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Bio-economic Outcomes under Alternative Management Strategies with Human Choice and Behavior: Modeling Tautog and Anglers' Preferences

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Bio-economic Outcomes under Alternative Management Strategies with Human Choice and Behavior: Modeling Tautog and Anglers' Preferences

Report of survey and preliminary analysis of results, April 2020

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Key findings

- There was relatively strong support for slot limits, and roughly comparable support for status quo management, among anglers fishing for Tautog in Long Island Sound.
- Respondents were not in favor of a total moratorium on fishing for Tautog.
- Providing survey respondents information on how different management scenarios will affect fishing in the future had little detectable impact on fishing preferences.
- Respondents expected to fish less in the future if a wide slot limit is imposed or if status quo management is maintained, but expected no change in effort if a narrow slot limit is imposed.
- Changes in regulations are likely to cause an increase in noncompliance, to the extent that 10%-20% of anglers may retain fish outside of a harvest slot or smaller than an increased minimum size limit.
- Six groups with distinctive preferences and demographic features can be identified among respondents. These include a class that prefers status quo management (the largest group consisting of 29% of respondents), three classes of slot supporters (together representing 45%), one that favors an early season (11.7%), and one that prefers a larger minimum size (14%).

Introduction

The primary goal of this project is to evaluate the biological and economic impacts of alternative recreational fishery management practices, taking anglers' behavioral changes into consideration. Our project focuses on Tautog (*Tautoga onitis*) fishing in Long Island Sound (LIS), for which we have developed a baseline population model that can project how the stock responds to different regulatory approaches. Population projections conventionally assume that there are no changes in fishing effort and compliance rate. We distributed a survey designed to assess the degree to which effort and compliance of CT and NY anglers would change under different management scenarios, based on anglers' perception of how the regulatory packages would affect the stock and the quality of their fishing. Ultimately, we are working to integrate biological projections (how the stock responds) with socioeconomic projections (how the anglers respond) to effect more informed implementation of management regulations.

Survey Description and Experimental Design

The survey firstly provided background information about different management strategies and elicited basic information about anglers' recreational fishing behaviors (Appendix A provides a sample survey). A series of choice questions were presented to identify anglers' preference toward different alternative management scenarios. In the final section, the survey included demographic questions to enrich the interpretation of survey data.

Each choice question asks respondents to choose one out of three scenarios. Each scenario comprised a potential management plan that incorporated: 1) a set of fishing regulations that limit season length, how many fish anglers could keep, and what sizes of fish could be kept; 2) an enforcement indicator, showing how many officers would be dedicated to Tautog fishing regulations; 3) an associated cost increase, which was represented as the amount that anglers would need to pay to bring about the management and enforcement of the regulations. Each choice question was followed by questions regarding how angling habits would change following the suggested changes in the chosen management scenario.

We designed survey using statistical design software (Ngene) and online survey preparation software (Qualtrics). Surveys of CT and NY anglers differed slightly to reflect salient features of

each state's fishery. Attributes represented in the choice questions and the sets of choice questions in each survey were varied systematically according to the statistical design.

Treatments testing the influence of outcomes on preference. One concern was the extent to which anglers understand the impact of different regulatory approaches on the stock and future fishing opportunities, such as a slot limit versus a minimum size limit. The first section of the survey described why alternative management approaches might have different impacts. We experimentally varied choice questions to examine this issue by randomly assigning respondents to the control and treatment groups. In the control group, choice question scenarios presented the regulations and the cost attributes but omitted the outcomes. In the treatment group, choice question scenarios included depictions of future fishing conditions (i.e., fish caught, keepers caught, and lunkers caught) based on projections of our baseline population dynamic model.

Treatments testing for noncompliance behavior. Care must be taken in eliciting information about noncompliance activities or other sensitive matters, even in a confidential survey. One approach we used in our surveys was to depersonalize the respondent reports, asking "of anglers you know, which restriction do you think they are likely to disregard." Even so, we were concerned that respondents may be reluctant to reveal their true attitudes towards noncompliance. We implemented a device called "list randomization" to further immunize respondents from disclosing sensitive information. The list in this case refers to a set of actions (e.g., increased or decreased effort to catch Tautog, increased or decreased effort to catch other species, and increased or decreased tendency to catch and release). Lists randomly included an item representing noncompliance behavior (e.g. retaining a fish outside of the slot limit). Respondents were asked *how many* of the actions in the list, instead of *which* actions in the list, they would be likely to take. Surveys experimentally varied so that for each management scenario, one group's list included the sensitive item in the set of actions, while the other group's list had the same set of actions except for the sensitive item. The rate at which anglers were predicting noncompliance can then be inferred from the difference in the number of actions between the groups.

Survey Preparation

Preparation of the survey included multiple rounds of preliminary testing. The team discussed 20 separately-dated revisions of the survey and conducted 3 focus groups (on 6 September and 2 October 2018, and 21 March 2019). The survey was also informally evaluated by undergraduates who were members of the University of Connecticut Student Subunit of the American Fisheries Society. Finally, near the end of the revision process, we distributed the survey to project partners, other regional experts in fisheries science, the Socioeconomics Section of the American Fisheries Society, and personnel with the New York Department of Environmental Conservation (NY-DEC) and the Connecticut Department of Energy and Environmental Protection (CT-DEEP). The focus groups and reviewers helped to ensure that survey questions were understood by respondents as intended by researchers and would yield an accurate reflection of respondent experience and opinions.

Survey Distribution and Completion

The target population for this project comprises recreational fishers for Tautog in LIS. The sampling frame for CT was the 2018 registry of those holding marine fishing licenses, and the sampling frame for NY was the 2018 registry of those holding marine fishing licenses who resided in eight counties that are adjacent to or proximate to LIS (Bronx, Kings, Nassau, Putnam, Queens, Richmond, Suffolk, Westchester). The registry for each state included angler e-mail addresses, street addresses, or both.

We distributed invitations to access the surveys by e-mail or surface mail. Invitations were delivered to all e-mail addresses in the sampling frame, and via postcard to randomly-selected subsamples of 10,000 street addresses in that portion of the sampling frames for which we had no e-mails. A template of the postcard that was sent to CT surface addresses is provided in Appendix B. Each invitation included the web link by which respondents could access the online survey. We used a single web link for all online surveys by state, but upon accessing the survey online respondents entered identifying information to tag their responses. Respondents were invited to contact our research team if they preferred to receive a printed copy of the survey by surface mail rather than completing it online.

The method for distributing invitations differed by state. The team had access to CT angler contact information, courtesy of CT-DEEP. We issued e-mail invitations using a mail merge function and provided the vendor who printed our postcards with the subsample of street addresses for CT anglers. CT respondents received individualized authorization codes in their invitations. We did not have access to NY angler contact information owing to more restrictive state privacy regulations. NY-DEC personnel performed the mail merge to generate email invitations to NY anglers, and provided the vendor with the subsample of street addresses of NY anglers to print postcards. It was not possible to generate individualized authorization codes using this method. Instead, respondents were asked to enter their e-mail address in the survey. In total, we sent invitations to more than 125,000 registered anglers (Table 1). E-mail addresses in the CT portion of our sample received three reminder invitations, on the fourth day, eleventh day, and 32nd day after the initial e-mail. No reminders were sent to postcard recipients and NY e-mail addresses. The survey was closed in the third week of October, 39 days after it opened.

Table 1. Survey Delivery. Entries represent the number of e-mail and postcard invitations sent and received, and the number of survey responses (responses as % of invitations received in parentheses), by state.

Sample	Sent	Received	Responses
<u>E-mail</u>			
CT ¹	38,404	38,006	2169 (5.7%)
NY	78,068	72,239	778 (1.1%)
<u>Postcard</u>			
CT	5000	5000 ²	135 (2.7%)
NY	5000	5000 ²	52 (1%)

¹CT e-mail invitees received three reminder e-mails

²Number of postcards received is assumed, because undeliverable postcards were not returned by USPS

The overall response rate to survey invitations, defined as the proportion of delivered invitations that yielded at least partial completion of a survey, was 2.5%. The response rate to e-mailed invitations was higher than to mailed invitations, and CT invitees responded at about 3 times the rate as NY invitees (Table 1). About 70% of respondents completed at least the choice question part of the survey, and almost two-thirds of respondents completed the entire survey (Table 2). 19 invitees requested paper surveys, and of these 17 returned completed surveys in time for their inclusion in data analysis.

Table 2. Survey Completion Numbers. Entries represent the number of survey responses, the number of surveys completed, and the number of surveys in which choice questions were completed, by state. Completion entries include % of responses in parentheses.

Sample	Responses	Completed	Choice questions completed
CT	2304	1463 (63.5%)	1642 (71.3%)
NY	830	511 (61.6%)	551 (66.4%)
Total	3134	1974 (63.0%)	2193 (70.0%)

Data on the time required to complete the online survey was available from Qualtrics. The majority of the respondents finished within 17 min, while some respondents do not finish it in one sitting (Figure 1).

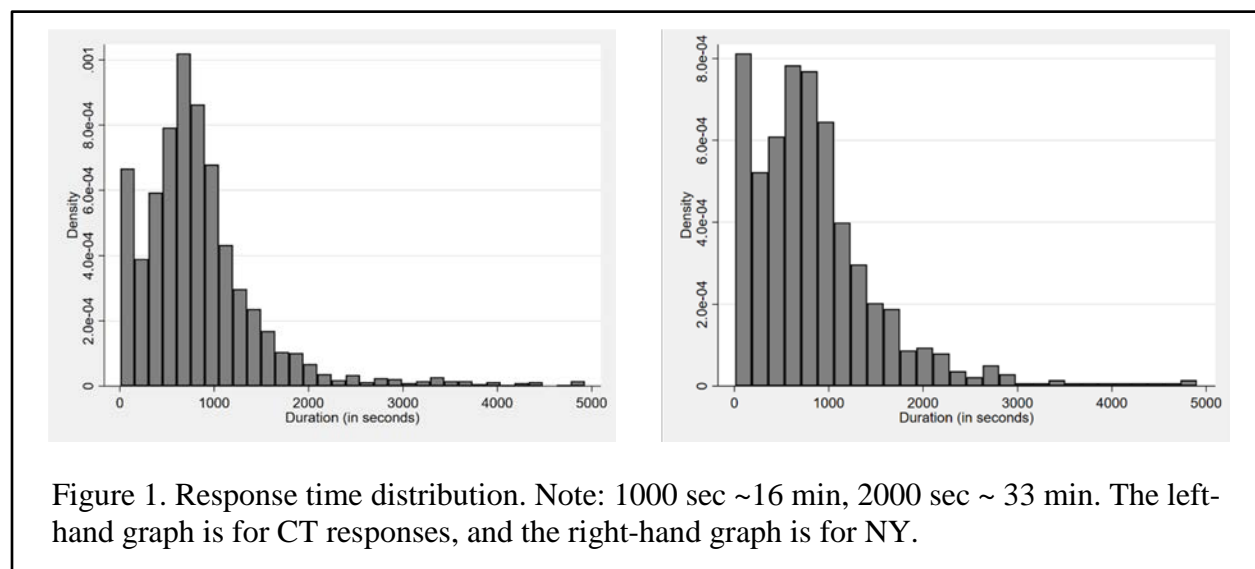


Figure 1. Response time distribution. Note: 1000 sec ~16 min, 2000 sec ~ 33 min. The left-hand graph is for CT responses, and the right-hand graph is for NY.

Response Bias

Demographics of respondents and summary data on their fishing habits are provided in Appendix C. Respondents were predominantly male, predominantly white, and most of them completed an undergraduate college degree. Fishing enthusiasts or professionals, particularly those targeting Tautog, appeared to be relatively likely to complete the survey. Note that 11% of the respondents were fishery professionals.

The CT angler registry includes age and we can therefore assess age-related respondent bias. Among anglers that received e-mail invitations, older anglers tended to have a higher response

rate than younger ones (Fig. 2). In contrast, there was no such respondent bias among those that received surface-mailed postcard invitations (Fig. 3). Two differences between the email and mail samples may have caused the differences in response pattern. First, anglers who do not provide emails may be older than those who do. Second, the email response rate depends heavily on email checking and replying habits, while the mail response rate depends on transferring information from a paper document to an online interface.

Average Respondent Preferences

We analyzed choice experiment question responses to uncover respondents' preferences regarding different regulation attributes. We used a standard conditional logistic regression using the choice as the dependent variable. The estimated coefficient represents the change of choice probability when the corresponding attribute is included in the choice option. A positive coefficient represents a preference for the attribute and a negative coefficient represents an aversion for the attribute. There was relatively strong support for slot limits and comparable support for status quo management (Table 3). Respondents were not in favor of a total moratorium on fishing. As expected, the cost attribute had a negative effect. All else being equal, respondents were less inclined to pay for management.

The Influence of Outcomes on Preference

We conducted conditional logistic regression separately on treatment and control groups to assess how preference for an attribute was affected by its impact on future fishing. The general pattern of preference did not change when outcomes are provided (Table 3 treated versus controls), suggesting that anglers have a good grasp of how management attributes are likely to affect future fishing. We observe differences in responses to some attributes: a description of projected outcomes reduced preference for status quo management, reduced preference for restricting daily possession limit and season length, and reduced preference for enforcement of regulations.

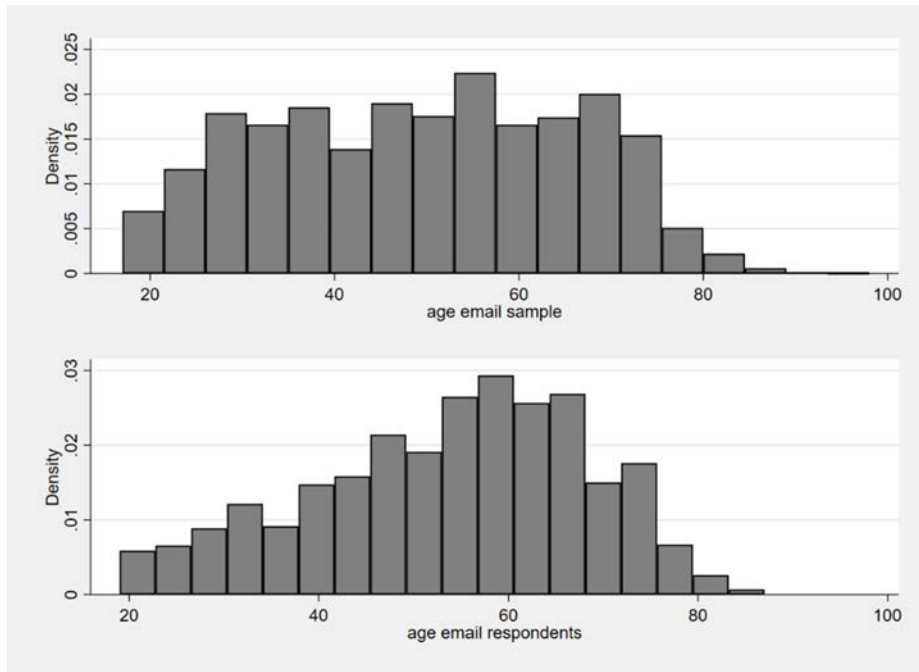


Figure 2. Age distribution of the emailed invitation recipients and the subset that responded.

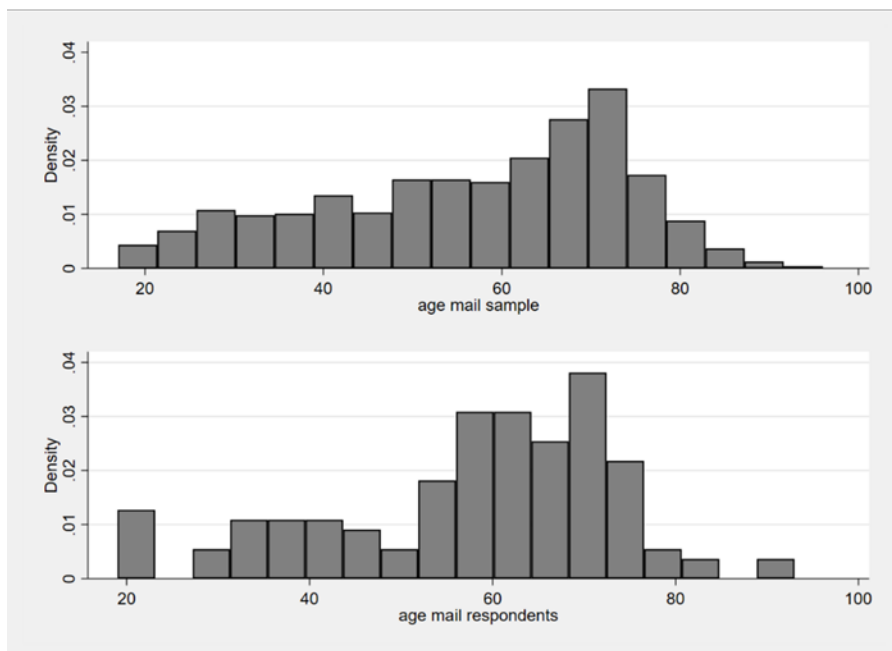


Figure 3. Age distribution of the surface-mailed invitation recipients and of the the subset that responded.

Table 3. Conditional Logit Results, respondent preferences for regulation attributes. Entries in the table are conditional logit coefficients for each management scenario, followed by estimates of their standard error in parentheses. The coefficients are estimated relative to a reference management scenario, an increased minimum size of 17" (from the status quo of 16"). Estimates for all responses (Full sample) are followed by estimates for those surveys that included outcomes information on how each scenario would affect fishing in the future (Treated only), and estimates for those surveys that omitted outcomes information (Controls only). Option A represents respondent preference for the first scenario presented in the choice set. Significance level: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Option Attributes	Full Sample ¹	Treated only ²	Controls only ³
Moratorium	-1.13*** (-0.0896)	-1.11*** (-0.127)	-1.14*** (-0.128)
Slot limit narrow (16" to 19")	0.232*** (-0.0457)	0.191** (-0.0639)	0.266*** (-0.0658)
Slot limit wide (16" to 21.5")	0.321*** (-0.0513)	0.318*** (-0.0721)	0.334*** (-0.0735)
Status Quo (16")	0.274*** (-0.0555)	0.148+ (-0.0769)	0.408*** (-0.0810)
Daily possession limit	0.0317** (-0.0114)	0.0215 (-0.0159)	0.0459** (-0.0166)
Season reduced by 10 days	0.0636* (-0.0283)	0.0208 (-0.0393)	0.102* (-0.0417)
Season earlier by 6 days	0.0411 (-0.0294)	0.0191 (-0.0416)	0.0453 (-0.0427)
Number of Enforcers	0.00132+ (-0.0007)	0.0011 (-0.0010)	0.00187+ (-0.0011)
Option A	0.189*** (-0.0282)	0.164*** (-0.0383)	0.230*** (-0.0419)
Annual Cost	-0.0188*** (-0.0008)	-0.0169*** (-0.001)	-0.0208*** (-0.001)

¹N (as number of questions) = 11,200

²N (as number of questions) = 5,610

³N (as number of questions) = 5,590

Changes in Fishing Effort and Noncompliance Behavior

Analysis of the choice experiment data included inference of likely changes in fishing effort. After each choice question, respondents were reminded about how many days per year (in the fall season) they said they had fished for Tautog and were asked how their effort would change if the choice they selected was implemented. As expected, respondents that chose a moratorium option indicated that their days of fishing would be sharply reduced in a moratorium (Table 4). Respondents that chose a wide slot limit also expected to curb their fishing effort but those that chose a narrow slot limit did not. Respondents that chose the higher minimum size limit expected to reduce their fishing effort similar to those chose the wide slot limit. These results indicate an interest in protecting the stock balanced by a desire to continue harvest under more restrictive regulations.

Table 4. Fishing Effort change. Entries in the table are conditional logit coefficients for each management scenario, followed by estimates of their standard error in parentheses. The coefficients are estimated relative to status quo management scenario. Significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. $N = 11,202$.

Scenario	Coefficient in days
Moratorium	-6.51*** (0.990)
Minimum Size (17")	-1.05* (0.498)
Slot limit narrow (16" to 19")	-0.39 (0.402)
Slot limit wide (16" to 21.5")	-1.05** (0.399)

We analyzed two sets of data from survey responses to infer noncompliance. One set of data aligned with that on fishing effort change described above; respondents were asked whether ‘anglers they know’ would be likely to violate size limit, season length, or daily catch limit, if the scenario they had selected were implemented. The results indicate that all new regulations will significantly increase violations on all three regulations, relative to status quo (Table 5).

Table 5. Noncompliance for selected scenario as estimated by respondents. Entries in the table are conditional logit coefficients for each management scenario, followed by estimates of their standard error in parentheses. Coefficients indicate estimated noncompliance with respect to size limit, possession (bag) limit, and season limit, for each management scenario relative to status quo as the reference management scenario. Significance level: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. N = 11,202.

	Size	Bag Limit	Season
Moratorium	0.582*** (-0.151)	0.814*** (0.158)	1.27*** (0.194)
Minimum Size (17")	0.363** (-0.123)	0.569*** (0.135)	0.472** (0.168)
Slot limit narrow (16" to 19")	0.454*** (0.113)	0.454*** (0.128)	0.305+ (0.158)
Slot limit wide (16" to 21.5")	0.472*** (0.108)	0.357** (0.123)	0.403** (0.149)

The second set of data we used to estimate noncompliance was drawn from list randomization questions. In these questions, we asked respondents to count actions in a list of possible responses to regulations in the future, randomly including noncompliance activity in the list. The sensitive question and non-sensitive question of the same scenario were presented to different individuals, and the treatment (getting a sensitive version) was randomly assigned.

Unexpectedly, when asked about anticipated responses to continued status quo management, respondents whose lists included a noncompliance activity indicated they would perform slightly fewer of the actions than respondents whose lists were otherwise identical but omitted the noncompliance activity (Table 6). When respondents were asked about anticipated responses to slot limits or increased minimum length, there was a stronger disparity in counts in the expected direction, meaning that respondents whose list included the noncompliance activity said they would engage in more of the actions in the list than respondents whose list omitted the noncompliance activity. The differences suggest that 10% to 20% of anglers would not comply with a slot limit or an increase in the minimum legal size.

Table 6. List randomization to estimate rate of noncompliance. Entries in the first two rows of the table are the mean number of items respondents selected from a given list of actions, followed by estimates of their standard error in parentheses. The first row represents responses to the list that includes the noncompliance behavior and the second row represents responses to the list that omits the noncompliance behavior. The third row represents the difference in the number of items selected (list with noncompliance harvest – list without noncompliance harvest), followed by the 95% confidence interval in square brackets, and significance level of a two-sample T-test (Significance level: *** $p < 0.001$).

	Slot limit 16"-19"	Minimum size 17"	Status Quo
Mean, list with noncompliance ¹	1.99 (0.041)	1.93 (0.039)	1.71 (0.043)
Mean, list without noncompliance ²	1.80 (0.035)	1.70 (0.037)	1.83 (0.038)
Difference	0.192 [.084,.298]***	0.230 [.125,.334]***	-0.116 [-.228,-.005]*

¹N = 954, 1003, and 940 for slot limit, increased minimum length and status quo scenarios respectively.

²N = 1001, 949, and 1006 for slot limit, increased minimum length and status quo scenarios respectively.

Heterogeneity – different preference patterns

We use a latent class model to investigate different preference patterns among anglers.

Specifically, we linked respondents' choice patterns with their demographics and self-reported fishing history. For simplicity, we only linked the choices with demographics. An analysis based on information criteria (calculating information loss in the estimation) is used to determine the best latent class numbers (Table 7), which suggests that there are 6 distinct classes among respondents.

Table 7. Panel Statistics of Latent Class Models. Evaluation of latent class models. Statistics are presented for models with varying number of latent classes; for each model, entries are the model fit in terms of likelihood, the number of parameters estimated in the model, and three information-theoretic representations of likelihood that is penalized for the number of parameters: Bayesian Information Criterion (BIC), and Bozdogan's Information Criterion (CAIC). Values in bold represent minimum value indicative of the best-fit model.

Classes	Log(likelihood)	n(parameters)	BIC	CAIC
2	-9532.59	20	19291.63	19320.63
3	-9303.36	39	18981.52	19029.52
4	-9083.52	58	18690.2	18757.2
5	-9006.91	77	18685.34	18771.34
6	-8896.628	105	18613.13	18718.13
7	-8860.435	124	18689.1	18813.1

Characteristics of each of these classes can be portrayed relative to comparison groups (Table 8).

To represent management preferences, the likelihood of favoring a scenario containing an

attribute is estimated relative to a scenario containing an increase in the minimum size to 17" (Table 8A). In contrast, we chose to represent demographic attributes in comparison to the group that favored status quo management (Table 8B). Classes 1, 2, and 4 represent anglers that prefer slot limits to a 17" size limit and dislike status quo management. Different classes vary on a more restrictive possession limit, a moratorium, changes in season length, and have a varying tendency to choose the scenario on the left side in the choice set (Table 8A). Members of these classes have a higher education level than those who prefer status quo management, and have higher income, are younger, or both (Table 8B). Class 3 comprises anglers who prefer an earlier beginning to the fishing season, dislike the moratorium, status quo management and more restrictive possession limit, and tend to be younger and more educated. Class 5 prefers the higher size limit of 17" and a more restrictive possession limit more than the narrow slot limit and an earlier season opening, and are more likely to choose the scenario on the left side in the choice set; they have a higher income level. Class 6, constituting slightly more than a quarter of respondents, prefers status quo management over the higher size limit.

Table 8. Six-segment latent class logit model. Estimates are based on 11,202 choices from 3134 survey respondents. The mean predicted class membership probabilities are 0.15, 0.20, 0.12, 0.10, 0.14, and 0.29 for classes 1-6, respectively. A) Respondent preferences for regulation attributes in each class. Entries in the table are conditional logit coefficients followed by estimates of their standard error in parentheses. Coefficients are estimated value in the equation representing choice or preference for various size limits, possession limits, season length, enforcement level and cost, relative to a larger minimum size limit as the reference management scenario. Option A represents respondent preference for the first scenario presented in the choice set. B) Member attributes of each class. Entries in the table are conditional logit coefficients followed by estimates of their standard error in parentheses. Coefficients indicate estimated value in the equation representing influence of demographic attributes on membership in each class, relative to Class 6. Significance level: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

A)						
Variable in choice eq'n.	Class 1(Slot-positive 1)	Class 2(Slot-positive 2)	Class 3(Early start)	Class 4(Slot-positive 3)	Class 5(Higher minimum)	Class 6(Status quo)
Moratorium	-3.629*** (0.480)	0.105 (0.542)	-4.675*** (0.646)	-0.917 (0.798)	-1.397*** (0.405)	-7.258 (3.766)
Slot limit narrow (16" to 19")	1.204*** (0.317)	0.532 (0.284)	0.882 (0.461)	0.788 (0.475)	-1.215*** (0.227)	-0.924 (0.733)
Slot limit wide (16" to 21.5")	1.093*** (0.299)	0.695*** (0.168)	0.239 (0.423)	1.275** (0.448)	-0.311 (0.199)	-0.267 (0.667)
Status Quo	-1.260*** (0.365)	-1.442*** (0.292)	-2.125*** (0.553)	-2.192*** (0.548)	0.402 (0.236)	2.049** (0.774)
Daily possession limit	0.470*** (0.0763)	0.207*** (0.0426)	-0.856*** (0.127)	0.113 (0.0907)	0.218*** (0.0603)	0.0415 (0.251)
Season reduced by 10 days	-0.406** (0.153)	-0.0653 (0.0810)	0.240 (0.171)	0.378 (0.220)	0.233 (0.133)	-0.00841 (0.529)
Season earlier by 6 days	-0.0980 (0.157)	-0.0630 (0.0863)	0.571*** (0.172)	0.276 (0.201)	-0.414** (0.141)	0.664 (0.508)
Number of Enforcers	0.00206 (0.00478)	0.00571 (0.00294)	-0.00453 (0.00708)	0.00977 (0.00545)	-0.00113 (0.00293)	-0.00649 (0.00715)
Option A	-0.279 (0.189)	1.289*** (0.136)	0.199 (0.215)	-2.115*** (0.344)	0.543*** (0.148)	0.368 (0.399)
Annual Cost	-0.0789*** (0.00863)	-0.0119*** (0.00348)	-0.0396*** (0.00604)	-0.00955 (0.00611)	-0.0143** (0.00443)	-0.210* (0.0874)
B)						
Var. in membership eq'n	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6(Reference)
Female	-0.693 (0.667)	-0.189 (0.648)	0.110 (0.734)	-0.553 (0.794)	1.635 (1.106)	-
Male	-0.581 (0.527)	-0.115 (0.540)	0.0720 (0.621)	-0.366 (0.643)	1.263 (1.031)	-
Fifty or above	-0.180 (0.182)	-0.453** (0.168)	-0.515** (0.193)	-0.436* (0.217)	-0.333 (0.212)	-
No Response	-2.497** (0.790)	0.172 (0.561)	-1.532* (0.749)	-0.0700 (0.669)	-0.203 (1.048)	-
Bachelor's degree or above	0.707*** (0.184)	0.675*** (0.166)	0.602** (0.194)	0.685** (0.225)	0.154 (0.207)	-
Income \geq \$100k	0.400* (0.186)	0.526** (0.172)	0.276 (0.199)	0.368 (0.239)	0.581** (0.217)	-
White	0.462 (0.302)	0.311 (0.260)	0.124 (0.287)	0.196 (0.335)	-0.242 (0.293)	-
Child fishing	-0.224 (0.184)	0.334 (0.182)	-0.172 (0.198)	0.152 (0.237)	0.0411 (0.221)	-
Constant	-0.467 (0.517)	-0.957 (0.547)	-0.797 (0.611)	-1.127 (0.655)	-1.684 (1.003)	-

Long Island Sound Tautog (Blackfish) Angler Survey



**Make choices. Show your opinions. Improve the Tautog fishery.
We are researchers studying fishery management and angler behaviors.**

Contact: Eric Schultz: 860-486-4692;

Email: eric.schultz@uconn.edu

Thank you for participating in this survey! This survey will take about 13 to 17 minutes for most people to complete. If you have any questions concerning your rights that Professor Schultz is unable to answer, you may contact the University of Connecticut Institutional Review Board (IRB) at 860-486-8802 (reference protocol X18-081).



Please enter your **authorization code** here! _____ (Only correct entries will be enrolled in the lottery!)

Section I. Background

This survey seeks your opinion on the best way to manage recreational fishing for Tautog. The first section asks questions about your background as a Tautog angler and provides you important information.

All the information published about this study will be presented in such a way that no individual can be identified; this is a secret ballot. All your answers will be kept strictly confidential within the research team.

Question 1. Considering the last five years of fishing:

How many days per year did you spend on salt water recreational fishing for any species?
_____ day(s) (please fill in a number for your best estimate)

How many days per year did you spend on recreational fishing for Tautog?
_____ day(s) (please fill in a number for your best estimate)

Question 2. Considering the last five years of fishing:

How many days did you fish Tautog per fall season?
_____ day(s) (please fill in a number for your best estimate)

How many hours per trip did you spend fishing for Tautog, on average, when you were on a trip for this fish?
_____ hour(s) (please fill in a number for your best estimate)

Question 3. How many Tautog, on average, did you catch and keep on a fishing trip for this fish? (Please fill in your best estimates)

On an average day targeting Tautog, I caught _____ fish and of these. Of the fish I caught, on average I kept _____ fish.

Question 4. Is your profession related to recreational or commercial fishing? (circle one)

My profession is related to recreational fishing

My profession is related to commercial fishing

My profession is related to both

My profession is related to neither

Question 5. How do you characterize yourself as a Tautog angler? (circle the most important to you)

I fish Tautog for fun

I fish Tautog for food

I want to catch very big ones

I want to catch fish that are big enough to eat

I like the fishing experience and want to share it with my children or grandchildren

Population status

- Fisheries managers have determined that the Long Island Sound Tautog population is overfished.
- As a result, managers are legally required to modify regulations to reduce harvest.

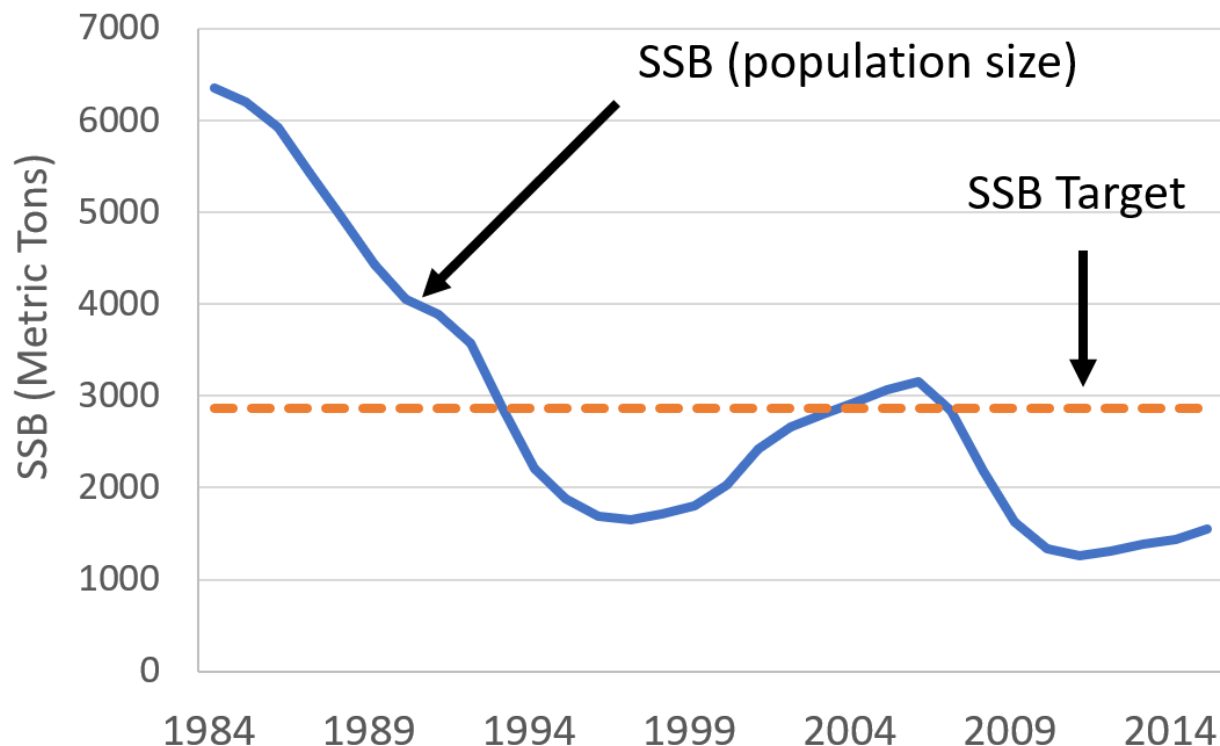


Figure 1. SSB plotted with their targets for the Long Island Sound region

Note: The figure comes from 2016 Tautog Stock Assessment Update by the Atlantic States Marine Fisheries Commission. As the SSB is below the target level (the level that produces the largest harvest), the stock is overfished.

Size and reproduction

- Large female Tautog produce many more eggs than small female Tautog.
- For example, a 20-inch female produces on average 7 times as many eggs as a 14-inch female. (Reference: Laplante and Schultz, 2007 in *Transactions of the American Fisheries Society*, and this study is based on Long Island Sound data)

Question 6. In your opinion, what about fishing for Tautog will change in the next 5 years if regulations remain the same? (circle all that apply)

The number of fish I catch will decrease

The number of keepers I catch will decrease

The number of lunkers (large fish) I catch will decrease

There will be no change

The number of fish I catch will increase

The number of keepers I catch will increase

The number of lunkers will increase

Other (please specify)

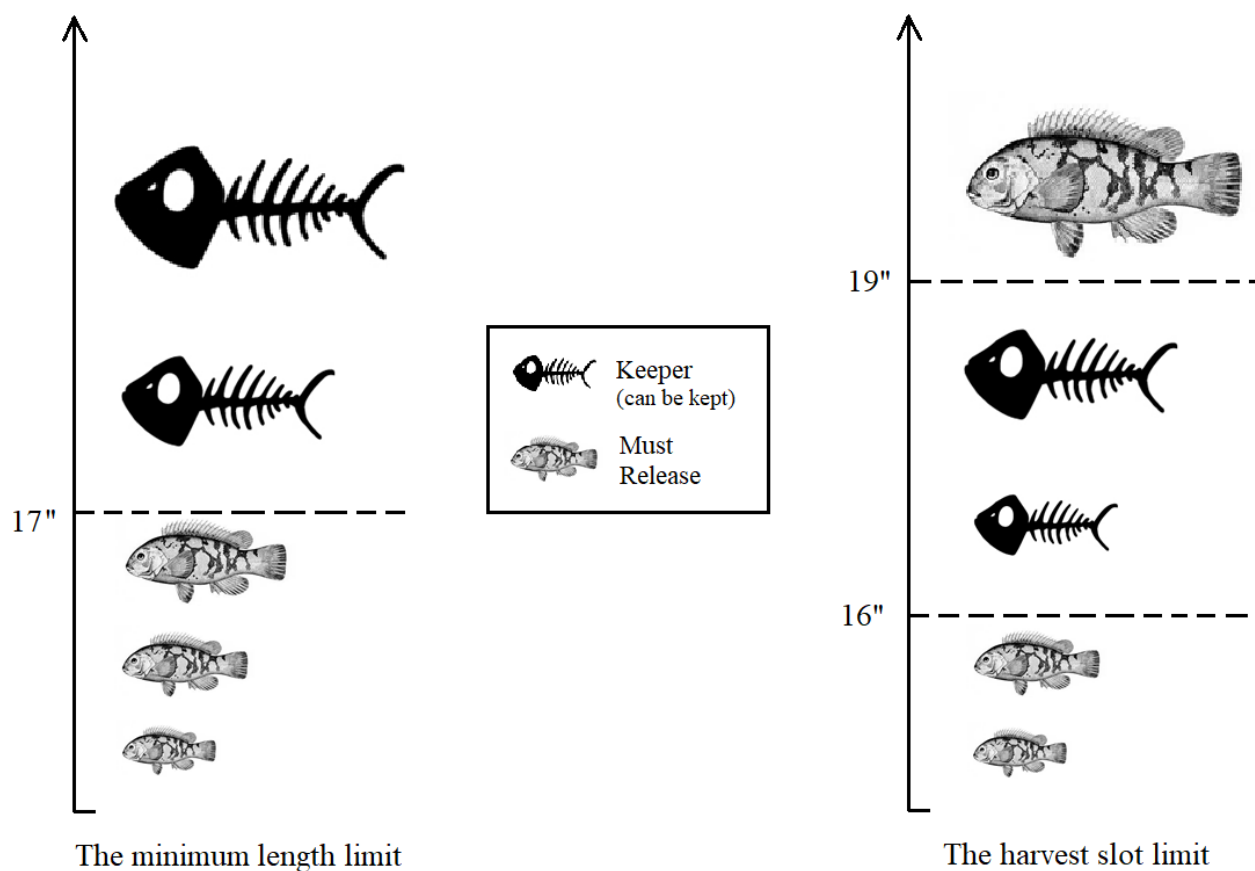


Figure 2. Proposed alternative size limits

Possible regulations to reduce harvest

- Harvest can be reduced by increasing the minimum length.
- At present, there is a minimum length limit for Tautog of 16". Managers have considered increasing the minimum length limit.
- Another kind of size limit is a harvest slot limit, setting both a minimum size and a maximum size between which fish may be kept.
- A harvest slot limit protects large female Tautog that produce more eggs.
- Harvest can also be reduced by decreasing daily possession limit or shortening the season.

Enforcement

- The effectiveness of a regulation increases with more enforcement.
- Changes in regulations may involve changes in license fees and other costs.
- Costs included in the survey's choice questions (see next section) would be used for fishery management activities sufficient to deliver the outcomes depicted in each scenario.

Question 7. In the last five years of fishing, how many times: (please enter estimated numbers)

Did you encounter officers enforcing the recreational fishing regulations? _____

Did you see their vehicles (cars, trucks, or boats)? _____

Section II: Choice Questions

*You will see **five different** choice questions in this section. Each of the following questions presents a set of scenarios involving different fishing regulations, enforcement levels, future outcomes for fishing, and related costs. Vote for Current Management, Alternative Management A, or Alternative Management B. Please choose as if you were voting on which of the regulation sets should be implemented, considering their associated outcomes.*

- The numbers presented in each scenario are based on the best scientific projections available; please take them at face value.
- The choice scenarios presented below combine different ways of reducing harvest. Your choices will be considered by managers who make real decisions regarding the fishery and anglers' experience. However, no regulations can be changed without public hearings and extensive technical reviews.

Imagine that changes to harvest restrictions, enforcement, and costs will be effective in 2020, and consider outcomes projected to occur in 5 years. Please tell us in each question which of the management options you prefer by crossing the box, comparing only the three options below. Each column (column Current, A, or B) presents one option.

Choice Question A.

I vote for:		Current Management <input type="checkbox"/>	Alternative Management A <input type="checkbox"/>	Alternative Management B <input type="checkbox"/>
Harvest restrictions	Size limit	Min: 16 inches No Max limit Only fish larger than 16 inches can be kept	Min: 16 inches Max: 21.5 inches Only fish between 16 inches and 21.5 inches can be kept	Min: 17 inches No Max limit Only fish larger than 17 inches can be kept
	Daily possession limit	3 fish per day Can keep as many as 3 fish per day	4 fish per day Can keep as many as 4 fish per day	1 fish per day Can keep as many as 1 fish per day
	Fall season length	50 days in Fall, starting Oct 10th No change in other seasons	50 days in Fall, starting Oct 5th No change in other seasons	40 days in Fall, starting Oct 10th No change in other seasons
	Enforcement level	16 officers There are 16 enforcement agents checking Tautog regulations in CT.	41 officers There are 41 enforcement agents checking Tautog regulations in CT.	90 officers There are 90 enforcement agents checking Tautog regulations in CT.
Outcome in 5 years	Tautog caught	100 % current management An average angler will catch as many fish as what they catch if current management remains	92% of current management An average angler will catch 92% as many fish as what they catch if current management remains	118% of current management An average angler will catch 118% as many as what they catch if current management remains
	Keepers caught	100% current management An average angler will catch as many keepers as what they catch if current management remains	81% of current management An average angler will catch 81% as many as what they catch if current management remains	96% of current management An average angler will catch 96% as many as what they catch if current management remains
	Lunkers caught	8 lunkers out of 10000 An average angler will catch 8 fish longer than 23" out of every 10000 caught	39 lunkers out of 10000 An average angler will catch 39 fish longer than 23" out of every 10000 caught	8 lunkers out of 10000 An average angler will catch 8 fish longer than 23" out of every 10000 caught
Cost	License and stamp fees	\$32 per year	\$45 per year Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.	\$70 per year Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.

Question A1.

Compared to your efforts to catch Tautog over the last five years, **will your fishing days in fall to catch Tautog change under the scenario you voted for above?** (Circle one)

Increase more than 48 days	Increase 36-48 days	Increase 24-36 days
Increase 12-24 days	Increase less than 12 days	
No Change		
Decrease less than 12 days	Decrease 12-24 days	Decrease 24-36 days
Decrease 36-48 days	Decrease more than 48 days	

Question A2.

Of anglers you know, **do you think they are likely to disregard** the harvest restrictions **under the chosen scenario?** (Circle all that apply)

Violate size limit	Violate daily possession limit	Violate season length limit
No		

Question A3.

What do you think the probability is that your voted option will be implemented?

[0%, 10%) [10%, 20%) [20%, 30%) [30%, 40%) [40%, 50%) [50%, 60%) [60%, 70%)
[70%, 80%) [80%, 90%) [90%, 100%)

Imagine that changes to harvest restrictions, enforcement, and costs will be effective in 2020, and consider outcomes projected to occur in 5 years. Please tell us in each question which of the management options you prefer by crossing the box, comparing only the three options below. Each column (column Current, A, or B) presents one option.

Choice Question B.

I vote for:		Current Management <input type="checkbox"/>	Alternative Management A <input type="checkbox"/>	Alternative Management B <input type="checkbox"/>
Harvest restrictions	Size limit	Min: 16 inches No Max limit Only fish larger than 16 inches can be kept	Min: 16 inches Max: 19 inches Only fish between 16 inches and 19 inches can be kept	Min: 16 inches Max: 21.5 inches Only fish between 16 inches and 21.5 inches can be kept
	Daily possession limit	3 fish per day Can keep as many as 3 fish per day	3 fish per day Can keep as many as 3 fish per day	3 fish per day Can keep as many as 3 fish per day
	Fall season length	50 days in Fall, starting Oct 10th No change in other seasons	40 days in Fall, starting Oct 5th No change in other seasons	50 days in Fall, starting Oct 10th No change in other seasons
	Enforcement level	16 officers There are 16 enforcement agents checking Tautog regulations in CT.	67 officers There are 67 enforcement agents checking Tautog regulations in CT.	16 officers There are 16 enforcement agents checking Tautog regulations in CT.
Outcome in 5 years	Tautog caught	100 % current management An average angler will catch as many fish as what they catch if current management remains	103% of current management An average angler will catch 103% as many fish as what they catch if current management remains	100% of current management An average angler will catch 100% as many as what they catch if current management remains
	Keepers caught	100% current management An average angler will catch as many keepers as what they catch if current management remains	81% of current management An average angler will catch 81% as many as what they catch if current management remains	97% of current management An average angler will catch 97% as many as what they catch if current management remains
	Lunkers caught	8 lunkers out of 10000 An average angler will catch 8 fish longer than 23" out of every 10000 caught	72 lunkers out of 10000 An average angler will catch fish longer than 23" out of every 10000 caught	38 lunkers out of 10000 An average angler will catch fish longer than 23" out of every 10000 caught
Cost	License and stamp fees	\$32 per year	\$32 per year Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.	\$85 per year Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.

Question B1.

Compared to your efforts to catch Tautog over the last five years, **will your fishing days in fall to catch Tautog change under the scenario you voted for above?** (Circle one)

Increase more than 48 days	Increase 36-48 days	Increase 24-36 days
Increase 12-24 days	Increase less than 12 days	
No Change		
Decrease less than 12 days	Decrease 12-24 days	Decrease 24-36 days
Decrease 36-48 days	Decrease more than 48 days	

Question B2.

Of anglers you know, **do you think they are likely to disregard** the harvest restrictions **under the chosen scenario?** (Circle all that apply)

Violate size limit	Violate daily possession limit	Violate season length limit
No		

Question B3.

What do you think the probability is that your voted option will be implemented?

[0%, 10%) [10%, 20%) [20%, 30%) [30%, 40%) [40%, 50%) [50%, 60%) [60%, 70%)
[70%, 80%) [80%, 90%) [90%, 100%)

Imagine that changes to harvest restrictions, enforcement, and costs will be effective in 2020, and consider outcomes projected to occur in 5 years. Please tell us in each question which of the management options you prefer by crossing the box, comparing only the three options below. Each column (column Current, A, or B) presents one option.

Choice Question C.

I vote for:		Current Management <input type="checkbox"/>	Alternative Management A <input type="checkbox"/>	Alternative Management B <input type="checkbox"/>
Harvest restrictions	Size limit	Min: 16 inches No Max limit Only fish larger than 16 inches can be kept	Min: 16 inches Max: 19 inches Only fish between 16 inches and 19 inches can be kept	Min: 16 inches Max: 19 inches Only fish between 16 inches and 19 inches can be kept
	Daily possession limit	3 fish per day Can keep as many as 3 fish per day	4 fish per day Can keep as many as 4 fish per day	1 fish per day Can keep as many as 1 fish per day
	Fall season length	50 days in Fall, starting Oct 10th No change in other seasons	50 days in Fall, starting Oct 10th No change in other seasons	40 days in Fall, starting Oct 5th No change in other seasons
	Enforcement level	16 officers There are 16 enforcement agents checking Tautog regulations in CT.	16 officers anglers' Tautog regulations in CT.	90 officers There are 90 enforcement agents checking Tautog regulations in CT.
Outcome in 5 years	Tautog caught	100 % current management An average angler will catch as many fish as what they catch if current management remains	103% of current management An average angler will catch 103% as many fish as what they catch if current management remains	115% of current management An average angler will catch 115% as many as what they catch if current management remains
	Keepers caught	100% current management An average angler will catch as many keepers as what they catch if current management remains	80% of current management An average angler will catch 80% as many as what they catch if current management remains	96% of current management An average angler will catch 96% as many as what they catch if current management remains
	Lunkers caught	8 lunkers out of 10000 An average angler will catch 8 fish longer than 23" out of every 10000 caught	72 lunkers out of 10000 An average angler will catch 72 fish longer than 23" out of every 10000 caught	66 lunkers out of 10000 An average angler will catch 66 fish longer than 23" out of every 10000 caught
Cost	License and stamp fees	\$32 per year	\$32 per year Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.	\$45 per year Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.

Question C1.

Compared to your efforts to catch Tautog over the last five years, **will your fishing days in fall to catch Tautog change under the scenario you voted for above?** (Circle one)

Increase more than 48 days	Increase 36-48 days	Increase 24-36 days
Increase 12-24 days	Increase less than 12 days	
No Change		
Decrease less than 12 days	Decrease 12-24 days	Decrease 24-36 days
Decrease 36-48 days	Decrease more than 48 days	

Question C2.

Of anglers you know, **do you think they are likely to disregard** the harvest restrictions **under the chosen scenario?** (Circle all that apply)

Violate size limit	Violate daily possession limit	Violate season length limit
No		

Question C3.

What do you think the probability is that your voted option will be implemented?

[0%, 10%) [10%, 20%) [20%, 30%) [30%, 40%) [40%, 50%) [50%, 60%) [60%, 70%)
[70%, 80%) [80%, 90%) [90%, 100%)

Imagine that changes to harvest restrictions, enforcement, and costs will be effective in 2020, and consider outcomes projected to occur in 5 years. Please tell us in each question which of the management options you prefer by crossing the box, comparing only the three options below. Each column (column Current, A, or B) presents one option.

Choice Question D.

I vote for:		Current Management <input type="checkbox"/>	Alternative Management A <input type="checkbox"/>	Alternative Management B <input type="checkbox"/>
Harvest restrictions	Size limit	<i>Min: 16 inches No Max limit</i> Only fish larger than 16 inches can be kept	<i>Min: 17 inches No Max limit</i> Only fish larger than 17 inches can be kept	<i>Min: 17 inches No Max limit</i> Only fish larger than 17 inches can be kept
	Daily possession limit	<i>3 fish per day</i> Can keep as many as 3 fish per day	<i>1 fish per day</i> Can keep as many as 1 fish per day	<i>3 fish per day</i> Can keep as many as 3 fish per day
	Fall season length	<i>50 days in Fall, starting Oct 10th</i> No change in other seasons	<i>50 days in Fall, starting Oct 5th</i> No change in other seasons	<i>40 days in Fall, starting Oct 10th</i> No change in other seasons
	Enforcement level	<i>16 officers</i> There are 16 enforcement agents checking Tautog regulations in CT.	<i>67 officers</i> There are 67 enforcement agents checking Tautog regulations in CT.	<i>67 officers</i> There are 67 enforcement agents checking Tautog regulations in CT.
Outcome in 5 years	Tautog caught	<i>100% current management</i> An average angler will catch as many fish as what they catch if current management remains	<i>103% of current management</i> An average angler will catch 103% as many fish as what they catch if current management remains	<i>107% of current management</i> An average angler will catch 107% as many as what they catch if current management remains
	Keepers caught	<i>100% current management</i> An average angler will catch as many keepers as what they catch if current management remains	<i>68% of current management</i> An average angler will catch 68% as many as what they catch if current management remains	<i>75% of current management</i> An average angler will catch 75% as many as what they catch if current management remains
	Lunkers caught	<i>8 lunkers out of 10000</i> An average angler will catch 8 fish longer than 23" out of every 10000 caught	<i>4 lunkers out of 10000</i> An average angler will catch 4 fish longer than 23" out of every 10000 caught	<i>5 lunkers out of 10000</i> An average angler will catch 5 fish longer than 23" out of every 10000 caught
Cost	License and stamp fees	<i>\$32 per year</i>	<i>\$45 per year</i> Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.	<i>\$70 per year</i> Cost is higher if you fish for Tautog, and the increased costs will be used for fishery management activities sufficient to deliver the outcomes described in the scenario.

Question D1.

Compared to your efforts to catch Tautog over the last five years, **will your fishing days in fall to catch Tautog change under the scenario you voted for above?** (Circle one)

Increase more than 48 days	Increase 36-48 days	Increase 24-36 days
Increase 12-24 days	Increase less than 12 days	
No Change		
Decrease less than 12 days	Decrease 12-24 days	Decrease 24-36 days
Decrease 36-48 days	Decrease more than 48 days	

Question D2.

Of anglers you know, **do you think they are likely to disregard** the harvest restrictions **under the chosen scenario?** (Circle all that apply)

Violate size limit	Violate daily possession limit	Violate season length limit
No		

Question D3.

What do you think the probability is that your voted option will be implemented?

[0%, 10%) [10%, 20%) [20%, 30%) [30%, 40%) [40%, 50%) [50%, 60%) [60%, 70%)
[70%, 80%) [80%, 90%) [90%, 100%)

Section III: List Count Question

Each of the following questions presents a list of actions. Go through these actions, count how many of the listed actions will you do under the scenario presented by the question, and circle the number below.

For Group 1:

Question A. How many of the following actions will you take if only fish between 16 inches and 19 inches can be harvested in the future?

- Increase fishing effort on other fish species;
- Reduce fishing effort on Tautog;
- Increase fishing effort on Tautog;
- Focus more on catching and releasing (trophy fishing);
- Keep large Tautog regardless of the regulations.

Your Count: 0 1 2 3 4 5 (please circle a number here)

Question B. How many of the following actions will you take if the minimum harvest size is increased to 17 inches in the future?

- Increase fishing effort on other fish species;
- Reduce fishing effort on Tautog;
- Increase fishing effort on Tautog;
- Focus more on catching and releasing (trophy fishing);

Your Count: 0 1 2 3 4 (please circle a number here)

Question C. How many of the following actions will you take if the current management is kept in the future (i.e., you can only harvest Tautog larger than or equal to 16 inches)?

- Increase fishing effort on other fish species;
- Reduce fishing effort on Tautog;
- Increase fishing effort on Tautog;

- Focus more on catching and releasing (trophy fishing);
- Keep Tautog smaller than 16 inches regardless of the regulations.

Your Count: 0 1 2 3 4 5 (please circle a number here)

Section IV: Demographic Information Question

Please circle answers that fit you best.

1. What is your gender?
 - A. Male
 - B. Female
 - C. Not-gender conforming
 - D. Prefer not to answer
2. Which range covers your age?
 - A. 18-20
 - B. 21-30
 - C. 31- 40
 - D. 41- 50
 - E. 51- 60
 - F. 61 -70
 - G. 71 or above
 - H. Prefer not to answer
3. What is the highest level of education you have completed?
 - A. High school or less
 - B. Associate's degree or some college
 - C. Bachelor's degree
 - D. Graduate degree or some graduate school
 - E. Prefer not to answer
4. What category best describes your annual household income before taxes?
 - A. < \$25,000
 - B. \$25,000-\$49,999
 - C. \$50,000-\$99,999
 - D. \$100,000-\$149,999
 - E. \$150,000 - \$200,000
 - F. > \$200,000
5. With what racial or ethnic group do you most closely associate?
 - A. White
 - B. Hispanic, Latino, or Spanish
 - C. Black or African American

D. Asian

E. American Indian or Alaska Native

F. Middle Eastern or North African

G. Native Hawaiian or other Pacific Islander

H. Some other race or ethnicity

6. Do you have at least one child that fishes with you or might fish in the future?

A. Yes

B. No

7. If you have anything related to this survey to say, share it with us! We appreciate any comments you make here!

Appendix B. Front and Back of Sample Postcard

	
<p>Long Island Sound Tautog Fishing Study</p> <h1>SURVEY OF ANGLERS</h1>	
<p>Dear -FIRST_NAME-:</p> <p>Anglers enjoy fishing for Tautog (also known as Blackfish) in Long Island Sound. Unfortunately, the Tautog population has declined, resulting in a shorter fishing season and a smaller daily limit. University of Connecticut researchers have developed a survey to explore different management options that could enhance your fishing experience and rebuild the Tautog population.</p> <p>Please join us in helping to improve fishing for Tautog! Go to our survey at https://tautog.research.uconn.edu/, and answer with your authorization code (this must be entered exactly):</p> <p>-AUTHCODE-</p> <p>You will be entered in a lottery to win one of ten \$100 gift cards after you finish the survey with this authorization code. Your privacy will be protected: all of your answers will be kept strictly confidential within the research team.</p> <p>We also have a limited number of paper surveys available. If you prefer one, email us at eric.schultz@uconn.edu or call us at (860) 486-4692, providing the authorization code above and your home state (CT), and we will mail you the hard copy!</p> 	<p>KFS #5645510 University of Connecticut 75 N. Eagleville Road, Unit 3043 Storrs, CT 06269-3043</p> <div><p>NON-PROFIT ORG. U.S. POSTAGE PAID STORRS, CT PERMIT NO.3</p></div> <p>-FIRST_NAME- -LAST_NAME- -ADDRESS- -CITY-, -STATE- -ZIP_CODE-</p>

Appendix C. Demographics and Background Variables

Table C1. Summary statistics for respondents who completed (N=2461) and started but did not complete (N = 673) surveys. Entries in the table are means (except where indicated) and standard deviations in parentheses. A) Proportion of survey respondents by state, by survey invitation method, and the length of time devoted to the survey. B)-G) Demographic characteristics elicited in Section IV of the survey. Respondents who did not complete the survey did not fill out this section. H)-K) Fishing history characteristics elicited in Section I of the survey. L) Expected change in catch under status quo management elicited in Section I of the survey.

	Completed	Not completed
A)		
Connecticut	0.746 (0.435)	0.694 (0.461)
Duration in seconds (median)	860	172
Postcard	0.066 (0.248)	0.037 (0.189)
B) Gender		
Female	0.044 (0.205)	.
Male	0.740 (0.439)	.
C) Age		
18 to 20	0.011 (0.106)	.
21 to 30	0.055 (0.228)	.
31 to 40	0.104 (0.306)	.
41 to 50	0.144 (0.351)	.
51 to 60	0.210 (0.407)	.
61 to 70	0.186 (0.389)	.
Above 71	0.077 (0.267)	.
No response	0.199 (0.399)	1
D) Educational level		
High school or less	0.123 (0.328)	.
Associate's degree or some college	0.209 (0.407)	.
Bachelor's degree	0.230 (0.421)	.
Graduate degree or some graduate school	0.204 (0.403)	.
No response	0.200 (0.400)	1
E) Annual Income		
Below 25k	0.032 (0.176)	.
25k to 50k	0.066 (0.249)	.
50k to 100k	0.214 (0.410)	.
100k to 150k	0.211 (0.408)	.
150k to 200k	0.127 (0.333)	.
Above 200k	0.115 (0.319)	.
No response	0.234 (0.424)	1

Table C1 (cont'd).

	Completed	Not completed
F) Ethnicity		
American Indian or Alaska Native	0.002 (0.045)	.
Asian	0.024 (0.154)	.
Black or African American	0.010 (0.100)	.
Hispanic, Latino, or Spanish	0.019 (0.137)	.
Middle Eastern or North African	0.001 (0.029)	.
Native Hawaiian or other Pacific Islander	0.002 (0.045)	.
White	0.703 (0.457)	.
No response	0.216 (0.411)	1
G) Intergeneration Context		
Have a child to fish with	0.549 (0.498)	.
No response	0.202 (0.401)	1
H) Effort		
Days saltwater fishing	57.0 (57.2)	51.4 (57.2)
Days Tautog fishing	13.5 (20.5)	14.4 (26.8)
Days Tautog fishing in the fall season	9.59 (10.6)	8.65 (10.5)
Hours per day	4.58 (2.4)	4.51 (1.9)
Tautog caught per day	6.73 (8.1)	6.33 (7.9)
Tautog kept per day	1.84 (1.9)	1.71 (1.6)
I) Profession		
Related to recreational fishery	0.129 (0.335)	0.055 (0.228)
Related to commercial fishery	0.027 (0.162)	0.015 (0.121)
No response	0.002 (0.040)	0.514 (0.500)
J) Angler type		
Food	0.118 (0.322)	0.059 (0.237)
Fun	0.270 (0.444)	0.098 (0.298)
Legacy	0.236 (0.425)	0.132 (0.339)
Big enough to eat	0.302 (0.459)	0.138 (0.345)
Trophy	0.061 (0.239)	0.037 (0.189)
No response	0.013 (0.112)	0.535 (0.499)
K) Enforcement		
Times encountered enforcers	1.77 (3.04)	1.14 (1.35)
Times encountered vehicles	4.99 (24.37)	4.32 (8.60)
No response	0.003(0.057)	0.82(0.388)

Table C1 (cont'd).

	Completed	Not completed
L) Change in catch		
No change	0.169 (0.375)	0.059 (0.237)
Catches will increase	0.046 (0.208)	0.012 (0.108)
Keepers will increase	0.037 (0.190)	0.007 (0.086)
Lunkers will increase	0.020 (0.140)	0.009 (0.094)
Catches will decrease	0.535 (0.499)	0.135 (0.342)
Keepers will decrease	0.479 (0.500)	0.119 (0.324)
Lunkers will decrease	0.350 (0.477)	0.073 (0.260)
No response	0.004 (0.067)	0.700 (0.459)