tag placement.

Figure 20. Top: Control fish showing condition after the 30 trial. Bottom: Condition of the gill of the control fish after the 30 day trial.

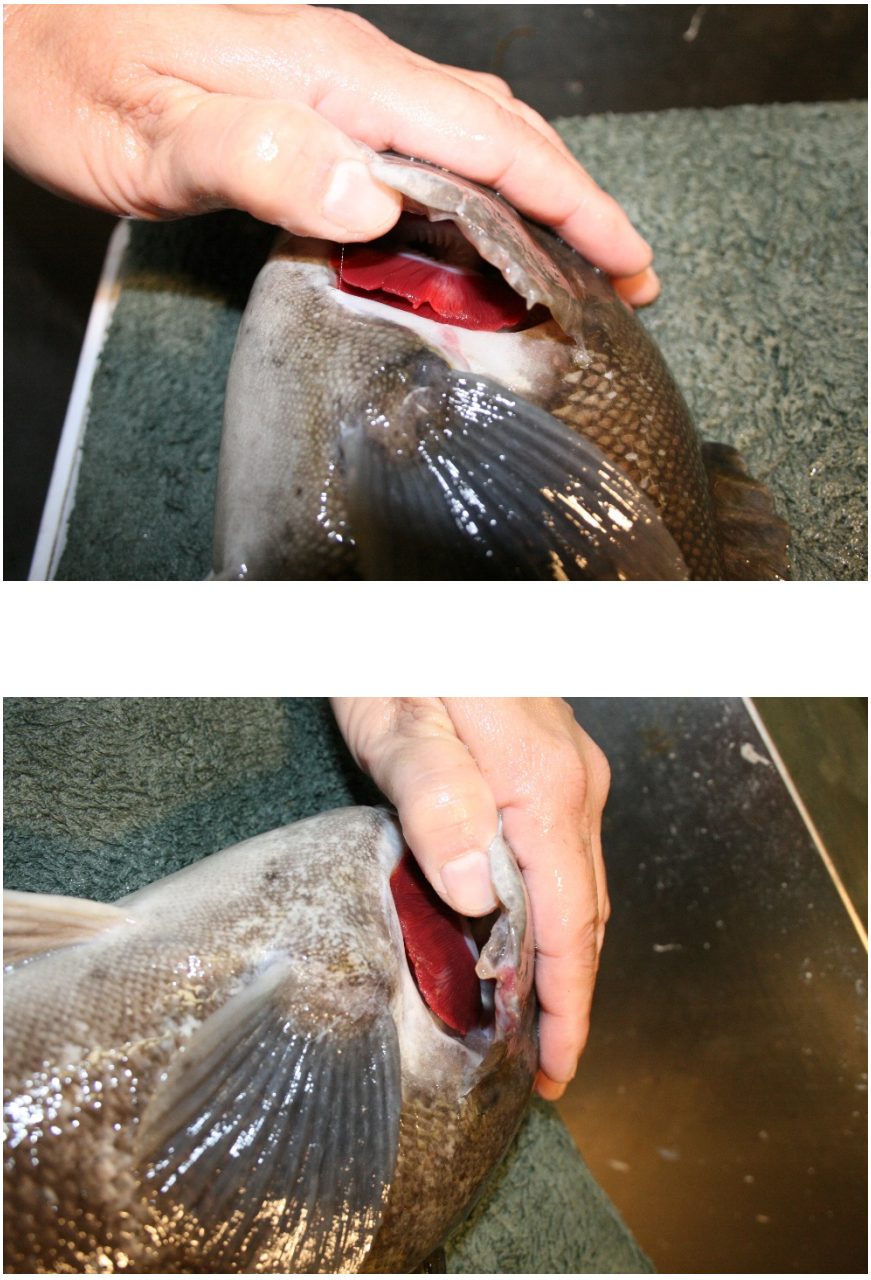

Figure 21. Examples of minor abrasion of the gill filaments of two different tautog at the end of the 30 day trial.

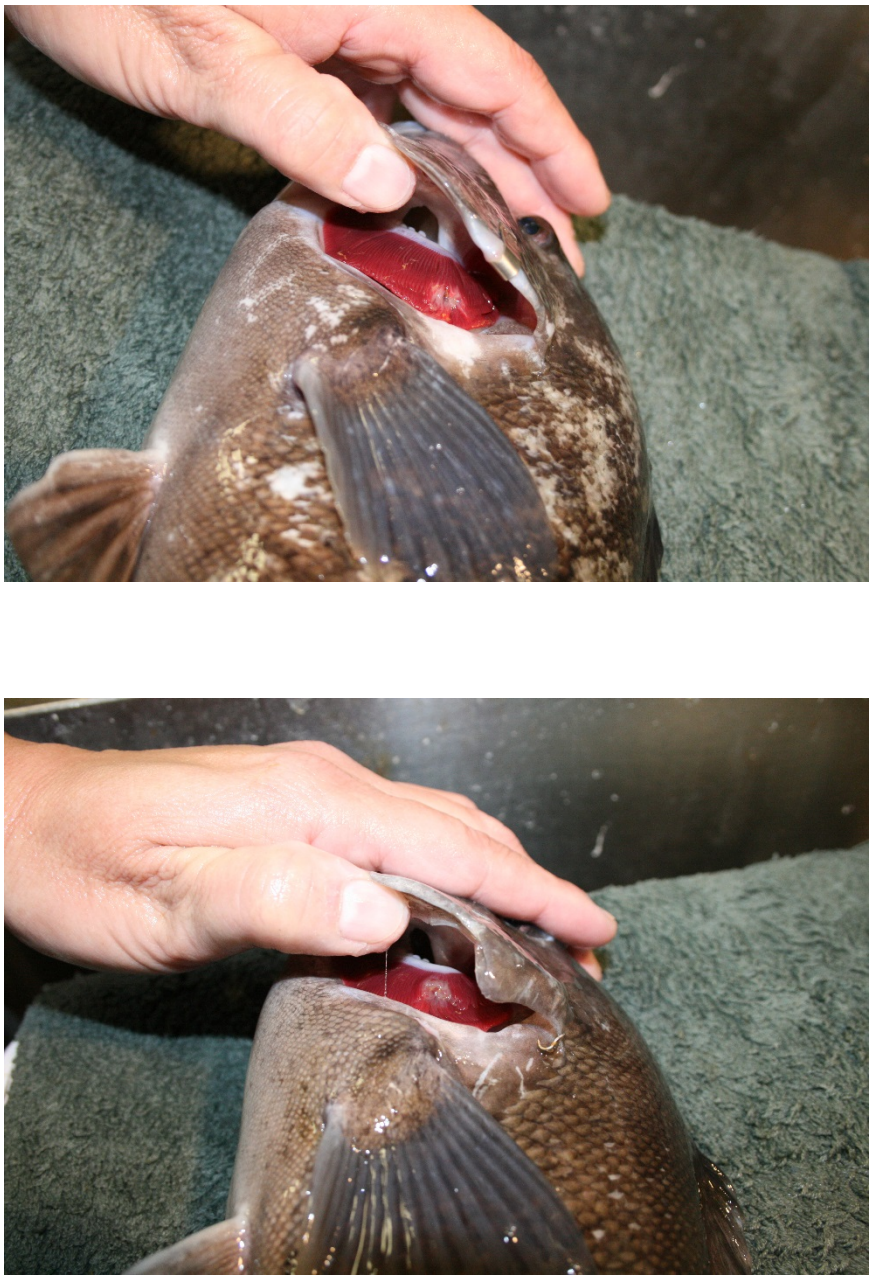

Figure 22. Examples of gill filament erosion resulting from tag placement.