Atlantic States Marine Fisheries Commission

Atlantic Striped Bass Management Board

August 6, 2026
8:30 – 9:30 a.m.

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 *(C. Batsavage)*	8:30 a.m.
2.	Board Consent • Approval of Agenda • Approval of Proceedings from May 2026	8:30 a.m.
3.	Public Comment	8:35 a.m.
4.	Consider Comments to NOAA Fisheries on its Document: *Charting a Course for Striped Bass: Science and Regulatory Innovation for Offshore Aquaculture (E. Franke)* **Action**	8:45 a.m.
5.	Consider Approval of FMP Review and State Compliance for the 2025 Fishing Year *(E. Franke)* **Action**	9:10 a.m.
6.	Update on 2027 Benchmark Stock Assessment *(K. Drew)*	9:20 a.m.
7.	Review and Populate Advisory Panel Membership *(T. Berger)* **Action**	9:25 a.m.
8.	Other Business/Adjourn	9:30 a.m.

The meeting will be held at The Westin Crystal City (1800 Richmond Highway, Arlington, VA; 703.486.1111) and via webinar; click here for details.

MEETING OVERVIEW

Atlantic Striped Bass Management Board
May 4, 2026
1:15 p.m. – 3:30 p.m.

Chair: Chris Batsavage (NC) Assumed Chairmanship: 2/26	Technical Committee Chair: Tyler Grabowski (PA)	Law Enforcement Committee Rep: Sgt. Jeff Mercer (RI)
Vice Chair: Nichola Meserve (MA)	Advisory Panel Chair: Eleanor Bochenek (NJ)	Previous Board Meeting: May 4, 2026
Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, DC, PRFC, VA, NC, NMFS, USFWS (16 votes)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from May 2026

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. Comments to NOAA Fisheries on Offshore Striped Bass Aquaculture (8:45-9:10 a.m.) Action
Background • In January 2024, NOAA Fisheries Office of Aquaculture provided a presentation to the ISFMP Policy Board on aquaculture in the EEZ, specifically of Atlantic striped bass. • The Policy Board requested NOAA Fisheries provide further information on several issues including environmental concerns, economic concerns, and enforcement/legal concerns. • NOAA Fisheries developed a draft technical memorandum on both the science and environmental issues as well as legal and policy issues regarding striped bass aquaculture and presented the report to the Board in February 2026 **(Meeting Materials)**. • NOAA Fisheries is seeking feedback from the Commission on the technical memorandum. • Board members provided comments to Commission staff via email to inform a draft letter to NOAA Fisheries for Board consideration **(Meeting Materials).**
Presentations • Overview of Board comments by E. Franke
Board action for consideration at this meeting • Approve for ISFMP Policy Board consideration a draft letter to NOAA Fisheries with feedback on the NOAA technical memorandum regarding offshore striped bass aquaculture

5. Fishery Management Plan Review (9:10-9:20 a.m.) Action
Background • State Compliance Reports were due on June 15, 2026. • The Plan Review Team reviewed each state report and compiled the annual FMP Review **(Supplemental Materials).** • There are no *de minimis* requests.
Presentations • Overview of the FMP Review Report by E. Franke
Board action for consideration at this meeting • Accept 2026 FMP Review and State Compliance Reports for the 2025 fishing year

6. Update on the 2027 Benchmark Stock Assessment (9:20-9:25 a.m.)
Background • The 2027 Benchmark Stock Assessment is underway. • The Assessment Workshop is scheduled for August 24-28, 2026 in Arlington, VA. • The NRCC peer review is being scheduled for late May/early June 2027 to allow sufficient time to incorporate the revised MRIP time series into the assessment.
Presentations • Update on the Benchmark Assessment by K. Drew

7. Advisory Panel Membership (9:25-9:30 a.m.) Action
Background • Mike Waine, with the American Sportfishing Association, has been nominated to the Atlantic Striped Bass Advisory Panel as a North Carolina representative.
Presentations • Nomination by T. Berger
Board actions for consideration at this meeting • Approve Advisory Panel nomination

8. Other Business/Adjourn (9:30 a.m.)

DRAFT PROCEEDINGS OF THE

ATLANTIC STATES MARINE FISHERIES COMMISSION

ATLANTIC STRIPED BASS MANAGEMENT BOARD

The Westin Crystal City
Arlington, Virginia
Hybrid Meeting

May 4, 2026

These minutes are draft and subject to approval by the Atlantic Striped Bass Management Board.
The Board will review the minutes during its next meeting.

TABLE OF CONTENT

INDEX OF MOTIONS

1. **Approval of agenda** by consent (Page 1).

2. **Approval of Proceedings of February 2026** by consent (Page 1).

3. **Move to use a steering committee process** (Page24). Motion by Shanna Madsen; second by Dave Sikorski. Motion passes by unanimous consent (Page 26).

4. **Move to elect Nichola Meserve as the Vice-Chair of the Atlantic Striped Bass Management Board** (Page 29). Motion by Megan Ware; seconded by John Clark. Motion passes by unanimous consent (Page 29).

5. **Move to adjourn** by consent (Page 30).

ATTENDANCE

Board Members

Megan Ware, ME, proxy for C. Wilson (AA)
Steve Train, ME (GA)
Kevin Sullivan, NH, proxy for Renee Zobel (AA)
Doug Grout, NH (GA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)
Nichola Meserve, MA, proxy for D. McKiernan (AA)
Ray Kane, MA (GA)
Rep. Sarah Peake, MA, proxy for Rep. Armini (LA)
Jason McNamee, RI (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)
David Borden, RI (GA)
Shanna Madsen, CT (AA)
Bill Hyatt, CT (GA)
Robert LaFrance, CT, proxy for Rep. Gresko (LA)
Marty Gary, NY (AA)
Emerson Hasbrouck, NY (GA)
Kris Kuhn, PA, proxy for T. Schaeffer (AA)
Loren Lustig, PA (GA)
Joe Cimino, NJ (AA)
John Clark, DE (AA)
Roy Miller, DE (GA)
Michael Luisi, MD, proxy for K. Charbonneau (AA)
Robert T. Brown. MD, proxy for R. Dize (GA)
David Sikorski, MD, proxy for Del. Stein (LA)
Joe Grist, VA (Acting AA)
JJ Minor, VA (GA)
Chris Batsavage, NC, proxy for K. Rawls (AA)
Malcolm Rhodes, SC (GA)
Erika Burgess, FL, proxy for J. McCawley (AA)
Daniel Ryan, DC
Ron Owens, PRFC
Max Appleman, NMFS
Lowell Whitney, US FWS

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

Ex-Officio Members

Jeff Mercer, Law Enforcement Committee Rep.

Staff

Bob Beal
Toni Kerns
Tina Berger
Madeline Musante
Caitlin Starks
Tracey Bauer
James Boyle
Chelsea Tuohy
Katie Drew
Jeff Kipp
Samara Nehemiah
Jainita Patel

The Atlantic Striped Bass Management Board of the Atlantic States Marine Fisheries Commission convened in the Jefferson Ballroom of the Westin Crystal City Hotel, Arlington, Virginia, via hybrid meeting, in-person and webinar; Monday, May 4, 2026, and was called to order at 1:15 p.m. by Chair Chris Batsavage.

CALL TO ORDER

CHAIR CHRIS BATSAVAGE: Good afternoon, everyone. I would like to call the Striped Bass Management Board meeting to order. My name is Chris Batsavage; I'm the Administrative Proxy from North Carolina and I'll be serving as Chair. Before I go to board consent on the agenda, I will check with Toni Kerns and see which Commissioner's Board members are online.

MS. TONI KERNS: I believe it is just Monica Martinez from New York.

CHAIR BATSAVAGE: Thanks, Toni. Start off with.

MR. JOSEPH GRIST: James Minor is also on.

APPROVAL OF AGENDA

CHAIR BATSAVAGE: Thanks, Joe. All right, start off with approval of the agenda. Are there any modifications to the agenda that anyone would like to make. Seeing none then that is approved.

APPROVAL OF PROCEEDINGS

CHAIR BATSAVAGE: Next is approval of the proceedings from the February, 2026 Board Meeting. Are there any modifications to the proceedings that anyone would like to offer? Seeing none; those are approved.

PUBLIC COMMENT

CHAIR BATSAVAGE: Next up is Public Comment. This is an opportunity for members of the public to provide comment on items not on the agenda. If there is time later on, I will try to offer a little bit of time for the public to provide comments on those particular items, but just checking for anything not on the agenda if you have any comments. None in the room and none online.

DISCUSS 2027 BENCHMARK STOCK ASSESSMENT

CHAIR BATSAVAGE: Next up is our first main item on the agenda, which is the 2027 Benchmark Stock Assessment Biological Reference Points and Spatial Management. Katie Drew will be doing a presentation on that, so Katie, whenever you're ready.

DR. KATIE DREW: Basically, today I'm just going to give you a quick, one-slide background on our current BRPs and then go to the topics that we're looking for Board input on, most notably sort of the question of balancing SSB and F, as well as sort of spatial management and what the Board's objectives and desires are on that. Then just a quick timeline of next steps. As a reminder, I think there have been some questions about, can we achieve the current target and threshold. We can say that striped bass were near or above the SSB target and the F threshold for about 2000 to 2010, which is this period highlighted in the box on the graph of recruitment. What we're pointing out with this graph is that that period of high SSB and high F was supported by a series of very strong year classes from 1993 to 2003, which are highlighted with those yellow bars.

You can see that recruitment has dropped off since then. While the SSB target is still attainable, the F rate required to do so under our current low or very low recruitment levels, may not be acceptable or palatable managers and stakeholders' level with the current recruitment. I think we came to the Board and said, interested in maybe some potential alternatives to this.

We will be exploring other reference point definitions to address TOR Number 6 as part of this assessment. We will be looking at model-based reference points like SPR or MSY proxies where we can.

PROVIDE GUIDANCE TO STOCK ASSESSMENT SUBCOMMITTEE ON BIOLOGICAL REFERENCE POINTS AND SPATIAL MANAGEMENT

DR. DREW: But we are also interested in hearing some guidance from the Board about how did the Board want to balance preserving SSB and allowing fishing, and what did the Board want from a spatial management framework as we go forward with this assessment?

At this point we don't need Board consensus on these issues and we don't need a specific BRP definition. We are just looking for some input to help the SAS develop some options going forward, so a range of opinions and kind of like what are the factors that you're thinking about and that you consider most important for managing the species.

As we work through the science, we can be keeping your objectives in mind and developing something that is scientifically appropriate, but also meets your management objectives as we go through this. In terms of the question of sort of balancing SSB and F. There is a tradeoff between preserving SSB and allowing F.

A higher fishing mortality is going to lead you to a lower SSB, whereas a higher SSB will require a lower F to maintain that SSB level. Lowering the SSB reference points would allow for a higher F target and a higher F threshold, but will not necessarily increase catch. This is because SSB is really a proxy for larger fish in the ocean region. Lower SSB means lower abundance of 28 inch plus fish in general.

Therefore, lower catch rates and encounter rates in the ocean fishery. It would be helpful to receive input on a number of things. We showed this last time around. I'm just going to highlight a couple of the ones in bold here, which are maybe more graspable in our time here today, which is for example, a preferred historical time period for F reference points and/or for SSB reference points when you are satisfied with fishery performance, either as a target to shoot for or a level that you do not want to go below.

In terms of the lower limit on acceptable SSBs relative to 1995 levels, or based on a historical time period. We can also think about or talk about the relative importance of maximizing yield versus maximizing catch rates or the availability of trophy sized fish, or acceptable levels of risk or other metrics, in terms of stock health, like not just SSB but abundance of specific age or size classes and things like that. This is sort of the question on balancing SSB and F, and this is really relevant to kind of our more empirically derived reference points. Obviously, like I said, we'll be trying for model-based reference points. They have not always worked out for this model in the past, which is why we have continued to move forward with the empirical reference points. But the empirical reference points require more management guidance, in terms of setting targets and thresholds.

The other side of this that we are also working towards a spatial model for this benchmark, which presents sort of additional questions or additional challenges for management. If this model does not pass peer review again, then this part is somewhat moot. But I think we are striving for a more spatially informed model.

Currently we have a single set of coastwide reference points for this coastwide sort of meta complex of striped bass, with separate regional management regimes. We do not have separate reference points for our different producer areas and the ocean, but we still have the flexibility of allowing different management measures and different management objectives in those regions to account for differences in the availability of fish, and the differences in those fisheries at that level.

This is something that we can maintain going forward. A spatial model we can still maintain a single overall reference point if we so desire, and then have spatial management regimes. But we are interested in knowing if the Board is truly interested in spatial reference points, that is having specific targets and thresholds by region to evaluate stock status against, or again would you prefer to keep out current approach and just use a more spatially informed model.

I think one of the things to think about as you are sort of debating this is, you know what happens when one region exceeds the F threshold and another region does not, or in the case of sort of multi-stock reference points. What happens when one stock is overfished or experiencing overfishing and the other stocks are not? How is that managed in our mixed stock fisheries?

The other question is kind of what to do with Delaware Bay in particular. We are exploring the option of trying to model Delaware Bay separately, but the data for that stuff is more limited than for the other two regions, and as a result you know we may not be able to actually model Delaware Bay separately. In that case what happens to Delaware Bay is it lumped in with the Chesapeake Bay, is it lumped in with the Ocean region?

That is something that we can, there are different implications for that within the model, neither one is more right or more wrong, it just depends on kind of what do you want to do with Delaware Bay and Chesapeake Bay and the Ocean as separate regimes or separate regions that reflect differences in fishing mortality, fishing effort within the model.

Combining Chesapeake Bay and Delaware Bay is sort of more in line with recent research on the genetic similarity of these fish, and the frequent movement of fish between the Bays via the C and D canal. We can model it both ways, and like I said, they would be sort of equally accurate or equally inaccurate, different assumptions and different implications for the model.

Then a third question of, is the Board interested in developing BRPs for the Hudson River specifically if the data supported that, as opposed to kind of this combined ocean region. In terms of next steps, ideally the Board will provide some guidance or some thoughts, some feelings to the SAS that we can consider as we go forward. Obviously, we are going to focus on sort of what is the best use of the data, the best scientific and biological approach to these models from our technical perspective.

But there are aspects of this that rely on management objectives. The right reference point will depend in part on how well you meet your management objectives, and that is what we're hoping to get from the Board today, so that we can provide you with something that is both technically and scientifically accurate and defensible, but also addresses your objectives.

Over the summer we'll work on incorporating your feedback into our BRP options as we continue with the assessment. We will have our assessment workshop the week of August 24, and then sometime in March we will have the review workshop that is going to be the spring research track. I do not believe we have specific dates for that yet.

At that point the Peer Review Panel will provide some feedback on the reference points, either the specific reference points that are chosen or maybe the methods to develop those reference points. That when you come back to, at the spring or the summer meeting, you will receive this assessment as well as BRP options for consideration. With that I am happy to take questions, or ideally, some guidance from the Board.

CHAIR BATSAVAGE: Thanks, Katie. We'll start with any questions Board members have on what Katie just presented. Once we kind of get past that question today I'll be looking for any input that Katie has requested. A show of hands here, start down the left side of the table, my left at least, Jason McNamee followed up by Bill Hyatt.

DR. JASON McNAMEE: Thank you, Katie. This is a question to start matters. With the empirical reference point, I remember there was like an evolution there, so they had set that SSB reference points in 1995. But then I remember early on in my tenure on this Board there was like this disconnect between the F metric in that point and time. Can you remind me? Like I know we connected them at one point, but I can't remember exactly what it was that we did to make them kind of congruent.

DR. DREW: Right, so for a while the SSB reference point was that 1995 value and then the F reference point was FMSY. But we found out during, I think it was the 2013 assessment, that basically if you project the population forward at FMSY you don't get back to the 1995 value. You actually get back to a lower SSB level.

We have concerns about the reliability of the stock recruit relationship that was needed to calculate FMSY and we had concerns about how well that would fit and how accurate that was. Given that the Board had sort of expressed a preference for, within the document the management itself.

The objective was really focused on expanding that age structure, things like that, so we kept the 1995 SSB value and then calculated the F value that you would need to get there under recent recruitment. Basically, from about the time, slightly before the stock was rebuilt to the most recent terminal year, drawing from that recruitment. The other option would be to pick a fishing mortality rate that the Board was satisfied with or that they wanted to aim towards, and then accept the SSB that you end up with as your target and threshold. I think that is kind of, if the Board has preferences on that and would like to see that explored, I think we could definitely do that.

CHAIR BATSAVAGE: Next up I have Bill Hyatt.

MR. WILLIAM HYATT: This is a question that I'm hoping leads to a suggestion. It has to do with the balance between yield and catch rate. I think that is going to be important in the discussions as we go forward. The question is, do you feel that for striped bass, for the striped bass recreational fishery that there is enough economic data on that fishery available to provide some insights that would guide us trying to make that balance?

I'm asking it from the context, you know a lot of the fisheries that we discuss around this table everybody brings up economic data, and it is sort of like there is a vacuum there. There just isn't enough data to have a meaningful discussion. On the other hand, I'm very well aware that for many recreational fisheries, marine and inland, there is sufficient data to kind of guide those tradeoffs and sort of quantify what those tradeoffs actually mean to the communities involved.

Question, is your knowledge of the economic data associated with the coastal striped bass recreational fishery. Do you believe that there is sufficient data, and then if so a suggestion that that should be a significant part of what we look at going forward.

DR. DREW: I would say probably the economic data for striped bass are better than some of our other species. I think that whether we could, how robust and quantitative we could be, in terms of developing options that maximize economic value, as opposed to maximizing yield. I don't know if we're there yet.

There is a Recreational Demand Model being built for striped bass to kind of help answer some of these questions and help get input from anglers on sort of preferred feedback, or preferred tradeoffs or preferred management measures, in terms of some of these questions. I don't know that we will have enough economic data to build something truly robust and quantitative in that sense.

But if the Board would like to consider. I mean there are things we can provide sort of on the modeling side, in terms of things like what does this reference point translate into, not into total SSB, but into maybe your abundance or your perceived catch rates or is it more important to you to be able to go out and catch a lot of fish, even if you can't keep all of them, or is more important for you to go out and catch a keeper?

Is it more important to you to go out and catch and keep something, even if it is small. These are the kinds of questions we will possibly be able to get at through some of the current research. But we can at least present strategies to maximize each of those outcomes, if you will. But the circumstance, all we're controlling is sort of turning that dial on fishing mortality. What matters to the stock is how hard you're fishing. The economics, I think come into play, in terms of the preferred management options to control and keep you at that F. But the F that you need is more about what is your goal for the fishery for the stock. I don't know if that is helpful or not.

CHAIR BATSAVAGE: Do you have a follow up?

MR. HYATT: No, it is. Just a quick follow up. What I was hoping is that there would be enough information there to at least translate a tradeoff between yield and catch rate into how it would influence trips, trips associated with certain expenditures, et cetera. I suspect that there is enough to tease some of that out at least, maybe not at the 5,000-foot level, but the 10,000- or 20,000-foot level. That is what I would be looking for.

MS. KERNS: I don't know if there is, Bill. I think it depends on when the last time MRIP asked some economic questions of the striped bass surveys, and they do some economic add-on questions, and I just don't know when that last was. I'll doublecheck with the folks that are working on the Recreational Demand Model, to see if we had any tradeoff questions in that avenue. But that model is not going to be done in time for August.

CHAIR BATSAVAGE: Show of hands again. I had Shanna and Mike. I have a few on my list here so I'll start with Shanna Madsen.

MS. SHANNA MADSEN: My question is probably for Toni and Katie. I'm trying to kind of think through the timelines associated with, also what we're going to be speaking about next, our work group. What I'm trying to think about is, if we give you some level of guidance, some BRPs we might like to see today. Those will go through the assessment; we'll get those back out on the other end in 2027. If we decide at that point that we would like to see some other level of BRPs did those need to also be peer reviewed, in order for them to be applied?

DR. DREW: Yes. I think we do need our reference points to be peer reviewed. Now, I think we can provide. What we've done with ERPs, as you know, is we've provided a method that got peer reviewed. Then the Board was allowed to sort of use that tool to come up with a reference point that met their objective.

Depending on the feedback that we get from the group today, try to come up with something that, and make it clear to the Peer Review as we go through that this is a tool to help the Board meet its management objectives. Depending on sort of what those objectives are, there may be room to change the final value, or to change sort of that balance, as long as the Peer Review Panel signs off on that.

The Peer Review Panel may come back and be like, no this is a terrible idea, you are going to pick F40% and you are going to like it. But we will try to come up with something, especially like I said, if we don't have like a real strong vision from the Board at this moment. Try to come up with something that can allow a little bit of flexibility down the road once the Board has dived into some of these questions a little more.

CHAIR BATSAVAGE: Follow up.

MS. MADSEN: Thank you, Katie, I think that helps a ton to clarify kind of exactly what I am thinking, as far as like timelines integrating this into this work group that we will be discussing. To follow up to my question. I guess I would go ahead and just give you a suggestion since I'm here and I'm on it.

My suggestion would be to do something just like that, keeping the tool itself flexible such that whatever comes out on the other end, like we did for ERPs kind of gives us a chance to maybe reevaluate some of our management objectives, such that those ERPs might vary. But we're using the same tool that has gone through peer review to get there. That is my thought process.

CHAIR BATSAVAGE: Mike Luisi.

MR. MICHAEL LUISI: Dr. Drew, a couple slides back there was some reference to the spatial management part that you're looking for some advice on. I'm trying to understand so that I can communicate this effectively with my stakeholders in Maryland. In Maryland there is constant ask. There is an ask all the time as to when is Maryland/Virginia going to be able to manage the Chesapeake Bay with that Chesapeake Bay reference point?

This is not a new conversation; this is something that has been around for a decade plus. At the last benchmark assessment there was some exploration through that process that did not lead to a peer reviewed approval. In your slide you spoke about. The question is, on your slide that spoke about having one reference point for the coast and then having spatial regimes. Is that what wasn't approved the last time, or was it specific Bay reference points for the different areas that would be deemed as, I guess the nursery areas?

DR. DREW: What was not approved last time was the spatial model. The spatial model had stock-specific reference points as well as sort of the fishing mortality that the Chesapeake Bay stock was experiencing in the Bay and in the ocean. There was a combination of sort of stock and spatial dynamics.

We developed reference points that would, there was a spatial component to the reference points. The Peer Review Panel did not love some of the choices that we made on that front, and I think gave us some feedback about how to go forward with kind of the idea of a spatial approach or a stock-specific approach, those kinds of questions.

I would say it's not that those specific definitions failed last time, it was more like the larger model wasn't ready to provide that information yet. We're going to try again this time. I think one of the things that we are interested in knowing is like if you guys, if that continues to be a priority for you to have spatial specific reference points, and if so at what kind of spatial level?

I think there is definitely sort of nuances to that at thinking things through like, what happens if one region exceeds their target and the other does not, but the stock overall is healthy, those kinds of questions, which is more of a management question. But yes, I don't know if that answers your question or not.

CHAIR BATSAVAGE: Follow up, Mike?

MR. LUISI: Just to kind of tie a bow on this. My advice would be, and it sounds like you are already moving in that direction to continue to explore the modeling approaches that would be used to establish spatial reference points. I'm not going to go on the record today and say that if that were to be the case that we would implement.

You know I would like to learn from it and understand the interplay between the different components of the stock, and to understand how managing one independently of the other could result in benefits to the entire stock. I don't know enough, I haven't seen enough.

Obviously, it wasn't supported by the Peer Review last time to really get into it. But I like the idea. I hope that we'll continue to move in that direction, and then have the opportunity to review, evaluate and understand the results, so that we can make decisions down the road.

CHAIR BATSAVAGE: John Clark.

MR. JOHN CLARK: Thank you for the update, Katie. I had a question. The graph you shared, I've been one of the people that brought up the reference points, especially for the SSB, that the target has seemed very high, and especially when you look at the SSB during the 2000s, when we were at historically high population of striped bass.

The graph you showed there, you said it was exceeding the target during the entire 2000s, right, during the aughts. Whereas, the one on the website shows it just barely, I mean it passes the target maybe four years out of the aughts, and the previous assessment. I remember it may have surpassed the target, so maybe just two years, and yet the F we're working with is based on the target, correct? Like we're trying to achieve that.

DR. DREW: Right, the size specifically says near or above the SSB target, so it included basically the confidence intervals included to the target for these years. It was similar to the target, and it's true, it only exceeded the target for a few years out of there, but it was close to there.

MR. CLARK: Right, and that's with the most recent assessment. But in previous assessments, I remember the one previous to this. I think it only surpassed the target once or twice during that time. Once again, I'm just kind of curious, because this makes it look like setting F to the target is not setting a really high reference point for SSB. Whereas, I think overall the target is a very high SSB, because when I see that and I recall what the striped bass population was in Delaware Bay during the aughts, it was really huge compared to where it is now.

DR. DREW: Right, and I think, so the point of this slide was, you know we've had questions of can you reach the target, and the answer is yes. We can and we have in the past. However, where we are now in terms of recruit. During that time, we were also overfishing, basically that entire time.

The fishery seemed great, in terms of a ton of fish out there, we had a ton of catch et cetera. But it was also supported by a lot of these really strong year classes that were coming in and sort of replacing that essentially overfished, overfishing levels. Again, it's biologically attainable, yes. Is it attainable from a management/stakeholder perspective now?

CHAIR BATSAVAGE: Emerson Hasbrouck.

MR. EMERSON HASBROUCK: Thank you, Dr. Drew for your presentation. Dr. Drew, one of the slides that you had up there, I don't remember which one it was. One of the bullets was maximizing yield versus maximizing catch rate. For that bullet are you defining yield as SSB?

DR. DREW: I think in that case we would be defining yield as the traditional sense of harvest.

MR. HASBROUCK: Okay.

DR. DREW: That can be in terms of a small number of very large heavy fish or a large number of very small fish.

MR. HASBROUCK: That's not really exclusive then of maximizing catch rates, right, because catch rates are going to include harvest.

DR. DREW: Right, do you want to maximize the number of fish out there that you can encounter, or how often you can catch them, or do you want to maximize sort of how many of them you can land? To get high catch you've got to have a higher abundance out there. But you can get high yield by applying a heavy F to a small population, or you can get that same yield by applying a very low F to a large population.

Those will have different implications, depending on are you landing all those fish and taking them back, and it takes you a while to do that, or are you going out and catching and releasing a lot, but there is a lot of them out there to be available to you. The restrictions on them are just very tight. That is kind of where you can get to the same yield, but can you get to the same fishery experience in those different scenarios.

MR. HASBROUCK: The second part of my question goes to using stock recruitment relationship. I think you mentioned that it was a question about using that stock recruitment relationship to calculate MSY. We kind of abandoned that stock recruitment relationship, so is that where we are right now that there is no stock recruitment relationship with striped bass?

DR. DREW: There is clearly some kind of stock recruit relationship, right. If you don't have spawning stock biomass you won't get any recruitment. You have some spawning stock biomass you are going to get some recruitment. But for striped bass I think there were two factors that we were concerned about, which is number one, the strong environmental influence on the actual recruitment that you see.

There is a lot of variability of right now we're sort of at a level of SSB that we were at in the early '90s, and yet the recruitment levels that we have seen are nowhere near that. Then the issue with that is that then the reference points are very sensitive to what you're assuming about or what you're estimating that steepness as in that relationship, and small changes in adding years of data, even though the sort of scatter plot doesn't look that different, it can affect the fit and can change the reference point from year to year if there is a lot of uncertainty or a lot of noise in that relationship.

MR. HASBROUCK: That was a good answer and we rushed right into the next part of the same question. Is there a minimum SSB that needs to be maintained, because as you just inferred, the environmental conditions kind of outweigh what is going on with SSB, in terms of recruitment. We can't control those environmental conditions, but we can try to control SSB.

But if there is no stock recruit relationship there, has anybody looked at, do we need to maintain a minimum SSB, you know to generate a good year class when we've got good environmental conditions. I mean there has to be some spawning adults in the population, but is there a minimum number?

DR. DREW: We have not looked at that. That is something we could potentially look at a little more. You know I think we do have a fairly decent history of extremely low SSB and extremely low recruitment. Can we parse that apart from the environmental effect that we're seeing? I don't know, but that is something we can look into a little more with this assessment.

CHAIR BATSAVAGE: Roy Miller.

MR. ROY W. MILLER: I wanted to just perhaps move off of that topic and focus a little bit on the question that you asked earlier with regard to spatial management, specifically the Delaware Bay stock. If you were to ask me, I kind of have mixed feelings about whether the Delaware Bay stock should be managed separately, or that it should be lumped in with the Chesapeake, or whether it should be managed as at present as part of the coastal stock.

I recall that we explored Delaware Bay separate management back in, I guess it was the late 1990s, and using tag-based estimates of that. The results were a little scary in that we decided that perhaps it wouldn't be a good idea to manage the Delaware Bay separately, based on those tag-based estimates.

I'm not sure which is the best way to go, but certainly, Katie, you hit upon the logic of the situation of the passage to and from the C & D Canal, both in terms of spawning adults moving and fry moving towards the Delaware Estuary. As I recall the net hydrological models showed that there was a tendency for the larvae to be carried into the Delaware system, more so than into the Chesapeake system from spawning in the canal.

I'm not entirely sure where we should go with this. But I think if you ask me for my opinion, I think it's logical to lump the Chesapeake and Delaware. Now, Maryland may not welcome us, I don't know. Virginia might not either, but anyway. I just thought I would lay that out there. Thank you.

CHAIR BATSAVAGE: I have a few more hands in the queue with questions, and I think from there we will probably transition over to providing some guidance to the SAS on Biological Reference Points and spatial management. Next up I have Doug Grout. Doug.

MR. DOUGLAS E. GROUT: I was going to ask you, are you ready for suggestions, because obviously there have been a couple commenters that have had valid good questions that they provided. I can put it off, but I have a couple of suggestions that I would like to bring forward. If you would rather me wait, I will be glad to until all the questions are through.

CHAIR BATSAVAGE: I think now is fine, even if there may be some general questions after that, while you have the mic, yes, please.

MR. GROUT: When Roy Miller and I were on the Technical Committee back in the '80s and '90s , and we were trying to figure out what a number of very intelligent scientists, one we were going to figure out how we were going to figure out we were covered, because we had the '82 year class, which you look at it now and it's nothing, and even an '89 year class is modest at best.

But then we got the 2023-year class and we knew we were on the right road at that point. But we were looking back at what occurred when we believed that the stock was healthy, which was back in the '60s. The thing that I remember noticing was you had strong year classes every 3 to 5 years that would show up very regularly. That is what we were kind of shooting for.

Once we saw periodic year strong year classes or dominant year classes every 3 to 5 years, it seemed like the stock would be healthy at that point. If that turned out that the Boards, and we said, well, 1995, we're here, this is a good level to shoot for. It seemed like a good level to shoot for, particularly with the kind of recruitment we were getting.

We were getting dominant year classes every 3 or 4 years. Fast forward to today, and we have had one strong year class in a decade, past decade. Clearly something has changed. I don't think we've really figured out what that is, whether it be temperature or flows, is there more predation going on than on some of the larval striped bass in the past.

But for whatever reason we are not getting nearly the year classes from the SSB we have right now that used to produce strong year classes. One of the things that I would like to suggest to the Technical Committee and SAS is to recognize this lack of productivity in developing the new threshold reference points.

I always look at targets as more of a management and threshold is something we don't want to go below, because we're afraid the stock is going to go down and eventually collapse because of that. That is one of the main things that I wanted to bring forward. I also kind of looked at this four years' worth of data that we had from the last stock assessment, and I noticed that we had some dominant year classes that were produced with SSB that was actually less than what our current target is.

For example, that very strong 1993-year class was produced with a female SSB of 73,000 metric tons. The most recent strong year class that we had or dominant year class was the 2015 one, and that was produced with an SSB of 67,000 metric tons. Maybe looking at that, it's not an exact stock recruitment relationship. But looking at what are the lower levels of SSB that have, when the conditions are right, the ability to produce a dominant year class or a strong year class, and that could be our threshold. Then the management could figure out what the target is.

CHAIR BATSAVAGE: A couple other hands, and for those folks if you have some input as well, you can give that too. But I have Marty Gary followed up by Nichola Meserve.

MR. MARTIN GARY: Sounds like you are transitioning into comments, so I do have a lingering question, so I'll use my turn to couple a question for Katie and a comment. The question, I know you touched on it a few times in the conversation already, Katie.

But I was hoping for a very distilled version of, so how do we manage these spatial BRPs when they aren't being fished independently, when there is a coastal take of mixed stock. I guess that could apply to the Hudson, Chesapeake and Delaware, so that is the question. Then I've got a quick comment after, Mr. Chair.

DR. DREW: There are two ways to do it, one of which is through a stock-specific reference point where you evaluate the fishing mortality that that stock is experiencing throughout its life. Again, in each region, and then decide. I think that would be maybe a question for the Board is, do you want to manage to the most sensitive stock in that complex?

If one stock is experiencing overfishing or is overfished under our current management regime, would you then take action on the fisheries that are exploiting that stock, so the mixed stock fishery and potentially the producer area fishery that it is coming from? That would mean that even if part of that stock complex is not overfished or experiencing overfishing, you would still need to be restrictive in that sense.

The other option would be to have sort of a fishing mortality rate apply to the regions, and say if fishing mortality overall in this region is too high, then we will bring it down and sort of not link it to specific necessarily stocks, but more about what is happening to either the stock's complex as a unit or each individual stock within that, you know if we exceed that reference point for the stock in that region then we would reduce fishing mortality in that region.

I think there is still the question of, what do you do if one region is exceeding the threshold, but the overall stock is not. But those are things I think we can sort out, maybe at the Board level of, in terms of thinking about it as allocating fishing effort or allocating fishing mortality instead of allocating yield.

MR. GARY: Quick comment, Mr. Chair. Thanks, Katie. You know having experienced that would put it in the camp back in the day when Louis Rugolo et al and the Harvest Control Model in Maryland, and the desire for the two-fleet paradigm was in place. Being at that meeting in Connecticut in 2014, when we tried desperately to hold onto that two-fleet system, and we acquiesced, obviously.

We changed to a coastal unit of management. I just feel like the uncertainty of what we're dealing with and listening to Doug Grout's comments, and looking at what has been happening these last few years. If you haven't paid attention to what has happened this spring, your flows in the Chesapeake are at like record levels. The Potomac is at 131-year low level. It's like no snow packs and what not. Things are so fundamentally different from the time that Doug explained or described. I'm not adverse to exploring the spatial nuances, but given the uncertainty of this stock and the complexity that this presents, I'm just very reticent to pursue it, thanks.

CHAIR BATSAVAGE: Next up is Nichola.

MS. NICHOLA MESERVE: I just wanted to reflect on some of the original rationale for the 1995 SSB as a reference point, and that having to do with the expanding age structure. That is something I would like to continue to see reference points focus on, is that wide age structure both from a stock resiliency perspective, as well as the fishery experience that results from it.

I would be surprised if MSY type reference points would lead us in that direction. One concern that I have with the current or with SSB reference points in general, whether it is 1995 or some other is that based on our current situation it can be masking other signs in the fishery. Right now, we have the assessment projecting that SSB may rebuild in a short number of years while abundance is below 1995 levels.

I am concerned that if we continue to just focus on SSB that it would be kind of a short-lived management response and ignoring what is coming down the road. If the SAS could give some thought to maybe a secondary reference point or somehow incorporating total abundance as well into the reference points that might be something worth consideration.

CHAIR BATSAVAGE: Jay McNamee:

DR. JASON McNAMEE: These are like ideas, direct guidance I guess I'll call it. I'll start with this first one, you know thinking about, I know we've had this discussion probably annually about MSY reference points and this like many stocks that we manage at the ASMFC the stock recruit relationship is not there.

Therefore, you cannot calculate the MSY reference point. But I am having some optimism that maybe the spatial model does a little magic and we're able to sort of understand. I'm not sure how it's going to treat recruitment. But all that being said, I think it is a big enough change that it is worth exploring, calculating an actual MSY reference point again. I think it is a worthwhile exercise.

Then I started thinking about, again my preference is always the happiest things, at least like connected within the machinery and so SPR is another version of that if we can't quite figure out the exact stock recruit relationship then we can base it around some other metrics, SPR being one of them.

I probably read a little too much into the memo, but I was thinking SPR 40% is sort of like a common one we use. It is considered to be conservative for the most part. I was thinking maybe the hesitancy there is that it kind of slides that reference point way too far down the curb. We've seen that tautog is an example of that, where you can kind of get that reference point to be way off that peak of abundance. That concern I think is fair. Then I started looking for other examples that are kind of like striped bass that use different SPR calculations, and the answer is there are not very many. The only versions that I saw where there was SPR 45% and SPR 50% was like reef fish that are hermaphrodite, with these atypical like traits. But all that being said, I think that would be worthwhile to do like a higher SPR, something that is even more conservative than F40%, so we can kind of take a look at that and it's connected to the model.

I think that would be a good way to go. I threw a lot of numbers out there at you, so maybe pick two of them, like a standard 40% and then add a 50% and just stick with those two. In the back of my mind, I'm wondering if there was actually some technical reason why we weren't using SPR reference points already, but maybe Kate, you can comment on that.

But let me get these last couple of things out and then I'll stop talking. Okay so there is some guidance. Then the empirical reference point, I think the nice thing about it is it's tractable, it's easy to sort of talk about and we all kind of understand it. I apologize if I'm just repeating what Doug has already said. If it is, then I support what Doug said.

I was wondering if, so right now the way the reference point is set up is it's the threshold that is set at that 1995 level, and then we bump the target up by 25% from that. I wondered if maybe we want to just set the target at that 1995 level, so we've seen it, right. That could be a spot that the stock could get to.

Then just flip the threshold to be 25% less than that. Just for context, another empirical reference point and then quickly, you said a couple comments about spatial management. Just from experience with other species. There has been concern by peer review panels about like calling it F, I guess I'll say it that way.

I think what you said before, Katie, to Marty's comment is in reference to that. I guess the comment I was going to make on this topic is, instead of trying to make like F reference points, spatially explicit, we could use other metrics like exploitation or something like that. Then we would have to sort of define the biomass level in these areas.

But we could use the different surveys in the areas that kind of guide us on that. Something like an exploitation rate that has some spatial X+ that is spatially explicit would be worthwhile. But I just worry a little bit about kind of defining different Fs for what is a single stock of fish in the end. I'll pause it there, and Katie if you have a comment to that, like technical issue with SPR I would be interested to hear that.

DR. DREW: We did look at SPR during the last benchmark assessment, and we found for the single stock non spatial model, like the F40% was very similar to either the F target or the F threshold that we were getting, but the projected SSB was much higher than the reference points. And since at that point the Board had already been making noises about those reference points are too high, we are like there is some kind of disconnect there that we are not capturing.

We did not have that same problem with the spatial model, which was also sex specific, so there may be some kind of sex and the differences in migration and the different rates that would do with this, the population is exposed to the different fisheries and the sexual dimorphism and growth may not be captured as well by the SPR reference point and the single-stock model that we were using at the time. That is kind of why we stayed with the current empirical reference points. I think we'll definitely take a look at it again for this benchmark. We can look at those numbers for sure and see if they are performing better or more intuitively with this either spatial model or the WAM model.

CHAIR BATSAVAGE: Craig Pugh.

MR. CRAIG PUGH: Thank you, Dr. Drew, is there a time constraint that is aligned with your spatial reference points?

DR. DREW: You mean time constraint in the sense of like over a specific set of years?

MR. PUGH: No, collection period. As you collect that spatial period, how does it focus on that time period of when you collected? As a fisherman that's our ultimate information. We base everything on that space at that time. If you are one day off, but you think because it is the fourth of May this year, it's not the same space as the fourth of May next year.

Being within that realm you can be very accurate, but I know from watching this for over 40 years, if I take that May 4 date and go back to that same spot, my data is going to be totally erratic and there is no congruency there whatsoever to give you good, solid information. That's what I'm getting at, how do we get to a better place and more accurate place?

I know that can be achieved, we've done it, we're doing that already in the fishery. That is what I am kind of asking. Is there that time constraint now, if not how do you apply that? I think your information will probably show you a lot more success instead of the line being jagged and up and down, up and down, it should level, what you do, so you are better upgrade or downgrade by collecting information that way. Thank you.

DR. DREW: Currently the model only uses like the full year, so it's just what happened in that year. The F over that whole year essentially averaged, well the model averages over the whole year. The spatial model is using sort of a two-season time step, so it's like the first half of the year which includes the spawning and the time in the producer areas.

Then the second half of the year, which is where the adult spawners have moved back out into the ocean., and so we're sort of looking at what happened from January to June and then what happened from July to August, as two separate time steps and two blocks of data within the model for every year.

CHAIR BATSAVAGE: Any other guidance from Board members? John Clark.

MR. CLARK: Yes, just so it is on the record as guidance recommendation. I would very much like to see a spatial analysis where the Delaware is combined with the Chesapeake. I think both the genetic and especially the telemetry data that Delaware has accumulated over the years makes it very clear that this is one population now, I mean you know one super producer. As you know, we've been asking for producer status for the Delaware again for years. This would allow us to look at that in conjunction with the Chesapeake. Of course, I assume by asking for anything like this that an analysis done the previous way with just the Chesapeake separately would be done.

We can look at the results of the two different analyses. I know that is more work, sorry about that. But it would be very interesting, I think to see how that comes out, and then further guidance, I agree with Jay that looking at the1995 reference points with the current threshold being used as a target would be good to pursue also.

CHAIR BATSAVAGE: Just one last call, Megan Ware.

MS. MEGAN WARE: Yes, it's been interesting hearing everyone. I'll kind of just comment. I think one of my concerns, and this would be a sign of a reference point that is not working is, in terms of availability or abundance. I think if we have a contraction of that we usually feel it first at the ends of the stock, i.e. in Maine.

I think the concern of Maine anglers is going to be maintaining some level of availability or abundance if there is still access to resource at the edges of the stock. I think a reference point that doesn't achieve that is not a successful reference point from my point. That is really more in the like feeling side of it. I don't have a mathematical number for what that is, Katie. I'm just trying to think of science of things that wouldn't be palatable in Maine.

DR. DREW: Yes, we can probably do something similar to the sort of analysis that I think Emerson and Doug had proposed on the recruitment side of like what level of SSB gives you, still produces strong year classes. We can look at sort of what level of SSB or abundance or age structure produces a strong availability at the end of the range versus not.

Can we finagle a reference point out of that? No, but maybe we can help evaluate some of the other reference points using that. I think back to the Delaware Bay question. I don't want to trivialize the amount of work it takes to do it both ways, so I don't actually know if we could do it both ways.

In terms of like the model structure and how we calculate the data, and also like the way the model works is it relies on understanding the movement rates in and out of that Bay area, so like the rate of fish moving out of Chesapeake Bay into the ocean and from the ocean into the Bay, during the year to parameterize that.

It's not just a matter of like letting the data out, putting it with one versus the other. There are other changes that have to be made. I don't want to like say that, oh yes, we can do it both ways and then look at it. I would like us to pick a base case, if possible, at this point, so that we have guidance and can stay focused on that model development going forward.

CHAIR BATSAVAGE: Follow up, John?

MR. CLARK: Well, it's kind of like the chicken and the egg, right? I mean we don't really know how it would work until we see it, but if we see it, we may want the standard model that you've been using. Yes, sorry, it's kind of a conundrum here, because it would be very interesting to see the Delaware combined with the Chesapeake.

Of course, if it is for the detriment of the Chesapeake states, we certainly wouldn't want to pursue that. But the question is, is there any way we could know? Is there like a preliminary work that could be done, to at least give us some sort of idea of where this would end up?

DR. DREW: I would be concerned about that with the timeline that we are on for completion of the model. Essentially, I do not want to develop two models at the same time and two data streams at the same time, when we are trying to make the March deadline. I will say, the Delaware Bay landings are small compared to both the Chesapeake Bay and the Ocean.

I don't think it would have a significant impact on the overall results from both regions, whether we put you with Chesapeake Bay or whether we put you with the Ocean. I think they are just sort of like maybe more management or implications for this of understanding this F rate, what does it represent?

Therefore, how should you respond to it? What is the most efficient or concise way of responding to this fishing mortality rate in this region versus this other region. Whereas, right now you are allowed, you have a separate management regime, even though you are part of the Ocean, you have a separate management regime to account for the differences in availability of fish to that fishery.

That is maybe more aligned with what is happening in the Chesapeake Bay than what is happening in the Ocean. Does it make sense or like is there a management benefit to pooling these two regions together? Even if there is not a benefit, does it make people deeply uncomfortable one way or the other?

I don't think where we put Delaware is going to make or break a specific region or specific assessment. Delaware Bay. But I guess I also don't want us to put, it's not trivial to develop these models at these different sections.

MR. CLARK: I understand, thanks, Katie. I mean that is the crux of the issue though is what it would do to management. I think as you know, we've had a separate recreational slot fishery in Delaware Bay for the past 10 years. But you know, we could see some advantages if we were able to manage more like the Chesapeake does recreationally, because of course that smaller size is available pretty much year-round in Delaware.

We do have to take resident population of striped bass. For the commercial side, of course as we've been saying for years, you know '72 to '79 landings were not favorable to Delaware. We would like to see something that might fix that. But again, you know I understand it is really a difficult to say do it one way and the other way so we can see them both, but that would probably be the ideal.

MS. KERNS: John, I think she's saying we can't do it both ways, so we need the Board to tell us one way or the other.

MR. CLARK: Yes, I'm guessing at that. I would, and I'm sure that we'll be in the minority, but I would like to see it that way then, the combined.

CHAIR BATSAVAGE: Is there any opposition to that being combined?

MS. KERNS: The spatial scale would be Delaware Bay with the Chesapeake Bay. Just making it very clear to everybody.

CHAIR BATSAVAGE: Seeing no opposition, I think that is the one we will choose. Katie, is there any more input you need from the Board on this task, this agenda item?

DR. DREW: No, I think that kind of spatial section was probably just the biggest. I guess we'll work on how you implement spatial reference points, and that would probably be something that would need to go through the Peer Review Panel, in terms of our method of how do we allocate F.

How do we specify spatial reference points that are scientifically valid and supportive of the stock, but also meets management objectives. It sounds like there is still interest in that in developing specific regional reference points, and so we will go forward with that and work it out with the Peer Review Panel.

CHAIR BATSAVAGE: This is in the interest of time, even though we're a little ahead of schedule, it usually doesn't end that way with striped bass.

DISCUSS WORK GROUP ON FUTURE STRIPED BASS MANAGEMENT

CHAIR BATSAVAGE: We'll move on to the next item, which is the Work Group on Future Striped Bass Management. Toni will be going over that.

MS. KERNS: In October of 2025, the Board took action to guide the development of a work group, after recognizing that the existing fishery management plan would need updating to address some long-term projection challenges, based on the continued low recruitment success for striped bass.

Declining recruitment in the Chesapeake Bay as well as the Hudson is the central concern driving this effort, in terms of what we want future management to look like in this fishery. The Work Group has been tasked with developing a white paper, to serve as the foundation for this future of striped bass management.

The Board has provided six core tasks for the Work Group. Several of these tasks are assessment related and a couple are not. A quick reminder, biological reference points and considering recruitment sensitive model-based approaches. Evaluating hatchery stocking as a research and management tool with cost analysis.

Exploring whether other river systems beyond the Chesapeake Bay can contribute to the coastal stock in a significant way. Assessing drivers of recruitment success and failure across the Chesapeake Bay, Delaware and Hudson. Examining the reproductive contribution of large versus small female fish, and size-based management implications, and then developing methods to address the discard mortality in catch and release fisheries. The Board motion indicated participation by all sectors, scientists and managers, but it did not provide specifics of exactly how to put together that Work Group composition.

We had several different ideas that came about at the February meeting, and the Board acknowledged the challenge of keeping this Work Group at a manageable size by still having adequate representation from each sector and region, and noting the variety of viewpoints that come from those, and an adequate size thinking of at maximum 15 members, somewhere between 12 and 15.

There were suggestions for expanding the Work Group beyond the traditional sort of Board Work Group process where you just have Board members and then could pull some expertise from outside, but those individuals would just come in for specific meetings, and still the core group would be Board members.

We developed some options in the memo that was provided in meeting materials of how to expand that Work Group. Then in addition, some Board members suggested that we pull together a traditional core Work Group and then that input from Sub Groups on some of the specific tasks, and you can break up a task into different sections.

Then there was also a suggestion to start the Work Group process for some of the tasks and delay for some of the other ones until the assessment has been completed. In terms of options for the Work Group composition, and these are just some ideas, it doesn't represent all of the ideas that were put forward, as I said before just the core workgroup of a Board Work Group, it only has Board members on that process.

A second option is to have sort of a mixture of work group, which would be Board members, Advisory Panel members, maybe up to 3, one per region and a couple of Technical Committee representatives. Then the last option was looking at either version of Option 1 or 2, but pulling in members of the public who are not a part of our committee process for this.

Then some of the questions that we need to think through today and provide guidance on is, will the Work Group seats be allocated by category to ensure diversity of the sector and the regional representation. Will they be structured nomination process for each of the state nominees to set a number of candidates, and how will the final participants be selected amongst the nominees.

Is it something that staff would work with the Chair on or is it something that the Board wants to vote on in the end. Then which option of composition that was in the previous slide you would want to do. Then thinking about how stakeholder engagement occurs with these work groups. If the Board did establish this core group and then have subgroups that are task specific.

We could bring in technical experts for some of those tasks, like thinking through the hatchery stocking task, you could bring in individuals that are doing more work on hatcheries that are outside of our normal Technical Committee or Advisory Panel process. There was an idea at the last meeting to bring forward facilitated workshops. These would be in depth sessions that focused on individual topics. This would require dedicated funding since it would require a facilitator, and there was a suggestion at the last meeting that they be regionally based. That would indicate more than one facilitated workshop.

Another way to bring in stakeholder engagement would be to do public surveys or webinars. The surveys and webinars could be topic specific as well, or we could just do one and they could be either sent out the same to everybody or adjust the surveys or webinars slightly for regional based differences. It is possible that if we were to take some of these issues out and we were doing public hearings or webinars, that it could be duplicative with scoping if some of these issues came forward, so there is that consideration.

Then we also could just have dedicated public input time during each of the workgroup sessions or subgroup sessions. We generally do that when we can. Sometimes with work groups the time gets short pretty easily, and sometimes we do run out of time. But if it is something that the Board wants to dedicate every time then we could more structurally build that into the agendas for those meetings.

In terms of timelines and the specific tasks, as Katie mentioned before, the stock assessment Peer Review is scheduled for March. We hope that that Peer Review will get presented at the May meeting, but it is also based on the timeline of when we get the assessment report back that it might not be until the August meeting.

Several of the Work Group tasks are very much related to outcomes of the assessment, and it is staff's recommendation that those tasks not be addressed until the completion of the assessment. We do think that the non-assessment tasks that release mortality and the hatchery stock being tasked could be addressed sooner.

I think hatchery could be addressed at any point in time, and staff suggests that we wait until the completion of Massachusetts's project on release mortality is completed, which I think will be later this year, maybe sometime in the summer or early fall. For today we are seeking some prioritization of these task lists, so we can have clear deadlines and milestones for how we move forward.

PROVIDE GUIDANCE ON WORK GROUP COMPOSITION, TASK DETAILS, AND TIMELINE

Just sort of as a summary of what we're trying to do today is get direction on the Work Group composition. Do you want a core group, and then have subgroups, or how do you want that core group to look? Is it Option 1, 2 or 3 or some other way? Then how does that nomination process work and selection process?

Are there going to be specific seats to each different sector types or not? What is the best way to get in stakeholder engagement and then to just prioritize or get a timeline for the tasks. Is the Board in agreement with staff on waiting for the assessment tasks and starting these other two earlier, or do you just want to wait until everything is done and go forward? It's that kind of choice.

CHAIR BATSAVAGE: I'll look to see if there are any questions before we kind of jump into feedback on these three tasks. When we get to that point maybe try to take them one at a time. But I'll first look for questions. See any questions? No, okay. I guess we'll try this, and if we have to skip around, so be it. We're looking for Board input on kind of the task prioritization and the timeline. Toni pointed out there are a couple items that could be addressed sooner rather than later, because they are not dependent on the stock assessment results.

We have a general idea when the assessment will be presented to the Board. The question for the Board is, when generally would you like the Work Group to get started? I'll look for input from any Board members. I have Shanna Madsen.

MS. MADSEN: I am going to, I know you said like maybe let's take this one at a time. I'm kind of thinking about this whole thing very holistically, and I want to give a big shout out to my other New England states for listening to my ramblings and trying to collect my ideas, and kind of move us forward here.

Today as we kind of talked through the MSE for lobster, I think that kind of helped maybe clarify maybe a path forward here, because as I was reading this document and looking at the timelines, it seemed like it is getting very confusing as to how the assessment and some of these things were going to be done concurrently.

Essentially my suggestion is that we put together like we are doing for lobster a Steering Committee, and that committee should be small. That Steering Committee would then help us to decide what we would like to prioritize, as far as some of these assessment questions are concerned.

Obviously, I agree with the statement that everything that we have in here that is an assessment question should not be answered until after the assessment. But then having the release mortality, maybe a workgroup or a hatchery stocking workgroup. I think a Steering Committee could help us make decisions about these kinds of subgroups that might be useful.

On a whole I would like to see after the assessment, and this kind of ties into my questions and comments to Katie and Toni before. I would like to see us have essentially a Management Objectives Workshop for striped bass. For me, I'm kind of listening. I've been listening to folks around the table for a long time, and it seems like there are a lot of competing objectives here. We need to understand the balance between those and what those tradeoffs might be.

If we move through the assessment process like Katie is suggesting, we have the tools a.k.a. the models that kind of tell us what to do. Then from there we're developing BRPs based off of hopefully what comes out of a Management Objectives Workshop with facilitated workshops that kind of go through, same thing that we did for menhaden, same thing that we did for horseshoe crab. But we would not do that until 2027, when we've gathered all of the data from the assessment.

We have everything peer reviewed and we can kind of start moving forward from there. But in the meantime, I think that a Steering Committee could help us kind of further define who could be on some of these littler workgroups that work could get done on right now, meaning again the hatchery stocking and the release mortality. I think that that would be kind of a clear path forward, and maybe these timelines kind of converge a little bit better than they did before. That is my thought process.

MS. KERNS: Follow up question. How would you compose that Steering Committee? What is your idea for membership and how many?

MS. MADSEN: For me a Steering Committee, super small. I would say, I don't know 6 Board members. I wouldn't go any further beyond that, because I feel as though, well, maybe we could have a TC Chair or SAS Chair. But a Steering Committee is really just helping to determine the steps in the process, and then maybe help to further define who might be a part of each one of these processes as they develop.

I would kind of keep that one tight. Then when we're starting to think about this management strategy evaluation, that is where we're going to want to make sure that we're getting a wide swath of stakeholders, management, scientists, et cetera, so that we are kind of getting all of those management objectives out at once.

CHAIR BATSAVAGE: Next up is Doug Grout.

MR. GROUT: I was originally just going to talk about task prioritization, start with that, then I'll give you my thoughts on the Working Group composition. I agree, as far as biological reference points instead of recruitment sensitive model-based approach, I agree that some stock assessments to work on and provide to us, that is something that we can put off until after the assessment to have.

Formerly review hatchery stocking. Yes, you could come up with a group that would look into that. But as I remember back when we were stocking heavily back in the '80s and '90s based on the tag returns. The stocked fish amounted to about 5% of the total biomass, or at least the total catch. I forget whether it was catch or total biomass.

Given the amount that had been put into how much stocking was going on back then, I'm not sure this is going to be something we might want to take up as a management document. But it might be good just to review the studies that were done, to find out, just to confirm these things. That to me could be a very simple thing that could be worked on almost immediately.

Evaluate potential for other river systems to contribute to the coastal stock. Outside of these three areas that are listed on here, Chesapeake Bay, Delaware Bay and Hudson River. The only other ones we were aware of in the past has been the Kennebec, and when was the last time, have you had any recruitment in the Kennebec, do you know? Below the average. Maybe something has happened since then. Is there any in the Merrimac?

I'm not sure we're going to get much out of that. We could address it but not much meat on the bone. As far as drivers of recruitment, a success or failure. Again, that is a stock assessment task so that will be after the stock assessment and exploring reproductive contributions to large and small female fish. It says in here that the TC and SAS could provide input after the assessment. That again, those are the three long term, and then of course the other thing we could be addressing in the near future could be the discard mortality and catch release in the fishery once the Mass DMF study is completed. The three that I think we could work on right now is discard mortality, potentially other rivers contributing to the stock in coastal systems, if we still think that is necessary, and then the review of the stocking data.

All the other things will be afterwards. Then my suggestion is for the work group composition. I believe having a combination of Board, AP, and

Technical Committee and staff on that working committee that working group, with the ability of that group to have public comment at some of these meetings, at the appropriate meetings.

If they find that something really needs to be dug into a little bit more, at that point see if the Steering Committee or the Working Group could have the ability to appoint small workgroups to work on it. But don't start off that we're going to have work groups working on this. Let's make sure we have the need for additional workgroups on it.

CHAIR BATSAVAGE: Yes, thanks, Doug. Toni has some follow ups on some of the comments so far.

MS. KERNS: I'll start with Doug's since that is fresh in my mind. For evaluating the potential for other river systems to contribute to the stock. One of things that I'm remembering because of my handy notes, is that the benchmark is going to include a review of recent genetic studies on spawning originations of striped bass so that could inform that. That won't be finished until the assessment, so that would make that harder to start now.

MR. GROUT: Yes, I agree with you. If that is part of the assessment then clearly that would have to wait until after the assessment.

DR. DREW: Let me read that.

MS. KERNS: I'll let Katie read that and we can come back to consider.

DR. DREW: I think it's not necessarily something we're doing specifically for the assessment, but there is work ongoing, genetic work. We're getting sort of a preprint of that to include in the assessment of evaluating the contributions of different genetic stocks, including the Kennebec/Merrimac and the Canadian stocks to catches in, I think it was about 2015 to 2016.

I don't think we have anything more recent. We do have obviously the recruitment indices from Maine that we could look into and compare that. I think it will be maybe we will just have some fresher information that won't be immediately available to the Work Group, but should be in publication soon. It's not necessarily specifically something that the assessment will do ourselves.

MR. GROUT: Okay, but it still would probably have to wait until after the assessment, because you're busy working on the assessment. Is that what you're saying?

DR. DREW: We're busy working on the assessment, and the team that is working on the specific paper. If that paper comes out before the assessment, we can share it with you guys, as well as, I think presumably, we could share the Maine Juvenile Index and see how it compares to other trends with you guys, if you wanted to look into that before the assessment.

MR. GROUT: If it's available, we can do it, but if not, again I think these are going to be minor things. Other questions?

MS. KERNS: Well, to you, Doug. Then I'm going to engage Bob for a second, and make sure he's listening to me. Back to Shanna. With a Management Objective Workshop that will require resources. We also have, it seems like we're moving down a pathway for management strategy evaluation for lobster, which also requires resources.

Two of which are resources of bundles of money that we typically do not just have laying around in the budget. I am just trying to make sure that if this is the path that the Board is going down that we can navigate that type of funding.

EXECUTIVE DIRECTOR ROBERT E. BEAL: Yes, I think for both of these that 2027 would be the earliest that we can pull these off, and we haven't set our 2027 budget. But I think a Management Objectives Workshop for striped bass is much less expensive, I think, than a full MSE. If we go down the full MSE pathway that is a pretty heavy lift financially.

I think if this Board wants to go down the path of a workshop for management objectives, we can most likely, I don't want to over promise, but most likely find some funds for that in 2027. As with all budget issues, all the competing different budget things that have come across the Commission as we map out 2027 activities of the Commission, we'll have to decide what are the priorities.

CHAIR BATSAVAGE: Follow up, Shanna?

MS. MADSEN: Yes, I just wanted to clarify. My intention definitely was just a Management Objectives Workshop similar to what we did the EMO Workshop for menhaden, what we just did for horseshoe crab, not full MSE. I just wanted to, I guess, make clear with my comment that I definitely think that a work group in order to discuss management objectives is absolutely necessary for striped bass.

Again, hearing around the table a bunch of competing objectives et cetera. This is our flagship species, I really think that we should give it the time that it needs to have a good understanding, specifically of what our management objectives are now currently. That would happen again in 2027, after we've collected all of the data from the stock assessment, and kind of cleared out.

CHAIR BATSAVAGE: Any other input from the Board on any of these items up here, as far as direction for this Work Group? Marty.

MR. MARTIN GARY: Not really anything to add to what has already been stated, but I just wanted to express my gratitude to Toni, Katie, all the staff at ASMFC and you as a Board Chair. In that moment back in October, we were faced with a somewhat cathartic moment, choice between a 12% reduction and status quo. Our delegation just didn't feel like either of those choices were the right one. This is really difficult to get your arms around, as we've found out, and certainly wasn't our intention to have this keyed up in such complexity.

But I was confident that you know the principal reason for the Work Group is to move the needle of conversation to what do we want this fishery to look like when we hit 2034, 5, 6; when this poor recruitment manifests itself at its apex. It's going to be a really difficult time and I can tell you from living through the '80s like a bunch of others this table had been through.

Don't recommend previous methodology of handling that, even though people celebrated. I think the engagement with this resource; it is so special and important to people. It's really something we need to strive for and provide a lot of thought to. I think the Board is doing it today. I just really wanted to express my thanks to everybody.

The collective wisdom around this table and our community is extraordinary. I do have one thought for you all to think about, and I shared it with Chris and a couple others is. I think whoever is going to Chair this endeavor, it's really important to pick the right person, and fortunately we're blessed with a lot of experienced and knowledgeable people. I don't know whether it should be a sitting Board member. We have some other folks.

That is something we can settle at another time. But you know I just really appreciate the thought, because I feel comfortable now going from that moment in October when it was so uncertain to now. I feel like we're really moving this conversation in a way we can address what we're having with our assessment next year. I am thankful and I appreciate it.

CHAIR BATSAVAGE: Mike next. So far, we've heard some thoughts on kind of what we talked about in the past is the general makeup of the Work Group, a subset of Board members, AP members, TC, SAS representatives and possibly what Marty suggested for a Chair.

Looking to see if people generally like that concept or have some other ideas as far as the makeup of this. Also heard the idea of providing the public opportunities for giving their input during those meetings. There are some other options that were in the presentation. Just kind of look and see if we can get some concurrence on that, and with that I have Mike Luisi.

MR. LUISI: I just wanted to for the record state to you specifically, Chris, because you and I had a conversation a few days ago about this. At the time I was thinking that a subset of Advisory Panel members was going to be a really challenging thing to try to figure out who that subset of members was going to be.

But I also, in the discussion with you, I had thought that maybe this working group would evolve maybe to having more management type conversations about what are we going to do with the charterboat fisheries in the future or how are we going to better manage the commercial fisheries in the future? If that were the intent, I would say that we would be probably better off sticking with Work Group members that are Board members and then having interactions with the different groups like the AP, like the Technical Committee. But I wanted to clarify for the record, Chris and for you. That given the list of things that this working group is planning to have conversations about to start. I would say that I think it was Option 2 up there, which was a combination of all of the different, the Technical, the AP and the Board membership would be appropriate. I just wanted to clear that up for you.

CHAIR BATSAVAGE: Other hands. Joe Cimino then John Clark.

MR. JOE CIMINO: I think Action 2 was the combination, Mike, is that what you were saying? I think yes, I think I can support that. I think one thing I would like to see is to ensure that the AP membership is kind of updated or refreshed for some states I think we need to look at that. There was a slide that had the numbers, I think on that.

It seemed very TC light. Those numbers were suggesting that there would only be like 2 TC members, but a total of like 12. I think it would be important to have some good TC representation is all I was saying there, Chris. I think one other thing I may have seen in a slide was a suggestion of a survey.

I think that is actually a really great way to get some public comment. You know I hate to see us going out to the public, having these huge meetings where people get 2 to 3 minutes to put all their thoughts together on this journey that Marty started us all on.

Some of that philosophical stuff, as far as what Marty was saying, like where do you want to see this go, I think can be done for the survey. It gives people some time to really consider it and put in what they are thinking. I would also encourage that maybe that is something that could be even developed through the working group.

CHAIR BATSAVAGE: John Clark.

MR. CLARK: I was fortunate enough to attend all the Menhaden Work Group meetings for the Chesapeake Plan and then also went through the Horseshoe Crab Stakeholder Process. I think keeping it simple helps. I would prefer to see the core working group of Board members and then have public comment at the end of every session.

I thought that helped streamline things. I think when these things get kind of big and unwieldly and they just keep going on and on and on, that you know people just get kind of frustrated with the whole process and that they would also, what I've seen in both cases too is that minds don't really get changed by these processes of the public.

Just a good way to almost the public relations standpoint of this is also very important, just to let them know that we are listening. I think that doing something that is streamlined and fast would be the best way to make people realize that we are taking this seriously. The Menhaden Work Group was Chaired ably by Marty Gary, so there is one more suggestion that he would be a great choice for that.

CHAIR BATSAVAGE: Thanks, John, I was wondering when that was going to come up. I'm going to turn to Toni. We have a few similar but different options going on here, as far as the composition and timing. I just want to check with Toni, she's feverishly taking notes, I'm making sure I'm not missing hands. Just kind of see where we are here and what we need to do to give staff good guidance they need.

MS. KERNS: I've been trying to put up on the slide so that everybody sees in front of them the different ideas that are being brought forward. At this point now we have three separate ideas. The first was the one brought forward by Shanna, which I am going to simplify and say, to have a Steering Committee.

That Steering Committee makes a decision of when to prioritize the task, and it also includes a Management Objectives Workshop for 2027 after the assessment comes out, and that Steering Committee would be 6 Board members and maybe a TC or SAS type person, tight and small.

The second option, which I heard came from Marty, is to utilize a version of Option 2, which was spelled out in the document, which is I think probably somewhere up to 15 Board members with 3 AP members and 2 Technical Committee members. There was a possibility of adding maybe another Technical Committee member from Joe.

It is possible that that could utilize some subgroups to address some of the tasks if necessary, utilizing potentially surveys to get broader input. I don't know if Marty said that, but I think someone else did, so I don't know if that comes into play there or not. Then the third option that I heard was just now from John Clark, and that was going with the simple method of just using Option 1, which is our traditional workgroup path.

This is a core work group of Board members and we do public comment, I think for both Option 2 and 1 would utilize a structured public comment at the end of each meeting, but making sure that that time is always there and not if we have time. I think we need some, sort of narrow this down.

CHAIR BATSAVAGE: Pretty easy. Yes, thoughts on those three options. Shanna.

MS. MADSEN: I think the first option, and Marty's option are basically the same, at least the way that I was kind of suggesting it. The Steering Committee only exists so that they can kind of put together these subgroups that can address these tasks. Mainly the hatchery and release mortality, so the Steering Committee only exists to kind of put those groups together.

Then Marty saying like the larger Work Group, you know we can get some surveys, get some broader stakeholder input. I think that is totally perfect for a Management Objectives Workshop also. We could do that preliminarily, get some stakeholder input. But I also want to make sure that stakeholders are part of that Management Objective Workshop more broadly.

I love the idea of using surveys to kind of get more public input, but utilizing obviously this workgroup method, have a more refined group of stakeholders that can give us some input on management objectives.

CHAIR BATSAVAGE: Other thoughts. Dennis Abbott.

MR. DENNIS ABBOTT: Yes, regarding surveys. My thought is that you would have to compose a survey. How many people are going to be involved in the survey? When are you going to do the survey? I think at the point we're at I think we shouldn't be looking at surveys very hard as we go along with what Shanna recommended. I'm just not comfortable getting into surveys right at this point in time.

CHAIR BATSAVAGE: Yes, Toni, to that point.

MS. KERNS: I do think that we have some CESS members that are happy to help out with some of our striped bass work, and there is some expertise in developing surveys. I think if there are some specific concepts that the Board is trying to gather from your broader public, a survey can get you there outside of our traditional process.

Where you may not see such a wide variety of individuals showing up to public hearings, but you may get more well-rounded input that you may not get otherwise. That we can utilize some experts in developing those surveys if we need to. They have reached out to say that they are willing to help out. It doesn't have to be for everything, but maybe a couple things.

CHAIR BATSAVAGE: Mike.

MR. LUISI: If it helps, sitting here thinking about it more. I like the idea that is put before us here at the top of this page we're all looking at. I would be inclined to withdraw the Option 2 if it just helps simplify things. I think as it has been discussed the Steering Committee idea.

Tackling some issues one at a time until we get to the point where we have a new assessment and we really need to put our where the rubber hits the road and we get down into management and other things like that. If it helps with this, Toni, if it helps just eliminate Option 2 as I suggested, you can just get rid of that idea.

CHAIR BATSAVAGE: Okay, I look for other input on that. Nichola.

MS. NICHOLA MESERVE: The thing I was going to raise with Option 2 as it is labeled up there is the difficulty of maybe just picking 3 Advisory Panel members. Unless they let the AP members choose those 3 themselves then I think we might struggle on that. Thinking about it more as like a Steering Committee that is going to define which process we're using for each task and the timeline for those.

I think a little bit smaller is probably better. I think you want to make sure that you do have some Technical Committee or SAS input to that discussion of a timeline to make sure we're getting it right still. Dr. Drew I'm sure can help keep us on the right track, I think the TC and SAS are I know a part of it as well. Just in terms of the priority of things here.

I do think that there are biological reference points and the management objectives are kind of the number one priority on this list for me, and making sure that that is a process that has good public input is important. One thing that is nice about surveys is that you can get a lot broader input than you can from just a workshop, Management Objectives Workshop. We would be inviting a smaller number of people to that, so maybe that is just a discussion that the Steering Group can continue to have about what is the best approach to get at public input at the management objectives to move forward. If it is a workshop, I am a little hesitant about a regional workshop. I think there is benefits to having the management unit in the room to view each other and how those objectives may differ by region.

CHAIR BATSAVAGE: Is there any objection to removing Option 2 from the composition of the Work Group? Seeing none; we're definitely narrowing down the composition, which is great. Any other thoughts, and Toni, I'll turn to you. Any other input we need to kind of firm up the guidance that staff needs to move this along?

MS. KERNS: We do still have John's Option 1 of a simplified work group, kind of the way we've worked on things in the past over this perception, and I apologize, John, that I don't have more words here. It's Toni at the end. We do have two paths here, so we need to decide which path we want to go down, and then once we decide which path we want to go down, I just need to determine how we are going to nominate and put people on either the Steering Committee or the Core Work Group.

CHAIR BATSAVAGE: Thoughts on that, John.

MR. CLARK: Just briefly. I mean I just want to keep things simple, just because we're the managers, ultimately, it's going to come to the Board to decide. I think as Board members we already hear from the public all the time. I think as I said, that Menhaden Work Group was very effective by having a public comment period at the end of each meeting.

But we're not doing a focus group for a new protein bar here, this is management that everybody knows what they think about striped bass already. The point is to just kind of focus where we're going forward with this. That is why once again, I think keeping it simple is the way to go.

CHAIR BATSAVAGE: I saw Doug's hand. Doug.

MR. GROUT: My suggestion, because both of these deal with essentially 6 Board members or just a core working group, that maybe we look at what was the selected, the recommendation in Item 2, Option 2, for the 6 Board members, and that is the Board Chair plus one from Chesapeake Bay, state, their jurisdiction, Delaware Bay jurisdiction, Hudson River jurisdiction, Southern New England and Northern New England. That would make up the 6 Core Working Group or Steering Committee, whatever is the pleasure of this Board.

CHAIR BATSAVAGE: I think that is what we need to hone in on is I guess the Steering Committee or the Core Work Group. I'm looking at Toni, just to kind of make sure I'm getting this right, as far as what the Board needs to kind of fix so we don't have competing things. There are a lot of similarities but just make sure we're not having competing ideas here.

MS. KERNS: We definitely have two competing ideas, so if we can't agree then we can just get a motion on the table.

CHAIR BATSAVAGE: Shanna.

MS. MADSEN: I just want to say what Doug is proposing is perfect for either Option 1 just Core Work Group or Steering Committee. The only thing I'm also thinking about when I'm thinking about my Steering Committee idea is I think I would like one member.

Probably the AP Chair, because again, that Steering Committee is going to help dictate who is going to be on the larger Management Objectives Workshops. I would like to see that person be a part of this process as we kind of build it out as well. Just one more in there, sorry. I know I was keeping it tight, but just that extra.

CHAIR BATSAVAGE: Toni, I guess we're kind of at a point where we need to make a decision here.

MS. KERNS: Are you going to need a motion or someone needs to.

CHAIR BATSAVAGE: Shanna.

MS. MADSEN: I'm essentially going to read what I've got up there. Move to use a Steering Committee to task out to several groups the various issues that we have within this document, followed up by the stock assessment, followed up by a Management Objectives Workshop for striped bass in 2027. The Steering Committee would help to dictate that process the whole time. Does that make sense?

MS. KERNS: That makes sense, Shanna, but can you just say Move to use the Steering Committee process and we'll make sure that all of those other pieces are included.

MS. MADSEN: Sounds great. **Move to use a Steering Committee process.**

CHAIR BATSAVAGE: Concise motion by Shana Madsen, looking for a second, Dave Sikorski. Further discussion on the motion. Shanna, I guess you gave some context, do you have any other thoughts on that?

MS. MADSEN: Just really quick. I guess I would say the reason why I'm looking for this a bit more complicated process is because I think it's a really complicated topic. When I went through the Management Objectives Workshop for menhaden, I think that the tradeoffs between all of the various management objectives need to be on the table and discussed in that room, in order to be able to understand specifically what we are and aren't giving up here.

I just think with our flagship species, again, it just really deserves the same time that we've given other species. I guess I would say ERPs are the result of that EMO Workshop. I think we should attempt this for striped bass as well.

CHAIR BATSAVAGE: As the seconder, Dave, no comment? Okay, further discussion on the motion? Yes, Rob LaFrance.

MR. ROB LaFRANCE: Having worked on a couple of these working groups, I really like folks' ideas of regional appointments. I don't know whether we just have to leave it at that, but I just want to go on record as saying I think that was a good idea that we should consider. I don't know if it needs to be part of the motion, I wanted to make that comment.

CHAIR BATSAVAGE: Yes, that is great even if it doesn't get part of the motion. Any other thoughts on this before I call the question? I was going to see if there was any objection, but I'll just quickly check. Does anybody need time to caucus first? Question, David Borden.

MR. DAVID V.D. BORDEN: I'll make this brief. If we're going to do a Steering Committee, shouldn't we have some discussion about how we're going to pick those individuals? I don't think the staff wants to be put in the role of picking the individuals. I have a suggestion if Toni doesn't have a suggestion.

CHAIR BATSAVAGE: Yes, I mean we could talk about that quicky now or vote on this motion and touch on that detail, because yes, that is an important one. Are you okay on calling the question then discussing that?

MR. BORDEN: Yes, we can talk about it next.

CHAIR BATSAVAGE: Is there any objection to the motion up on the board? Seeing none, got a question, Roy Miller.

MR. MILLER: Excuse me, Mr. Chair. I just want to make sure I understand. We've discussed this back and forth and I no longer am certain I know who would be on the Steering Committee. Was it the suggestion of one from each producer area and one from New England, that suggestion? I think it was Doug that brought it up. Is that what we're following?

MS. KERNS: The suggestion was, and I haven't heard opposition yet, but I was going to just confirm that is that we go with that. That would be six Board members, so the Chair plus a person from the Chesapeake, the Delaware, the Hudson, Southern New England and Northern New England. There would be a TC/SAS representative that could be the Chair or could be somebody else, and the AP Chair. Those would be the Steering Committee.

MR. MILLER: Thank you.

CHAIR BATSAVAGE: Shanna.

MS. MADSEN: Just wondering if we should put that in the motion at this point. It seems like people are kind of confused.

MS. KERNS: We'll do that, it just will take us time. The Board can nod if you need it up on the motion, or if it is reflected in the record and everybody understands then we do not need to write it up there. The Board can nod if you need it up on the motion, or if it's reflected in the record and everybody understands, then we do not need to write it up there.

CHAIR BATSAVAGE: Does the Board understand the makeup? Okay, so we'll keep the motion the way it is. Just to double check, **is there any objection to the motion? Okay, seeing none;** back to David Borden's question about who is on the hook to pick the Steering Committee. David, I don't know if you had anything else to add.

MR. BORDEN: The list that Toni just read is where in the document, Toni?

MS. KERNS: It is listed under Number 2 of the Work Group composition; it's on Page 2. It is Board Chair plus one from each spawning region, Chesapeake Bay, Delaware Bay, Hudson River, Southern New England and Northern New England. In the past when we have put together work groups, we have solicited nominations from the Board.

We could do that by region, I guess, or anybody could nominate someone for these areas, and then we would have the Chair finalize that work group, that is what we have done in the past. We can do that for this, or if there is some other way that the Board would like to establish that Steering Committee, let us know.

CHAIR BATSAVAGE: Follow up, David.

MR. BORDEN: Personally, I would prefer it if it was equal numbers from the producer states and equal numbers from the coastal states. The way that language is written, Toni, I'm not looking at, is it 4 and 2? Is that what the composition would be?

MS. KERNS: It's 1 person from the Chesapeake, 1 person from the Delaware, 1 person from New York/Hudson, 1 person from Southern New England and 1 person from Northern New England.

MR. BORDEN: Okay, so we end up with 3 producer states and 2 coastal states.

MS. KERNS: Plus, the Board Chair, who is a coastal state.

MR. BORDEN: I guess my only point would be, I would prefer if it was 3 and 3. It would be fine with me if the producer states selected their 3 candidates and the coastal states caucused and selected their 3 candidates.

MS. KERNS: That would be 7 Board members.

CHAIR BATSAVAGE: Dave Sikorski.

MR. DAVID SIKORSKI: I can understand the concern, but I think the whole point of the Steering Committee is to get us to the point where we have the Work Group that can be more broadly representative of everybody's interest. Also, coming from a producer area, we also have a coast, so we have coastal fisheries, bait fishers et cetera. For the Steering Committee, I would prefer we keep it simple, and what Toni just listed off is sufficient for me.

CHAIR BATSAVAGE: Okay, any other thoughts on kind of the original idea of the Steering Committee composition, is everyone okay with that? If there is kind of strong ideas as far as changing that composition, probably should do it through a motion. If not, we'll go with what we were originally discussing. Nichola.

MS. MESERVE: Just a question as to whether the Steering Committee meetings would be open to other Board members to listen in and chime in if they feel like something is missing out.

MS. KERNS: I think yes, generally speaking every Commission meeting is open to the public, unless we're discussing confidential data.

CHAIR BATSAVAGE: Joe Grist.

MR. GRIST: Either way we're going here, we are going to take a look at the APs, right, at the AP locals. Long day for all of us, but we're going to look at that, because I think Joe Cimino said earlier, we really need to be going to dive in on the AP and getting it repopulated correctly.

MS. KERNS: The Steering Committee would only have the AP Chair, and we can dive into evaluating what the AP composition should be, as we move along between now and when we get to the Management Objectives Workshop.

CHAIR BATSAVAGE: Okay, just looking around the table. Anything else on this. Toni, is there anything else you need from the Board on this task?

MS. KERNS: No.

CHAIR BATSAVAGE: Thanks, I appreciate that. If I didn't note the **motion passed with no objection.** It might have got lost in the shuffle, but yes, that is what we're going with. Easy to lose track, sorry about that.

UPDATE ON ADDENDUM III IMPLEMENTATION FOR MARYLAND SEASON

CHAIR BATSAVAGE: Well, next on the agenda is an Update on Addendum III implementation for the Maryland Season. I'll look to, or maybe I'll see who wants to cover that.

MS. KERNS: I might be able to get it done real fast for you, if that is helpful, Mike. There are two things I need to report on here. The first was that Maryland did in fact implement the season that was in their implementation plan and they are moving forward with that. We put this on the agenda, just in case there was a change and there is not, so moving forward.

I also wanted to note that Potomac River Fisheries Commission in evaluating their total length definition, actually already had that definition within their current regulations, so they are no longer putting in place what they had proposed in their implementation plan, because what was in their definition already was sufficient. Letting the Board know about that, that wasn't in the agenda.

CHAIR BATSAVAGE: Any questions on that? Moving along.

DISCUSS TIMELINE AND PROCESS TO PROVIDE FEEDBACK ON THE NOAA FISHERIES STRIPED BASS AQUACULTURE

CHAIR BATSAVAGE: Next item is Discuss a Timeline and Process to Provide Feedback on NOAA Fisheries Striped Bass Aquaculture Plan. We've got an update, a presentation on this at the last meeting, and you'll probably notice, those in the room, that the tables are a little more populated than most striped bass meetings. We have Board members from South Carolina and Florida not on the Striped Bass Board. However, some of the options offered in that plan could be possibly down there into the coast. Just welcoming them as they show up early, and I probably won't be seeing them again at another Striped Bass Board meeting, but you're always welcome if you want to. With that, Toni, I'll turn it over to you.

MS. KERNS: I am not going to re go over the entire Technical Memo that was presented at the last Board meeting. But NOAA did present their technical memo on offshore striped bass aquaculture at our last meeting. Striped bass has been prohibited from being harvested in the EEZ since 1990.

Their technical memorandum looks at advances in science, engineering, genetics, disease management, regulatory frameworks that could make the offshore for pure strain striped bass aquaculture both feasible and manageable, provided a carefully designed regulatory carve out is done.

NOAA is seeking the Board's feedback on our position regarding the memo. We did not really provide a ton of comments back to NOAA at the last Board meeting, and we don't have time on the agenda today to get all of the comments that I think this Board and the southern states may want to provide.

I just want to point out a couple of areas where I think that the Board may want to go back and reread the memo and focus potential comments on. These were areas that I saw that I thought that I thought you all, based on conversations that have been had in the past that you may want to talk about.

Then I'll provide a timeline for receiving those comments. In terms of economic analysis, the Board did request an economic analysis from NOAA. I'm not sure at this time they are prepared to do an economic analysis, unless they know they are going to be moving forward with some sort of plan.

But the report doesn't have any published U.S. production costs and economic analysis that they do have in there relies on cost estimates that have been extrapolated from other species like red drum, greater amberjack and salmon operations. But we don't have any actual cost study for striped bass.

There is also not market impact analysis. The report explicitly states that the impact of farmed striped bass on wild caught and import markets would require further analysis. They do acknowledge that one might need to be done. It is an omission that I think this Board has said that they do want to see.

The report talks about using sterilization technologies, in order to make sure that the populations that are in the net pens aren't breeding with the wild fish, but the report also states that the technologies have not been tested. It is something that you may want to look at and think about as you're sending your comments. If those technologies haven't been tested then what types of risk does that put on the wild stock with possible escapement?

The report looks at thermal modeling, but it only uses data from 2020 to 2023, so four years of ocean temperature data is a pretty short baseline for a long-term sighting decision, especially given our known uncertainty with climate. A spatial analysis would benefit from a longer timeframe, especially when those sighting areas are mostly off of our southern states.

The two most prime sightings that it had suggested were off of North Carolina, as well as off of Florida. Some of the disease therapy information that is being suggested, in terms of what would be put into the water has not been tested by the FDA in marine striped bass, so that might be something that the Board would be interested in looking at.

Then lastly is looking at habitat and protected species. For some of the areas that are being suggested for sighting, it is critical right whale habitat that overlaps along the Atlantic Coast, so offshore permitting processes may face a lot of scrutiny under Section 7 consultations, as well as containment risks. It does suggest using an entanglement risk framework, but to my knowledge using a 3D entanglement simulator, but to my knowledge that simulator has not actually been used before. It has not been brought forward to the TRT, so I am not aware of what that simulator would be, so just an untested product.

Those were some of the things that I saw, but there may be additional things in there that are either things that raise concerns for you, or things that you like from the report. What we are suggesting is that the Board provide very specific comments to staff by mid-June. I'll follow up with an e-mail with the report, as well as deadlines for you all to get information back to us.

We would take all of the information that you've given us and draft a letter for the Board to review, and we would invite the southern states again, if they wanted to participate during that timeframe. Anything that this Board would approve for a letter moving forward back to NOAA, would also go to the Policy Board in August for final approval, and then we would send that letter off to NOAA Fisheries in early August. I can take questions.

CHAIR BATSAVAGE: Questions for Toni. Roy Miller.

MR. MILLER: Mr. Chair, I was just talking a little bit with John. I read the Aquaculture Proposal, and I know they have a dedicated brood stock. But remembering in the past, when I was working for a state agency, we had to decide whether to issue collecting permits to allow capture of wild caught striped bass to be used for aquaculture purposes. I just would like to express concerns with that, should a proposal of that nature come up again. It caused problems before, and I can anticipate it causing problems in the future, if it ever comes up again.

CHAIR BATSAVAGE: Any other questions or thoughts regarding this? Kind of see the timeline. Erika.

MS. ERIKA BURGESS: Thank you for the invitation to sit in on this conversation. A couple points that I did not see in the list that Toni put together that I just want to share for the Board while we're all here is, the document that was provided to us is very brief on conflicts with other ocean users. In an area off of Northeast Florida where they said there are potential sights, we've got shrimpers operating in the ocean, as well as commercial vessel traffic in shipping lanes. We would like to see that taken into consideration with sightings. The other thing that was not mentioned was the potential impact for storms. That area is very often impacted by hurricanes and we would want any infrastructure that was to go out there to be durable and able to persist past those storms.

CHAIR BATSAVAGE: Toni.

MS. KERNS: Thank you, Erika, and I'll note that Danielle did address in her presentation the conflicts with other user groups and I'm trying to remember. She said that NOAA is well versed in that, dealing with conflict in other user groups. I have that written down, but if you have any concerns with the way conflicts with other user groups have been processed in the past, that maybe we should try to use some of those as examples. If there has been successes or failures in dealing with conflict, we can work together to help develop those comments.

CHAIR BATSAVAGE: Any other thoughts? Yes, Ben Dyar.

MR. BEN DYAR: I appreciate you all having the time for us today as well. I apologize for this question if it's already been answered or directed. But how does this fit in with like, in other regions as in the Gulf and Southern California, where NOAAs extensive work with aquaculture opportunity areas and aquaculture atlases, and deriving all this information and going through these vetting processes of where these sighting locations are. How does that differ from that process, and where does that fit in?

MS. KERNS: I can take that question back to NOAA, Ben, but I don't know, Max is turning his head, he's not sure. I'm not sure, but I can ask of that and then get back to you.

CHAIR BATSAVAGE: Any other thoughts, questions on this? Seeing none; so yes, Toni will follow up with an e-mail asking Board members for comments. You see the timeline where this will be considered, again in August. Thanks for all that.

ELECT VICE CHAIR

CHAIR BATSAVAGE: Next item is to elect a Vice-Chair, so I'll be looking for a motion. Megan.

MS. WARE: **It would be my pleasure to nominate Nichola Meserve.**

CHAIR BATSAVAGE: Second by John Clark. Any discussion on the motion**, any objection to the motion? Motion passes**, congratulations, Nichola.

MS. MESERVE: No entertaining early retirement, Chris.

ADJOURNMENT

CHAIR BATSAVAGE: On to the last item, Other Business. Is there any other business before the Board? Seeing none; if there is no objection this Board is adjourned. Thanks, everyone.

(Whereupon the meeting adjourned at 3:33 p.m. on Monday, May 4, 2026)

Atlantic States Marine Fisheries Commission

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Sustainable and Cooperative Management of Atlantic Coastal Fisheries

DRAFT LETTER FOR BOARD REVIEW

August xx, 2026

Ms. Danielle Blacklock
Director, Office of Aquaculture
NOAA Fisheries
1315 East-West Highway
Silver Spring, MD 20910

Dear Ms. Blacklock,

This letter responds to NOAA Fisheries' request for the Atlantic States Marine Fisheries Commission's (Commission) feedback on the NOAA Fisheries draft technical memorandum, *Charting A Course for Striped Bass: Science and Regulatory Innovation for Offshore Aquaculture* (NMFS-F/OAQ-001). The Commission appreciates the opportunity to provide feedback on the memorandum and appreciates NOAA Fisheries' engagement with the Commission on this topic.

The Commission recognizes the importance of evaluating innovative approaches to seafood production and understands that striped bass is one of the more recognizable fish for seafood consumers. However, the Commission is concerned the memorandum does not adequately address several significant economic, regulatory, enforcement, biological, and ecological issues associated with potential offshore aquaculture of striped bass, as described in the following sections. There are substantial concerns regarding risks to wild striped bass populations, commercial fisheries, seafood markets, protected species, and marine ecosystems, while also creating significant regulatory and financial obligations for states. Given these risks and the information currently available, the Commission does not support moving forward with consideration of offshore striped bass aquaculture at this time.

Enforcement Concerns

Enforcement capacity in the EEZ is currently limited, and aquaculture sites would create additional enforcement responsibilities, either increasing costs or diverting resources from other enforcement priorities. Since the EEZ is currently closed to striped bass fishing, there is potential for offshore aquaculture to be used as cover for some illegal fishing. The memorandum's discussion of traceability, monitoring, compliance, and enforceability lacks sufficient detail to evaluate whether these programs would be practical or effective. For example, existing tagging requirements do not provide a mechanism to verify whether striped bass fillets sold in seafood markets originate from wild harvest or aquaculture production. Because consumers do not receive documentation at the point of sale, retained aquaculture tags and associated records could be misused to falsely market illegally harvested wild-caught striped bass, including undersized fish, as aquaculture-raised product. Research could be done to evaluate the proposed traceability measures, which currently appear limited to fish racks and fillets, and could include methods to improve fillet-level identification of farmed striped bass.

Regarding on-the-water activity, the integration of vessel monitoring systems (VMS) or remote electronic monitoring, as referenced on page 12 of the memorandum, may not be practical as a tool to prevent illegal wild harvest. Many striped bass fishermen operate smaller vessels that are not currently subject to electronic monitoring requirements. Expanding VMS to these vessels could generate data volumes that exceed the capacity of enforcement agencies to effectively review and act upon.

The memorandum does not clearly identify which agencies would be responsible for carrying out these monitoring and enforcement activities or how they would be funded. Historically, federally permitted activities often result in states and interstate commissions assuming substantial administrative, regulatory, enforcement, and financial responsibilities without corresponding federal resources. Additionally, there is a question of whether all states on the Atlantic coast have the authority to enforce and monitor striped bass aquaculture operations. The report gives enforcement and monitoring details for states in the Commission's striped bass management unit (Maine through North Carolina), but no information is available for the southern states (South Carolina through Florida), and offshore Florida was listed as favorable location for striped bass aquaculture. Many states' enforcement capabilities are already stretched very thin with limited resources. These implementation burdens must be fully evaluated before advancing any offshore striped bass aquaculture program.

Economic Concerns

The memorandum does not adequately address or consider the economic consequences of potential off shore aquaculture on the wild fishery. Increased production of aquaculture-raised striped bass has the potential to flood seafood markets, reducing the value of wild-caught striped bass—a premium product that supports commercial fishermen throughout the Atlantic coast—and directly impacting the wild-caught striped bass harvest fisheries (the mom-and-pop businesses). The report does not attempt to quantify these direct consequences to the wild fishery. Analysis is needed to evaluate the market impacts of an influx of aquaculture-reared striped bass on the wild-caught striped bass fishery, including potential effects on pricing, demand, and overall economics of the fishery.

Rather than creating new economic opportunities, offshore striped bass aquaculture may shift economic benefits from traditional fishing communities to private aquaculture operations. Greater public benefit may be realized by investing in the utilization, marketing, and consumer acceptance of wild-caught species that are harvested sustainably and currently receive limited market value.

User Conflicts

User conflicts need to be addressed in greater detail. The memorandum downplays user conflicts that offshore aquaculture for striped bass would present, especially at a time when user conflicts due to other ocean uses (e.g., offshore wind) are at the forefront. Access to traditional fishing grounds would be reduced for commercial and recreational fisheries, particularly for mobile gear users and for year-round fisheries in warmer waters that have been identified as potentially suitable aquaculture sites. These user conflicts deserve greater consideration given the important role that Regional Fishery Management Councils and the Commission play in managing fisheries that depend upon continued access to fishing grounds.

To inform this issue, more details are needed regarding what offshore farms would look like in practice, and which uses would be allowed or restricted within these shared-use areas. NOAA should clarify whether exclusion zones would be established around farm infrastructure, and if farms are expected to aggregate pelagic finfish species, whether recreational or commercial fishing would be prohibited in the surrounding area. Regarding vessels, available data on the frequency or risk of vessel collisions with offshore aquaculture infrastructure should be considered.

Project Siting
The current description provides limited detail beyond general, high-level considerations, and appears to underestimate the engineering and operational challenges associated with locating striped bass net pens in offshore environment. Based on Figure 1 in the memorandum, offshore waters from Virginia southward appear to offer the most suitable temperature conditions for year-round operations. As ocean temperatures continue to rise, however, suitable production areas are likely to shift over time. The memorandum does not adequately address how the regulatory framework would accommodate the need to relocate facilities as environmental conditions change. Additionally, the timeframe used in the temperature modelling for suitable areas of the coast only includes very recent years, but should consider a longer timeframe.

The areas identified are also highly susceptible to severe weather events, including hurricanes and winter storms. Notably, the strongest hurricanes often stay offshore, which could result in aquaculture facilities taking a direct hit. NOAA should evaluate and describe the expected resilience of offshore aquaculture operations under extreme storm conditions, including the measures that would be implemented to minimize infrastructure damage, fish escapes, and environmental impacts. This information should also specify the depths at which cage systems would need to be submerged under varying storm scenarios. Overall, the term "offshore net-pen system" should be clearly defined including description of system dimensions, design specifications, and schematics.

There is also concern that potential sites are being proposed outside of the engagement and planning for Aquaculture Opportunity Areas (AOA) as seen in other areas of the EEZ as in the Gulf and Southern California which are specific, predefined geographic zones identified by NOAA to support sustainable commercial aquaculture. AOA planning allows for rigorous scientific spatial analysis and public input, these areas are evaluated to be environmentally, socially, and economically suitable for farming finfish, shellfish, and seaweed. The potential sites indicated in this memorandum do not appear to be part of the AOA process. The memorandum had little to no information about public input/outreach regarding aquaculture sites. Stakeholder input and education are needed for stakeholder buy-in and without buy-in, there will likely be pushback against these operations.

Aquaculture Industry Specifics
Additional information is needed regarding the level of industry interest in offshore striped bass aquaculture and the basis for pursuing this initiative. It is unclear whether there is currently an interested party seeking to develop an offshore striped bass aquaculture operation, or whether the intent is to establish a regulatory framework for potential future applicants. If there are no active proposals at this time, it is important to ensure that any regulatory framework is informed by realistic operational practices and industry needs. Experience from offshore wind development has demonstrated that regulations developed without a clear understanding of eventual project designs and operational requirements may not align well with implementation.

Specific to the farm sites, the operating costs and the associated production volumes and average farm scale required to support the economic viability of striped bass aquaculture operations should be identified and evaluated. Information on profitability estimates for striped bass aquaculture, both land-based (pond & RAS) and offshore, is needed. The report included profitability information based on comparable species despite striped bass aquaculture existing in the U.S. There is also a question of whether land-based aquaculture of striped bass could help fill U.S. origin seafood supply/demand.

Ecological Concerns
The memorandum does not address one of the longstanding concerns associated with farming high-value carnivorous marine fish species: dependence on fish-based feeds. Although feed technology continues to evolve, forage fish remain an important component of diets used to optimize growth and product quality.

The ecological tradeoffs associated with diverting forage resources into aquaculture deserve careful consideration. Maintaining healthy forage fish populations benefits not only wild striped bass but also numerous marine mammals, seabirds, and other ecologically and economically important species.

Regarding habitat, offshore units/structures tend to act as fish "attractor" devices through complex structure, food availability or prey availability and could have unforeseen effects on essential fish habitat (EFH) in close proximity to other bottom structure or pelagic species. Any potential threat of offshore striped bass aquaculture to EFH would vary widely depending on siting, depth, benthic type below the facility, etc. Some EFH concerns include any coral or live/hardbottom habitat, including deepwater coral communities; marine and estuarine waters; any waters that support diadromous fishes and spawning or nursery habitat; and waters hydrologically and ecologically connected to waters that support EFH. Management plans for any offshore facility should require permittees to have adequate funds (e.g., assurance bond) committed to ensure removal of fish and decommissioning of the facilities that are abandoned, obsolete or storm-damaged or had their permits revoked. This would ensure no continued effects on EFH.

Protected Species

Offshore aquaculture operations create the potential for entanglement and other interactions with species protected under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). The current information in the memorandum is limited on this issue and remains a potentially significant outstanding concern. If available documentation indicates that entanglement risk is low but not negligible, quantitative information should be provided regarding the frequency of marine mammal and seabird entanglements. Regarding implementation, one question is how frequently net systems are inspected for integrity and potential wildlife interactions.

Biological Risks: Escapement, Genetic Concerns, and Disease

Significant biological risks remain unresolved. Disease transmission, parasite transfer, escape of cultured fish, and genetic interactions with wild striped bass populations continue to present legitimate concerns. Likewise, questions remain regarding the adequacy and consistency of federal oversight related to therapeutants, antibiotics, and other chemicals that may be used in commercial aquaculture operations. Wild fish in close proximity to facilities could be exposed to therapeutics environmentally or through excess feed escapement and potential parasitic infection with unknown effects. This also applies to therapeutics used to prevent parasitic infections, which can be a problem in culture facilities. These issues warrant additional scientific evaluation before large-scale offshore production is considered.

The memorandum should explain how genetic tracking would be implemented in practice. If "pure-strain" stocks are non-interbreeding (e.g., sterile), NOAA should evaluate whether this would affect the economic viability of production, particularly if such fish are considered genetically modified. NOAA should describe how consumers would be informed that the product is genetically modified. If pure-strain stocks are not sterile, there are concerns regarding the risk of escapement and potential impacts on wild striped bass populations and information is needed on average escapement rates from similar net-pen aquaculture systems. The term "pure-strain striped bass" should also be clearly defined.

Information should also be provided regarding how disease events would be managed given the apparent lack of approved antibiotics for striped bass. Wild striped bass experiencing stress, such as during overwintering, can develop significant skin lesions that reduce marketability. NOAA should provide available data on fish condition and market quality of aquaculture-reared striped bass under culture conditions.

The memorandum notes there may be some small losses (escapements) that may intermingle with the wild population, but that risk should be given more weight and consideration, as well as the risk of a catastrophic failure (which would be a real risk considering weather events and potential vessel interactions). There is no way to guarantee that aquaculture striped bass would not mix with the wild population, and these risks are much greater in open water systems. Containment rules as well as genetic modification of cultured fish (triploids and diploids) or potential sterilization techniques are not necessarily validated for striped bass in large-scale production culture situations.

Policy and Regulatory Roles

Strong regulatory barriers for starting these type of operations exist, as they should if they are to be done properly. Many of the regulatory concepts presented in the memorandum remain vague with respect to implementation. There appears to be limited direct regulatory authority by NOAA or the Commission over offshore aquaculture operations. Further discussion or clarification is needed regarding whether EPA or USACE are appropriately positioned to address issues related to biosecurity and potential impacts on wild stocks. It may be more appropriate for NOAA Fisheries and USFWS to have a more direct oversight role, beyond participation as cooperating agencies in the NEPA process, which is anticipated to be led by USACE.

The memorandum notes that the Commission may wish to consider whether existing authorities could be used to develop monitoring and enforcement programs specific to striped bass aquaculture. However, it is indicated that such actions would serve primarily to "influence" federal partners rather than establish mandatory requirements. Clarification is needed regarding how Commission-developed actions would be used by NOAA Fisheries and other permitting agencies, particularly given the significant time and resources required to develop such programs.

Conclusion

In summary, offshore net pen aquaculture of striped bass has a very limited operational history and no demonstrated record of large-scale, long-term success in the United States. The Commission has substantial concerns including risks to wild striped bass populations, commercial fisheries, seafood markets, marine ecosystems, and protected species, enforcement concerns, as well as the potential for significant regulatory and financial obligations for states. Based on the information currently available, these risks are not adequately balanced by the potential public benefits described in the memorandum. Given these risks and unresolved issues described above, the Commission does not support moving forward with consideration of offshore striped bass aquaculture at this time.

The Commission is focused on rebuilding the wild stock of striped bass, including upcoming discussions on whether hatchery stocking can enhance that effort. The potential for offshore aquaculture does not seem to support that rebuilding effort, and instead would pose risks to the resource and the fisheries. Land-based aquaculture systems may provide a more readily achievable path toward the same domestic seafood production goals with substantially fewer of the risks described in this letter. If NOAA elects to pursue offshore striped bass aquaculture, any effort should begin at a small scale and address the concerns identified in this letter, with meaningful opportunities for stakeholder input built in from the outset.

The Commission appreciates the opportunity to provide these comments and is available for further discussion.

Respectfully,

Robert E. Beal
ASMFC Executive Director

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Charting A Course for Striped Bass: Science and Regulatory Innovation for Offshore Aquaculture

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

NOAA Technical Memorandum NMFS-F/OAQ-001
FEBRUARY 2026

Charting A Course for Striped Bass: Science and Regulatory Innovation for Offshore Aquaculture

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NOAA Technical Memorandum NMFS-F/OAQ-001
February 2026

U.S. Department of Commerce
Howard Lutnick, Secretary

National Oceanic and Atmospheric Administration
Neil Jacobs, NOAA Administrator

National Marine Fisheries Service
Eugenio Piñeiro Soler, Assistant Administrator for Fisheries

About:

The mission of the National Oceanic and Atmospheric Administration (NOAA) is to understand and predict changes in the Earth's environment and to conserve and manage coastal and oceanic resources and habitats to support our Nation's economic, social, and environmental needs. The NOAA Fisheries Office of Aquaculture advances cutting-edge science and research, while supporting federal policymaking and regulation, to promote sustainable aquaculture in the United States alongside healthy commercial and recreational fisheries. We also work to ensure that science, policies, and regulations allow communities to realize the social, economic, and environmental benefits of aquaculture.

This Technical Memorandum series provides a means for documenting and rapidly communicating preliminary results, interim reports, or other special-purpose information. The scientific results and conclusions, as well as any views or opinions expressed herein, are those of the authors and do not necessarily reflect those of the National Marine Fisheries Service or the Department of Commerce.

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Copies of this report are available online at:
https://spo.nmfs.noaa.gov/tech-memos/

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1 Executive Summary

Striped bass (*Morone saxatilis*) is one of the most valued fish species along the Atlantic coast of the United States (U.S.), noted for its ecological, cultural, and economic importance. Recreational and commercial fisheries have long depended on this species, but harvest in federal waters of the Exclusive Economic Zone (EEZ) along the East Coast has been prohibited since 1990. While the moratorium was vital for rebuilding wild stocks, it also blocks the potential to develop striped bass aquaculture offshore, despite major advances in science, technology, and management that now make such development both feasible and promising. Balancing aquaculture development with protection of wild striped bass populations and the fisheries they support is essential for ensuring the resilience of this iconic species. Over the past three decades, substantial progress has been made in aquaculture biology, offshore engineering, disease management, and regulatory oversight. Controlled breeding, biosecurity protocols, site selection tools, and environmental monitoring now allow offshore aquaculture systems to reduce risks of escapement, disease transmission, and ecosystem impacts. At the same time, governance frameworks have evolved to better integrate aquaculture with other ocean uses and conservation objectives. These advances suggest that offshore production of pure-strain striped bass could be feasible under a carefully designed regulatory structure that distinguishes aquaculture from wild harvest and ensures accountability, traceability, and environmental safeguards.

The purpose of this discussion paper is to identify the legal, policy, and scientific constraints on the production of cultured pure-strain striped bass in federal waters and outline the economic and environmental topics raised by the Atlantic States Marine Fisheries Commission (ASMFC). At the 2024 Winter Meeting of the ASMFC, Danielle Blacklock, Director of the NOAA Fisheries Office of Aquaculture, led the Interstate Fisheries Management Program (ISFMP) Policy Board in a discussion on the future of aquaculture and the potential role of Atlantic Striped Bass in U.S. seafood production. The Board raised longstanding concerns, describing issues on escapement, ecosystem impacts, enforcement related to the existing moratorium in the EEZ and illegal harvest, competition with wild-caught markets, economic feasibility, and the challenges of managing aquaculture alongside other ocean uses.

Building on this exchange, this Technical Memorandum provides historical context, summarizes the Commission’s concerns, and identifies potential pathways forward. It examines the biological foundations, regulatory history, technological readiness, environmental considerations, market dynamics, and governance needs for striped bass aquaculture. The memo highlights how coordinated science, policy, and industry innovation could support sustainable offshore farming of this species in a way that complements wild stock conservation and contributes to U.S. seafood supply and coastal economies.

NOAA Fisheries, in coordination with ASMFC, could amend the relevant regulatory provisions to allow aquaculture as an explicit exception to the EEZ moratorium on the fishing, harvest, possession, and retention of striped bass. The sections that follow summarize the key regulatory and scientific issues and outline proposed next steps.

Summary of Key Regulatory and Science Issues

1.1 Enforcement Considerations

Fishery managers have expressed a need for strong, enforceable assurances that the development of an aquaculture market for pure-strain striped bass will not create incentives for illegal harvest or lead to negative impacts on wild stocks and the fisheries they support. The ASMFC (through its Law Enforcement Committee), state agencies, and NOAA Fisheries' Office of Law Enforcement (OLE) collaborate extensively on interjurisdictional fisheries enforcement. State precedents for labeling and tagging farmed product offer models for ensuring consumer confidence and preventing substitution of wild fish into aquaculture supply chains. Product differentiation and proper enforcement mitigate these challenges by providing better accountability on the water and enabling law enforcement to track a fish from its origin. Strategies could be developed for regulatory frameworks to ensure that aquaculture-raised striped bass are accurately labeled and traceable throughout the supply chain.

1.2 Economic Contributions

Market demand strongly supports the development of a domestic striped bass aquaculture sector. U.S. seafood consumption continues to outpace supply, with the majority of products imported. The development of a robust striped bass aquaculture industry has the potential to generate similar spillover benefits, particularly for coastal communities. Recent economic research suggests that striped bass aquaculture is most profitable in offshore net-pen systems, with breakeven prices comparable to those of commercially farmed red drum (*Sciaenops ocellatus*). Demand-side conditions are favorable, yet production cost challenges and regulatory inconsistencies, especially in states with gamefish designations, may be addressed. Interstate transport and sale of pure-strain farmed striped bass could present barriers for market development that will require synergies between state and federal regulations to avoid enforcement challenges and ensure transparency. A complete understanding of the impacts that a farmed striped bass industry will have on existing imports and wild-caught alternatives will require further analysis on potential production volumes and targeted markets. However, introducing farmed striped bass into non-traditional retail and food-service channels could expand consumer exposure to the species, increasing overall demand for both farmed and wild-caught products.

1.3 Managing Ocean User Conflicts

The identification of suitable areas for aquaculture development, coupled with careful site selection and management, is fundamental to ensuring the long-term success and sustainability of offshore aquaculture. In the U.S., where competition for nearshore space is intense, expansion into the EEZ provides opportunities for larger sites with fewer nearshore user conflicts and greater social acceptance among commercial and recreational fishing communities. As part of NOAA's National Ocean Service, the National Centers for Coastal Ocean Science (NCCOS) plays a central role by developing science-based inclusive decision tools to inform precision siting for aquaculture and other sectors of the ocean economy.

1.4 Environmental Concerns

In the context of striped bass aquaculture, potential environmental effects can be grouped into several categories: (1) water quality, (2) benthic and sedimentary processes, (3) interactions with marine life and habitats, (4) cumulative and landscape-scale effects, and (5) mitigation strategies, including novel approaches such as integrated multi-trophic aquaculture (IMTA). Modern production technologies, standardized operating procedures, and best management practices reduce risks of degradation to water quality, benthic habitats, and marine life. All of these issues are managed by the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (USACE), in coordination with NOAA through consultations under existing federal law. EPA generally applies water quality models to characterize interactions between effluent and the receiving environment. Further, the NOAA NCCOS has ongoing collaborations with the EPA to provide depositional and water quality modeling products and science advice to support agency permitting and associated environmental reviews and consultations for finfish aquaculture projects proposed for federal waters.

1.5 Escapement and Genetic Concerns

Escape events are among the most widely recognized ecological risks associated with marine finfish aquaculture. Recent advances in genomic technologies now enable high-resolution monitoring of striped bass population structure. These tools have been applied to striped bass, where they have clarified stock composition and informed management across the species' range. Decades of hatchery experience, the success of the hybrid striped bass industry, and advances in selective breeding and fish health management have established a strong technical foundation for farming pure-strain striped bass. Offshore net-pen systems, which have been successfully demonstrated internationally, provide suitable growing conditions while reducing many environmental pressures on coastal ecosystems. Emerging tools in genetics, automation, and biosecurity further strengthen the case for expansion into offshore environments. Additionally, NOAA and partners have developed models to evaluate genetic and ecological risks associated with aquaculture escape events. The intent of these tools are to support risk-based assessments of offshore aquaculture operations and to inform the development of management and engineering strategies that reduce the potential adverse effects of escape events on wild populations.

1.6 Disease

Equally important to environmental performance is maintenance of aquatic animal health. Disease represents one of the most significant operational risks in striped bass aquaculture and requires continuous, proactive management. Striped bass are susceptible to a range of pathogens and parasites, with recent research improving understanding of disease dynamics in both wild and farmed populations. Even well-managed farms may periodically require therapeutic intervention to control outbreaks, limit mortality, and protect animal welfare.

The Food and Drug Administration (FDA) provides centralized oversight of aquaculture therapeutants, ensuring that their use is scientifically justified and environmentally protective. At present, no antibiotics are approved for striped bass or most marine finfish species, reinforcing the importance of preventative health strategies. For striped bass aquaculture, disease prevention is therefore the primary line of defense, relying on vaccination where available, rigorous biosecurity protocols, water quality management, and structured health-monitoring programs to enable early detection and response. By integrating science-based biosecurity, judicious therapeutic use, and informed site selection, offshore aquaculture operations can reduce pathogen pressure, safeguard stock health, and minimize both economic losses and environmental risks. Comprehensive health-management frameworks that emphasize prevention, surveillance, and targeted intervention are thus essential for the sustainable development of offshore striped bass aquaculture.

1.7 Summary of Next Steps

Production of striped bass is already occurring abroad, with farmed product entering U.S. markets and competing with domestic seafood. The commercial appeal of cultivating pure-strain striped bass is therefore grounded in the existence of an established and recognized market opportunity. While demand in many regions remains seasonal, a key opportunity lies in expanding striped bass into a stable, year-round product that can complement and relieve pressure on wild fisheries while increasing total supply.

Realizing this opportunity will require coordinated progress across science, industry, and governance. Priority research needs include continued broodstock and selective-breeding programs, deployment of genetic safeguards, offshore production trials, fish health management, and development of sustainable feed strategies. At the same time, policy modernization will be essential, including reforms to regulatory frameworks in the EEZ, strengthened interagency coordination of federal permitting, expansion of marine spatial planning tools, and supporting workforce development and stakeholder engagement.

Striped bass aquaculture represents a strategic opportunity to expand domestic seafood production, strengthen coastal economies, and reinforce conservation of wild stocks. When science, governance, and markets are aligned, offshore farming of this species can move from technical feasibility to commercial reality, helping the United States advance national goals for seafood security, economic growth, and resilient coastal communities while coexisting with and supporting the long-term sustainability of commercial and recreational fisheries.

2 Overview

2.1 Biology and Distribution of Striped Bass

The striped bass (*Morone saxatilis*) is one of the most important sport fish and commercial fisheries along the Atlantic coast of North America. It is an all-time favorite for anglers. It belongs to the family Moronidae, which comprises both freshwater and anadromous taxa. In North America, the genus *Morone* is represented by four species: striped bass, white perch (*M. americana*), white bass (*M. chrysops*), and yellow bass (*M. mississippiensis*). Striped bass is the largest and longest-lived member of the group, with individuals documented to live more than 30 years and reach weights exceeding 100 pounds, although fish over 75 pounds are rare (Bowers, 1900; Smith, 1907).

Striped bass populations display regionally distinct migratory behaviors along the U.S. Atlantic coast. North of Cape Hatteras, North Carolina, adults are anadromous, ascending freshwater or brackish rivers in spring to spawn before returning to the coastal ocean (Rulifson & Dadswell, 1995; Morris et al. 2003). Major spawning grounds on the U.S. Atlantic coast includes the Chesapeake Bay (Virginia and Maryland), the Hudson River, and the Delaware River, although smaller spawning populations exist in several other bays and rivers as well, including the Albemarle Sound-Roanoke River (North Carolina) and the Kennebec River (Maine). Larval and juvenile recruitment occurs in estuaries, where young fish typically reside for one to two years before dispersing offshore. Seasonal migrations extend northward to Nova Scotia during summer and southward to Virginia and North Carolina during winter, where spawning occurs in spring (Greene et al., 2009). In the Chesapeake Bay, migration patterns differ by age and sex, reflecting ontogenetic variation in maturity (Kohlenstein, 1981). The Hudson River stock shows similar dynamics, with both resident and ocean-migratory contingents (McLaren et al., 1981). In the Bay of Fundy, adults migrate downstream after spawning, while juveniles either remain in rivers or disperse along the coast (Rulifson & Dadswell, 1995).

In contrast, striped bass populations south of Cape Hatteras, extending to the St. John's River in northern Florida and into the Gulf of America, are primarily riverine and potamodromous, lacking consistent oceanic migrations (Setzler-Hamilton 1980; McIlwain, 1980). Historically, the Gulf range extended from the Suwannee River, Florida, westward to rivers of the Lake Pontchartrain basin in Louisiana (Pearson, 1938; Merriman, 1941; Barkuloo, 1961, 1967; GSMFC, 2006). Today, the only remnant population persists in the Apalachicola–Chattahoochee–Flint (ACF) river system spanning northwest Florida, Georgia, and Alabama. No records exist of Gulf specimens captured in open ocean habitats, although telemetry studies indicate that ACF striped bass occasionally enter the Gulf and migrate along the coastline (McIlwain, 1980; Fruge, 2006; Long et al., 2013).

Commercial landings of striped bass in the Gulf ended in the 1960s, however, coastal stock enhancement and contributions from reservoir escapement have created recreational fisheries in some areas. Although not native to Texas, striped bass are occasionally reported in estuaries and rivers as escapees from stocked reservoirs. These reports, documented by Texas Parks and Wildlife through gill net and creel surveys, occur mostly in Sabine, Galveston, and Matagorda Bays (Texas Parks and Wildlife, n.d.).

Beyond their native range along the Atlantic and Gulf coasts, striped bass were successfully introduced to the Pacific coast in the late nineteenth century (ca. 1879). Within a decade, they supported vibrant recreational and commercial fisheries from southern California to the Columbia River, Oregon (Nichols, 1966). An introduction to Kauai, Hawaii, in 1920 was unsuccessful, as the transplanted California fish failed to survive (Randall, 1987).

2.2 Striped Bass Fisheries Management

Management of Atlantic striped bass is coordinated through the Atlantic States Marine Fisheries Commission (ASMFC), which works in partnership with state and federal agencies to assess population status and implement regulatory measures across the species' range (ASMFC, 2022a). The management unit includes all coastal migratory striped bass stocks from Maine through North Carolina. ASMFC has primary authority for striped bass management within state waters, while NOAA Fisheries (NMFS) has management authority in federal waters. Federal waters under the Magnuson-Stevens Fishery Conservation and Management Act are defined as the Exclusive Economic Zone (EEZ), which extends from the seaward boundary of state waters out to 200 nautical miles offshore.

Stock assessments have consistently documented the species' natural population variability and periods of overexploitation. Severe overfishing during the late 1970s and early 1980s led to a coastwide collapse, prompting the adoption of a moratorium and strict harvest controls in the mid-1980s (Richards & Rago, 1999; ASMFC, 1990). These actions facilitated recovery, and by the mid-1990s the stock was declared rebuilt (ASMFC, 1997).

Since recovery, striped bass have remained among the most intensively managed fisheries along the Atlantic coast. Regulatory tools have included size and slot limits, seasonal closures, quotas, and gear restrictions, with measures adjusted adaptively in response to new scientific assessments (ASMFC, 2022a). Despite these efforts, the 2018 benchmark stock assessment concluded that the stock was overfished and that overfishing was occurring (NEFSC, 2019). In response, the ASMFC enacted harvest reductions in 2020 to curb fishing mortality and initiate rebuilding (ASMFC, 2020).

Total removals in 2021, including commercial harvest, commercial discards, and recreational harvest and release mortality, were estimated at 5.1 million fish, similar to

2020 levels (ASMFC, 2022b). Recreational removals accounted for approximately 86% of this total, reflecting the dominance of the recreational sector. The commercial fishery, managed under state-specific quotas, has maintained relatively stable landings since 2004, while the recreational fishery is managed through bag limits, size restrictions, and seasonal closures in some jurisdictions (ASMFC, 2022b).

Broader management reforms were codified in Amendment 7 to the Interstate Fishery Management Plan (FMP), approved in 2022. Amendment 7 introduced more precautionary recruitment triggers, clarified conservation equivalency standards, enhanced measures to reduce recreational release mortality, and reaffirmed the requirement to rebuild the stock by 2029 (ASMFC, 2022a). Addendum I, approved in May 2023, further allowed for voluntary transfers of commercial quota in the ocean region, contingent on stock status (ASMFC, 2023).

Following the 2024 Stock Assessment Update, which determined the stock remained overfished though not experiencing overfishing, the ASMFC initiated Draft Addendum III in December 2024. This addendum, currently under development, is intended to provide new recreational and commercial measures for implementation in 2026 to ensure rebuilding by 2029 (ASMFC, 2024a). The Board is expected to finalize the addendum following public comment in late 2025, with implementation planned for early 2026 (ASMFC, 2025).

This evolving management framework illustrates the dynamic and adaptive nature of striped bass governance. The challenge remains to balance sustainable harvest opportunities with long-term conservation goals for a species that holds ecological, cultural, and economic importance along the U.S. Atlantic seaboard.

2.3 Legal History of Striped Bass Management

2.3.1 Atlantic States Marine Fisheries Commission and the Striped Bass Conservation Act of 1984

The ASMFC, established in 1942 through an interstate compact, was created to coordinate management of interjurisdictional fisheries along the Atlantic seaboard, including striped bass (ASMFC, 2022a). The Commission is composed of representatives from 15 states, the District of Columbia, the Potomac River Fisheries Commission, and federal agencies including NMFS and the USFWS. Collectively, these entities hold primary management authority and adopt regulations consistent with the Interstate FMP (ASMFC, 1990).

By the mid-1970s, striped bass populations had declined to historic lows. In 1979, Congress directed NMFS and USFWS to conduct a comprehensive study of the causes of this decline, examining environmental change, predation, competition, and fishing mortality (U.S. Congress, 1979)[1]. In response, ASMFC adopted the first Atlantic Striped Bass FMP in 1981 (ASMFC, 1981). To strengthen implementation, Congress enacted the Atlantic Striped Bass Conservation Act of 1984 (Pub. L. 98-613), which required states to implement ASMFC's striped bass regulations and established a federal enforcement backstop (U.S. Congress, 1984).

The Striped Bass Act empowered ASMFC to notify the Secretaries of Commerce and the Interior if a state failed to comply with the interstate FMP. Upon such notification, the Secretaries could jointly impose a moratorium on striped bass fishing in that state's waters (ASMFC, 1990). This enforcement authority, unique among the interstate marine fishery commissions, has proven effective in ensuring state compliance with ASMFC management actions (NMFS, 2020a).[2]

Congress strengthened the Striped Bass Act through amendments in 1988, authorizing the Secretary of Commerce acting through NMFS to regulate striped bass within the federal waters of the EEZ (U.S. Congress, 1988). Using this authority, the Secretary may develop offshore regulations, but any regulations are required to be consistent with the Magnuson–Stevens Fishery Conservation and Management Act (16 U.S.C. §1851 et seq.) and compatible with the ASMFC striped bass FMP. The 1988 and subsequent amendments also authorized NMFS and USFWS to carry out annual studies and population assessments of striped bass. The amendments also mandated biennial stock assessment and management reports from the Secretaries to ASMFC and Congress, expanded requirements for public participation in preparation of management plans, and provided dedicated annual funding for striped bass research and assessment (NMFS & USFWS, 1990).

In November 1990, NMFS implemented a moratorium on the harvest and possession of striped bass in the EEZ under the Striped Bass Act (55 Fed. Reg. 40184, 1990). This action was designed to reinforce ASMFC's rebuilding program, provide additional protection for striped bass thereby reducing fishing mortality, and ensure the effectiveness of state regulations. The moratorium remains in effect today (NMFS, 2020b). Amendment 4 to the Striped Bass Plan, adopted in 1989, allowed for limited increases in harvest. Amendment 4 relaxed the measures, and as states reopened fisheries, NMFS closed federal waters of the EEZ to ensure effectiveness of state

[1] "Reauthorization of the Atlantic Striped Bass Conservation Act", U.S. House of Representatives Report, 106-698.

[2] The Atlantic Coastal Fishery Cooperative Management Act (1993) generally mirrors the Striped Bass Act in giving the Secretary of Commerce the authority to impose moratoria in State waters, albeit for other Atlantic fisheries managed under ASMFC-approved fishery management plans.1988 Amendments and the Federal Moratorium.

measures (ASMFC, 1989). Although reopening of the EEZ has been periodically evaluated, including under Amendment 6 in 2003, both managers and stakeholders have consistently supported its continued closure, citing the predominance of mature, spawning-capable females offshore and the risk of increased fishing mortality if federal waters of the EEZ were reopened (ASMFC, 2003).

2.3.2 Executive Order 13449

In 2007, Executive Order 13449 affirmed federal policy to conserve striped bass and red drum, while clarifying that aquaculture production of these species was not restricted (Bush, 2007). The order declared that it is “the policy of the U.S. to conserve striped bass and red drum for the recreational, economic, and environmental benefit of the present and future generations of Americans” (Bush, 2007). The E.O. notes, importantly, that the order must be implemented in a manner consistent with applicable law. The E.O. essentially directed NOAA to promulgate regulations that restrict the sale of EEZ striped bass if it could do so consistent with the law. NOAA already had regulations on the books (i.e., closure of federal waters of the EEZ) that achieved the policies of the E.O.

2.3.3 Federal Jurisdiction and Regulations (Current Legal Constraints)

Management authority for Atlantic striped bass within state waters resides with the coastal states, coordinated through the ASMFC’s Striped Bass FMP (ASMFC, 2022a). Federal authority in the EEZ is derived from the Magnuson Stevens Act, which predates the Atlantic Striped Bass Conservation Act and which requires NMFS to ensure that any regulations implemented for striped bass in the EEZ: (1) are consistent with the national standards under Section 301 of the MSA (16 U.S.C. §1851 et seq.); (2) are compatible with the ASMFC Striped Bass FMP and any federal moratoria authorized by statute; (3) ensure the effectiveness of state regulations within coastal waters; and (4) achieve long-term conservation and management objectives for the Atlantic striped bass resource (U.S. Congress, 1984; NMFS, 2020). In other words, NMFS or the Councils could develop a federal FMP for striped bass under the MSA if it so chooses. Alternatively, NMFS may implement regulations for striped bass under the ACA instead, which is the scheme we have today.

Federal regulations in the EEZ can be developed to complement ASMFC’s Striped Bass FMP. Currently, federal regulations prohibit fishing for, harvesting, possessing, or retaining Atlantic striped bass in the EEZ (50 C.F.R. §697.7). Limited exceptions exist in Block Island Sound, where possession is permitted during continuous transit provided no fishing occurs in EEZ waters (NMFS, 1990).

In 1995, following ASMFC’s declaration that striped bass stocks were rebuilt, NMFS considered lifting the EEZ ban or revising it to align with state size limits, as recommended by the Commission (ASMFC, 1997). After reviewing public comment and updated mortality estimates indicating fishing pressure was higher than previously believed, NMFS elected to maintain the EEZ moratorium (NMFS, 1995). Further, Amendment 6 included a recommendation to NMFS to consider reopening the EEZ (ASMFC, 2003). Following public review and consideration of updated stock assessments, NMFS concluded in 2006 that reopening the EEZ posed unacceptable risks because effort levels and associated fishing mortality could not be reliably controlled (NMFS, 2006).

Currently, implementing regulations (50 CFR 697.7(b)) state that it is unlawful for any person to do any of the following:

(1) Fish for Atlantic striped bass in the EEZ.

(2) Harvest any Atlantic striped bass from the EEZ.

(3) Possess any Atlantic striped bass in or from the EEZ, except in the following area: The EEZ within Block Island Sound, north of a line connecting Montauk Light, Montauk Point, NY, and Block Island Southeast Light, Block Island, RI; and west of a line connecting Point Judith Light, Point Judith, RI, and Block Island Southeast Light, Block Island, RI. Within this area, possession of Atlantic striped bass is permitted, provided no fishing takes place from the vessel while in the EEZ and the vessel is in continuous transit.

(4) Retain any Atlantic striped bass taken in or from the EEZ.

2.4 Solutions and Recommendations

A regulatory pathway that allows for offshore aquaculture of striped bass in the U.S. EEZ could be achieved without undermining the conservation achievements of the Striped Bass Conservation Act or ASMFC’s management program. The following solutions are recommended:

2.4.1 Regulatory Carve-Out for Aquaculture

NMFS could lead an effort to amend existing regulations to explicitly recognize aquaculture operations as an exception to the EEZ moratorium. Permitting criteria may be established specific to aquaculture while reaffirming the prohibition on wild harvest in the EEZ. The language would have to be specific about who, when, and where the exemption would apply. This amendment would be subject to public comment and could include commentary by the ASMFC. While straightforward textually, NMFS intent is to work with the ASMFC to address any possible concerns before such action is considered.

2.4.2 Enforcement and Monitoring Framework

Federal and state enforcement agencies may adopt a robust compliance and monitoring program for aquaculture operations. This may include reporting requirements, periodic inspections, and integration of vessel monitoring systems or remote electronic monitoring to ensure no illegal harvest of wild striped bass occurs under the guise of aquaculture.

2.4.3 Traceability and Supply Chain Integrity

A comprehensive traceability system ("farm-to-market") is essential to differentiate cultured striped bass from wild-caught products. Tools could include genetic certification, tagging, or electronic product tracking. Such measures would prevent substitution of illegally harvested wild fish into aquaculture supply chains, thereby preserving confidence among regulators, markets, and consumers. Importantly, this approach would align with existing wild striped bass tagging programs used by coastal states, creating a seamless framework for distinguishing wild and farmed fish in commerce.

2.4.4 Alignment with Fisheries Management Measures

Complimentary aquaculture regulations could be developed by the States in consideration of existing striped bass fisheries management tools such as bag limits, size limits, and possession limits. While these limits may not apply directly to aquaculture, aligning aquaculture rules with conservation objectives will minimize regulatory conflicts and reinforce stock protection.

2.4.5 Certification of Pure-Strain Cultured Striped Bass

To ensure that aquaculture production supports conservation, cultured fish could be certified as pure-strain and non-interbreeding with wild stocks. Hatchery protocols, broodstock management, and genetic testing would safeguard against introgression and maintain the integrity of wild striped bass populations. Non-interbreeding status can be achieved through strict physical containment measures, siting farms away from migratory stocks, or by applying genetic control approaches such as triploidy, sterility induction, or technologies to prevent successful interbreeding with wild fish.

2.4.6 Preventing Market Leakage of Wild Harvest

Clear rules, coupled with enforcement and traceability, must ensure that wild-caught striped bass do not enter markets under the label of cultured product. This will protect both the conservation gains achieved under ASMFC management and the credibility of aquaculture enterprises. Such safeguards are not new; they already exist within the current hybrid striped bass and pond-farmed striped bass industries, where farmed product is clearly distinguished from wild harvest through tagging, documentation, and distribution controls. Building on this established framework, similar approaches can be extended to offshore aquaculture operations to provide regulators, markets, and consumers with confidence that aquaculture production remains separate from wild harvest.

3 Striped Bass Aquaculture in the EEZ: Jurisdiction, Enforcement, and ASMFC's Potential Role

The governance landscape for striped bass in federal waters remains shaped by moratoria and ASMFC oversight, yet opportunities exist to adapt these frameworks for aquaculture without undermining wild stock protections. Traceability systems, tagging protocols, and strong enforcement provisions can close loopholes that otherwise risk illegal harvest. With proactive engagement, ASMFC and federal agencies can ensure that aquaculture complements conservation rather than conflicts with it.

3.1 Jurisdictional Context

As outlined in Section 2.3, harvest within the U.S. East Coast EEZ is prohibited. This section explores how the ASMFC could consider adapting existing authorities for oversight of striped bass aquaculture. These restrictions do not apply in the Gulf of America, where applications are actively being explored to farm Atlantic striped bass, not hybrid varieties, and commercial activity is already occurring, for the purpose of human consumption. Pond-based farms are operating in North Carolina, South Carolina, and Texas. North Carolina and Ohio are pursuing commercial-scale recirculating aquaculture following successful research trials. To have a meaningful role in the development of this industry, the ASMFC could consider using existing authority to establish monitoring and enforcement programs for striped bass aquaculture as the market expands and interest grows for production in the Atlantic.

Permitting for most aquaculture operations in the U.S. EEZ currently falls under the authority of federal agencies, specifically the Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (ACE). Under the Magnuson-Stevens Act, the Regional Fishery Management Councils (RFMC) are consulted by NMFS in relation to impacts to Essential Fish Habitat (EFH) regarding the regulatory actions taken by either the EPA or the ACE. The ASMFC has representation on some regional fisheries management councils, but does not currently have a direct regulatory or enforcement role in EEZ aquaculture.

To clearly outline the current situation: permitting within the EEZ primarily falls under the jurisdiction of the EPA and the ACE. The RFMCs are typically not involved beyond Essential Fish Habitat (EFH) consultations, or to the extent a Council has taken actions on policies concerning aquaculture.

A complicating exception to the general rule above is that the management of Atlantic striped bass in state waters is primarily the responsibility of the coastal states, and is promulgated through the ASMFC’s Striped Bass FMP. The management unit includes all coastal migratory striped bass stocks on the East Coast of the U.S., excluding the EEZ, which is managed separately by NMFS. Under the Atlantic Striped Bass Act, Section 5158 requires NMFS to ensure that any regulations implemented in the EEZ for striped bass:

1) Are consistent with the national standards in Section 301 of the MSA (16 U.S.C. 1801 et seq.).
2) Are compatible with the Striped Bass FMP and each federal moratorium in effect, as authorized by statute.
3) Ensure the effectiveness of State regulations within the coastal waters of a state.
4) Achieve long term conservation and management goals for the Atlantic striped bass resource. Federal regulations in the EEZ can be developed to complement ASMFC's Striped Bass FMP.

In November 1990, NMFS implemented a moratorium on the harvest and possession of striped bass in the EEZ under the Striped Bass Act to support the ASMFC Striped Bass Plan, provide additional protection for striped bass, and ensure the effectiveness of state regulations. This moratorium remains in effect today and current federal regulations ban the fishing, harvesting, possession and retention of Atlantic striped bass in the EEZ. As interest grows in the commercial culture of pure-strain striped bass in federal waters both in the Gulf of America and along the Atlantic, it is essential to recognize the regulatory gap that exists and the opportunity for ASMFC to step into a more proactive and protective role.

If the ASMFC wishes to have a meaningful role in this process, it could implement enforcement provisions specific to striped bass aquaculture, an authority that it currently possesses. It is also important to note that the ASMFC may be compelled to act regardless, given the potential expansion of pure-strain striped bass aquaculture in the Gulf of America and the potential of that product entering markets along the Atlantic.

This represents a timely opportunity for the ASMFC to actively engage with its stakeholders and ensure its voice is heard in shaping policy.

3.2 Scenarios for ASMFC Involvement

The expansion of pure-strain striped bass aquaculture presents both economic opportunity and ecological risk. The ASMFC is uniquely positioned to provide oversight of this industry, in conjunction with their protection of the wild striped bass stock. While it does not control permitting in the EEZ, the Commission establishes fishery management provisions and compliance standards that apply to its member jurisdictions, and thus influence the actions taken by Federal agencies working in the EEZ. If the ASMFC wishes to ensure that aquaculture development walks in parallel with decades of conservation work, it can consider exercising its authority to define and enforce compliance expectations related to striped bass aquaculture. The emergence of pure-strain production in regions like the Gulf of America underscores the urgency of this engagement.

Core Enforcement and Compliance Issues

Ultimately, fishery managers need strong, enforceable assurances that the development of an aquaculture market for pure-strain striped bass will not create incentives for illegal harvest, not undermine the commercial fishery or cause negative impacts on wild stocks. The primary enforcement concern appears to be illegal harvest, direct illegal sales of striped bass to consumers and restaurants. Strategies such as product differentiation and proper enforcement mitigate these challenges by improving accountability on the water and enabling law enforcement to track fish back to their origin. Effective regulation may include:

1. **Traceability and Product Differentiation**

Consistent labeling protocols across the supply chain, from production through market, are critical to preventing product misrepresentation. Effective approaches include physical identifiers, documentation procedures, and standardized processing requirements. Regulatory frameworks vary by jurisdiction, with some states tagging fish at the point of landing and others at the point of sale. The ASMFC has considered mandating dockside landing tags for all states, citing concerns that point-of-sale systems create greater opportunities for illegal harvest. A uniform dockside landing requirement could strengthen enforcement by reducing the risk of unrecorded landings, particularly in states with individual quotas where incentives for illegal sales are high. By ensuring traceability from the time fish are landed, tagging provides enforcement agencies with a critical tool to safeguard quota integrity and deter unlawful market activity.

Harvest of aquaculture striped bass from large offshore farms presents unique challenges for product tagging. Unlike small-scale operations, tagging at the point of capture, during loading to a well boat, or aboard a harvest vessel is impractical when tens of thousands of fish may be collected in a single event. Although gill- or tail-tagging systems can process up to approximately 200 fish per minute, they require individual handling, may adversely affect product quality, and can raise animal welfare concerns.

Dockside tagging reduces the risk of illegal mislabeling between aquaculture and wild-caught fish and is generally supported by enforcement agencies as a means of enhancing oversight, reducing opportunities for unlawful practices, and strengthening accountability across the seafood supply chain. Implementation considerations include enforcement logistics, operational safety, and consistency across fisheries with differing management structures. In particular, fisheries operating under individual quota systems are especially vulnerable to quota evasion, making rigorous dockside tagging a critical tool for compliance and traceability.

2. Monitoring and Market Controls

Reporting and tracking mechanisms must be adopted to monitor volumes of production, sales, and distribution of cultured striped bass. Rules concerning possession limits, vessel traffic, and size regulations may be considered, where appropriate, to ensure that aquaculture harvests are not masking illegal wild harvests.

3. Enforcement and Penalties

Penalty structures can deter violations, including fraudulent substitution between wild-caught and aquaculture products. Penalties should be calibrated to serve as effective deterrents and implemented through a clearly articulated enforcement framework that coordinates federal, state, and interstate authorities. Enforcement records show persistent convictions for the illegal possession or sale of fish by recreational fishers, underscoring the need for robust accountability measures (ASMFC, 2025). While the direct risk of recreational fish being misrepresented as aquaculture products may be relatively low, traceability systems and tagging requirements strengthen oversight and help address illicit market activity. There may also be value in exploring tagging protocols for recreational harvest, which could support traceability efforts and help deter unauthorized sales. In addition, consideration could be given to consistent size restrictions across recreational and commercial sectors.

4. Enforcement Burden and Legal Authorizations

The ASMFC and NOAA (specifically NMFS Office of Law Enforcement, OLE) collaborate extensively on fisheries enforcement. Their partnership blends federal oversight with regional/state-level enforcement, sharing burdens via multi-agency agreements and funding mechanisms tied to the Magnuson-Stevens Act and the Atlantic Coastal Fisheries Cooperative Management Act.

Under the Atlantic Coastal Fisheries Cooperative Management Act, NOAA provides funding to the states, in part, to support law enforcement capacity, including for Joint Enforcement Agreements (JEAs). NOAA's OLE maintains formal agreements with a wide list of states (e.g., MD, MA, FL, GA, etc.) to ensure nationwide coverage. ASMFC's Law Enforcement Committee (LEC) includes representatives from each member state plus NOAA, U.S. Coast Guard (USCG), and U.S. Fish and Wildlife Service (USFWS). Its tasks include reviewing enforcement plans, coordinating cross-jurisdictional efforts, and advising on regulation enforceability.

5. Law Enforcement Considerations

When reviewing investigation and criminal provisions, the following may be considered by the Law Enforcement Committee of the Atlantic States Marine Fisheries Commission:

- Consider a uniform regional traceability system for all seafood products harvested or produced for commercial sale, clearly distinguishing aquaculture from wild-caught sources.
- Standardize labels by year, type (aquaculture vs. wild-caught), color, and inscriptions for easy identification and traceability.
- Issue time-limited tags or labels (valid for a single calendar or fishing year) to ensure currency and prevent reuse or fraud.
- Include essential information on each tag, such as year, state or facility of origin, source type (aquaculture/wild), size limits (if applicable), and a unique identifier.
- Use tamper-evident and traceable tags that cannot be transferred between fish or altered without detection.
- Consider immediate tagging at the point of harvest or harvest-equivalent (e.g., at aquaculture facility dispatch or wild harvest landing).
- Require aquaculture operations to report production volumes and verify tag use based on certified harvest quantities.
- Enforce annual or seasonal return of all unused tags or labels, and prohibit federal permit renewal for non-compliance.
- Integrate tag tracking into dealer reports or electronic trip tickets, including identification of whether the product is farmed or wild-caught.
- Apply meaningful penalties, including license suspension or revocation, for mislabeling, misuse of tags, or other violations at the state or federal level.
- Ensure real-time, centralized access to tag issuance and use data for authorized enforcement personnel to facilitate on-the-ground inspections and audits.

Existing Models and Precedents

States have already taken action to regulate striped bass aquaculture in ways that promote transparency and accountability. Some states require a tagging program for commercially harvested striped bass. It is unlawful to sell or purchase commercially caught striped bass without a commercial tag. The intent is to prevent the sale or purchase of untagged striped bass in a state or jurisdiction where there is currently no commercial fishery program. Notably, Virginia had previously administered a detailed regulatory framework for culture of pure-strain striped bass. These efforts provide a valuable foundation for broader regional and federal collaboration.

A strong regulatory framework with effective enforcement and monitoring is essential to maintaining the integrity of the seafood supply chain. Clear differentiation between aquaculture-raised striped bass and wild-caught striped bass is critical to ensure consumer transparency and market fairness. To address these concerns, several Atlantic coastal states, including Massachusetts, Maine, New Hampshire, and Virginia (prior to repeal) have taken steps to regulate the labeling, handling, and marketing of aquaculture-raised hybrid striped bass. These state efforts promote transparency and accountability and provide a valuable foundation for broader regional and federal collaboration.

1. Maine and New Hampshire

Maine and New Hampshire have adopted similar regulatory frameworks to ensure that aquaculture-raised striped bass are accurately labeled and traceable throughout the supply chain. This alignment reflects a broader regional effort to promote consistency in labeling and enforcement standards across jurisdictions.

The sale of wild striped bass caught for personal use or by commercial fisheries in other states or jurisdictions is prohibited in the State of Maine. Striped bass sold in Maine markets and restaurants is therefore a cultured product and is primarily hybrid striped bass. In Maine, regulations under 13 DMR § 188-42-02 require containers of aquaculture-raised hybrid striped bass, whether whole or filleted, to be labeled as “Hybrid Striped Bass” and include the state of origin; the names, permit numbers, and addresses of shipping and receiving dealers; the date of shipment; and the net weight of the container. Fillets must retain their skin, and like in Massachusetts, the use of the term “striped bass” for marketing hybrid products is prohibited. Possession exemptions already exist in Maine; chiefly the exemption applies to aquaculture products that do not meet the legal size or season requirements for wild-caught marine organisms of the same species.

New Hampshire enforces nearly identical standards through N.H Admin. Code § Fis 807.14. The regulation cites the potential for hybrid striped bass markets to be used as outlets for undersized striped bass and emphasizes the importance of regulatory consistency across states. Like Maine and Massachusetts, New Hampshire mandates clear product labeling, skin-on requirements for fillets, and restricts the use of the term “striped bass” in marketing or sales for hybrid striped bass.

2. Virginia

Regulations for the commercial striped bass fishery in Virginia include minimum sizes, possession limits, gear restrictions, seasons, and quotas. Virginia previously administered a detailed regulatory framework for the lawful propagation, sale, and transport of aquaculture-raised striped bass and hybrid striped bass under 4VAC20-252.

Under this system, anyone seeking to operate an aquaculture facility to raise striped bass or hybrid striped bass in Virginia was required to obtain a permit from the Virginia Marine Resources Commission. The permit authorized and defined the limits for the purchase, possession, sale, transfer, and transport of striped bass and hybrid striped bass for aquaculture purposes. Permits were issued annually on a non-transferable basis, and were automatically renewed by the Commission provided the facility had been adequately maintained and remained structurally unchanged and in compliance with all permit conditions.

Permitted facilities were only allowed to acquire eggs, fry, and fingerlings from state-permitted, disease-free dealers. Each acquisition required documentation with receipts detailing the species, quantity, date, source, and destination. Harvesting striped bass from Virginia's tidal waters for the purpose of artificial spawning in aquaculture facilities remained subject to applicable state fishing laws, such as size limits and seasonal closures. Under the previous section, 4VAC20-252-210(C), striped bass or hybrid striped bass produced at a permitted aquaculture facility in another state may be imported for sale in Virginia, provided that all standards outlined in the regulation are met. Section 252-210 was repealed in April 2024 as an attempt to streamline regulations by the Commonwealth.

All market-ready fish had to be labeled with the name, address, and permit number of the producing facility. In addition, all sales and resales needed to be accompanied by a receipt documenting the species, seller, purchaser, date of sale, and production facility information. Copies of receipts were required to be kept by both parties and made available to enforcement authorities upon request. Permitted facilities were also required to maintain a chronological file of transactions for inspection by the Department of Wildlife Resources or agents of the Marine Resources Commission.

3. Massachusetts

Though Massachusetts does not have a legal framework addressing the aquaculture of pure strain striped bass, it does have an analogous legal framework for product differentiation of aquaculture vs wild caught product. Massachusetts enforces robust standards under 322 CMR 14.00 for the sale, transport, and distribution of aquaculture-raised finfish, with specific provisions for aquaculture-raised hybrid striped bass. Under Section 14.01, the state requires that all containers of aquaculture-raised striped bass, whether whole or filleted, are clearly labeled as "Hybrid Striped Bass". The labels must also include information on the state of origin, the names, and addresses of shipping and receiving dealers, the permit numbers of the shipping and receiving dealers, the date of shipment, and the net container weight. Aquaculture-raised hybrid striped bass fillets are also required to have the skin attached. Additionally, 322 CMR 14.01(5) makes it unlawful to promote, market, sell, or advertise hybrid striped bass products as "striped bass". Massachusetts extends these labeling requirements to all aquacultured finfish species that are wild caught and landed in the state. It also prohibits any sale, promotion, or transport of aquaculture-raised finfish unless they are properly labeled and clearly identified as being an aquaculture product.

4. North Carolina

Finally, while not directed toward aquaculture, an analogous legal framework for product differentiation exists in North Carolina. The state governs the possession and sale of wild-caught striped bass through a permitting and tagging system under 15A NCAC 030. 0503. Fish dealers must obtain a Striped Bass Dealer Permit for a specific harvest area- the Atlantic Ocean, the Albemarle Sound Management Area, or the Joint and Coastal Fishing Waters of the Central/Southern Management Area. Sale, purchase, or possession of striped bass without a validated dealer permit is unlawful. Striped bass taken from open harvest proclamation areas must have a tag attached to the mouth and gill cover. Tags are issued by the North Carolina Division of Marine Fisheries and must not be bought, sold, or transferred. These regulations support accountability and traceability and are designed to separate legally harvested wild-caught fish from illegal or misrepresented products in the market. Farmed striped bass in North Carolina are not subject to tagging requirements for transport or retail sale but must be accompanied by documentation identifying their cultured origin throughout shipment and distribution. The production of farmed striped bass requires appropriate permits or licenses from the North Carolina Department of Agriculture and Consumer Services, with additional regulatory oversight by the North Carolina Division of Marine Fisheries.

Without clear and consistent standards for traceability, aquaculture markets could unintentionally become an outlet for illegally harvested or undersized wild-caught striped bass. This not only undermines fishery management goals, but also erodes consumer confidence. Together, these state-level regulations demonstrate a coordinated approach to strengthen transparency, traceability, and compliance in the seafood supply chain. Additionally, they provide a valuable foundation for coordinated regional strategies or future federal policies aimed at ensuring product integrity and building consumer trust in the growing domestic aquaculture sector.

4 Marine Spatial Planning and Siting

The identification of suitable areas for aquaculture development, coupled with careful site selection and management, is fundamental to ensuring the success and long-term sustainability of offshore aquaculture. Forecasting environmental interactions represents a critical first step, providing the foundation for coastal and ocean-use planning while helping to equitably address points of resistance to aquaculture expansion.

This section highlights the challenges associated with unplanned or poorly coordinated aquaculture development and emphasizes the benefits of structured marine spatial planning (MSP) approaches. Spatial planning tools ranging from geographic information systems (GIS) and remote sensing to coupled biophysical and socioeconomic models offer science-based frameworks to guide aquaculture expansion in both coastal and offshore environments (Froehlich et al., 2017; Lester et al., 2018). Integrated approaches, such as the ecosystem approach to aquaculture (EAA), explicitly account for ecological carrying capacity, stakeholder interests, and governance structures (Morris et al., 2025; Theuerkauf et al., 2019). Increasingly, these tools are being adopted by regulatory agencies and decision-makers to address environmental, economic, social, and governance considerations, including biosecurity, climate change, and competition among ocean users.

Recent advances in MSP have yielded a suite of decision-support tools that foster coordinated, participatory, and integrated approaches to aquaculture management (Kapetsky et al., 2013; Gentry et al., 2017). Such tools not only help protect natural resources but also provide mechanisms to balance multiple, and often conflicting, uses of marine space. Drawing on case studies, this section identifies both successful examples of MSP implementation and common pitfalls or barriers that may hinder practical application.

Planning for aquaculture operations in U.S. federal waters requires a particularly high level of spatial analysis, given the diversity of existing ocean uses and the complex siting criteria required for offshore fish farms. Suitable sites must balance biophysical parameters (e.g., water depth, current speed, wave exposure, distance to port) with regulatory requirements, ecological sustainability, and social acceptance. Effective planning also necessitates consideration of cumulative impacts across time and space, as well as harmonization of aquaculture siting with broader sustainability goals and regulatory frameworks.

Recent planning and permitting efforts in the Gulf of America and Southern California highlight the necessity of multi-agency collaboration in evaluating candidate farm areas (Riley et al., 2021; Morris et al., 2021; Wickliffe et al., 2024). These processes incorporated assessments of navigation corridors, military operations, industrial activities, commercial and recreational fisheries, protected species, and sensitive habitats to minimize conflicts across ocean sectors. In both cases, spatial analysis tools proved essential at different stages of decision-making. For example, automatic identification system (AIS) vessel-tracking data, which record ship position, course, and speed, were used to evaluate potential navigational conflicts during planning. These analyses highlighted when specific data layers (e.g., vessel traffic, habitat mapping, socioeconomic information) were most informative—some being critical during the early planning phase to guide siting alternatives, and others later in permitting phases to refine project footprints and mitigate conflicts.

Together, the Gulf of America and Southern California case studies represent the most significant federal step yet to support offshore aquaculture development and underscore the importance of structured spatial planning in advancing offshore aquaculture for species such as striped bass along the U.S. coastline. By integrating ecological, economic, and social dimensions, MSP provides a transparent and adaptive framework capable of facilitating industry growth while safeguarding ecosystem health and compatibility among multiple oceanic uses.

As part of NOAA's National Ocean Service, the National Centers for Coastal Ocean Science (NCCOS) plays a central role in advancing MSP by developing science-based inclusive decision tools to inform precision siting for aquaculture and other sectors of the ocean economy. NCCOS integrates GIS technologies with ecological and ocean-use data to support planning, scoping, authorizing, and mitigating activities. These robust quantitative tools are paired with community and stakeholder engagement methods to bring in social-cultural considerations into the analysis. This approach provides strategies for siting aquaculture operations that account for regulatory and management priorities as well as stakeholder concerns. By reducing user conflicts and enabling coordination among regulators, operators, and stakeholders, spatial planning supports responsible aquaculture development in U.S. federal waters.

4.1 Siting Considerations for Atlantic Striped Bass

NOAA's NCCOS conducted a preliminary spatial analysis to identify thermally suitable areas for striped bass aquaculture along the U.S. Atlantic coast. The analysis evaluated both state and federal waters from Maine through Florida by quantifying how often water temperatures fell within defined biological production thresholds.

The suitable temperature range is defined as the range of water temperatures over which striped bass can maintain normal physiological function, survive, feed, and grow at commercially viable rates. Recent work conducted with industry partners indicates that temperatures from 15 to 30 °C support commercial production of striped bass from approximately 50 g to 2.5 kg (Andersen et al., 2021). Within this broader suitable range, the optimal temperature range represents the narrower thermal window that maximizes growth, feed conversion, and production efficiency. Laboratory studies of juvenile striped bass have identified optimal temperatures ranging from 24 to 28 °C (Cox & Coutant, 1981; Secor et al., 2000), while grow-out performance in production settings is generally reported optimal between 22 and 26 °C (R. Borski, North Carolina State University, pers. comm.). This framework aligns with bioenergetic growth models developed for striped bass, where the suitable thermal range represents conditions that sustain survival and growth (Hartman & Brandt, 1995), while the optimal range for aquaculture identifies the temperatures that maximize growth, production efficiency, and profitability (Klinger et al., 2017; Mengual et al., 2021).

Temperatures below 15 °C or above 30 °C are expected to reduce physiological performance, slow growth, and lower economic returns. Because striped bass in offshore systems are fully submerged, the assessment used modeled temperatures between 6-10 m depth to represent cage conditions. The siting analysis also limited candidate areas to water depths of 50 to 150 m to support cage infrastructure and to locations within 30 nautical miles of shore, since greater distances are likely to reduce economic viability.

The Naval Research Laboratory Global Ocean Forecasting System 3.1: 41-layer HYCOM + NCODA Global 1/12° Analysis dataset was used to estimate temperatures at depth as it provided the high spatial and temporal range and resolution needed for this analysis. The dataset provides modeled temperatures at 40 depth levels throughout the global ocean, at eight times throughout the day to inform daily temperature ranges. For each grid cell, minimum and maximum daily temperatures were extracted, and a location was considered to fall within the thermal range only if both values were within the defined threshold range. The number of qualifying days was then tallied across the study period. Cage culture constraints, as outlined previously, were applied to further isolate areas with appropriate thermal conditions, sufficient depth for viable cage deployment, and distances from shore that are economically realistic. Depth estimates were sourced from the NOAA National Centers for Environmental Information Earth Topography (ETOPO) Global Relief Model (NOAA NCEI, 2022). Data from 2020–2023 were used to calculate the mean number of days within suitable and optimal ranges per year.

Large areas of thermal suitability were identified throughout the mid-Atlantic and southern Atlantic regions, with many locations remaining within the suitable range for nearly an entire year (Figure 1). When cage culture siting criteria were applied (i.e., depth and distance to shore) the extent of available areas decreased substantially; however, regions off Florida and North Carolina continued to provide broad areas of suitable conditions. Optimal temperatures were less common than the broader suitable range, as expected, but conditions exceeding 100 days per year at optimal temperatures were observed along the mid-Atlantic and southern coast. Despite the prevalence of wild striped bass populations in the northeast, areas north of Cape Hatteras, North Carolina, frequently experienced temperatures below the suitable range, often for weeks at a time and more than 100–200 days annually. Elevated temperatures were less problematic, as the Gulf Stream remains offshore of the 30 nm distance from shore constraint that was applied.

During our study period, an average of 68.2 million ha of state and federal waters along the Atlantic coast met the suitable temperature range for striped bass aquaculture ≥ 250 days annually. Within this area, an average of 27.1 million ha was within the optimal temperature range for at least 150 days. When depth and distance from shore criteria were applied to the areas that experienced optimal temperatures on average ≥ 180 days the area decreased to 429,000 ha, located off the coasts of North Carolina and Florida.

Although the physiological performance, growth, and bioenergetics of striped bass is comparatively well studied (e.g., Anweiler et al., 2019; Penny & Pavey, 2021; 2023), important uncertainties remain regarding the thermal tolerances of different populations and life history stages. Laboratory studies are required to clarify how thermal thresholds vary across developmental stages and genetics, thereby informing more precise bioenergetic modeling. Additional physiological thresholds should also be quantified and integrated into future analyses to better characterize the species' aquaculture potential.

Expanding this analysis to other regions of the U.S. EEZ would provide a broader perspective on feasibility. Moreover, as ocean conditions continue to shift, evaluating bioenergetic thresholds under forecasted climate and thermal regimes will be essential to assessing the opportunity and longevity of aquaculture potential. Such analyses should also consider the adaptive capacity of both the industry and the species itself when estimating long-term temperature changes. Finally, extending this framework to other candidate species would help identify opportunities for advancing offshore aquaculture in U.S. waters.

Climate Change and Ocean Warming

Projected warming of the northwest Atlantic is expected to alter thermal suitability for striped bass. Offshore sites in North Carolina and Florida already approach the upper tolerance threshold of 30°C during summer months, potentially increasing risks of thermal stress (Friedland et al., 2025). Conversely, northern sites may become more viable under warming scenarios.

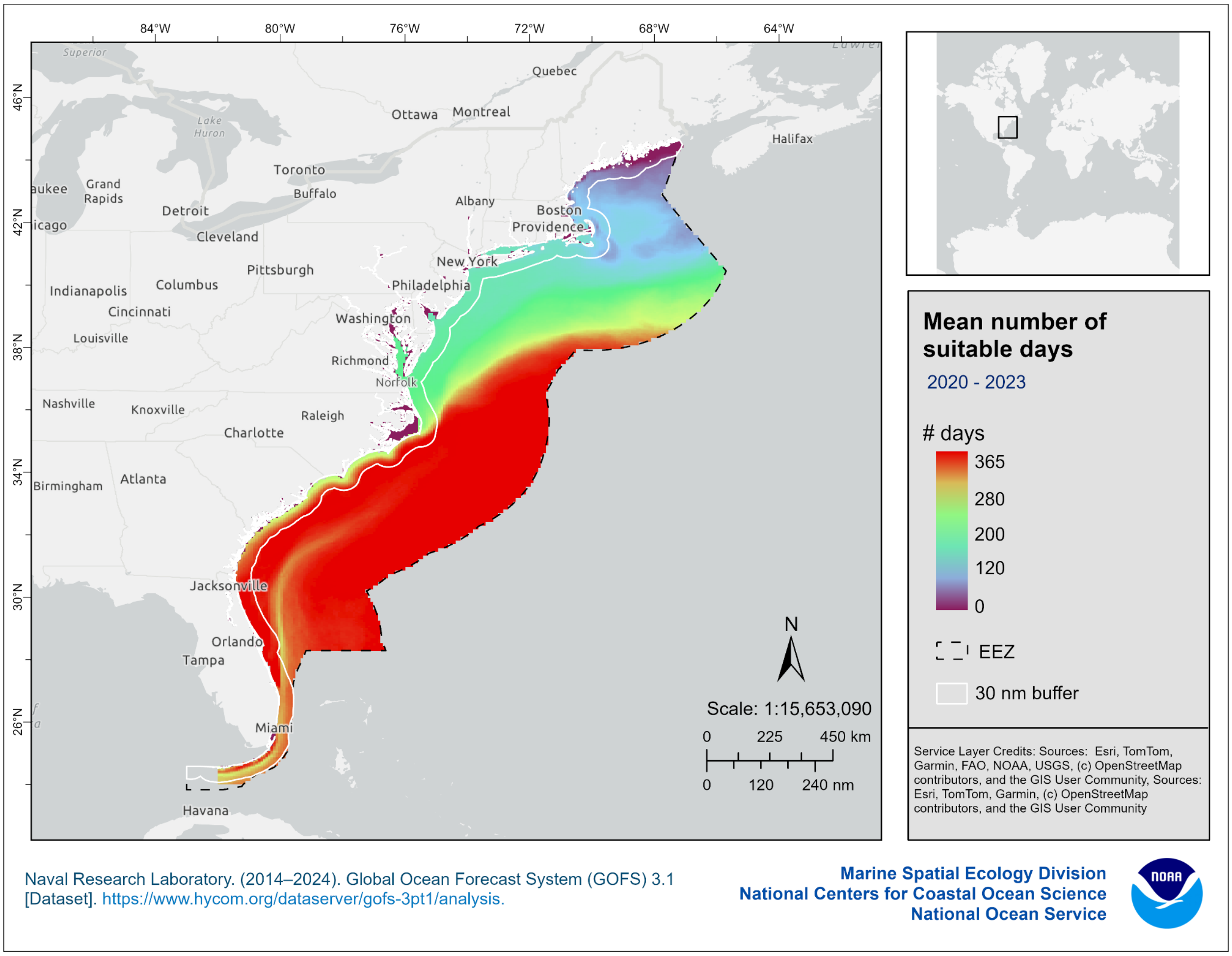

Figure 1. Number of days at suitable temperatures (15–30 °C) for striped bass, *Morone saxatilis*, in 2023. Water temperatures are presented for coastal and offshore waters through the extent of the Atlantic Coast U.S. EEZ (200 nm).

5 Consumer Awareness and Markets

Market conditions strongly favor the development of a domestic pure strain striped bass aquaculture sector (Andersen et al., 2021). Demand for sustainable, locally produced seafood is high, while wild harvests remain limited and imports of striped bass dominate supply. Pure-strain striped bass is well positioned to fill this gap, offering a recognizable and desirable product with strong consumer appeal and broad market potential.

When assessing the economic viability and sustainability of any new aquaculture industry, understanding market conditions, including supply and demand dynamics, is fundamental. These data inform pricing strategies, consumer behavior, and resource planning, while also guiding regulators and legislators on how to maximize economic benefits and minimize conflicts with existing enterprises.

Commercial hybrid striped bass aquaculture has been established in the U.S. since the late 1980s, complementing centuries of commercial capture fisheries. Despite these markets, interest from both producers and buyers is growing for pure-strain striped bass to meet rising demand for white-fleshed marine fish. Recent research and stakeholder engagement have also identified striped bass as a top candidate species for marine aquaculture expansion in the U.S. (Rexroad et al., 2021; Andersen et al., 2021; StriperHub, https://ncseagrant.ncsu.edu/striperhub/). These developments underscore the importance of evaluating the species' economic characteristics as commercialization advances.

5.1 Supply

A critical component of any economic analysis is the characterization of current market supply. For domestic aquaculture, evaluating the supply of wild-caught and imported alternatives provides insight into existing demand for a species and reveals trends in market strength over time. A comprehensive supply analysis for striped bass and other marine finfish species was previously conducted by Engle, van Senten, and Schwarz (2023); a similar methodology will be applied here using updated statistics to reflect current market conditions. This analysis will also incorporate the supply of farmed hybrid striped bass, given its relevance and similarity to the striped bass market.

According to the FAO (2025a), the only two regions where pure strain striped bass has been farmed since 1950 are Mexico and the Palestinian Territories. In 2023, Mexico had not reported any production (1,406 metric tons; 2022) and the Palestinian Territories had produced only 4 metric tons (FAO 2025a). Seven countries have produced farmed hybrid striped bass since 1950, however only four (Denmark, Israel, Italy, and the U.S.) reported production in 2024. The U.S. produced nearly 80% of the total supply of farmed hybrid striped bass in 2023 reaching 2,404 metric tons (FAO 2025a). Although the 2023 USDA Census of Aquaculture did not individually report statistics on food fish striped bass farms, 51 operations were identified as producing pure striped bass for "conservation, recreation, enhancement, or restoration purposes" in 2023 (USDA-NASS 2024).

Several states along the Atlantic coast allow for variable scales of commercial striped bass harvest, including Massachusetts, Rhode Island, New York, Delaware, Maryland, Virginia, and North Carolina. Commercial landings of striped bass reached 1,788 metric tons in 2023 while recreational landings were more than six times that (10,961 metric tons) in the same period (NOAA 2025b). While commercial landings remained relatively flat from the prior year, recreational landings fell by 33% in 2023 compared to 2022 (NOAA 2025b). Overall, the current supply of striped bass products in the U.S. is limited, fragmented, and unable to keep pace with demand. Wild harvests are strictly regulated and hybrid aquaculture production, though established, has not scaled to meet broader seafood market needs. These constraints on supply highlight the opportunity for pure-strain striped bass aquaculture to expand domestic availability. With this supply gap established, the following section considers consumer demand and market drivers that make striped bass a compelling candidate for offshore aquaculture development.

5.2 Demand

The U.S. per capita consumption of seafood has remained relatively stable for the last 20 years, reaching 22.1 kg of consumption in 2022 similar to other "high-income countries" (FAO 2024). However, demand for imported seafood in the U.S. still remains the highest in the world, purchasing $26.6 billion in 2024 which was $4 billion more than the next country, China (FAO 2025b). In fact, 70-90% of the total seafood that is consumed in the U.S. is imported, with more than half of that volume coming from farmed sources (NMFS 2024). In recent years, the American consumer has shown an affinity for farmed products and is willing to pay more for locally produced seafood (Fonner & Sylvia 2015; Brayden et al., 2018; Quagrainie 2019; Bouchard et al., 2021; Asche et al., 2022; Athnos et al., 2023). A domestic farmed striped bass industry has the potential to tap into these markets and take advantage of these US demand characteristics.

The primary market for striped bass extends across much of the U.S. eastern seaboard and Gulf States, where the species is well recognized and valued due to its long-standing fisheries. Additional, though smaller, markets exist in inland states. Wild-caught striped bass are harvested commercially under strict state-specific seasonal quotas and size limits and are typically landed at larger sizes (greater than 8–10 lbs.), making them well suited for fillet markets and high-end restaurants. In contrast, hybrid striped bass supply a different niche, commonly marketed at smaller sizes (1.5–2.0 lb.) and sold whole or live, particularly to urban ethnic markets. Farmed striped bass could enter channels similar to those of wild-caught fish while offering the advantage of year-round availability. As a highly recognizable product with versatile applications (e.g., whole fish, fillets, sushi), farmed striped bass would be positioned to complement, rather than replace, existing market segments.

Consumer preferences for several aquaculture species highlighted in the southeastern U.S. have been evaluated to better understand consumption habits (Agyeman et al. 2025; Rexroad et al. 2021). Respondents who rated the "source" of their striped bass as an important attribute, consumed it seasonally, and preferred to purchase it in restaurants or grocery stores were more likely to express strong demand (Agyeman et al. 2025). These findings suggest that future producers could successfully market striped bass through restaurants and grocery stores to seasonal consumers already familiar with the product.

Interestingly, price was not a statistically significant factor influencing the likelihood of purchase (Agyeman et al. 2025). Further work on consumer perceptions specific to striped bass is currently being conducted by StriperHub.

The extent to which farmed striped bass will substitute for imported or wild-caught striped bass in domestic markets remains uncertain and will require further study once production facilities are established. Market impacts will depend on factors such as relative price and availability of alternatives, product quality, production volumes, and the specific market channels targeted. Importantly, the introduction of a farmed product could also stimulate overall demand by increasing consumer exposure to striped bass in different seasons and product forms not traditionally available.

5.3 Harvest, Transport, and Processing

Hybrid striped bass are typically harvested at a size of 1.5-2.5 lbs., which is attained after 16-20 months of growout depending on the culture practices and environmental conditions. Fish are harvested using seines, lift nets, or pumping systems, and are either immediately placed in ice slurries to maintain product quality or live-hauled to urban ethnic markets which often provide the highest prices. Regardless of the sales channel, hybrid striped bass are sold almost exclusively as whole fish, with limited processing into fillets or other value-added products. At typical harvest sizes, hybrid striped bass yield only 30–35% fillet recovery, which is comparatively low and provides little incentive for processors to pursue fillet production.

Pure striped bass are produced in much smaller volumes, largely for regional markets. In the U.S., their proposed market size is 3–7 lbs., which can be attained in 24–36 months under favorable culture conditions. Unlike hybrids, pure striped bass are envisioned for harvest and processing into fillets and other value-added products, following a model more typical of marine finfish such as salmon. At these larger harvest sizes (≥3 lbs.), striped bass can achieve fillet yields closer to 40%, producing thicker cuts that resemble their wild-caught counterparts, a characteristic that enhances consumer familiarity and market appeal.

Efficient harvest and processing logistics are critical to resource use in offshore striped bass aquaculture. Variables such as harvest frequency, size uniformity, and stocking density directly influence costs and product quality (Engle et al., 2024). Uniform fish size simplifies grading and increases processing efficiency, though variability at scale can complicate operations. Optimizing stocking densities and harvest timing improves yields and reduces waste (Andersen et al., 2021).

Cold-chain management is important for striped bass, a high-value product requiring rapid chilling and continuous refrigeration to maintain freshness. Offshore distance complicates logistics, often necessitating insulated containers or onboard chilling systems (Srikanth et al., 2018). Efficient harvest and processing capacity will be critical for maintaining product quality, securing consistent supply, and enabling striped bass to penetrate broader domestic seafood markets.

5.4 Production Costs and Economic Contribution

Although no published studies have directly measured the cost of production for striped bass aquaculture in the U.S., several analyses have drawn on data from related species and production systems. Engle et al. (2024) estimated production costs for striped bass under three scenarios in the southern U.S.: coastal ponds modeled after red drum farms, offshore net pens modeled after greater amberjack (*Seriola dumerili*) and salmon farms, and recirculating aquaculture systems (RAS) modeled after salmon and rainbow trout facilities. Capital investments, production costs, and equipment requirements were adapted from these established industries, while biological performance assumptions for striped bass were derived from scientific literature and expert consultation. The analysis indicated that striped bass aquaculture was only profitable in offshore net pens, with breakeven prices comparable to those of commercially farmed red drum. Breakeven yields were similar to those of black drum, but higher than those required for species such as spotted seatrout and Florida pompano. Additional commercial research is needed to refine these estimates, and profitability in pond or RAS culture may be achievable with further technological and management improvements.

Economic contribution analyses provide broader insight into the linkages between aquaculture and other sectors of local, state, and national economies. A recent study by Kumar et al. (2024) found that U.S. aquaculture contributed $3.8 billion to the national economy and supported more than 22,000 jobs. Foodfish farms exhibited an economic multiplier of 1.79, while marine aquaculture had a multiplier of 1.78, meaning that each dollar spent generated an additional $0.79 and $0.78, respectively, in related economic activity. The development of a robust striped bass aquaculture industry has the potential to generate similar spillover benefits, particularly for coastal communities. Such growth could stimulate investment in marine infrastructure and logistics networks, creating shared benefits across multiple industries.

5.5 Conclusion

While the true economic and marketing characteristics of striped bass aquaculture cannot be fully assessed until a commercial industry is established in the U.S., potential can be estimated from current science, existing literature, and comparable industry sectors. Hybrid striped bass has been cultured successfully at commercial scale since the 1980s.

There is momentum and a growing shift toward pure-strain striped bass culture, with several farms in North Carolina, Florida, and Texas already pursuing this transition. In contrast, the supply of wild striped bass in the U.S. remains limited relative to other fisheries, and the long-term sustainability of both commercial and recreational harvest is increasingly uncertain.

Demand for seafood in the U.S. remains strong with the majority of products being imported. While commercial-scale striped bass aquaculture is still in the early stages, economic indicators suggest the species has viable market potential, particularly in the context of growing consumer demand for domestic, sustainably produced seafood. Demand-side conditions are favorable, yet production cost challenges and regulatory inconsistencies—especially in states with gamefish designations—must be addressed. Interstate transport and sale of pure-strain farmed striped bass could present barriers for market development that will require synergies between state and federal regulations to avoid enforcement challenges and ensure transparency.

6 Striped Bass Aquaculture History

The history of striped bass aquaculture has been detailed extensively in the literature, with Andersen et al. (2021) offering the most current account. The culture of striped bass was first described in the late nineteenth century by managers with an interest in stock enhancement to improve production of fish for enhancing commercial and recreational fisheries for tributaries of Albemarle Sound, Chesapeake Bay, Delaware Bay, and New York Bay (Worth 1884a; Bowers 1900). The first published report of a successful hatch of striped bass eggs under artificial conditions was made in 1874 by Spencer Baird, the first commissioner of the U.S. Commission of Fish and Fisheries (Baird, 1874). In 1879, the U.S. Fish and Wildlife Service (USFWS) hatched striped bass fry at a site located along the Abermarle Sound in North Carolina that had been used as an American shad (*Alosa sapidissima*) hatchery (USFWS, 1882). The U.S. Fish Commission established the first dedicated hatchery for the propagation of striped bass in Weldon, NC (Worth 1884b). The Edenton National Fish Hatchery was then established in North Carolina in 1898 by the USFWS with a similar purpose to Weldon (Woodroffe, 2012).

In the early twentieth century, the USFWS published technical manuals detailing procedures for spawning, hatching, and fry release of various cultured fishes, including striped bass (Piper, 1982). By 1910, the foundational methods for striped bass propagation were already established; however, the U.S. Bureau of Fisheries, formerly U.S. Fish Commission, abandoned plans for marine stock enhancement (Worth, 1910). Interest in hatchery-based programs was revived in the 1950s, following the discovery of a naturally reproducing striped bass population in the Santee–Cooper Reservoir system of South Carolina (Scruggs Jr., 1957). This development stimulated a large-scale augmentation program aimed at creating self-sustaining populations in freshwater rivers and reservoirs across the southeastern U.S., including Kentucky, Alabama, Georgia, and South Carolina (Geiger & Parker, 1985; Kinman, 1988; Stevens, 1975). By the 1980s, striped bass had been successfully stocked into hundreds of reservoirs across at least 36 states (Stevens, 1984; Kinman, 1988). Despite much success advancing culture and stocking practices, striped bass remained a challenging species.

A range of biological and operational constraints historically limited the development of striped bass culture. Key challenges included: (1) high sensitivity to handling and confinement stress; (2) inconsistent spawning success and unreliable hatchery production; (3) cannibalism during larval and juvenile stages, particularly under high stocking densities; (4) susceptibility to bacterial, parasitic, and viral diseases; and (5) elevated mortality during harvest, grading, and transport. Collectively, these constraints hindered large-scale adoption of striped bass aquaculture and shifted industry emphasis toward the culture of hybrid striped bass, which demonstrate improved tolerance to handling and environmental variability, more consistent performance on formulated feeds, and greater overall resilience to health management challenges. While history shows technical challenges, the hybrid industry demonstrates scalable solutions that inform pure-strain development.

6.1 Striped Bass Aquaculture: Lessons from the Hybrid Industry and Pathways for Expansion

Beginning in the 1960s, hybrid crosses between striped bass and other Moronids were produced because preliminary findings indicated that hybrids exhibited greater tolerance to extremes in temperature and dissolved oxygen than either parental species so were better suited in many aquaculture systems (Logan 1968). The most common cross made was between striped bass males and white bass (*M. chrysops*) females (i.e., sunshine bass) because many producers found that spawning smaller white bass females required less expertise than spawning striped bass females (Smith 1988). It was not until emergency fishing moratoriums were imposed (Maryland 1985–90; Virginia 1989–90) following the collapse of the striped bass fishery in the 1980s that the path for commercial hybrid striped bass aquaculture as a means of supplying a valuable seafood product emerged (Hodson & Hayes, 1990).

Today, the hybrid striped bass industry is fourth in value among finfish species in the U.S., behind only channel catfish, Atlantic salmon, and rainbow trout. Hybrid striped bass are currently cultured in about 19 different states, particularly in the South and Midwest, in constructed, inland freshwater ponds. The fish are usually grown for about 16 months, and are marketed whole at approximately 680 g (1.5 lbs.; D'Abramo et al., 2002). In coastal states, consumers are accustomed to, and often prefer, pure-strain wild striped bass harvested from marine environments. Pure strain striped bass, rather than hybrids, are also highly preferred in lucrative ethnic markets, seafood restaurants and sushi bars, and unlike hybrids, these pure strain striped bass can be grown in “open” systems (e.g., coastal areas) with reduced risk of genetic contamination of wild stocks. Marine striped bass culture was even initiated to meet this demand, and for these purposes, fish are generally grown to larger sizes (2.2 kg) for whole, gutted, or filleted market forms.

Although hybrids have successfully established their niche in the US aquaculture landscape, they have struggled to penetrate mainstream markets where pure striped bass have an advantage. Nonetheless, they offer a close industry comparable in terms of production planning discussions and have helped lay the foundational research for pure striped bass aquaculture. The remaining sections of this chapter will provide an overview of the current understanding of production planning and intensive culture systems for striped bass by drawing upon strategies from the closely related and established U.S. hybrid industry.

6.2 Hatchery and Nursery Systems

Hatcheries typically maintain broodstock, which are induced to spawn using temperature and photoperiod manipulation, behavioral cues, and hormone induction when necessary (Hodson and Sullivan 1993; Clark et al., 2005; Andersen et al., 2021). Once spawned, fertilized eggs are incubated in McDonald-type hatching jars or tanks until they hatch, usually within 2-3 days at water temperatures of 18-22°C. After hatching, the larvae are either transferred directly into fertilized ponds or maintained in indoor nursery tanks where they are fed a diet of live zooplankton such as rotifers and brine shrimp nauplii (i.e., *Artemia*). As the larvae grow, they are weaned onto commercially prepared diets.

Once juvenile striped bass reach a size of approximately 1–2 g, they are typically transferred to outdoor nursery ponds or larger tanks for further grow-out. Earthen ponds, ranging from 0.1 to 1.0 ha, are fertilized to enhance natural productivity and supplemented with commercial feeds. Juveniles are commonly stocked at densities of 50,000–100,000 fish per hectare and grown to 10–50 g over a period of 3–4 months.

Indoor RAS systems represent an alternative nursery method, particularly in regions where temperatures are unsuitable for pond culture (e.g., colder latitudes). RAS facilities produce juveniles for transfer to larger land-based farms. Outdoor ponds and climate-controlled RAS present viable opportunities to produce large numbers of fingerlings required for offshore aquaculture operations. A parallel model exists in the Atlantic salmon industry in Norway, where smolt are reared in freshwater hatcheries and nursery systems before transfer to coastal and offshore marine cages. Over the past decade, conventional flow-through hatcheries have increasingly been replaced by RAS, which offer advantages in water use efficiency, environmental control, and siting flexibility (Brown et al., 2025).

6.3 Transport and Stocking

When juvenile striped bass reach the target size, they are harvested from nursery systems and transferred to grow-out facilities. Harvesting is commonly conducted using seines or by draining ponds, after which fish are loaded into transport tanks equipped with aeration or oxygenation systems to maintain water quality during transit. Upon arrival, fish are acclimated to the receiving water before being stocked into production units.

Stocking densities in grow-out systems vary with production intensity and facility design, typically ranging from 10 to 50 kg/m³. In pond or net-pen systems, densities are generally maintained at the lower end of this range due to limited environmental control, whereas RAS can support higher densities under carefully managed conditions with systems for management of water quality, dissolved gases, and disinfection. In these open-water and pond environments, densities are also moderated by the larger volume of production systems and the space afforded allowing individuals to swim more freely.

6.4 Growout Systems

Although most U.S. production of hybrid and pure striped bass occurs in ponds, tanks, and raceways, there is increasing interest in offshore culture systems to meet growing demand for marine foodfish. Offshore aquaculture involves rearing fish in marine cages or net pens located in coastal or offshore waters. These systems offer potential advantages over land-based production, including reduced land use, lower energy requirements, and in some cases, improved economic feasibility. At the same time, offshore operations face unique challenges such as exposure to severe weather, predation, and logistical constraints associated with remote locations.

Net pens used for culture are commonly constructed of high-density polyethylene (HDPE) or steel and range in volume from 100 to 1,000 m³. Stocking densities typically range from 10 to 25 kg/m³, with fish fed commercial diets through automated feeding systems. Offshore environments are generally characterized by high water exchange, stable temperatures, and elevated dissolved oxygen, conditions that support favorable growth. However, the open nature of these systems increases risks of escapement and disease transmission to wild stocks compared with land-based facilities.

Land-based indoor systems (i.e., RAS technology) provide an alternative grow-out strategy, offering controlled culture conditions, robust biosecurity and disease management, flexible siting to enhance market access, and reduced risks to marine ecosystems (Brown et al., 2025). Despite these advantages, widespread adoption of RAS for striped bass and other marine finfish has been limited by high capital and operating costs and the challenges of maintaining stable production. Continued research is needed to address economic feasibility, product quality, feed formulation, and control of early maturation in culture systems.

7 Offshore Aquaculture Technology

Technological innovation has made it increasingly feasible to culture marine finfish in coastal and open-ocean environments, including the U.S. EEZ. Offshore aquaculture is generally defined as taking place in open ocean waters, in highly exposed environments subject to strong currents, waves, and storm events, requiring more robust and complex infrastructure than inshore or nearshore systems (Price & Morris, 2013; Drumm, 2010; Kapetsky et al., 2013). While offshore aquaculture represents only a small fraction of U.S. production today, demonstration projects and deployments in deep water have demonstrated that innovation in gear, materials, and monitoring systems can unlock substantial potential for growth (Froehlich et al., 2017; Buck et al., 2025). This sector currently consists of an offshore fish farm in Hawaii state waters and a small number of open ocean shellfish and seaweed farms around the nation.

7.1 NOAA's Role in Offshore Aquaculture Development

As one of the federal agencies responsible for stewardship of the nation's marine resources, NOAA is fostering the growth of a robust domestic aquaculture industry while ensuring that offshore development remains consistent with its environmental stewardship mandates. These efforts include developing tools to evaluate the ecological benefits and risks of marine aquaculture, implementing science-based regulations to safeguard ecosystems, and advancing production designs and operational practices that are compatible with sustainable fisheries and ocean use (Nicolls et al., 2020; NOAA OCM, 2023; BEA, 2021). Multi-agency work groups are also developing regionally tailored permitting frameworks to improve the efficiency and transparency of decision-making while maintaining compliance with environmental law. In support of these initiatives, Feldman et al. (2025) published a *Technical Guide to Marine Aquaculture Gear*, providing detailed guidance on cage and net-pen systems, mooring and anchoring technologies, and other essential components required for offshore aquaculture. These roles ensure that technological innovation is paired with regulatory oversight to support sustainable striped bass farming.

7.2 Marine Cages and Net-Pen Systems

Marine cage and net-pen aquaculture require large, durable enclosures designed to withstand offshore wave energy and the strong swimming behavior of cultured species. Striped bass, in particular, require high water flow for oxygenation, ample space to support growth, and robust containment systems to prevent escapes or structural damage. Successful offshore operations also depend on high-quality formulated feeds, continuous monitoring of fish health, and strict biosecurity measures to minimize the risk of disease. Site selection is critical to avoid harmful algal blooms, ensure dispersal of organic waste, and maintain thermal regimes within the species' tolerance limits.

For striped bass, offshore production would likely use large-volume submersible or semi-submersible cages engineered for high-energy environments. Submersible cages can be lowered below the wave zone during storm events, while semi-submersible pens and large circular HDPE cages provide surface stability with reduced wave exposure (Langan & Horton, 2003; Price et al., 2017). Cage volumes on the scale of tens of thousands of cubic meters afford fish the ability to swim freely, which not only supports welfare but also reduces effective stocking densities allowing for optimal growth and production of striped bass.

7.3 Nets and Predator Exclusion

Net design is central to containment and welfare. Offshore nets are typically constructed from abrasion-resistant, high-strength materials such as knotless nylon or high-density polyethylene (HDPE), designed to withstand constant pressure from fish and environmental forces. Mesh sizes are selected to retain the smallest stocked fish while minimizing drag and maximizing water exchange. Predator exclusion is achieved through reinforced predator nets or double-net systems that deter sharks, seals, and other large marine animals. These barriers are tensioned with spacers or standoff frames to prevent collapse into stock nets, reducing the risk of escapes or entanglement. Overhead bird nets or canopy structures are commonly installed to prevent depredation by seabirds, reducing stock stress and feed loss. Routine inspection and net cleaning are essential to maintain mesh integrity, prevent fouling that diminishes water exchange, and ensure both containment and predator deterrence. Increasingly, copper-alloy mesh is being adopted despite its higher cost, as it provides superior resistance to biofouling, reduces the frequency of net cleaning, and offers enhanced durability and predator protection relative to traditional synthetic materials.

7.4 Innovation and Future Directions

Technological advances are rapidly enhancing the sustainability and profitability of offshore aquaculture. Innovations include co-location with existing offshore infrastructure, autonomous feeding barges, ship-based aquaculture, real-time environmental monitoring platforms, and novel antifouling materials. In the U.S., there is competition for nearshore space and expansion into federal waters provides opportunities for larger sites with fewer user conflicts and greater social acceptance among commercial and recreational fishing communities (Kapetsky et al., 2013; Buck et al., 2025). With one of the largest EEZs in the world, the U.S. has significant potential to expand striped bass production offshore, provided that engineering, logistical, and environmental stewardship challenges are addressed through continued research, innovation, and regulatory collaboration.

8 Environmental and Ecosystems

Evidence from modern offshore systems shows that environmental impacts of net pen aquaculture can be limited and manageable when best practices are applied (Price & Morris, 2013). Strong currents, deeper waters, and advanced feeds reduce risks of nutrient buildup and habitat degradation, and with appropriate siting and monitoring, offshore striped bass farming can align with ecological sustainability goals while avoiding significant long-term ecosystem harm.

Despite these opportunities, public perception and regulatory concern remain among the largest barriers to starting new offshore aquaculture ventures in the U.S., particularly given the large ocean areas that could support development and the potential number of farms. The environmental effects of marine aquaculture vary widely depending on species selection, production methods, siting, and scale of operations (Belle & Nash, 2008; Price & Morris, 2013). Modern production technologies, standardized operating procedures, and best management practices (BMPs) reduce risks to water quality, benthic habitats, and marine life. Offshore farming, in particular, provides opportunities to minimize impacts due to deeper waters, stronger currents, and greater dilution potential compared to nearshore settings (Buck et al., 2025). At the same time, offshore development requires careful evaluation of ecological interactions, cumulative effects, and regulatory safeguards to ensure sustainable growth.

In the context of striped bass aquaculture, potential environmental effects can be grouped into several categories: (1) water quality, (2) benthic and sedimentary processes, (3) interactions with marine life and habitats, (4) cumulative and landscape-scale effects, and (5) mitigation strategies, including novel approaches such as integrated multi-trophic aquaculture (IMTA). This section synthesizes current knowledge, with a focus on offshore relevance, and highlights management and monitoring frameworks that can safeguard essential fish habitats (EFH) while supporting the expansion of a domestic striped bass aquaculture industry.

8.1 Water Quality and Nutrient Enrichment

Discharges such as solid wastes, nutrients, ammonia, fish waste, feed waste, pharmaceuticals, and chemicals from aquaculture operations are primarily governed by the implementing regulations of the Clean Water Act (CWA) Sections 402 and 403 (EPA, 2021). Section 402 requires that a National Pollution Discharge Elimination System (NPDES) permit for discharge into federal waters be issued in compliance with the U.S. Environmental Protection Agency's (EPA) ocean discharge criteria under Section 403, which aim to prevent unreasonable degradation of receiving waters (NOAA, 2022; EPA, 2025). In preparation of an NPDES permit, EPA generally applies water quality models to characterize interactions between effluent and the receiving environment. These models can address effluent dispersion within the water column and particulate deposition in near- and far-field zones, thereby informing monitoring plans to ensure environmental compliance and performance (Cromey et al., 2002; Stucchi et al., 2005).

Three-dimensional (3D) modeling tools have been developed to refine these assessments by predicting the transport and fate of aquaculture-derived wastes under site-specific conditions. By incorporating hydrodynamics, bathymetry, stocking densities, and feed inputs, these models simulate the dispersion of dissolved nutrients and the deposition of solid wastes, enabling forecasts of benthic organic enrichment, nutrient concentrations, and dissolved oxygen dynamics (Cromey et al., 2002; OSPAR, 2005; Newell & Richardson, 2014). Their predictive capability provides a science-based framework to evaluate farm-scale and cumulative impacts, guide siting decisions, establish thresholds for sustainable production, and reduce ecological risks. When integrated into regulatory processes, such modeling approaches strengthen the environmental safeguards of aquaculture permitting while supporting industry growth in a precautionary and adaptive management framework.

Organic Loading

The primary water quality concerns from finfish cage culture are nutrient enrichment (nitrogen and phosphorus), suspended particulates, lipids, and fluctuations in dissolved oxygen (Belle & Nash, 2008; Holmer, 2010). Waste from feed and fish excretion contributes organic matter and nutrients to surrounding waters. In offshore environments, strong currents and high flushing rates typically enhance dispersal, reducing localized benthic accumulation compared to nearshore systems (Chamberlain & Stucchi, 2007). Nonetheless, large-scale striped bass production could elevate nitrogen and phosphorus inputs, particularly if stocking densities are not matched with site-specific hydrodynamics.

Studies across the U.S. and Europe indicate that when farms are sited in deep, well-circulated waters, measurable nutrient effects are typically limited to within 30 m of cages, and persistent long-term impacts are rare (Price & Morris, 2013). Improvements in feed formulation, feeding efficiency, and digestibility have also substantially reduced nutrient loading compared to historical operations (Naylor et al., 2009). Nutrient spikes and transient oxygen declines may occur during feeding events but generally recover quickly in offshore sites with strong flushing (Troell et al., 2009).

In contrast, farms located in shallow or semi-enclosed nearshore systems are at higher risk of causing localized eutrophication. Here, aquaculture impacts may be difficult to distinguish from terrestrial nutrient inputs or municipal discharges (Shumway, 2011). For striped bass offshore culture, siting in high-energy environments such as off the continental shelf of North Carolina or Florida may reduce these risks. Maintaining high water exchange rates and adopting BMPs such as optimized feeding regimes, precision monitoring of feed delivery, and selection of formulated diets are critical for protecting water quality.

Dissolved Oxygen Dynamics

Respiration of fish and decomposition of organic waste can reduce dissolved oxygen (DO) levels, potentially affecting both cultured stocks and wild organisms. Offshore siting criteria, particularly depth (>50 m) and current speed (>5 cm s^{-1}), help mitigate these risks by ensuring sufficient oxygen replenishment. Seasonal stratification along the Atlantic coast, particularly in the mid- and south-Atlantic Bight, may constrain vertical mixing and should be carefully considered in site selection and hydrodynamic models (Friedland et al., 2025).

Hydrodynamics and Waste Dispersal

Modeling current velocities, flushing rates, and vertical mixing is central to evaluating carrying capacity. Offshore aquaculture has an advantage of greater dispersion compared to coastal farms, but cumulative impacts across multiple farms could overwhelm assimilative capacity if not spatially managed. Advanced models such as coupled hydrodynamic-biogeochemical frameworks (e.g., FVCOM, HYCOM, ROMS) can predict dispersal of nutrients and organic matter.

8.2 Benthic Habitats

Sedimentation Impacts

Deposition of waste feed and fecal matter can alter benthic community structure beneath cages. In coastal salmon farms, shifts toward opportunistic polychaetes and hypoxia-sensitive taxa have been observed (Hargrave, 2010). The extent of benthic impact offshore is expected to be more diffuse due to deeper water and higher energy conditions, though localized organic enrichment remains possible. For example, at well-managed offshore farms, these effects are typically confined to within 100 m of cages and benthic recovery between harvest and re-stocking is often rapid (Keeley et al., 2014). Anaerobic conditions may develop under heavily impacted sites, particularly in depositional environments with limited flushing or soft sediments (Kutti et al., 2007). To minimize risk, site selection should prioritize erosional seafloors, adequate depth, and high current velocity to disperse organic matter (Belle & Nash, 2008).

Emerging monitoring tools, including stable isotope tracers, acoustic imaging, and automated image analysis, provide cost-effective methods for assessing benthic impacts and far-field dispersal (Callier et al., 2018). Regulatory protocols often require sediment monitoring of indicator parameters such as redox potential, total organic carbon, and sulfide concentrations. Adaptive management frameworks, wherein farm management practices are modified in response to monitoring outcomes, represent a best practice for ensuring benthic protection.

Essential Fish Habitat

Offshore aquaculture operations may occur within or adjacent to designated Essential Fish Habitat (EFH). To the extent practicable, siting should minimize interactions with sensitive benthic features, including deep-water corals and hard-bottom reef systems. Along the Atlantic coast, these habitats are frequently associated with shelf breaks and submarine canyon systems (NOAA, 2021). Early consultation with relevant management agencies, combined with baseline environmental surveys, can inform site selection and help reduce the risk of habitat disturbance or degradation.

In the South Atlantic region, proposed offshore aquaculture sites may also overlap with habitats that support diadromous fish species, coral reef systems, and estuarine waters that are hydrologically connected to EFH (SAFMC, 2014). Mandatory consultation processes and site-specific environmental review can help identify these sensitivities and guide placement decisions. While poorly sited operations have the potential to affect benthic communities and water quality, locating facilities in deeper, well-flushed offshore waters is generally associated with a lower likelihood of significant environmental impacts.

The NOAA NCCOS has ongoing collaborations with the EPA to provide depositional and water quality modeling products (see Figure 2) and science advice to support agency permitting and associated environmental reviews and consultations for finfish aquaculture projects proposed for U.S. federal waters.

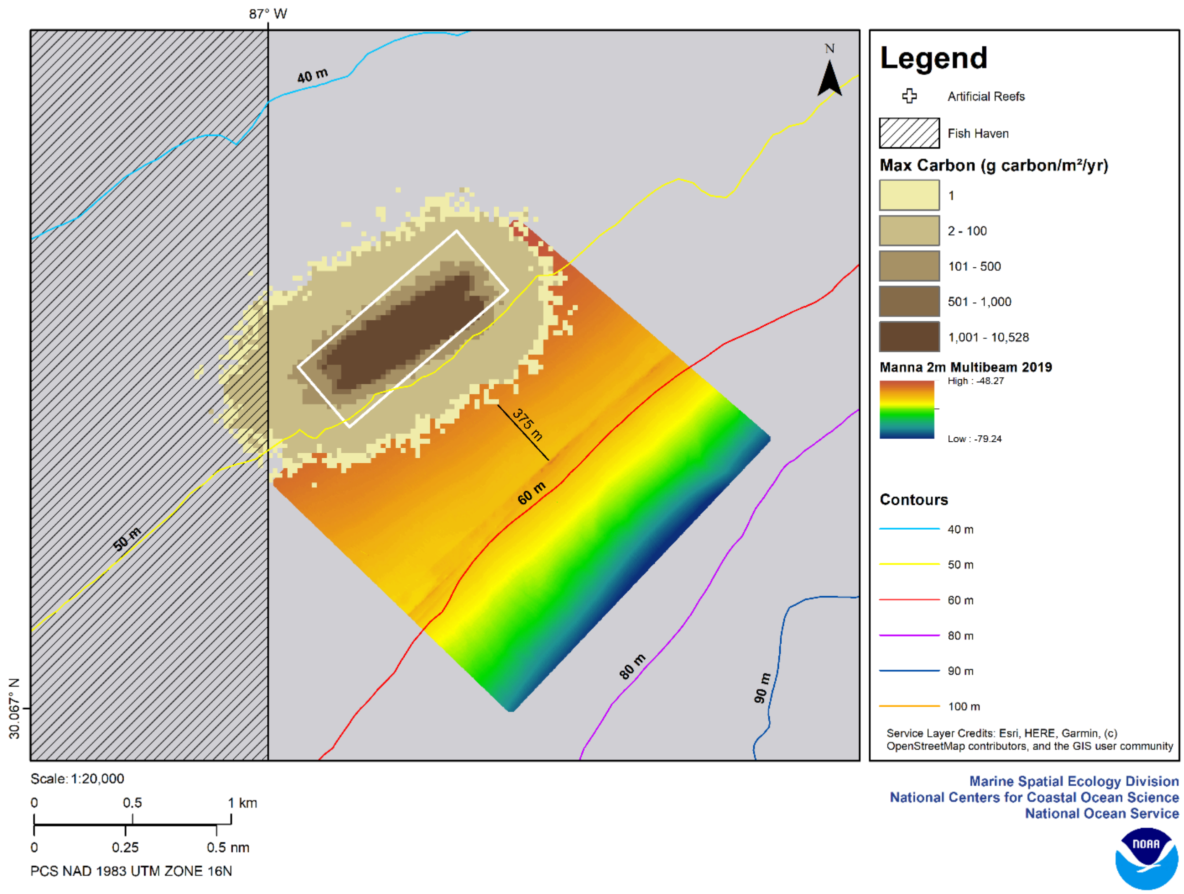

Figure 2. NOAA's National Centers for Coastal Ocean Science applied high-resolution depositional modeling to estimate maximum carbon deposition from a commercial-scale offshore finfish farm in the Gulf of America. Bathymetric data were collected during the baseline environmental survey and are represented at 2-m spatial resolution. The depositional model was run over a five-year period under maximum biomass conditions for an 18-cage configuration. Hydrodynamic forcing was derived from 2018 current fields produced by the Gulf of America HYCOM model. Model results demonstrate the importance of precision siting in identifying locations where solid waste and carbon deposition are sufficiently dispersed, thereby minimizing localized accumulation and supporting environmentally appropriate farm placement.

8.3 Protected Species and Habitat Interactions

The introduction of offshore aquaculture structures into Atlantic waters requires careful evaluation of potential interactions with protected resources, including marine mammals governed by the Marine Mammal Protection Act (MMPA) and species and habitats protected under the Endangered Species Act (ESA) (NOAA Fisheries, 2023a; NOAA

Fisheries, 2023b). Interactions between aquaculture gear and marine mammals, sea turtles, and seabirds remain an active concern but have been well documented both globally and domestically (Price & Morris 2013; NMFS 2015; Price et al. 2016; NMFS 2019; Bath et al. 2023). Recently, the NOAA Technical Guide to Offshore Aquaculture Gear and Protected Species Interactions indicates that entanglement risk is generally low for most offshore cage designs but not negligible, particularly for large whale species and protected turtles (Feldman et al., 2025). Gear modifications such as tensioned mooring lines, weak links, minimized slack, and the use of stiff or coated materials are essential to reduce entanglement hazards. In addition, strategic siting that avoids migratory corridors and ecologically sensitive habitats further lowers the likelihood of interactions.

Adequate risk assessment requires a baseline understanding of offshore aquaculture system design, mooring and net-pen configurations, feed inputs, and operational practices proposed for striped bass culture (Price & Morris, 2013). Potential pathways of interaction include entanglement with nets or mooring lines, attraction of predators such as seals and dolphins to farm sites, displacement or alteration of migratory routes, and changes in prey availability for ESA-listed fish, sea turtles, and marine mammals (Nelson et al., 2021; Read, 2008). The proximity of farms to designated critical habitats requires precautionary siting to avoid overlap (NOAA Fisheries, 2016; NMFS, 2021a; 2021b).

Emerging best management practices and technological innovations provide pathways to further reduce risks. These include predator-resistant and tensioned netting, siting analyses that explicitly exclude sensitive habitats and migratory routes, and adaptive monitoring programs that integrate acoustic, visual, and satellite data (Rust et al., 2014). Taken together, these measures highlight the importance of coupling aquaculture science with regulatory frameworks to ensure that striped bass offshore aquaculture develops in a manner consistent with the long-term protection and recovery goals of the MMPA and ESA.

NOAA’s NCCOS is advancing a physics-based 3-D entanglement simulator in collaboration with partners (Bureau of Ocean Energy Management and BelleQuant Engineering) to support risk assessments for marine mammal entanglements with new and existing ocean industries including aquaculture. The simulator combines digital models of large whales and other protected species and underwater structures (moorings, rope, chain, and other structures) to mathematically and physically characterize the interactions between animal and gear. Potential entanglement scenarios, gear re-design can be tested to better understand risk and likelihood of adverse interactions between the gear and animal. This tool supports science-based risk assessments for regulators and industry, helping to inform engineering design, siting decisions, and mitigation strategies, thereby reducing one of the principal environmental concerns associated with offshore aquaculture expansion and facilitating efficient permitting and consultations for commercial-scale farms. By enabling proactive evaluation of entanglement risk and alternative design solutions, the entanglement simulator is intended to lower ecological impact uncertainty around offshore farm operations, support environmental compliance, and ultimately de-risk farm deployment in federal waters as part of broader marine spatial planning and protected species interaction research.

8.4 Ecosystem-Level Considerations

Food Web Dynamics

Offshore striped bass aquaculture introduces an artificial biomass of piscivores into marine ecosystems. While contained, the farms may act as fish aggregating devices, altering local species distributions. Evidence from salmon and tuna net pens suggests farms attract pelagic species, including forage fish, invertebrates, and predators (Dempster et al., 2002). Such aggregations may increase predation pressure or alter trophic pathways, though they can also enhance foraging opportunities for wild species (Callier et al., 2018).

Harmful Algal Blooms

Naturally occurring harmful algal blooms (HABs) pose a direct risk to striped bass aquaculture through mechanisms including gill irritation and damage, toxin exposure, hypoxia, and acute mortality events. As a result, understanding whether offshore cage culture contributes to HAB dynamics is a critical consideration for siting and management in the EEZ. Synthesis of the global literature indicates that marine net pen aquaculture does not exhibit a consistent or causal relationship with HABs when farms are appropriately sited and managed (Price & Morris, 2013). While dissolved nutrient releases from cage culture can produce localized and transient increases in phytoplankton biomass, particularly within tens to hundreds of meters of net pens, these responses have not been linked to the initiation or persistence of toxic or nuisance algal blooms (Price et al., 2015). In offshore and well-flushed environments characteristic of the EEZ, hydrodynamic dispersion and biological assimilation rapidly dilute dissolved nutrients, rendering aquaculture-derived inputs minor relative to background nutrient variability and watershed-driven sources. Evidence suggests that HAB risk is primarily governed by site-specific factors such as flushing, stratification, and existing nutrient loads rather than cage culture itself. Consequently, precision siting in dispersive offshore waters, combined with modern feed formulations and efficient feeding practices, is expected to minimize eutrophication risk and decouple offshore striped bass aquaculture from HAB dynamics in the EEZ.

9 Escapement Risks and Genetic Considerations for Offshore Striped Bass Aquaculture

Escape events pose real risks for genetic introgression, but decades of selective breeding, coupled with new genomic tools, provide safeguards to manage those risks. Domesticated strains, sterility technologies, and rigorous monitoring can ensure that aquaculture operations do not compromise wild population integrity. When paired with robust containment systems, striped bass aquaculture can proceed without undermining the genetic resilience of wild stocks.

For offshore operations, it is useful to distinguish between chronic, low-level seepage of escapees and rare, high magnitude catastrophic releases, because these pathways differ in detectability, dispersal potential, and the timing of exposure that drives genetic risk. Seepage most often results from small holes, net abrasion, predator related tearing, and routine activities such as handling and lifting, creating a persistent trickle of escapees that can be difficult to detect directly yet still sustain contact with wild conspecifics (Jensen et al., 2010; Holmen et al., 2021). Catastrophic events are more commonly linked to structural failure or mooring failure, collisions, and extreme weather, and they can release large numbers of fish over short periods, overwhelming recapture capacity and increasing the likelihood that mature escapees enter migratory corridors or spawning habitats during sensitive windows (Jackson et al., 2015; Thorvaldsen et al., 2015).

Escape events are among the most widely recognized ecological risks associated with marine finfish aquaculture, with outcomes shaped by species behavior, farm design and durability, siting and hydrodynamic conditions, operational practices, and interactions with predators such as sharks, marine mammals, and seabirds. Ecological consequences have been well documented across freshwater, estuarine, and marine systems, including competition with wild conspecifics, habitat displacement, disease and parasite transmission, and genetic introgression (Naylor et al., 2005; Hutchings & Fraser, 2008). Although domesticated fish often show reduced individual fitness and survival compared to wild stocks (Glover et al., 2017), even limited interbreeding can erode local adaptation, homogenize genetic structure, and reduce the long-term resilience of wild populations (Bourret et al., 2011).

For offshore aquaculture of native striped bass, these risks warrant particular attention. Striped bass are highly mobile and migratory, with populations ranging from the Gulf of St. Lawrence (Canada) to the St. John’s River (Florida) (Waldman et al., 2012). Resident populations occur in southern systems such as Albemarle Sound, North Carolina, while northern populations migrate extensively along the Atlantic coast (Boreman & Lewis, 1987; Overton et al., 2008). Escaped individuals could therefore disperse widely, interact with multiple genetically distinct subpopulations, and introduce risks of maladaptation or loss of genetic structure. Given the cultural, recreational, and commercial importance of striped bass, and their complex genetic composition, safeguarding wild populations is a priority for both fisheries and aquaculture management (ASMFC, 2019).

9.1 Historical Stocking and Genetic Legacy

The striped bass has a long history of hatchery propagation and stock enhancement. Beginning in 1884, striped bass from the Roanoke River were widely distributed for research and restoration purposes (Geddings, 1971). By the mid-20th century, federal and state hatcheries were producing and transporting striped bass throughout the U.S. and abroad. These efforts expanded during the 1970s and 1980s, when more than 20 hatcheries collectively released millions of fish annually to support restoration following severe population declines caused by overfishing, habitat degradation, and recruitment failure (Boreman & Austin, 1985; Rulifson & Laney, 1999). Although stocking programs contributed to recovery, widespread “cross-stocking” introduced non-native genetic material into multiple watersheds, altering natural genetic structure and raising long-term conservation concerns (Waldman et al., 2012). For example, while remnant native Gulf populations persist in the Apalachicola–Chattahoochee–Flint (ACF) river system in Florida, genetic analyses reveal substantial introgression (52%) from Atlantic stocks used in enhancement programs across the Gulf (Wirgin et al., 1997; Wirgin et al., 2010; GSMFC, 2006). The legacy of these programs underscores the importance of preventing further anthropogenic genetic alteration through aquaculture escapes.

9.2 Advances in Genomic Tools

Modern genomic approaches now allow high-resolution monitoring of striped bass population structure. Methods such as RADseq and genome-wide SNP genotyping enable the detection of fine-scale differentiation, even among weakly structured marine populations (Vendrami et al., 2017; Drinan et al., 2018; Jenkins et al., 2019). Analytical advances, including identification of outlier loci, provide insights into adaptive divergence and improve assignment accuracy in mixed-stock analyses (Gagnaire et al., 2015). These tools have been applied to striped bass, where they have clarified stock composition and informed management (LeBlanc et al., 2020; Wojtusik et al., 2023, 2025). Applications extend to monitoring genetic introgression, detecting illegal harvest, and assessing risks associated with aquaculture escapes (Ackerman et al., 2011; Martinsohn & Ogden, 2009).

9.3 Domesticated Strains and Aquaculture Applications

In parallel with restoration programs, a domesticated striped bass broodstock line has been developed through more than 30 years of selective breeding for aquaculture performance. The National Program for Genetic Improvement and Selective Breeding, based at North Carolina State University’s Pamlico Aquaculture Field Laboratory, created this line from multiple founder strains including the Roanoke River, Chesapeake Bay, Santee-Cooper Reservoir, Florida–Gulf of America, Canadian, and Pacific populations (Harrell et al., 1990; Kenter et al., 2018; 2023). Selection has emphasized growth, stress tolerance, and disease resistance, resulting in a strain phenotypically and genetically divergent from wild populations. This divergence may reduce the likelihood that escapees would survive or reproduce successfully in the wild, potentially lowering ecological risk compared to more recently domesticated or wild-derived stocks. However, if interbreeding occurs, maladaptive traits from the cultured line could still introgress into wild populations, compromising local adaptation and resilience (Ignatz et al., 2024; San Roman et al., 2025).

9.4 Risk Assessment and Mitigation

Effective escape risk management for offshore striped bass aquaculture requires a precautionary, multi-layered approach. Risk assessments incorporated into siting and permitting typically evaluate both the probability of escape and the ecological consequences of farm–wild interactions. Engineering strategies including robust mooring systems, regular inspection of nets and cages, predator deterrence, and contingency planning are critical for preventing escapes (Jackson et al., 2015). Genetic management measures such as broodstock traceability, use of sterile lines, and long-term genomic monitoring of both farmed and wild populations provide complementary safeguards (Glover et al., 2017; Karlsson et al., 2011).

Life-history traits of striped bass further inform risk analysis. For example, escaped males should reach maturity earlier and thus are more likely to contribute to wild spawning than females, which typically require two additional years to mature (Waldman et al., 2012). This suggests a moderate but non-negligible risk of introgression.

9.5 Reproductive Control and Genetic Containment

A practical operational safeguard is mandatory harvest before maturation, implemented through production schedules and, where appropriate, permit conditions that require complete cohort removal before fish are capable of spawning. This approach is widely treated in the aquaculture escape literature as a risk reduction measure because it limits the chance that escapees can contribute to reproduction, including scenarios where spawning can occur in or near net pens, or where mature escapees reach spawning habitats following an escape (Baskett et al., 2013).

One of the most effective strategies to minimize ecological and genetic risks from aquaculture escape events is the use of reproductively sterile fish. By eliminating or reducing the potential for interbreeding with wild populations, reproductive control technologies provide a biological safeguard that complements physical containment measures. Several approaches are currently available or under development in finfish aquaculture and could be applied to striped bass (Xu et al., 2023).

NOAA has developed the Offshore Mariculture Escape Genetic Assessment (OMEGA) model to evaluate genetic and ecological risks associated with aquaculture escape events. OMEGA simulates the probability of fish escaping from offshore farm systems, their survival and dispersal in the marine environment, and the likelihood of encountering and interacting with wild conspecifics. The model is intended to support risk-based assessments of offshore aquaculture operations and to inform the development of management and engineering strategies that reduce the potential adverse effects of escape events on wild populations (Purcell et al., 2025).

Triploidy

Induction of triploidy, producing fish with three sets of chromosomes, has been successfully applied in numerous aquaculture species, including salmonids, carp, and catfish, to create sterile or functionally sterile individuals (Piferrer et al., 2009; Benfey, 2016). While triploid performance varies by species, triploid striped bass have been produced experimentally and show promise for use in commercial systems (Okomoda et al., 2020). Incorporation of triploid technology into offshore striped bass culture could provide a near-term strategy for genetic containment, though further research is required to ensure consistent induction rates, animal welfare, and commercial performance.

Genetic Knockdown Approaches

Emerging biotechnologies offer more targeted methods of inducing sterility through gene knockdown or knockout of key reproductive pathways (Houston & Macqueen, 2019; Gutasi et al., 2023; Xu et al., 2023). For example, suppression of genes involved in germ cell development or meiosis can yield sterile phenotypes without altering somatic growth. While these methods are not yet commercially applied in striped bass, they are commercially available technologies for other marine fish species and the technology represents a potential long-term avenue for highly reliable reproductive control.

Monosex or Sex-ratio Control

Manipulation of sex ratios, such as producing all-male or all-female populations, can reduce reproductive capacity if only one sex is cultured. For striped bass, male fish reach sexual maturity earlier and could present a higher risk of genetic introgression following escapes, whereas all-female populations may reduce this risk (Waldman et al., 2012). Sex control has been applied in other aquaculture species through hormonal or genetic methods (Beardmore et al., 2001; Luckenbach et al., 2017; Berlinsky et al., 2020), but further research is needed to assess its feasibility in striped bass.

Research and Development

Development of sterility induction methods for striped bass aquaculture remains a critical research need. While the domesticated broodstock line developed at North Carolina State University provides a stable genetic foundation for offshore farming, it has not yet been systematically adapted for sterility. Developing robust and commercially viable sterility methods, whether through triploidy, gene knockdown, or sex-ratio control, would likely require 4–5 years of focused research to optimize protocols compatible with domesticated strains and evaluate fish performance in a commercial setting. Investment in this research would provide regulators and producers with a powerful tool to minimize ecological risk and ensure the sustainability of offshore striped bass aquaculture.

10 Aquatic Animal Health Considerations for Offshore Aquaculture

Disease is a primary operational risk for striped bass aquaculture and a recurring constraint on economic performance. Offshore net pens can support healthy production, but only when farms prevent pathogen introduction, detect problems early, and respond quickly under a regulated framework (Rhodes et al., 2023).

Open water pens continuously exchange water with surrounding ecosystems. That exchange improves flushing, but it also allows microbes and parasites to move between cultured fish and wild fish. Stocking densities needed for commercial production can amplify outbreaks and increase losses if farms do not maintain strong health controls (Rhodes et al., 2023).

Offshore striped bass aquaculture can maintain high animal health standards when farms treat disease as an operational risk that must be managed continuously. The priority is prevention, early detection, and targeted response. Site selection, biosecurity, surveillance, and compliance with therapeutic regulations together reduce disease incidence and limit potential effects on nearby wild fish populations (Rhodes et al., 2023).

10.1 Main pathways for disease and parasite pressure

Several conditions elevate risk in offshore culture, and each point to a specific management response.

1. **Proximity to wild fish**
   Pens located near migratory or resident striped bass can support two-way

movement of pathogens, which raises concerns for both farmed and wild fish (Rhodes et al., 2023).

2. **High connectivity through water exchange**
   Pathogens and parasites can disperse beyond farm boundaries, so surveillance and response planning must account for the broader site area, not only the cage footprint (Rhodes et al., 2023).

3. **Stress and suppressed immune function**
   Handling, fluctuating environmental conditions, and periods of suboptimal water quality can increase susceptibility to infection (Virginia Cooperative Extension, 2023).

4. **Biofouling and infrastructure condition**
   Fouling can reduce water circulation and degrade local water quality inside and around cages. Farms can reduce this risk through routine cleaning and appropriate materials, including copper alloy mesh where feasible (Rhodes et al., 2023).

Once aquatic pathogens establish in natural systems, eradication becomes difficult. Experience and modeling show that farms can increase pathogen abundance in surrounding waters if controls fail, which can affect farm productivity and nearby wild populations (Rhodes et al., 2023).

10.2 Striped bass pathogens and treatment considerations

Striped bass culture faces a recognizable set of bacterial and parasitic hazards, with risk shaped by environment, husbandry, and baseline pathogen presence.

In the Chesapeake Bay, mycobacteriosis caused by *Mycobacterium shottsii* and *M. pseudoshottsii* is endemic among juvenile wild striped bass, particularly in nutrient enriched estuaries. Mycobacteria also occur in cultured striped bass and hybrid striped bass, most often in recirculating systems, broodstock settings, or facilities experiencing chronic stress and poor water quality. Relative to other bacterial diseases, mycobacteriosis is not typically a leading driver of commercial losses. Columnaris disease, caused by *Flavobacterium covae*, remains a concern for net pen production. Additional pathogens and parasites documented for striped bass include the following (Paperna and Zwerner, 1976; Rhodes et al., 2023; MD DNR, 2024).

- *Ichthyophthirius multifiliis*, a protozoan that causes ich, or white spot disease, in freshwater fish (Rhodes et al., 2023).

- *Edwardsiella tarda*, which can cause systemic infection and mortality (Lee Herman and Bullock, 1986).

- *Streptococcus iniae*, documented in hybrid striped bass with systemic impacts (Evans et al., 2006).

Parasites can cause meaningful health impacts when infestation intensity is high, increasing stress and weakening fish condition (Rhodes et al., 2023).

10.3 Prevention focused management

For striped bass aquaculture, prevention carries the most weight. Farms typically rely on vaccination where available, strict biosecurity, careful water quality management, and structured health monitoring to detect emerging problems before mortalities escalate (Evans et al., 2006).

Several actions consistently support better health outcomes:

Area of Focus	Key Practice/Goal
Optimal Water Quality	Maintaining stable, high-quality water conditions to reduce stress and disease susceptibility.
Nutrition	Proper nutrition is critical for supporting the immune system and overall health of cultured striped bass.
Robust Biosecurity	Preventing pathogen introduction through controlled stock movements, disinfection protocols, and equipment sanitation.
Appropriate Stocking Densities	Avoiding overcrowding to limit stress and disease transmission.
Regular Health Monitoring	Early detection of pathogens or parasites through systematic surveillance, diagnostics, and record keeping.
Strategic Site Selection	Well-sited net pens in areas with adequate current flow help disperse waste, excess nutrients, and potential pathogens. Good water exchange reduces the concentration of organic matter and microbial loads, limiting the accumulation of disease agents. Sites must also allow for practical access and regular monitoring.

10.4 Therapeutants, antibiotics, and U.S. regulatory oversight

Even well managed farms sometimes require therapeutic intervention to address mortalities, infestations, or infections (FDA, 2022). In U.S. marine aquaculture, the set of approved options remains limited compared to other animal production sectors (FDA, 2022). Therapeutant use is governed by a regulatory system designed to protect animal health, the environment, and food safety (FDA, 2020). Treatments, including extra label use where applicable, require veterinary supervision and must follow federal rules. Current constraints include the lack of therapeutants explicitly approved for offshore marine aquaculture systems in the United States, which increases the importance of prevention and careful case management (FDA, 2020).

FDA provides central oversight for aquaculture therapeutics, and this oversight helps limit ecological risk associated with medication use (Scott, 2004). Management approaches that reduce parasite pressure, such as adjusting stocking densities and timing stocking events, can reduce reliance on drugs. Antibiotic use has declined substantially in salmon aquaculture, including a reported drop of roughly 90 percent around the turn of the century with continued reductions thereafter (Tveterås 2002). In Maine, antimicrobial medicated feeds such as oxytetracycline were reported in 8 percent of salmon production cycles from 2003 to 2017, with no reported use from 2009 to 2017 (Love et al. 2020). Despite declining use, antibiotic persistence in sediments can range from days to years depending on light, oxygen, pH, temperature, and sediment characteristics (Adenaya et al. 2023; Coyne et al. 2001; Rigos and Troisi 2005). This persistence can contribute to selection for antibiotic resistant bacteria near aquaculture sites, so any use should remain limited and carefully controlled.

At present, no antibiotics are approved for striped bass and other marine aquatic species. Some broad-spectrum antibiotics and feed additives, including florfenicol and oxytetracycline, may be available under the National Investigational New Animal Drug Program as permitted by the U.S. Fish and Wildlife Service. Use should remain sparing, under veterinary oversight, and consistent with approved protocols to limit environmental accumulation and ecological disruption.

10.5 Vaccines and alternatives

Vaccines have been under development in aquaculture for more than 50 years and now represent a rapidly expanding disease prevention tool. Adoption varies because cultured species, production conditions, and delivery methods differ widely across aquaculture systems. Even so, vaccine development and use increasingly supports production practices that reduce antibiotic dependence while improving fish welfare.

11 Resource Use and Operational Efficiency in Offshore Striped Bass Aquaculture

Striped bass aquaculture is resource-intensive, but innovations in feed efficiency, automation, and renewable energy offer pathways to reduce costs and environmental impacts. Studies suggest offshore production can be profitable when efficiency is prioritized at scale. With continued improvements, striped bass farms could achieve both economic competitiveness and operational sustainability in U.S. waters.

11.1 Feeds and Feed Efficiency

Feed represents the single largest input cost in striped bass aquaculture and is the most significant driver of environmental performance. Research has focused on reducing reliance on fishmeal and fish oil while maintaining growth and health outcomes. Alternative ingredients such as soybean meal, corn gluten meal, and poultry by-product meal show promise, though digestibility and nutrient availability remain ongoing challenges (Fujita et al., 2023). Novel sources, including insect meals, bacterial biomass, fish silage, and single-cell proteins, are also being tested as viable replacements for traditional marine-derived proteins (Turchini et al., 2019; Glencross et al., 2007). Advances in formulation now allow diets to be tailored to species-specific needs, improving feed conversion ratios (FCR) and nutrient retention (Price & Beck-Stimpert, 2014; Hua et al., 2019).

Aquaculture has historically relied on forage fish (e.g., anchovy, sardine, menhaden) due to their high-quality protein and omega-3 fatty acids, with roughly 20 million metric tons (≈20% of the global marine harvest) processed annually for fishmeal and oil (FAO, 2018). However, supply has plateaued, and their proportional use in aquafeeds has declined for two decades (Naylor et al., 2021). Despite these trends, fishmeal and fish oil remain critical for some marine species requiring highly digestible proteins and long-chain polyunsaturated fatty acids (Hua et al., 2019). Studies have shown that alternative protein sources can replace much of the fishmeal in aquaculture diets without compromising performance (Rust et al., 2011; Gatlin et al., 2007). Plant proteins (soy, corn, algae, seaweed) and microbial or insect meals offer scalable solutions, with ongoing USDA and NOAA-supported research aimed at reducing environmental impacts and improving adoption (Rexroad et al., 2021).

Striped bass have demonstrated efficient feed conversion and can grow well on formulated diets with reduced reliance on fishmeal and fish oil (Rexroad et al., 2021; Andersen et al., 2021). This flexibility distinguishes them from other marine carnivorous species and helps limit pressure on forage fish resources. Continued refinement of striped bass-specific feeds will further strengthen the species' sustainability profile while supporting offshore aquaculture development.

11.2 Energy Use

Energy use is a major determinant of both cost and environmental footprint in offshore striped bass farming. Operations require energy for feeding, monitoring, cage maintenance, harvesting, and transport (Price & Beck-Stimpert, 2014). Lacking grid connectivity, farms rely on fossil fuels or renewable systems to power infrastructure (Fujita et al., 2023).

Harvesting is especially energy-intensive, with vessels consuming fuel for propulsion, refrigeration, and lifting equipment. Long-distance logistics amplify these demands, raising operational costs and carbon emissions (Sardar et al., 2025; Basurko et al. 2013). Optimizing vessel routing and adopting hybrid or alternative-fuel vessels can reduce energy use.

Renewable energy technologies such as floating solar, wave, and hybrid wind-solar systems are increasingly evaluated as alternatives for offshore aquaculture infrastructure (Rubino, 2008; Soto & Wurmann, 2019). Coupled with energy storage, these systems can provide reliable low-carbon power for feeding, sensors, and communications (Haider et al., 2024). Strategic siting also plays a role: proximity to shore reduces vessel fuel use and enables more efficient logistics (FAO, 2024).

As offshore aquaculture expands, energy management will become central to economic viability and environmental performance. Reducing fossil fuel dependence and integrating renewables will support both industry competitiveness and broader carbon-reduction goals. Integrating renewable energy and efficiency technologies can lower operating costs while reinforcing the sustainability profile of offshore striped bass aquaculture, strengthening its alignment with U.S. climate and seafood goals.

12 Historical Review of Research Initiatives and Commercial Projects

Past research and pilot projects in the U.S. and abroad show that striped bass aquaculture is biologically feasible but historically hampered by regulatory uncertainty, infrastructure challenges, and limited market development. Recent advances in genetics, production systems, and consumer demand now address many of these barriers. These lessons confirm that the current moment offers the strongest opportunity yet for offshore striped bass aquaculture to succeed.

12.1 Research Initiatives

StriperHub, a coordinated NOAA Sea Grant initiative led by North Carolina Sea Grant and North Carolina State University, is advancing striped bass aquaculture in the U.S. by integrating genetics, production research, and industry outreach. Long-term selective breeding programs at NC State's Pamlico Aquaculture Field Laboratory have produced domesticated lines with improved growth, feed efficiency, stress tolerance, and disease resistance, now capable of reaching 1.8 kg within 18 months. By coupling these advances with seed production, grow-out demonstrations, and market development, StriperHub is positioning pure-line striped bass to compete directly in both premium and commodity markets, creating new opportunities for expansion of U.S. aquaculture.

The USDA has played a pivotal role in advancing striped bass and hybrid striped bass aquaculture through strategic research funding and breeding programs. Notably, USDA-supported initiatives, such as the National Research Support Project 8 (NRSP-8), NIFA projects, and Agricultural Research Service (ARS) collaborations, have fostered genetic improvement and selective breeding efforts, enabling enhanced growth, disease resistance, and performance in RAS and pond systems. These investments, combined with targeted SBIR grants focused on pedigree tracking, semen preservation, and broodstock development, have strengthened the industry's capacity for commercial diffusion of superior striped bass genetics

12.2 Marine Cage Culture

United States

Over the past five decades, several experimental and pilot-scale commercial attempts have been made to culture striped bass in marine net pens or cages, particularly in New York waters. These projects demonstrated the biological feasibility of cage culture but also underscored the environmental and operational challenges. The earliest documented trial occurred in 1974–1975, when researchers deployed floating cages in a seawater lagoon off Shelter Island, New York. Fingerlings stocked in the fall suffered from mortality events when water temperatures dropped to 1 °C, necessitating onshore overwintering. Restocked fish grew during the following summer, but survival and retention were poor due to escapes, and only 14% were harvestable by fall (Harrell et al., 1976). A second pilot project in 2011 stocked 15,000–20,000 striped bass into net pens in New York State waters (University of Vermont Sea Grant, 2022). This effort was short-lived after a vessel strike damaged infrastructure and Hurricane Sandy further disrupted operations, ultimately forcing removal of the pens. Finally, in 2012, a private venture launched in Gardiners Bay at the northern end of Long Island. Striped bass raised in net pens exhibited strong growth and survived the impacts of Hurricane Sandy. Fish were later transferred to an onshore facility and marketed through restaurants and seafood retailers in Long Island and Manhattan, demonstrating small-scale biological and commercial feasibility. However, broader challenges related to permitting, scalability, and storm resilience remain unresolved (Multi Aquaculture Systems, 2012).

Collectively, these U.S. case studies highlight both the opportunities and risks of striped bass aquaculture in marine cages. While growth performance can be strong, success depends heavily on site selection, infrastructure resilience, and regulatory clarity. Despite these challenges, multiple offshore aquaculture initiatives have identified striped bass as a promising candidate for the U.S. EEZ in recent years. These include Pacific Ocean AquaFarms, with proposed sites off San Diego and Long Beach, California, and Manna Fish Farms, with proposed sites off Pensacola, Florida, and Long Island, New York.

International

Pacifico Aquaculture, founded in 2010 in Ensenada, Baja California, was the first and only commercial-scale offshore striped bass farm in North America. Situated 8 miles offshore near Isla Todos Santos, the operation utilized marine net pens supported by a hatchery and nursery RAS at Playa Tres Emes, where juveniles were reared to approximately 80 g before transfer offshore. The company achieved four-star Best Aquaculture Practices (BAP) certification, encompassing hatchery, grow-out, processing, and feed, and was recognized by Monterey Bay Aquarium's Seafood Watch with a "Good Alternative" rating. At its peak, Pacifico consistently produced up to 3,200 metric tons annually, with ambitions to scale toward 20,000 metric tons per year. Their product was marketed to "conscientious consumers" and premium channels across North America. Its striped bass entered retail and foodservice markets through distribution partnerships with Whole Foods, Amazon Fresh, Fresh Direct, Earth Fare, and through Santa Monica Seafood in California and the U.S. Southwest. Nationwide distribution extended through wholesalers such as Profish, Seattle Fish Company's Chef's Fresh Fish, Samuels Seafood, and Wulf's Fish, while restaurant chains including Pacific Catch prominently featured the product. Pacifico was also a regular exhibitor at the Seafood Expo North America, where it promoted its brand and product lines to domestic and international buyers.

For more than a decade, Pacifico represented the sole commercial example of offshore striped bass aquaculture in the region. In June 2025, the company ceased operations, marking the closure of North America's only offshore striped bass producer and concluding a pioneering commercial effort (Fiorillo, 2025; Mayer, 2025).

Several co-authors of this report conducted site visits to the Pacifico operation during commercial development, peak production, hatchery construction, and following its closure, providing important lessons for future striped bass aquaculture development. Despite strong market demand, the operation experienced persistent production challenges, largely attributed to suboptimal siting relative to suitable thermal regimes. Temperature variability negatively affected growth rates and feed conversion efficiency, resulting in inconsistent production performance and difficulty in reliably supplying product to market. These observations underscore the critical importance of precision siting to ensure thermal suitability, production reliability, and long-term commercial viability for offshore striped bass aquaculture.

12.3 Recirculating Aquaculture Systems

Feasibility of land-based culture has been researched in depth for pure striped bass (Engle et al., 2024), but commercial scale comparables only exist for their hybrids in the U.S. and Asia. The U.S. companies included AquaFuture Inc., founded in 1990 (Turners Falls, Massachusetts) and Kent SeaTech founded in 1972 (Mecca, California). Both operations experienced years of technical successes with the species but economic challenges (e.g., feed cost, energy demand, stagnant fish prices) caused them to pivot to barramundi (*Lates calcarifer*) and biofuel respectively. Operations in China continue to demonstrate successful production in RAS for their domestic premium markets. Although the biological and technical potential exists to produce pure striped bass at scale in RAS, concerns about operating costs and market price remain when raising fish to marketable size.

12.4 Pond Aquaculture

Most commercial striped bass and hybrid striped bass production occurs in the southeastern and midwestern states (notably North Carolina, Arkansas, Mississippi, and Texas) where earthen ponds are used for fingerling and grow-out phases. Hybrid striped bass have historically been preferred due to superior hardiness and growth. The typical production system is a two-phase model: fry are first reared in hatcheries, then stocked into fertilized ponds to grow into fingerlings or market-size fish. Pond culture benefits from relatively low infrastructure costs and established feed-based management, though it requires substantial land, warm water, and aeration. The 2023 USDA Census of Aquaculture reports there were 57 farms producing hybrid striped bass in the U.S., with 32 of those marketing food-size fish.

13 Conclusions

Striped bass is among the most iconic and economically valuable fishes of the U.S. Atlantic coast. Decades of hatchery propagation, hybrid striped bass aquaculture development, and scientific advances have laid the foundation for farming pure striped bass in offshore environments. This report demonstrates that offshore striped bass aquaculture is biologically feasible, economically competitive, and aligned with national goals of expanding domestic seafood production. Yet, current federal rulemaking prohibits possession of striped bass in the EEZ, creating a de facto ban on offshore striped bass farming along the eastern Atlantic. To advance sustainable aquaculture, this prohibition could be reconsidered. Updating federal and state regulations to explicitly allow striped bass aquaculture in the EEZ would unlock opportunities for economic growth, seafood security, and coastal community development while safeguarding wild stocks through modern genetic, ecological, and regulatory safeguards.

The pathway forward requires targeted investment in science and deliberate policy reform. Offshore striped bass aquaculture should proceed within a precautionary, adaptive management framework that emphasizes ecological compatibility, environmental responsibility, and stakeholder trust. With appropriate research, policy innovation, and regulatory clarity, the U.S. can establish a robust offshore striped bass aquaculture sector that complements conservation of wild fisheries and strengthens the resilience of the seafood supply chain.

13.1 Priority Research Needs

- Offshore production trials: Conduct large-scale demonstration farms to test performance under high-energy offshore conditions.
- Broodstock improvement: Expand selective breeding programs to enhance growth, feed efficiency, and disease resistance in domesticated lines.
- Feeds and nutrition: Optimize sustainable diets using alternative proteins, oils, and functional ingredients tailored to striped bass.
- Genetic containment tools: Develop and validate methods to ensure reproductive sterility of farmed striped bass.
- Fish health management: Advance vaccines and biosecurity protocols for aquatic animal health management in offshore settings.
- Farm economics: Model the production costs and business feasibility of striped bass aquaculture to determine profitability timelines and financial risk.
- Market research: Assess consumer preferences, willingness to pay, and branding strategies for farmed pure-strain striped bass.

- Reproductive control for striped bass aquaculture remains a critical research need.

13.2 Policy and Management Needs

- Regulatory reform: Amend 50 C.F.R. §697.7 to permit aquaculture of striped bass in the EEZ, while maintaining the ban on wild harvest.
- Permitting frameworks: Develop clear, streamlined, and science-based offshore aquaculture permitting pathways that integrate NOAA, EPA, and USACE authority.
- Traceability and labeling: Establish traceability standards to distinguish cultured striped bass from wild harvest, ensuring market integrity.
- Compliance and enforcement: Implement monitoring systems to verify containment, environmental compliance, and genetic safeguards.
- Biosecurity regulations: Update aquatic animal health frameworks to address offshore net-pen systems, including rapid response protocols for disease events.
- Stakeholder engagement: Facilitate public and industry input into striped bass aquaculture planning to build social license and reduce conflict.
- Workforce development: Support training programs to transition maritime workers into skilled aquaculture careers.

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Atlantic States Marine Fisheries Commission

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MEMORANDUM

June 2, 2026

To: **Atlantic Striped Bass Management Board**

From: **Tina Berger, Director of Communications**

RE: **Advisory Panel Nomination**

Please find attached a new nomination to the Atlantic Striped Bass Advisory Panel – Mike Waine, with the American Sportfishing Association, as a North Carolina representative. Mike replaces Jon Worthington.

Please review this nomination for action at the next Board meeting.

If you have any questions, please feel free to contact me at 703.842.0749 or tberger@asmfc.org.

Enc.

cc: Toni Kerns/Emilie Franke

M26-57

Atlantic Striped Bass Advisory Panel

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ATLANTIC STATES MARINE FISHERIES COMMISSION

Advisory Panel Nomination Form

This form is designed to help nominate Advisors to the Commission's Species Advisory Panels. The information on the returned form will be provided to the Commission's relevant species management board or section. Please answer the questions in the categories (All Nominees, Commercial Fisherman, Charter/Headboat Captain, Recreational Fisherman, Dealer/Processor, or Other Interested Parties) that pertain to the nominee's experience. If the nominee fits into more than one category, answer the questions for all categories that fit the situation. **Also, please fill in the sections which pertain to All Nominees (pages 1 and 2). In addition, nominee signatures are required to verify the provided information (page 4), and Commissioner signatures are requested to verify Commissioner consensus (page 4). Please print and use a black pen.**

Form submitted by: Chris Batsavage State: NC
(your name)

Name of Nominee: Mike Waine

Address: 712 Arendell St

City, State, Zip: Morehead City, NC 28557

Please provide the appropriate numbers where the nominee can be reached:

Phone (day): 508-221-5508 Phone (evening): ________

FAX: ________ Email: mwaine@asafishing.org

FOR ALL NOMINEES:

1. Please list, in order of preference, the Advisory Panel for which you are nominating the above person.

   1. Striped Bass
   2. ________
   3. ________
   4. ________

2. Has the nominee been found in violation of criminal or civil federal fishery law or regulation or convicted of any felony or crime over the last three years?

   yes________ no X

3. Is the nominee a member of any fishermen's organizations or clubs?

yes ________ no X__________

If "yes," please list them below by name.

________________________________ ________________________________

________________________________ ________________________________

________________________________ ________________________________

4. What kinds (species) of fish and/or shellfish has the nominee fished for during the past year?

striped bass	fluke
bluefish	red drum
black sea bass	spotted seatrout

5. What kinds (species) of fish and/or shellfish has the nominee fished for in the past?

cobia	atlantic bonito
tuna	spanish mackerel
false albacore	

FOR COMMERCIAL FISHERMEN:

1. How many years has the nominee been the commercial fishing business? ________ years

2. Is the nominee employed only in commercial fishing? yes_______ no__________

3. What is the predominant gear type used by the nominee?_________________________________

4. What is the predominant geographic area fished by the nominee (i.e., inshore, offshore)?____

FOR CHARTER/HEADBOAT CAPTAINS:

1. How long has the nominee been employed in the charter/headboat business? _______ years

2. Is the nominee employed only in the charter/headboat industry? yes _______ no_______

   If "no," please list other type(s)of business(es) and/occupation(s):__________________________

   ____

3. How many years has the nominee lived in the home port community? _______ years

   If less than five years, please indicate the nominee's previous home port community.

   ____

FOR RECREATIONAL FISHERMEN:

1. How long has the nominee engaged in recreational fishing? 30+ years

2. Is the nominee working, or has the nominee ever worked in any area related to the fishing industry? yes x no ________

   If "yes," please explain.

Atlantic Fisheries Policy Director at the American Sportfishing Association since 2018.

____

____

FOR SEAFOOD PROCESSORS & DEALERS:

1. How long has the nominee been employed in the business of seafood processing/dealing? _________________years

2. Is the nominee employed only in the business of seafood processing/dealing?

   yes ______ no ______ If "no," please list other type(s) of business(es) and/or occupation(s):

   ____

   ____

   ____

3. How many years has the nominee lived in the home port community? _______ years

If less than five years, please indicate the nominee's previous home port community.

____

FOR OTHER INTERESTED PARTIES:

1. How long has the nominee been interested in fishing and/or fisheries management? _______ years

2. Is the nominee employed in the fishing business or the field of fisheries management?
yes _____ no _____

If "no," please list other type(s) of business(es) and/or occupation(s):

____

____

____

FOR ALL NOMINEES:

In the space provided below, please provide the Commission with any additional information which you feel would assist us in making choosing new Advisors. You may use as many pages as needed.

Nominee Signature: ______________________________ Date:

Name: Michael Waine
(please print)

COMMISSIONERS SIGN-OFF (not required for non-traditional stakeholders)

Chris Batsavage (Proxy for Kathy Rawls)
______________________________ ______________________________
State Director State Legislator

____
Governor's Appointee

Written Comment on Atlantic Striped Bass Recruitment and Management Response

The Board is well aware that, over the past several years, striped bass management has relied heavily on progressively tighter harvest controls. Since 2019, management actions have included Addendum VI, restrictive slot limits, Amendment 7, the 2023 Emergency Action, and Addendum II.

These actions collectively represent one of the most sustained periods of striped bass regulatory tightening since the 1980s moratorium era.

Despite those restrictions, young-of-year production has remained weak in major spawning and nursery areas. Maryland's 2025 juvenile striped bass survey recorded a young-of-year index of 4.0, marking the seventh consecutive below-average spawn in the Chesapeake Bay. Maryland DNR also noted that recent management actions have resulted in a healthy population of spawning-age striped bass, yet recruitment remains low.

That raises the central concern: if fishing mortality has been reduced, adult fish have been better protected, and recruitment still has not responded, then the current rebuilding challenge may not be primarily a harvest-control problem.

Harvest restrictions may continue to protect adults, but they cannot by themselves create strong year classes if recruitment is being limited by any or all of these factors: spawning-river conditions, nursery habitat, forage availability, predation, climate-related timing changes, or other ecosystem factors.

Recent work on Hudson River striped bass spawning behavior also suggests that recruitment dynamics may be changing. Pan et al. (2025) found long-term shifts in spawning behavior, including a narrower range of optimal spawning temperatures and reduced diversity in spatial and temporal spawning behavior. Those kinds of changes may help explain why recruitment can remain weak even when fishing mortality has been reduced.

This comment is not an argument for deregulation. It is a request for accurate problem identification. If the limiting factor has shifted, then weak rebuilding progress should not automatically be treated as evidence that more harvest restriction is the only appropriate response.

Given the evidence, management emphasis should rebalance away from a primarily harvest-control response and toward closer evaluation of forage dynamics, including menhaden availability, predation, environmental and habitat conditions, spawning-run conditions, nursery-habitat function, and climate-driven recruitment variability.

If the Board is not already doing so, these factors should be kept central in future rebuilding discussions, particularly when evaluating whether additional harvest restrictions are likely to address the underlying causes of weak recruitment.

Specifically, the Board should consider whether recruitment, spawning-river conditions, nursery habitat, forage availability, predation, and broader ecosystem changes are being adequately evaluated alongside fishing mortality when assessing rebuilding progress and future management responses.

Sources cited: ASMFC Atlantic Striped Bass Addendum VI, Amendment 7, 2023 Emergency Action, and Addendum II management documents; Maryland DNR 2025 YOY Survey, reported October 15, 2025; Pan et al. (2025), Ecological Indicators, 173, 113410.

Respectfully submitted,
Joseph Beneventine
Mamaroneck, NY
Recreational stakeholder

Toni Kerns

From: David Peterson <davidlawrencepeterson@gmail.com>
Sent: Thursday, June 4, 2026 8:02 AM
To: Toni Kerns
Subject: [New] [External] Striper Mortality

Given the poor handling of many over-slot stripers, perhaps it is time to enact some stricter measures. Short of a moratorium on targeting Stripers, perhaps the next step is that they can not be taken out of the water and must be released immediately in the water. No glory shots . This might only work with a moratorium and if the YOY for 2026 is another bust, time to clamp down.

Respectfully,

Dave Peterson ....¿<º))))><
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