Atlantic States Marine Fisheries Commission

Tautog Management Board

October 18, 2021
1:30 – 4:00 p.m.
Webinar

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 (*W. Hyatt*)	1:30 p.m.
2. Board Consent • Approval of Agenda • Approval of Proceedings from August 2021	1:30 p.m.
3. Public Comment	1:35 p.m.
4. Review 2021 Stock Assessment Update (*N. Ares*)	1:45 p.m.
5. Consider Management Response to 2021 Stock Assessment Update (*W. Hyatt*) **Possible Action**	2:45 p.m.
6. Review and Provide Feedback on Risk and Uncertainty Decision Tools for Tautog (*J. McNamee*)	3:00 p.m.
7. Develop Guidance for Law Enforcement Committee Review of Commercial Tagging Program (*K. Rootes-Murdy*)	3:45 p.m.
8. Other Business/Adjourn	4:00 p.m.

The meeting will be held via webinar, click here for details.

MEETING OVERVIEW

Tautog Management Board
October 18, 2021
1:30 - 4:00 p.m.
Webinar

Chair: Bill Hyatt (CT) Assumed Chairmanship: 11/19	Technical Committee Chair: Coly Ares (RI)	Law Enforcement Committee Representative: Jason Snellbaker (NJ)
Vice-Chair: Mike Luisi (MD)	Advisory Panel Chair: VACANT	Previous Board Meeting: August 3, 2021
Voting Members: MA, RI, CT, NY, NJ, DE, MD, VA, NMFS, USFWS (10 votes)		

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 should use the webinar raise your hand function and the Board Chair will let you know when to speak. 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 Board 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.

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from August 3, 2021

4. Review 2021 Stock Assessment Update (1:45-2:45 p.m.)
Background • The 2017 Stock Assessment Update was updated with data through 2020. The assessment updates the statistical catch-at-age model for each management region. Results and stock status for each region will be presented (**Briefing Materials**).
Presentations • 20201 Stock Assessment Update by N. Ares

5. Consider Management Response to 2021 Stock Assessment Update (2:45-3:00 p.m.) Possible Action

Background

- The 2021 Stock Assessment updates the stock status and reference points for all management regions.
- The Board should determine if management action in any region or request additional analysis from the Technical Committee (TC) is needed.

Board Actions for consideration

- Consider management action, if necessary

6. Review and Provide Feedback on Risk and Uncertainty Decision Tools for Tautog (3:00-3:45 p.m.)

Background

- In February, the ISFMP Policy Board indicated support for using Tautog as pilot case for the Risk and Uncertainty Policy. The pilot case is to be developed in conjunction with the 2021 Stock Assessment Update in order to use the most current information to help inform management decisions.
- The Tautog TC and the Committee on Economics and Social Sciences (CESS) provided technical inputs for the Tautog Risk and Uncertainty Decision Tools. The preliminary Tautog Risk and Uncertainty Report (**Supplemental Materials**), which summarizes the technical inputs, will be presented.
- The Board met via webinar in September to provide input on weightings for the decision tool's components. The preliminary weightings (**Supplemental Materials**) will be presented for additional Board review.

Presentations

- Review of the preliminary Tautog Risk and Uncertainty Decision Tools and Report by J. McNamee

Board Actions for consideration

- Provide feedback on the preliminary Tautog Risk and Uncertainty Decision Tools and Report including current weighting, scores, and risk and uncertainty by region.
- If a management action is being considered, task TC and CESS with producing the recommended probability of achieving the references points.
- Task TC and CESS with additional analyses to support the refinement of the decision tools, if needed.
- Provide feedback on the process for developing the decision tools thus far, including the weightings poll and webinar.

7. Develop Guidance for Law Enforcement Committee Review of Commercial Tagging Program (3:45-4:00 p.m.)
Background • The Law Enforcement Committee (LEC) provided preliminary feedback on the implementation of the commercial harvest tagging program to the Board in August 2021. • To better assess the impact of the tagging program on the illegal harvest and sale of tautog, Board Chair Bill Hyatt has drafted additional questions for LEC to address.
Presentations • Overview of the draft question to LEC on commercial harvest tagging program by K. Rootes-Murdy (**Supplemental Materials**)
Board Actions for consideration • Provide feedback on draft questions

6. Other Business/Adjourn

Atlantic States Marine Fisheries Commission

Preliminary Tautog Risk and Uncertainty Report

Produced for the 2021 Tautog Assessment Update

October 2021

The following report details the preliminary inputs for the Tautog Risk and Uncertainty Decision Tools. There are four decision tools, one for each tautog management region: Massachusetts – Rhode Island (MARI); Long Island Sound (LIS); New Jersey – New York Bight (NJ-NYB); and Delaware, Maryland, Virginia (DelMarVa). The report summarizes both technical inputs (scores) and weightings for the decision tools. The technical inputs characterize components of the tautog stock and fishery that may contribute to risk and uncertainty, while the weightings indicate the relative importance of each component to management considerations for tautog.

Preliminary Risk and Uncertainty Decision Tools for Tautog Management Regions

	MARI		**LIS**		**NJ-NYB**		**DelMarVa**	
Decision Tool Component	Weight	Score	Weight	Score	Weight	Score	Weight	Score
Stock Status, scale: 0 to 1								
P(SSB < SSB threshold)	0.13	0.000	0.13	0.003	0.13	0.491	0.13	0.085
P(SSB < SSB target)	0.10	0.069	0.10	0.528	0.10	0.947	0.10	0.378
P(*F* > *F* threshold)	0.13	0.000	0.13	0.259	0.13	0.239	0.13	0.000
P(*F* > *F* target)	0.11	0.000	0.11	0.754	0.11	0.722	0.11	0.012
Additional Uncertainty Considerations, scale: 0 to 5								
Model uncertainty	0.11	3.13	0.11	3.17	0.11	3.17	0.11	4.00
Management uncertainty	0.10	2.83	0.10	3.6	0.10	3.67	0.10	3.20
Environmental uncertainty	0.07	1.80	0.07	1.5	0.07	1.80	0.07	1.40
Additional Risk Considerations, scale: 0 to 5								
Ecosystem/trophic importance	0.06	0.80	0.06	1.00	0.06	1.00	0.06	1.40
Socioeconomic Considerations, scale -5 to 5								
Short-term commercial socioeconomic effect	0.09	*	0.09	*	0.09	*	0.09	*
Long-term commercial socioeconomic effect	0.09	*	0.09	*	0.09	*	0.09	*
Short-term recreational socioeconomic effect	0.10	*	0.10	*	0.10	*	0.10	*
Long-term commercial socioeconomic effect	0.10	*	0.10	*	0.10	*	0.10	*

*A portion of the socioeconomic scores will only be calculated if a management action will be initiated. See the Socioeconomic Considerations for further details and socioeconomic sub-scores.

Region: Massachusetts – Rhode Island (MARI)

The following technical inputs were provided by the Tautog Technical Committee.

Stock Status

All stock status inputs are based on the 2021 Tautog Assessment Update.

Spawning Stock Biomass (SSB) Threshold

Probability that SSB is less than the threshold (range: 0 – 1): 0.000

SSB Target

Probability that SSB is less than the target (range: 0 – 1): 0.069

F Threshold

Probability that fishing mortality (*F*) is more than the threshold (range: 0 – 1): 0.000

F Target

Probability that *F* is more than the target (range: 0 – 1): 0.000

Additional Uncertainty Considerations

Model Uncertainty

Score (range: 0 – 5): 3.13

Justification: The MRIP PSEs for the MARI region are high as it is a small region with a low intercept rate. There are two age 1+ fishery independent indices with long time series; however, they are trawl surveys, which are not ideal for tautog. Retrospective patterns were large but in a conservative direction, underestimating SSB and overestimating *F*. There were more significant overestimations of *F* in the retrospective patterns than underestimates of SSB. SSB and *F* have been fairly steady the past several years and continue to track total removals and fishery independent indices well. There are some concerns with the age structure as length-at-age estimates differed between MA and RI in recent years; while this is not a major concern, it adds some uncertainty. There was some patterning in residuals. Sensitivity runs did not change the stock status.

Management Uncertainty

Score (range: 0 – 5): 2.83

Justification: The recreational fishery accounts for approximately 95% of removals in the MARI tautog fishery by weight. MRIP estimates for the region have moderate to high PSEs, indicating limited ability to accurately estimate catch. As a result, there is limited capacity to regulate removals and assess recreational compliance. There are known issues with illegal and unreported harvesting in the region, however, the commercial tagging program was implemented to help combat these issues. There is a moderate to high level of fishing activity and interest in tautog from fishermen in the region. Stock status (not overfished, overfishing not occurring) and the lack of significant biomass fluctuations over the last 20 years indicate successful management.

Environmental Uncertainty

Score (range: 0 – 5): 1.80

Justification: Recruitment is steady and there is no evidence that recruitment is strongly influenced by environmental factors. Natural mortality is believed to be adequately accounted for in the assessment. There are no major concerns with habitat loss. Although Hare et al.

(2016) identified tautog as having a very high vulnerability to climate change, there is no clear, imminent risk of climate change to tautog. While prey dynamics are not accounted for in the model, prey dependence is low and it is likely that tautog are generalists. Predator dependence is also low, with no known species that preferentially target tautog (Bigelow and Schroeder 1953).

Additional Risk Considerations

Ecosystem/Trophic Importance

Score (range: 0 – 5): 0.80

Justification: Tautog is not a keystone predator. However, it does provide control of crab populations that prey on other shellfish and turnover of mussel populations. There are no known species that preferentially prey on tautog and there are no known interactions with threatened or endangered species. Tautog is not known to provide any important ecosystem services or support key ecosystem functions.

Socioeconomic Considerations

See socioeconomic considerations section below.

Region: Long Island Sound (LIS)

The following technical inputs were provided by the Tautog Technical Committee.

Stock Status

All stock status inputs are based on the 2021 Tautog Assessment Update.

SSB Threshold

Probability that SSB is less than the threshold: 0.003

SSB Target

Probability that SSB is less than the target: 0.528

F Threshold

Probability that fishing mortality (*F*) is more than the threshold: 0.259

F Target

Probability that *F* is more than the target: 0.754

Additional Uncertainty Considerations

Model Uncertainty

Score (range: 0 – 5): 3.17

Justification: The MRIP estimates have high PSEs, especially as a result of splitting New York between Long Island Sound and New York Bight. The interruptions to the recreational sampling surveys and fishery independent surveys in 2020 increase uncertainty. There is high uncertainty in catch and catch-at-age due to poor sample sizes. There is an age 1+ fishery independent index with a long time series; however, it is a trawl survey, which is not ideal for tautog. Overall, there are few biological observations. There are not enough catch and length observations for all modes, particularly: headboats (no length observations since 2016), spear fishing (no observations at all), and the commercial fleet (few observations). Length-age observations had to be borrowed from different years and different regions to fill out a minimal age-length key.

The retrospective patterns were large but in a conservative direction. The retrospective patterns fit within the 95% confidence intervals, however the percent difference in *F* is as high as 250% different from 2020. Percent different in SSB in the retrospective patterns is up to 30% different from 2020. Retrospective patterns in recruitment are distributed more evenly, some years overestimating some underestimating. Harvest is fairly variable.

Management Uncertainty

Score (range: 0 – 5): 3.60

Justification: The recreational fishery accounts for approximately 96% of tautog removals in the LIS region in weight. Tautog fishermen are poorly encountered by MRIP sampling and MRIP estimates for the region have moderate to high PSEs, indicating limited ability to accurately estimate catch. As a result, there is limited capacity to regulate removals and assess recreational compliance. In addition, there are difficulties with separating Long Island Sound catch from New York Bight catch for New York. There are significant concerns with illegal and unreported harvesting in the region, however, the commercial tagging program was implemented to help combat these issues. There is a high level of fishing activity and interest in tautog from fishermen in the LIS region.

Environmental Uncertainty

Score (range: 0 – 5): 1.50

Justification: Recruitment is steady and there is no evidence that recruitment is strongly influenced by environmental factors. Natural mortality is believed to be adequately accounted for in the assessment. Tautog requires structured habitat and moves from shallow to deep water for preferred water temperature and food (shellfish). There are no major concerns with habitat loss. Although Hare et al. (2016) identified tautog as having a very high vulnerability to climate change, there is no clear, imminent risk of climate change to tautog. While prey dynamics are not accounted for in the model, prey dependence is low and it is likely that tautog are generalists. Predator dependence is also low, with no known species that preferentially target tautog.

Additional Risk Considerations

Ecosystem/Trophic Importance

Score (range: 0 – 5): 1.00

Justification: Tautog is not a keystone predator. However, it does provide control of crab populations that prey on other shellfish and turnover of mussel populations. There are no known species that preferentially prey on tautog and there are no known interactions with threatened or endangered species. Tautog is not known to provide any important ecosystem services or support key ecosystem functions.

Socioeconomic Considerations

See socioeconomic considerations section below.

Region: New Jersey – New York Bight

The following technical inputs were provided by the Tautog Technical Committee.

Stock Status

All stock status inputs are based on the 2021 Tautog Assessment Update.

SSB Threshold

Probability that SSB is less than the threshold: 0.491

SSB Target

Probability that SSB is less than the target: 0.947

F Threshold

Probability that fishing mortality (*F*) is more than the threshold: 0.239

F Target

Probability that *F* is more than the target: 0.722

Additional Uncertainty Considerations

Model Uncertainty

Score (range: 0 – 5): 3.17

Justification: Changes in scale for SSB were seen with the new MRIP data, as expected; however, the overall trend tracks with the prior update. The MRIP estimates have high PSEs, especially as a result of splitting New York between Long Island Sound and New York Bight. There is high uncertainty in catch and catch-at-age due to poor sample sizes. There is an age 1+ fishery independent index with a long time series; however, it is a trawl survey, which is not ideal for tautog. In addition, there were uncertainties related to 2020 data, including: a high proportion of imputed estimates for the MRIP landings, interruptions to two surveys providing FI indices (NY DEC WLI seine survey had a delayed schedule and NJ DEP ocean trawl survey ceased operations for 2020), and commercial landings that may have been impacted by market disruptions due to COVID-19. Sensitivity runs showed little to no impact on F, however two models did influence SSB and recruitment and could result in stock status changes with regards to the final overfished determination. Retrospective patterns were apparent for SSB and F, but in a generally conservative direction. *F* was consistently overestimated, while SSB showed a smaller percent difference and showed both over and underestimation. Retrospective patterns for recruitment were also present, and a concern as the model was consistently overestimating recruitment. There were moderate residual patterns for *F* and SSB (overestimating *F* and underestimating SSB), but the Mohn's Rho adjusted estimates for these parameters were within the 95% CI of the model estimates.

Management Uncertainty

Score (range: 0 – 5): 3.67

Justification: Recreational removals account for approximately 95% of removals within the NJ – NYB region. Tautog fishermen are poorly encountered by MRIP sampling and MRIP estimates for the region have moderate to high PSEs, indicating limited ability to accurately estimate catch. As a result, there is limited capacity to regulate removals and assess recreational compliance. In addition, there are difficulties with separating LIS catch from NYB catch for New

York. There are significant concerns with illegal and unreported harvesting in the region, however, the commercial tagging program was implemented to help combat these issues. There is a high level of fishing activity and interest in tautog from fishermen in the NJ – NYB region.

Environmental Uncertainty

Score (range: 0 – 5): 1.80

Justification: Recruitment is steady and there is no evidence that recruitment is strongly influenced by environmental factors. Natural mortality is believed to be adequately accounted for in the assessment. Tautog requires structured habitat and moves from shallow to deep water for preferred water temperature and food (shellfish). There are no major concerns with habitat loss. There is no clear, imminent risk of climate change to tautog. Although Hare et al. (2016) identified tautog as having a very high vulnerability to climate change, there is no clear, imminent risk of climate change to tautog. While prey dynamics are not accounted for in the model, prey dependence is low and it is likely that tautog are generalists. Predator dependence is also low, with no known species that preferentially target tautog.

Additional Risk Considerations

Ecosystem/Trophic Importance

Score (range: 0 – 5): 1.00

Justification: Tautog is not a keystone predator. However, it does provide control of crab populations that prey on other shellfish and turnover of mussel populations. There are no known species that preferentially prey on tautog and there are no known interactions with threatened or endangered species. Tautog is not known to provide any important ecosystem services or support key ecosystem functions.

Socioeconomic Considerations

See socioeconomic considerations section below.

Region: Delaware – Maryland – Virginia

The following technical inputs were provided by the Tautog Technical Committee.

Stock Status

All stock status inputs are based on the 2021 Tautog Assessment Update.

SSB Threshold

Probability that SSB is less than the threshold: 0.085

SSB Target

Probability that SSB is less than the target: 0.378

F Threshold

Probability that fishing mortality (*F*) is more than the threshold: 0.000

F Target

Probability that *F* is more than the target: 0.012

Additional Uncertainty Considerations

Model Uncertainty

Score (range: 0 – 5): 4.00

Justification: Retrospective patterns are in a risky direction, i.e., *F* was consistently underestimated and SSB was overestimated. However, the percent difference for *F* has been decreasing in more recent years. SSB has been overestimated to a larger scale than the underestimations in F. Retrospective patterns in recruitment are varied and less of a concern. There is high uncertainty in MRIP recreational catch estimates for individual states, including a number of years with CVs > 50%, due to low intercept rates for tautog. The only index of abundance is MRIP CPUE and there is potential underestimation of CV in recreational CPUE. There are large blocks of years with consistently negative or positive residuals in index and catch model fits. In addition, there is no fishery independent index for the region. Because of the lack of indices, there were limited sensitivity runs that could be conducted. Some runs were completed testing starting values and CVs, none of which resulted in changes to stock status.

Management Uncertainty

Score (range: 0 – 5): 3.20

Justification: The DelMarVA tautog fishery is almost exclusively recreational, with 99% of removals by weight coming from the recreational fishery. MRIP estimates for the region have high PSEs, indicating limited ability to accurately estimate catch. As a result, there is limited capacity to regulate removals and assess recreational compliance. There are known issues with illegal and unreported harvesting in the region, however, the commercial fishery is an extremely small component of the overall removals and the commercial tagging program was implemented to help combat these issues. There is a low level of fishing activity and interest in tautog from fishermen in the DelMarVa region.

Environmental Uncertainty

Score (range: 0 – 5): 1.40

Justification: Recruitment is steady and there is no evidence that recruitment is strongly influenced by environmental factors. Natural mortality is believed to be adequately accounted for in the assessment. Tautog requires structured habitat and moves from shallow to deep water for preferred water temperature and food (shellfish). There are no major concerns with habitat loss. Although Hare et al. (2016) identified tautog as having a very high vulnerability to climate change, there is no clear, imminent risk of climate change to tautog. While prey dynamics are not accounted for in the model, prey dependence is low and it is likely that tautog are generalists. Predator dependence is also low, with no known species that preferentially target tautog.

Additional Risk Considerations

Ecosystem/Trophic Importance

Score (range: 0 – 5): 1.40

Justification: Tautog is not a keystone predator. However, it does provide control of crab populations that prey on other shellfish and turnover of mussel populations. There are no known species that preferentially prey on tautog and there are no known interactions with

threatened or endangered species. Tautog is not known to provide any important ecosystem services or support key ecosystem functions.

Socioeconomic Considerations

See socioeconomic considerations section below.

Socioeconomic Considerations

The following technical inputs were provided by the Committee on Economics and Social Sciences (CESS). After comparing regional data, the CESS decided to provide a single coastwide score for each socioeconomic component. The data examined (tautog landings as a proportion of total landings, tautog ex-vessel value as a proportion of total ex-vessel value, proportion of removals from the recreational vs. commercial fishery) did not indicate major concerns with heterogeneity and providing a coastwide score would be consistent with the socioeconomic criteria.

Commercial Value

Score (range: 0 – 5): 2

Justification: The average (2018-2020) ex-vessel value of tautog from Virginia to Massachusetts was $1,383,049 in 2020 dollars. This indicates a score of "low" based on the socioeconomic criteria.

Commercial Community Dependence

Score (range: 0 – 5): 4

Justification: The average (2018-2020) commercial community dependence for the top ten communities was 35.1%, indicating a score of "high" based on the socioeconomic criteria. The top ten communities were determined based on the ports with the ten highest average tautog landings (2018-2020). Community dependence, calculated as the annual value of tautog landings as a proportion of the value of landings for all species for that port, was produced for each of the top ten communities.

Recreational Desirability

Score (range: 0 – 5): 3

Justification: The average (2018-2020) recreational desirability was 2.4%, indicating a "moderate" score based on the socioeconomic criteria. Recreational desirability is calculated as the total coastwide (Virginia to Massachusetts) annual targeted trips for tautog (primary or secondary target) as a percentage of total trips for all species.

Recreational Community Dependence

Score (range: 0 – 5): 2

Justification: The average (2018-2020) recreational community dependence for the top ten communities was 7.2%, indicating a score of "low" based on the socioeconomic criteria. The top ten communities were determined based on the counties with the ten highest average (2018-2020) tautog targeted trips. Community dependence, calculated as the annual number of

tautog targeted trips as a proportion of all trips for that county, was produced for each of the top ten communities.

Commercial Short-term Management Change
Score (range: 0 – 1; + or – depending on direction of effect):
To be calculated if management actions are initiated.

Commercial Long-term Management Change
Score (range: 0 – 1; + or – depending on direction of effect):
To be calculated if management actions are initiated.

Recreational Short-term Management Change
Score (range: 0 – 1; + or – depending on direction of effect):
To be calculated if management actions are initiated.

Recreational Long-term Management Change
Score (range: 0 – 1; + or – depending on direction of effect):
To be calculated if management actions are initiated.

Preliminary Decision Tool Weightings

The following weightings were produced based on Tautog Management Board input. The Board provided input on priorities for risk considerations in tautog management via a webinar poll and survey. Each component of the Risk and Uncertainty Decision Tool was scored on a scale of 1 to 5, where 1 = this component is much less important than other components, 3 = this component is equally important as other components, and 5 = this component is much more important than other components. Responses were averaged and converted to the weighting scale.

Component	Score	Weight
SSB Threshold	4.14	0.13
SSB Target	3.14	0.10
***F* Threshold**	4.14	0.13
***F* Target**	3.43	0.11
Model Uncertainty	3.50	0.11
Management Uncertainty	3.21	0.10
Environmental Uncertainty	2.29	0.07
Ecosystem Importance	1.79	0.06
Commercial Short-term	2.93	0.09
Commercial Long-term	3.00	0.09
Recreational Short-term	3.14	0.10
Recreational Long-term	3.29	0.10

Literature Cited

Bigelow, H. B., & Schroeder, W. C. 1953. *Fishes of the Gulf of Maine* (No. 592). US Government Printing Office.

Hare JA, Morrison WE, Nelson MW, Stachura MM, Teeters EJ, et al. 2016. A Vulnerability Assessment of Fish and Invertebrates to Climate Change on the Northeast U.S. Continental Shelf. PLOS ONE 11(2): e0146756. https://doi.org/10.1371/journal.pone.0146756

Atlantic States Marine Fisheries Commission

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MEMORANDUM

TO: Tautog Management Board

FROM: Bill Hyatt, Chair

DATE: October 8, 2021

SUBJECT: Law Enforcement Committee Review of Commercial Harvest Tagging Program and Impact on Illegal harvest

The Tautog Management Board (Board) is assessing the best path forward for evaluating compliance with the commercial harvest tagging program and its impact on the illegal fish market. In August, the Board received an initial report from the Law Enforcement Committee (LEC) on implementation of the tagging program. To further understand if the program is having the intended effect of reducing illegal harvest, the following questions have been drafted by Chair Bill Hyatt for Board consideration. Responses to these questions will better enable the Board to develop the best possible monitoring and enforcement recommendations.

Chair Hyatt is requesting that Board members review these questions and be ready to provide feedback at the Annual Meeting. If the Board agrees on a set of questions at the Annual Meeting, the LEC will meet and aim to provide responses to the Board by the 2022 Winter Meeting, if possible.

1) **Are there any areas of concern (ex. specific fisheries or markets) where compliance with tautog tagging requirements remains a significant issue? Please be as specific as possible.**

2) **Is there a practical way for Agencies to collect information on non-compliance with tagging requirements in the fishery or markets that could inform and improve the efficiently and effectiveness of law enforcement efforts? Examples might include specific types of advance information gathered by agency biologists or by partner organizations. Please be as specific as possible.**

3) **Any additional thoughts or recommendations for improving the efficiency and effectiveness of enforcement of the tagging program?**

4) **Now that the tagging program has been underway for a couple of years, what is your expectation on if the program will ultimately be successful at reducing illegal fishing and markets?**