

Atlantic States Marine Fisheries Commission

American Eel Management Board

*August 4, 2016
8:00 – 9:30 a.m.
Alexandria, Virginia*

Draft Agenda

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

1. Welcome/Call to Order (*J. Clark*) 8:00 a.m.
2. Board Consent 8:00 a.m.
 - Approval of Agenda
 - Approval of Proceedings from May 2016
3. Public Comment 8:05 a.m.
4. Discussion to Consider Changes to Addendum IV Yellow Eel Allocations (*K. Rootes-Murdy*) **Possible Action** 8:15 a.m.
 - Technical Committee Report (*T. Wildman*)
5. Consider North Carolina Glass Eel Aquaculture Plan for 2017 (*K. Rootes-Murdy*) **Action** 8:55 a.m.
 - Technical Committee Report (*T. Wildman*)
 - Law Enforcement Committee Report (*M. Robson*)
6. Other Business/Adjourn 9:30 a.m.

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

MEETING OVERVIEW

American Eel Management Board Meeting

August 4, 2016

8:00 – 9:30 a.m.

Alexandria, Virginia

Chair: John Clark Assumed Chairmanship: 8/15	Technical Committee Chair: Tim Wildman (CT)	Law Enforcement Committee Representative: Cornish
Vice Chair: Martin Gary	Advisory Panel Chair: Mari-Beth Delucia	Previous Board Meeting: May 3, 2016

Voting Members: ME, NH, MA, RI, CT, NY, NJ, PA, DE, MD, VA, NC, SC, GA, FL, D.C., PRFC, USFWS, NMFS (19 votes)

2. Board Consent:

- Approval of Agenda
- Approval of Proceedings from May 2016 Board Meeting

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-up 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 Board Chair will not allow additional public comment. 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. Discussion to Consider Changes to Addendum IV Yellow Eel Allocations (8:15 – 8:55 p.m.) Possible Action

Background

- At its February 2016 meeting, the Board agreed to discuss revisiting Addendum IV yellow eel allocation at the May 2016 Board meeting.
- At the May 2016 meeting, the Board was presented a draft proposal from New York with options to adjust the current commercial yellow eel fishery state by state quotas if enacted by management trigger as well as the timetable for revisiting allocations in the future. The Board agreed to consider a follow-up proposal from New York with more specific information on addressing allocation concerns at the August 2016 Meeting.
- In July 2016, New York submitted a follow-up proposal (**Supplemental Materials**).
- The Technical Committee reviewed the follow-up proposal from New York and provided recommendations. (**Briefing Materials**)

Presentations

- New York Proposal to adjust Commercial Yellow Eel Fishery Quota by K. Rootes-Murdy

- Technical Committee Report by T. Wildman

Board actions for consideration at this meeting

- Consider Revisiting Addendum IV Yellow Eel Allocation

5. Consider North Carolina Glass Eel Aquaculture Plan for 2017 (8:55 – 9:30 a.m.)

Background

- At its February 2016 meeting, the Board approved an Aquaculture Plan for North Carolina in 2016 that allows harvest of up to 200 pounds of glass eel for domestic aquaculture purposes.
- At its May 2016 meeting, the Board was informed by North Carolina that due to delays in the issuance of permits, no glass eels were caught for aquaculture purposes in spring 2016. North Carolina indicated that they would submit a similar Aquaculture Plan for the 2017 season by June 1, 2016. **(Briefing Materials)**
- In July 2016, the Technical Committee and Law Enforcement Committee reviewed the revised Aquaculture Plan and provided recommendations. **(Briefing Materials)**

Presentation

- Revised North Carolina Glass Eel Aquaculture Plan for 2017 by K. Rootes-Murdy
- Technical Committee Report by T. Wildman
- Law Enforcement Committee Report by M. Robson

Board actions for consideration at this meeting

- Consider approval of North Carolina’s revised Aquaculture Plan for Implementation in 2017

7. Other Business/ Adjourn

**DRAFT PROCEEDINGS OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
AMERICAN EEL MANAGEMENT BOARD**

The Westin Alexandria
Alexandria, Virginia
May 3, 2016

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

TABLE OF CONTENTS

Call to Order, Chairman John Clark..... 1
Approval of Agenda 1
Approval of Proceedings, February 2016 1
Public Comment..... 1
2017 Stock Assessment for American Eel 2
Discussion to Consider Changes to Addendum IV, Yellow Eel Allocations 4
Update on North Carolina’s Glass Eel Aquaculture Plan 16
Adjournment..... 17

INDEX OF MOTIONS

1. **Approval of Agenda by Consent** (Page 1).
2. **Approval of Proceedings of February, 2016** by Consent (Page 1).
3. **Main Motion: Move to initiate an addendum to reconsider the coastal cap and the state by state yellow eel allocation** (Page 12). Motion by James Gilmore; second by David Borden. Motion postponed.
4. **Motion to Postpone: Move to postpone until August meeting** (Page 14). Motion by Bill Adler; second by Martin Gary. Motion carried (Page 14).
5. **Move to create a working group to address the inequities of the coastal allocation of yellow eels, as well as revisit the glass eel quota** (Page 14). Motion by Patrick Keliher; second by Dave Borden. Motion failed (Page 16).
6. **Move to adjourn** by consent (Page 17).

ATTENDANCE

Board Members

Pat Keliher, ME (AA)	Loren Lustig, PA (GA)
Sen. Brian Langley, ME (LA)	Andy Shiels, PA, proxy for J. Arway (AA)
Terry Stockwell, ME, Administrative Proxy	David Saveikis, DE (AA)
Steve Train, ME (GA)	John Clark, DE, Administrative proxy (AA)
Dennis Abbott, NH, proxy for Sen. Watters (LA)	Roy Miller, DE (GA)
Doug Grout, NH (AA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Cheri Patterson, NH, Administrative proxy	Bill Goldsborough, MD (GA)
G. Ritchie White, NH (GA)	Lynn Fegley, MD, proxy for D. Blazer (AA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Rob O'Reilly, VA, proxy for J. Bull (AA)
Dan McKiernan, MA, proxy for D. Pierce (AA)	Cathy Davenport, VA (GA)
William Adler, MA (GA)	Kyle Schick, VA, proxy for Sen. Stuart (LA)
Robert Ballou, RI, proxy for J. Coit (AA)	Rep. Bob Steinburg, NC (LA)
David Borden, RI (GA)	Michelle Duval, NC, proxy for B. Davis (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Doug Brady, NC (GA)
Dave Simpson, CT (AA)	Robert Boyles, Jr., SC (AA)
Emerson Hasbrouck, NY (GA)	Mel Bell, SC, proxy for M. Rhodes (GA)
James Gilmore, NY (AA)	Pat Geer, GA, proxy for Rep. Nimmer (LA)
Steve Heins, NY, Administrative proxy	Spud Woodward, GA (GA)
Mike Falk, NY, proxy for Sen. Boyle (LA)	Jim Estes, FL, proxy for J. McCawley (AA)
Adam Nowalsky, NJ, proxy for Asm. Andrzejczak (LA)	Mike Millard, USFWS
Russ Allen, NJ, proxy for D. Chanda (AA)	Chris Wright, NMFS
Tom Fote, NJ (GA)	Martin Gary, PRFC
J. Thomas Moore, PA, proxy for Rep. Vereb (LA)	

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

Ex-Officio Members

Jon Cornish, Law Enforcement Representative

Staff

Bob Beal	Ashton Harp
Toni Kerns	Kirby Rootes-Murdy
Mike Waine	

Guests

Derek Orner, NOAA	Gregg Waugh, SAFMC
Charles Lynch, NOAA	Stew Michels, DE DFW
Peter Burns, NMFS	Joe Cimino, VMRC
Mike Ruccio, NMFS	Wilson Laney, US FWS
Kelly Denit, NMFS	Corey Hinton, Passamaquoddy Tribe, ME
Alli Murphy, NMFS	Jack Travelstead, CCA
Nichola Meserve, MD DMF	Arnold Leo, E. Hampton, NY
Jeff Pierce, MEFA	David Bush, NC Fisheries Assn.
Abden Simmons, MEFA	Des Kahn, Fisheries Investigations

The American Eel Management Board of the Atlantic States Marine Fisheries Commission convened in the Edison Ballroom of the Westin Hotel, Alexandria, Virginia, May 3, 2016, and was called to order at 4:26 o'clock p.m. by Chairman John Clark.

CALL TO ORDER

CHAIRMAN JOHN CLARK: Okay, will the Eel Board please be seated; we want to get this meeting started. All right the sooner we get started the sooner we move on to whatever it is that is coming next. Thank you all for coming. This is the American Eel Board. I'm John Clark, the Administrator Proxy for the fabulous first state, and let's move right into the agenda.

APPROVAL OF AGENDA

APPROVAL OF PROCEEDINGS

CHAIRMAN CLARK: Does anybody have any additions or changes to make to the agenda? Seeing none; proceedings from the November, 2015 meeting, does anybody have any changes to make to those? Seeing none; the agenda and proceedings are approved by consent.

PUBLIC COMMENT

CHAIRMAN CLARK: Our next item is public comment for issues that are not on the agenda. I've been told that Mr. Corey Hinton would like to address the board, is he here? Oh yes, there he is. The public microphone is in the back there, Corey.

MR. MICHAEL-COREY F. HINTON: Hello, my name is Michael-Corey Hinton I am an attorney here on behalf of the Passamaquoddy Tribe of Maine. I would like to begin by expressing my thanks to Commissioner Keliher for the opportunity to speak here today, and to all of you for listening to my remarks.

This year for the Passamaquoddy tribe with regard to the glass eel fishery was one of what I would say is historical significance. This year the tribe had an allocation of well over 1,000 pounds of quota; which we fulfilled several weeks ago. It was a very active fishery, and for the first year in several years I would say that this season went off largely without hitch.

For the first time in as long as I've participated in this fishery on behalf of the Passamaquoddy Tribe, we managed the fishery as a tribe pursuant to a memorandum of understanding with the state of Maine; something that the tribe had pursued for several years. I would say that this model of co-management worked extremely well this year; not without difficulties, there are issues that we need to address within our own community.

But on the whole, this was a season that went off with very little, if any, friction; as far as large issues go. The Passamaquoddy Tribe looks forward to building its presence with the ASMFC, and I understand that there will be a meeting in Bar Harbor at the end of this year; I believe that will be in November.

As you may or may not be aware, the island Bar Harbor is a place of great spiritual significance to the Wabanaki people includes the Passamaquoddy the Penobscot, the Micmac and the Maliseet. We are the four federally recognized tribal nations in the state of Maine, and Bar Harbor is our home. Bar Harbor is a place that for many years was viewed as a gathering place for Native Americans up and down the East Coast, so I feel it is very fitting that the November meeting will be in Bar Harbor. The Passamaquoddy Tribe looks forward to an opportunity to give a little bit more of a fullsome presentation about the historical significance of the American Eel to our people.

At that time the leadership of the tribe, we have two Chiefs and Vice-Chiefs from our two respective reservations. We'll look forward to an opportunity to address the management board in person. They send their regards for being unable to attend today; but there was a passing in our community. But on the whole I would just like to again say thank you to the board and to Commissioner Keliher. This was a very successful year and we look forward to continuing to build on this into the future. Wilwni. (Algonquin Indian translation: thank you)

CHAIRMAN CLARK: Thank you, Mr. Hinton.

2017 STOCK ASSESSMENT FOR AMERICAN EEL

CHAIRMAN CLARK: Moving on to our next agenda item, Mike Waine will bring us up to date on the timing of the 2017 stock assessment for American eel.

MR. MICHAEL WAINE: Just to remind the board, the last time we conducted a stock assessment was in 2012; that was a benchmark. The five-year trigger is 2017. In preparation of that five-year trigger, we got the American eel Technical Committee together on a conference call to look at all the various research priorities that came out of that 2012 assessment.

As we began to evaluate, basically conducting another assessment in 2017, we wanted to look at what progress had been made on those research recommendations from the last time we conducted the assessment. Ultimately we have identified some data gaps that we would like to try to close, and also identified some action items with the Technical Committee that they would like to work on in the interim.

Through that discussion they decided that it would likely make more sense to do a stock assessment update, as opposed to a full blown benchmark. The distinction there is, keeping the datasets the same and the modeling approach

the same, and just updating everything through a terminal year, which would likely be 2016 for a 2017 update, as opposed to sort of reviewing all different modeling approaches for eels, and reconsidering all available datasets; which would be the benchmark version.

Because of the progress that has been made since 2012, they recommended the update assessment for 2017; and Assessment Science Committee reviewed that recommendation and approved what the Technical Committee had suggested. The policy board will review that later in the week when they consider the stock assessment schedule. But I just wanted to update the management board about that, as I think it had relevance to some of the discussions we were having on today's agenda.

CHAIRMAN CLARK: Are there any questions for Mike about the update?

MR. PATRICK C. KELIHER: Mike, I'm trying to understand what this might mean for future catch advice associated with the assessment. Would you expect catch advice to be different doing an update instead of a full benchmark?

MR. WAINE: With the update it is simply updating the data, and to remind the board, American eel is a very data poor stock. We didn't have useable reference points that came out of the 2012 assessment; and so an update of the assessment would likely not yield useable reference points; therefore, I would expect that the advice that was provided to the board, in terms of management, would be similar for a 2017 update as it was for a 2012 benchmark; because it is the function of an update, and we haven't changed the modeling approaches and haven't sort of reconsidered or closed some of those research data gaps that exist.

CHAIRMAN CLARK: Follow up, Pat.

MR. KELIHER: With the understanding that this is a very data poor fishery, would it not make more sense to look at potentially tasking the TC to try to determine what we should be trying to gather for additional data, and then do a full benchmark at a later date? I am thinking back to the long discussions that this board had regarding catch advice.

Frankly, at the end of the day, the catch advice for both yellow eels and glass eels was not based on the assessment; it was based on some uncertainties associated with a potential listing of American eel. It was based on, for glass eels, Maine's willingness to voluntarily put a 35 percent reduction in glass eel harvest on the board.

The yellow eel allocation, which I know is going to be a topic later in this meeting, was pulled together by a workgroup; but then reworked in a very long meeting in Connecticut, where we finally ended up with something that we hoped would help. What I personally would like to see, Mr. Chairman, is the potential of having an addendum to address some of these quota issues; both for yellow eel and glass eel.

I am not putting that on the table, because I am looking for a major increase in glass eels back to anywhere near our 2011 or '12 years, as far as glass eel quota, but maybe trying to find a way for this board to create stability for harvest for both yellow eel and glass eels; correct some of these issues, and then run them out for six or seven years. Have some stability in management. Have a full assessment done, and then come back with some catch advice to make corrections in the future.

CHAIRMAN CLARK: Mike, is it fair to say that being that this will be another turn of the DBSRA model, which is only working off of landings, and since landings have been fairly steady, it will

probably show that we are still in a depleted state; as far as the eel stock goes?

MR. WAINE: Yes, I mean, it is hard to predict exactly what the results will show. I think a large part of the concern at the TC level was simply that we're just not in a position to conduct a benchmark and really reconsider everything, given the progress that has been made from the 2012 assessment, in terms of what kind of catch assessment approaches and datasets would be needed, to ultimately get to the end goal of providing this management board catch advice.

That is something that I think the Technical Committee should really wrestle with; so they might provide a little bit more expectation, in terms of how far away that is. I will tell you that from the discussions we had at the TC level, at this point it would take considerable advancements to, I think, get to where the board would be getting catch advice out of that assessment.

MR. KELIHER: I know the time is short here, and I don't want to abuse my time at the microphone here, Mr. Chairman. But I think from Maine's perspective, we were looking at a three-year consistent quota, with the hopes of having some additional information to base changes to this glass eel fishery in Maine; but potentially in other states, looking out at 2018 and 2019.

With the information presented by the outgoing Mr. Waine, maybe we should reconsider and look at some small adjustments across the board for yellow eel and glass eels with an addendum that makes the adjustments that have been brought up by Mid-Atlantic States.

CHAIRMAN CLARK: Do we have any other questions for Mike?

MR. ROB O'REILLY: Is this a good time to bring up the data that are going to be used for

allocation? I realize New York is going to have some information for us in a little bit. But in particular, we were sort of all poised for a quota system to be enacted. We really didn't know. I think that might happen at some point.

It is sort of a detail, but I'm not really sure what data are available for allocation; and by that, I mean, I don't know which jurisdictions or states have submitted or been asked for harvest data, and which have been asked for landings data. There is a difference. For example, I think in the past a lot of the states beyond Delaware, perhaps, maybe had landings data.

We need to figure that that should be streamlined for everyone; so I'm requesting that at some point there be a look at the data sources, and make sure they are the same. Most of the ASMFC species are managed by landings. Clearly, there is some harvest data in that table that is ready for allocation purposes that Pat talked about. I think we need to decide what that should be.

If you look at Potomac River Fisheries Commission, that is probably the area where the Maryland landings data and the Virginia landings data could be attributed to Potomac River Fisheries Commission; with the remainder as landings, and all the other states would be landings as well. Again, it is sort of a detail here, but we can't reproduce that information through ACCSP, for example.

I know that when the data work compiled, there were some difficulties, because we were running pell-mell into Addendum III and then Addendum IV; and changes were made to the original dataset that ASMFC had tried to obtain. I just want to see if there are any reservations from anyone around the table to get a composite set of data of landings for yellow eel that are all symmetrical to landings information. If that is all

right with everyone, I think that that will take maybe another look from ASMFC staff.

CHAIRMAN CLARK: Mike would like to respond to that.

MR. WAINE: Yes, thanks Rob, it is a good transition to what we're going to talk about next. Certainly, if this management board considers revisiting allocation, it would be useful for staff to confirm with all the states that the landings data that we are using to do that is in fact, the best available information from all of the states. As we move into the next agenda item, staff has noted that that is likely where the board would like us to end up; in terms of making sure those landings data are correct, if we revisit allocation.
CHAIRMAN CLARK: Yes, Rob.

MR. O'REILLY: Just as a follow up, so you can understand what I'm talking about. The data that we have in there is strictly from Virginia waters. That is what we have in that table that is going to be used for quotas. It doesn't include any harvest from any other area, except for Virginia waters. I have a pretty good hunch that that is not going to be the case for all the other states, so that is why I'm asking this question.

DISCUSSION TO CONSIDER CHANGES TO ADDENDUM IV, YELLOW EEL ALLOCATIONS

CHAIRMAN CLARK: That is a good lead into our next topic, as Mike alluded to. This is one that has come up before, and it is a discussion to consider changes to Addendum IV, yellow eel allocations. As you recall, New York has brought this subject up, I believe, at least the previous meeting, and perhaps another meeting before that. You have something about that, Mike? First, Mike has something to say about it, and then we'll turn it over to Jim.

MR. WAINE: Trying to get my 15 minutes of fame here. I actually put together -- I took New York's

proposal and just put it into a few slides. I told Jim that I would go through it, and if he had anything to add he could do so after I finished. This is a consideration of yellow eel commercial allocation.

On your supplemental materials you received a New York proposal that outlines some of the ideas they had for revisiting allocation. Just a little bit of background. Addendum IV implemented a coastwide cap of 907,671 pounds for the yellow eel commercial fishery starting in 2015. As a reminder, there are two management triggers.

That coastwide cap is currently -- it is not allocated; but there are triggers in the addendum that say if the quota is exceeded by 10 percent in a given year, or if the quota is exceeded by any amount in two consecutive years, then it triggers an automatic state-by-state allocation; and that state-by-state allocation is actually directly in Addendum IV.

To continue with the background, the commercial yellow eel allocation is one of the more confusing allocations that I think the commission has done here; in terms of it takes average landings from 2011 through 2013 and then assigns sort of a filtering procedure in which each state's minimum quota is at least fixed at 2,000 pounds.

Then the quota cannot exceed 2,000 pounds above the 2012 landings, and the minimum quota must be within 15 percent of 2010 landings. After all that procedure there is this leftover amount of quota that got divided equally to states that were negatively impacted by the filtering method. This is ultimately the allocation scenario that came out of the Allocation Working Group that worked many meetings on this, to arrive at this final allocation that made it into Addendum IV.

New York brought forward a proposal saying that they had incomplete landings during those allocation years, and that New York and other states now have several more years of accurate data. Remember that a lot of those calculations were based on landings that ended in 2013 or 2012, so there has been consecutive years since then with new data.

They highlight that ASMFC's operating principal is to use the most accurate data for management, and Addendum IV does not have a revisit allocation provision. They submitted a proposal to basically discuss these two topics, one, reconsider allocation and then two, consider a revisiting timeframe. These are the options that were in New York's proposal. First, reconsidering Addendum IV allocation, the first option is our status quo; what the working group had come up with. Option B is allocation based off most recent three years of data, so that is through 2015. Option C is the most recent five years of data through 2015, and then Option D is an allocation based on the most recent five years as a partial percentage, and some other historical timeframe as the other partial, so basically a combination of timeframes there.

In the proposal, using the landings data that came from Addendum IV, updated through 2015, the state of New York has submitted what these various options would look like in terms of state-by-state quotas. Those were included, not only in the document that New York provided, but also on the slide as shown; so we can come back to those if the board wishes. Then the other topic being considered is the allocation revisit timeframe.

Right now, the status quo is that there is no revisit timeframe in there, so that allocation that we talked about the working group coming up with didn't have a specific provision in the addendum to say, we will revisit this allocation in so many years after it's implemented, or after

the addendum passed. New York is submitting a few options of Option B, revisit the allocation every three years, or Option C, revisit the allocation every five years.

This plays a little bit back to our Climate Change Workshop that we just had prior to this eel board meeting. Ultimately, I'll sort of leave this slide up at the very end, and let Jim add some more info if he would like. Their recommendation was to circulate their proposal to the board for review and discussion, with the potential to initiate an addendum at this meeting to address those issues that were in their proposal.

CHAIRMAN CLARK: Jim, do you want to add something to that before we put it out to the board for discussion?

MR. JAMES J. GILMORE: Just a couple of comments, and Mike, thanks, that was a terrific summary. You did a really great job. We're going to very much miss you when you go on to bigger and better things. Just a couple of comments first off, and I think the most important thing that motivated New York to do this was, remember we go back a couple of meetings ago, and the landings that were coming in last year were looking like we were going to hit the cap.

We hit that cap; New York does not have a fishery any more. We only have a 15,000 pound quota. Again, mea culpa, we didn't have the landings data; but now we pretty much documented that we have a fishery that probably lands in the 40 to 50,000 pound range per year. Again, we hit that cap; New York's fishery is just shut down. There is no savior to that; because essentially, there are not transfers at that point. That is how we've survived, and we've actually gotten more accurate landings under this.

It is I guess fortuitous that we had this right after the climate change, because I actually saw things in there, and trust me, I had nothing to do with the climate change thing, and seeing things like we were going to use percentages of historic landings, whatever. Maybe great minds think alike, I am not sure.

But what we're really looking at doing is, if we follow from that climate change and the allocation part of what we're really going to have to get into; this is sort of a baby step. The bigger allocation issues on things like bluefish and summer flounder and menhaden and so on and so forth, are going to be a very big lift. This is pretty simple in some respects, because all we're looking at is the recent data. We're just going to take that most recent data and try to do just a tweak to that.

We did put down how that would change the individual states. Quite frankly, there is not a lot of flux in that. Most of the states stay pretty close. There is a couple that go down; some of them go up. But again, I think this might be a good first step to just get at maybe talking about allocation; where it is like almost a four letter word, everybody gets crazy about it.

They understand the pain that everyone goes through, especially this, when they went through this, I was not on that work group, but I understand how difficult it was; and probably why everyone is probably reluctant to try to do this. But again, this is a simpler step to that. I think I'll leave it at that and maybe we can get some discussion on this, and then we'll see where we're going to go.

CHAIRMAN CLARK: Before I open it up to discussion, one thing that was not put up in this proposal and Pat Keliher brought up is, we could also think about the coastal cap. It was set very arbitrarily; I don't think Delaware has made any secret about it. We thought the cap was set too

low. I would just, as part of our discussion; I think it is something we can consider also. With that, I will open the floor up for discussion.

MR. RUSS ALLEN: I don't even know where to start. I agree with your thought process on the quota itself. I think if we're going to change the allocation that the quota needs to come into question, also. Just one of Jim's options there, one of our numbers for New Jersey would put us out of compliance every year; so it put us over the quota every year. I don't think that is where we want to be when we do this. That is why we tried to do all the crazy things we did the last time through. It was a very good working group.

Rob made a good suggestion on making sure those landings data are correct, and I know the TC will do that. I think, maybe, we can start an addendum. I don't have a problem with that. But I think we need to have a working group together again to possibly vet out any of the options that come about. We, in New Jersey, have tried to make sure that our landings don't go up.

That is what we've done over the last few years; and our fishermen thought we were kind of crazy last time. If I come back to them now with an addendum, where we actually go lower in quota for no reason, I don't think that will go over very well. I want to make sure everything is vetted out appropriately, to make sure we do this the right way. I'm willing to be a part of whatever we can work on, to do that even though it drove us crazy the last time.

DR. MICHELLE DUVAL: I think one of the differences between this conversation and the one that we just had during the Climate Change Workshop is that this is not something that is being considered due to a shift in distribution of climate change. I mean this is being considered due to data collection.

I feel Jim's pain, but landings of eels were not necessarily being required to be reported during that timeframe, but I feel like this conversation is a little bit different than the one we were engaged in a while ago. Honestly, I am certainly willing to go back and look at allocation; but it is probably not going to surprise anyone that when I look at these tables here, based on the most recent three years or the most recent five years, North Carolina takes a significant hit. I mean that is like a 60 percent reduction in allocation.

I sure can't go back to my constituents and say, oh yes, you know we just did this. To echo the words of Mr. Luisi, I think you know being creative in this process is what we need to do. Quite honestly, when I look at Option B and Option C, I mean we've exceeded that just in the past couple of years, and quite frankly in about 75 percent of the last 18 years.

That is pretty concerning to me. I would rather see something that is more of a combination approach, where you're looking at perhaps a combination of historic, as well as more recent landings. I know that doesn't speak to the problem that New York is trying to address. One of the other things that we've talked about in the South Atlantic is looking at a common pool allocation that would be accessible.

We were talking about commercial and recreational sectors in the South Atlantic, but this could be something that would be accessible to any state, if they start coming up upon an allocation cap. I think those are my initial thoughts, and then I did have one question for Mike. In Addendum IV, we do have a transfer provision, correct; if a quota system goes into place?

MR. WAINE: That is a good question. John is telling me there was. Let me check that while the discussion continues. We obviously haven't triggered allocation, but let me look it up.

DR. DUVAL: Mr. Chairman, I guess, just in looking at it I see, looking at the final version of Addendum IV in evaluating. There are a couple paragraphs on transfers that if a state-by-state quota system is implemented, then any state or jurisdiction may request approval to transfer all or part of its annual quota. I guess I would urge us to consider transfers as a very important piece of any conversation about allocations, because that certainly has helped states and jurisdictions out in the past.

MR. O'REILLY: While you're looking for that, I seem to remember that when we had these discussions before, the 2,000 pounds for certain states that had not had very much landings; that the discussion was, well you will have something to transfer. There must be a transferability built in there somewhere; although I haven't looked for a while.

It does sound sort of painful. I don't want to arm wrestle with Pat again down there, not that we did before. I think it is worthwhile to take a look at this. I'm trying to remember everything that got us to this point, and it seems that we had Technical Committee advice that I thought would keep it about 10 percent below 2010. We didn't do that exactly.

CHAIRMAN CLARK: It was 12 percent below the average for the reference period.

MR. O'REILLY: Thank you. We didn't do that exactly, but I agree with Russ that if we change allocation we change the cap. I still think, despite the fact that there was not a listing; we're still depleted from what I know. I can't imagine that the update is going to tell us anything different. It would be great if it was qualitative and could say, well you're not as depleted as you were through 2010; but that is not going to happen either. I'll support going ahead. I don't think it is going to have a big impact in Virginia. I suspect that when we take

our harvest and make it landings that there is probably about an 8,000 pound difference right there. Hard to think how the final scheme will be, but it is going to take some effort again. I am very aware of Michelle's concern over taking a massive decrease. I'll support it.

MS. LYNN FEGLEY: I guess I agree that I don't have any fundamental problems with supporting and addendum, but the problem is that anytime you -- and we all know that when we consider allocation there are winners and losers. At a certain point you know, it is like best of seven. We're always going to be in this situation where somebody is going to sit in New York's seat and say, well this just is really a bad deal for us.

With the cap, I have to ask the question, and the whole thing sounds remarkably like menhaden to me; where we've gotten ourselves in a situation where we've allocated a quota, when we don't have very good harvest data in many cases. To me, that speaks to the broader question of what do we do?

Is there some kind of broader policy that we, as a board, as a commission should consider when we start to talk about allocations with poor harvest data? As we're talking about the stock assessment update, we know that the current cap was arbitrarily set. For example, if that update was done applying if every state applied a scalar to the degree they think their catch was underestimated, so let's say we all, or New York bumps up by 10 percent.

You bump up your catch and then you do your assessment update. Does it change the stock status? Is it worse? Is it better? If the stock status is insensitive to some magnitude of harvest; then maybe we should just consider changing the cap, and that leads me to my final question, which is, how much do you need, New York? How much do we need? How much would we have to go up to solve this problem in a

painless way? Not that there is a painless way, but just food for thought.

MR. ROY W. MILLER: I debated whether to hold this point for later, but I decided to make it now, so it can be part of the thought process. In any allocation scenario, using three years or five years of the most recent data, one problem with that is our management of other species has impacted our eel harvest.

I'm referring specifically to our management of horseshoe crabs. If we look at the data, for instance for New Jersey and Delaware that we see between, oh, looking at 2006, 2007, and then years since then, the combined landings as shown in Table 2 dropped off appreciably. I suspect a lot of that could be to the non-availability of female horseshoe crabs as the primary bait for American eel.

Also, in the case of New Jersey, a total closure of their horseshoe crab harvest, and that had to impact their eel industry. We should, in my view, take perhaps a longer term view rather than the three or five most recent years. I just wanted to throw that out there for part of the thought process.

CHAIRMAN CLARK: These are some of the problems that came up when, of course, Addendum IV; the working group came up with the scheme that was put forth in Addendum IV. I will once again say, I think the easiest thing, in terms of administrative burden and given the health of the stock and the stability in the landings, I don't see a problem with increasing the cap. But that is my opinion. Any other people want to have an opinion here?

MR. DANIEL MCKIERNAN: I recall in the 1990s, Massachusetts sued in Federal Court about scup allocations of quota; due to an inadequate data collection. I believe we prevailed, but it was such a long time ago I am not quite sure how that was

all resolved. But I know it was resolved at this board.

I guess the question I have, is New York in a unique position or the most obvious position for having a legitimate fishery with clearly a lack of data? In other words, do they really stand out, and if they do, would it be palatable to simply increase their quota by the amount they requested, based on signed affidavits; and we just finish this and go home?

CHAIRMAN CLARK: Are you saying then, increase the cap by the amount that they need?

MR. MCKIERNAN: Yes.

MR. DAVID G. SIMPSON: Yes, really I think that would be the most expeditious thing to do. But to the point of data quality, I could certainly make arguments that ours has been less than perfect on eels. Since Jim is arguing that they've made great improvements in data collection on eels, I am interested in the specifics of what changed in their data collection procedures that led to improved data collection in the last two years.

CHAIRMAN CLARK: Are there any other comments? I'm sorry, Mike was sidebar with me. Do you want to just repeat that Dave?

MR. SIMPSON: Yes, it was a question to Jim.

MR. GILMORE: With your indulgence, Mr. Chairman. We had, it was more a voluntary issue back in 2010. The way we fixed it was twofold. First off, we required mandatory landings starting in 2010. That was essentially a legal way of doing it; but secondly, we did outreach to a lot of the fishermen, because in our state and in other states there was a sense that if they didn't report anything, actually if they reported it would hurt them.

We finally got them to the understanding that if we're going into quota management with allocations, it is the exact opposite. If you don't report it, it would hurt you. I think those two combinations of mandatory reporting and that outreach that we're trying to manage the fishery to what we actually need, not what you guys think that you should be telling us; I think got us to where the numbers we have now seem to be pretty accurate to what we think the fishery is.

MR. BOB BALLOU: Following up on Dave Simpson's line of questioning anyway. Jim, I also have a question regarding your understanding of the percentage of your landings that are silver eels coming from the Delaware weir fishery. Is that a major factor in what you're seeing in your total landings?

MR. GILMORE: We actually, when we did the silver eel fishery, we know part of that is yellow eel and we were doing some monitoring with that and those landings to try to determine how much is yellow versus silver eels. I don't know the answer to that but I can get that, Bob. Again, that is a relatively small amount of the fishery, and more because we reduced that down to nine permits from the 16 or 17 that were traditionally out there. Again, that is a relatively small part for our overall bait landings of yellow eels.

DR. DUVAL: Just looking at the table of states landings from Addendum IV over time, there is quite a bit of fluctuation, I think, from year to year within all of the states. It obviously complicates any reconsideration of allocations. Like Lynn said, someone is going to be sitting in a seat of losing. Right now, it is North Carolina under these proposals.

Those formulas are, like I said not surprisingly not acceptable to me, and I would prefer to see some additional flexibility if we plan to continue to walk down this road. But if there was some scalar that could be applied to New York's past

harvest. If New York is pretty certain that this has been a somewhat stable fishery over the years, and there could be some scalar that was applied to past year's harvest.

Again, Mr. Chairman, this gets to your point about revisiting the catch cap, and then we might find that the problem might be solved. Again, if we choose to go down this road of an addendum and revisiting allocations, I would request that this go back to the Technical Committee as well. I mean certainly it might require a work group of the board, but I would ask that it go back to the Technical Committee as well. I would again also ask that we consider the fact that there are quota transfers as well.

MR. O' REILLY: Virginia is right where Lynn and Michelle have placed us, not personally of course, but where the process placed us. I was on the record last meeting to indicate that somehow through the machinations of the three different pieces of Addendum IV, when it settled out we were at our low point, which was 2010. That is the 78,000 that you see up there, despite the fact in the last couple of years before 2015 we were up to 110/115,000 pounds.

Despite it all, I think we need some way to make sure that if this cap doesn't change and the trigger is pulled, New York is sitting in a precarious position. I think that is probably something that is the biggest issue here today with this particular proposal. How we do that, whether it is the suggestion to just bump New York up and bump the cap up.

That is certainly pretty straightforward. At the same time I have to tell you, Virginia is in a tough slot. We've been in a tough slot since this was adopted. Once we relook at the data I think that will help, at least in Virginia. I don't know who is wary of having landings data, but I suspect a lot of that is already landings data. Then the last thing to mention is, mentioning data gaps. I

don't know what other states are doing, but I know we had to have a permit.

Everyone had to undergo the mandatory buyer reporting, harvester reporting, and then you've got self-marketers out there. These are folks who do the harvest; they find their own way to sell that eel. They have to be captured, as well. That is really taking mandatory reporting and going one step more, to make sure that you don't miss anybody.

CHAIRMAN CLARK: Well, sounds like we're in a bind of our own making here. There have been plenty of suggestions here, but it doesn't sound like we have anything that satisfies everybody. This is a possible action item. Would anybody care to move forward with an action on this item?

MR. GILMORE: Almost, so now we've got two options. I like Dave and Dan's suggestion to do the quick fix on this. But I don't know what number I would even ask for right now. I would have to go back and look at -- it is like Lynn's question; how much do we need? I know it is somewhere between 35 and 50. I don't know what that number is.

Then I don't know how easy or difficult that will be, arguing over what the amount I need is. That is one option. The other option was, and I was doing this a little on the fly or amending this on the fly. The other one would be to initiate an addendum. But after the discussion, do an addendum to do both things; increase the cap and revisit the allocation.

I still like, as much as it's more work, Option B, because it sounds like from the discussion around the table and what Rob had said. Forgive me, Michelle, but I told Louis this. You guys won the lottery. That is why you don't take one year for a number, because you got the biggest harvest in 2010; but besides that outlier. It

seems like maybe doing that would be a more sane way to do this, because I think more people would benefit from it. Just maybe what your opinion is before I offer a motion, Mr. Chairman.

CHAIRMAN CLARK: Well, I think I've been pretty clear that I think that as I said that we've gotten ourselves into a bind on this. Even if we did go to state-by-state allocations, I don't know about other states, but I know it would be a real bear to administer this in our state; and I'm sure that is the case in several others.

I've made no secret of it. When you look at the landings data that is presented in the addendum, if you didn't know anything else about this fishery, you would say wow that looks like a very sustainable fishery there. We're at about the same amount. I'm pretty sure with an assessment update, given the way the assessment worked; it will show the stock is still depleted; we'll still be in this situation.

I think that raising the cap would be the simplest fix to this, but I understand there is resistance to that; any other suggestions here?

MS. FEGLEY: Just looking at the table of landings quickly by eyeball. You look at the total landings between '98 and 2015. The range of landings has been, from what I can see, and if I'm wrong, I think we've gone from about 681,000 pounds to 1.2 million; I mean, that's the breadth. That is the range in all of those years. That is 400,000 pounds, is that about right, 500,000 pounds?

What my question for the Technical Committee would be, given what seems to be a fairly range of fluctuation, I say narrow without really understanding the impact on the stock. This is not a one way trip up or down; I mean, this thing has just been sort of oscillating around a low level. If we're thinking about increasing the cap, you could set it somewhere near that maximum,

a little bit less, and ask the Technical Committee what the implications would be.

CHAIRMAN CLARK: Yes, one of the things that I thought, looking at the same data, Lynn, was instead of going with an average if we went with the 75th percentile for that same reference period, because that would put us closer to what our higher levels were during those years. Just by doing that would bring us up to, if we just use the reference period, I figured about 980,000 pounds; which would probably take care of all these problems we see here, but anyhow, Jim.

MR. GILMORE: Let me try to move this along. Let me put a motion up and we'll see how it goes. **Move to initiate an addendum to reconsider the coastal cap and the commercial yellow eel state-by-state allocation.**

CHAIRMAN CLARK: Dave Borden. Anybody want to address this motion? I had Russ up before. Any other people want to comment on this?

MR. ALLEN: I am not sure where I stand on this at this time, but I can say one thing. The working group spent a lot of time on that cap. The whole goal of that cap was to try to make it so we were close to what the Technical Committee was looking for. I think if we go back to the Technical Committee now with something that we want to raise the cap, they are not going to be real happy with that. Even though we think that is the easiest way to settle what we're trying to do. I mean, that was the whole point behind the machinations of trying to figure that out.

I mean, we're talking about raising the cap so New York can get about 25,000 pounds; yet there is going to be every other state. If you go to an addendum and take it out of every other state, every other state is going to want some more poundage; because we think that we're too low, anyway. Like I said, I am on the fence on this on moving forward as is. I think we can

do better by having some meaningful discussions and coming back in August and maybe moving forward with something. But I don't think I'm ready to move forward at this time.

MR. KELIHER: I think to Russ's earlier point, and following along with that line of thinking, the way to move forward here may be to reconvene a working group to work through the details associated with these allocations. I would include the allocation of glass eels within those conversations.

MR. G. RITCHIE WHITE: Serving on the past working group with Russ, I agree with him to a large degree that I hate opening this can of worms, because it was a very difficult process to come up with what we have; and I hate to open that can of worms for the small amount that we need to fix New York. Having said that, if this passes, I hope that it goes to a working group prior to writing the addendum, but I guess I haven't decided whether I'm going to support it or not.

DR. DUVAL: I am on the fence. Like Russ, I was not part of that working group, obviously. But I also wanted to address Jim's previous comment about 2010 being an anomaly for North Carolina. I would disagree with that. I mean we have during that time series landings of 124,000 pounds, 118,000 pounds, 102,000 pounds, 169,000 pounds, 126,000 pounds. I would not say that 2010 was an anomaly.

I mean, certainly, it was a jackpot; I will definitely give you that. But I would not consider it an anomaly. Again, I'm on the fence. I'm more inclined to agree with Russ that perhaps coming back, having some time to discuss this and coming back in August with a better sense of how we might move forward to address New York's concerns might be my preference.

MR. SIMPSON: Can you remind me when it was that we got the determination on listing? Was it last September? Was it less than a year ago that we kind of went, whoo, we got away with that one? Now, we're going to talk about increasing the quota. I'm concerned about the optics of that. I don't have a lot of faith in the eel data and the landings.

It is a fishery that takes place for us anyway, sort of remote from our mainstream fishery, our data collection system, the characters that are in this fishery, lots of concerns. Boy, we spent a lot of time trying to work through this. I'm really reluctant to revisit so quickly before another assessment, and just after narrowly missing an endangered species listing. I don't think I can support this.

DR. MIKE MILLARD: I'll jump on the back of that comment. The ink is barely dry on the warranted decision for the listing. That shouldn't be seen as a green flag. I know after that came out someone asked me, well so what now? What next? What happens with American eels in terms of the ESA? My answer was, as I was told by the experts, it kind of goes off the radar under the ESA, unless there is a big shift or a significant shift in management.

I just put that on the record to remind folks. Another comment I have, it comes as no surprise I'm sure that the Service would not support an increase in the cap right now. As far as I know, and Mike, correct me if I'm wrong, the current advice from the TC is to reduce mortality on all life stages. To talk about increasing the cap, of course, flies in the face of that.

MR. WAINE: That is what I was side barring with John about earlier when he missed the question from Dave, was that I don't know what more the board expects the Technical Committee to do with this. This went back and forth with the TC

and the working group as multiple board members have mentioned around the table.

They made a recommendation that is below the current cap right now. I don't know what more the TC will be able to give this board on this topic, and I just wanted to reiterate that point so they don't hate us going back and asking them to look at this again without having told the board that they spent a lot of time on this. It is not likely that their recommendation would change, just because the board is reconsidering the cap.

MR. DENNIS ABBOT: Looking at what New York wants that if we put round numbers on it and they're looking maybe for an increase of 30,000 pounds against a total catch of 900,000 pounds; by my quick calculations that is like about 2.7 percent. Then if you look at the catches over the period of time from 2010 to 2015 for each state, you see fluctuations running from 10 to 50 percent.

I don't think it is outrageous to just increase New York's number by some given amount versus going through the agony of an addendum. I go along with the thoughts that were brought up across the table from me. Let's just increase New York's number by a couple of percent and put it away.

MR. O'REILLY: Similar but different. I still think the transferability when we look at the last couple years or 2015 in particular; it is more that New York was about 38,000 pounds more than what the Addendum IV quota would be for New York. But there is obviously quota around. Transferability is the key here. It is not the first species that has been involved in that situation, whether it's summer flounder, bluefish, no matter what it is. I think that is the first step is for New York to avail itself of what's available, as long as that transferability is in there. Wait for the next step, I guess.

MR. McKIERNAN: I do plan to vote against the motion. Just to reiterate, I would support in August a motion to enhance the quota by 30,000 pounds or something close to that; with sound documentation by the state of New York that that fishery has been operating during the critical time period.

MR. GILMORE: Maybe Dennis can help on this. That is fine. I think maybe that's the smartest thing to do right now, we can come back with a number for the August meeting. However, and would it be the easiest thing is just to table this motion until August, and then if we come back with it we can just dispense with the motion.

I don't know if I can table my own motion, but I'm not worried about that. But that would be my suggestion right now. Table it, and then we'll come up with a number and an alternate proposal for August. If that doesn't go, then we'll go back to this.

CHAIRMAN CLARK: Sounds like a good suggestion.

MR. BALLOU: I just want to make sure that if we do follow through in the way that has been suggested that we don't get ourselves caught up in a situation. I need to ask the question, does the addendum allow for the adjustments of state-by-state quota amounts through board action versus through a change to the addendum?

MR. WAINE: I think the suggestion would be to have an addendum to fix it with whatever the poundage amount is that New York comes up with. It would still require an addendum; it just wouldn't be a full reconsider of something that took a lot of work to get to where we are now.

MR. WILLIAM A. ADLER: Would it be appropriate to make a motion to table this to the next meeting?

CHAIRMAN CLARK: Yes, I think that would be a good idea.

MR. ADLER: So moved.

CHAIRMAN CLARK: Do we have a second? Marty Gary. Do we want further discussion? Okay, no discussion at this point. In that case do we need to caucus or should we just vote on this? Are we ready? Any need to caucus? **Seeing none; is there any objection to this motion? Seeing none; then the motion is tabled until the August meeting.**

MR. DAVID BORDEN: I am not arguing about the motion, we supported it. I just want to make the point that I am sympathetic to New York's plight on this. But I would note that we have five states around the table that all have difficulties; that are talking about kind of core flaws in the original conceptual framework.

I think one of the things that we want to avoid doing is revisiting all of these problems multiple times. If we don't figure out a strategy to address these problems, every time we have this on the agenda, I guarantee you one of the states will be in here saying we really need an adjustment. I think there has got to be like a dual strategy. Maybe we reconsider this at the August meeting, but we've got to look at it in a different manner. Thank you.

CHAIRMAN CLARK: That's a great point, Dave, because as happened with the working group, it was really difficult to come up with anything that would make everybody happy, and as we see, that is still the case.

MR. KELIHER: Mr. Chairman I would like to make a motion. Move to create a working group to address the inequities in the coastal allocation of yellow eels, as well as revisit the quota related to the glass eel fishery.

CHAIRMAN CLARK: Do we have a second? Dave Borden second. Is there any discussion of the working group proposal?

MR. MCKIERNAN: I'm not sure you've got the motion correct. You talked about inequities, Pat and I don't see the word inequities up there.

CHAIRMAN CLARK: Just wait until the motion is up on the board. Does that capture your motion, Pat?

MR. KELIHER: Yes, it does, Mr. Chairman.

MR. WHITE: What is the definition of inequities? In other words, are states going to come forward with what they feel is not correct; both in the glass eel and yellow eel fisheries?

CHAIRMAN CLARK: I'll refer that to the maker of the motion.

MR. KELIHER: My intent is to try to address, to open it up with a working group to visit all of the issues that have been brought up around the table here today.

MR. WHITE: States would then have the ability to express their inequities to this working group prior to it being formed. All the states could say what they want to see the working group discuss, yellow eels and glass eels.

CHAIRMAN CLARK: I would assume that the working group will end up looking at yes, the allocations of every state. Again, I don't understand how this can be done without reopening the whole process, but that is just the way I see it. Any other comments on this?

MR. MCKIERNAN: It sounds like Festivus, the Airing of Grievances.

CHAIRMAN CLARK: Eels and Festivus, it's a great combo. Any other comments?

MR. SPENCER: I don't know, we are just emboldened by the lack of action on the endangered species front. I suppose revisiting glass eel quota means that my partner representative Miner will get another opportunity to open a glass eel fishery in Connecticut. I mean that is what I am sure he will have in mind, very lucrative fishery and we certainly have the resource in our state. We'll be contemplating that if this passes.

MR. ADAM NOWALSKY: Clarification on this. Addressing the inequities of the coastal allocation of yellow eels might include increasing the quota as a mechanism of achieving that; or are we talking about purely going back and looking at the allocations?

MR. KELIHER: Again, I've heard many different thoughts about how to address this for even increasing the quota specifically for New York to try to address it for, as Dave Borden said there is potentially five other states that have concerns, and it could include the intent of the options that were presented by Mike on behalf of New York earlier.

I think the idea is to have a working group. The working groups usually try to have as much flexibility to try to look at these issues as possible. We're short on time here today. The idea would be to try to have that conversation and bring back a more focused plan to this board at the next meeting.

MR. THOMAS P. FOTE: I'm having a problem with the word inequities. It is not inequities that basically caused this problem; it was poor record keeping by the states. I am looking at that is not inequities, nobody basically did anything wrong. The states had poor records, and the allocation is off because of poor records, not because inequities were formed by the working group when they put together the quotas. I can't support it with the word inequities in there.

MR. LOREN W. LUSTIG: I don't see the word justification anywhere on the screen, but I would be very concerned that the working group also present a very solid justification for their recommendations from a conservation perspective. If that is inherent to their plan, I can support the working group.

CHAIRMAN CLARK: Any other comments?

MR. ABBOT: Yes, just quickly. I wasn't sleeping, but we just spent the last hour talking about yellow eels and then I look at the board and we're going to revisit essentially Maine's glass eel quota. To me the subject that we've been discussing is yellow eels. If we want to talk about glass eel quota, I think there should be a discussion amongst the board for the need for that; prior to us putting it into a motion to have a working group go to work on it. I cannot support this motion.

CHAIRMAN CLARK: Are there any more comments or is it time to call the question? Seeing no more comments, why don't we take a minute's caucus and then we'll call the question. Okay, are we ready to call the question? **Those in favor of the motion, show so by raising your right hand. Those opposed, same sign; any null votes, any abstentions? Motion fails 2 to 15.**

MR. WHITE: Could we request New York to come back to us with a tighter figure on what they're looking for, and then the justification for that figure; if they could document how their record keeping did not allow them to have the proper quota. If there could be some proof of how that record keeping was inadequate. Then we could look at that in August, and then make a decision whether we want to go forward with a working group or try to solve just that or other quota issues.

CHAIRMAN CLARK: I think that clarifies pretty much. Jim, I think that is pretty much what you

were planning to do, but that stated it very nicely. Are we finished with this issue? As of right now in August, we'll be coming back to this. We have the tabled motion, and Jim will be bringing much more information about New York's landings.

MR. GILMORE: Ritchie, my word and my good looks are not good enough?

MR. WHITE: That's a start.

UPDATE ON NORTH CAROLINA'S GLASS EEL AQUACULTURE PLAN

CHAIRMAN CLARK: Now we'll move on to another item of business. If you all recall, back in the last meeting we approved North Carolina's glass eel aquaculture plan. Michelle has an update on that and I believe a request.

DR. DUVAL: This will be very quick, because I have a plane to catch. As the chairman noted, at the February board meeting you all approved North Carolina's request for an aquaculture plan. That also required our state commission to provide a declaratory ruling to the applicant to allow him to possess undersized eels that were below the nine inch minimum size limit; harvested from within North Carolina.

He had a declaratory ruling to purchase glass eels from either South Carolina or Maine; but he did not have one from our commission. Unfortunately, he did not receive that until March 21st, or March 22nd actually; so he made his first attempts to fish on March 24th, which is mostly after the glass eel season or the glass eel run is over. He did set nets for three weeks of fishing. He did not harvest any glass eels during that time.

He set nets in two major sites in the southern part of the state, and then one set of sites in the central part of the state, creeks on the Neuse

River. Mr. Allen did formally request us to submit another aquaculture plan by June 1st of this year, so this is just a heads up to the board that we do plan on doing that. We'll have lots more exciting discussion in August. We would be asking the board's indulgence that this be considered also a pilot project, just as the existing plan which you all approved in February was.

Given the fact that Mr. Allen really through no fault of his own, but really more through administrative issues, missed the pulse of glass eel harvest. If you recall the discussion around the table was to provide the Technical Committee with information that they could use to help the applicant design a young-of-the-year survey in one of those systems. That is my update, Mr. Chairman and I will be happy to take any questions.

CHAIRMAN CLARK: Do we have any questions for Michelle on this item? Seeing none; Michelle, I assume then in the next meeting you would want an action item from the board to approve this.

DR. DUVAL: Yes, Mr. Chairman, thank you.

ADJOURNMENT

CHAIRMAN CLARK: Is there any other business to come before the board? Seeing none; I will entertain a motion to adjourn, and we have that so we are adjourned. Thank you.

(Whereupon the meeting was adjourned at 5:44 o'clock p.m. on May 3, 2016)



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmf.org

American Eel Technical Committee Meeting Summary

July 7, 2016

Attendance: Tim Wildman (CT), Troy Tuckey (VIMS), Phil Edwards (RI), Kirby Rootes-Murdy (ASMFC), Jordan Zimmerman (DE), Jason Rock (NC), Kim Bonvechio (FL), Robert Eckert (NH), Carol Hoffman (NY), Keith Whiteford (MD), Derek Orner (NOAA), Lindsey Aubart (GA), Josh Newhard (USFWS), Jen Pyle (NJ), Wilson Laney (USFWS), Brad Chase (MA), Kristen Anstead (ASMFC)

Members of the public: Dick Stone (AEF) and Zoemma Warshafsky (VIMS)

The American eel Technical Committee (TC) met via conference call July 7th, 2016, to review and make recommendations regarding an updated aquaculture plan from North Carolina, review a quota proposal from New York, and discuss agenda items for an upcoming TC meeting in the fall.

1) **NC Update to Eel Aquaculture Plan & Discussion**

Addendum IV to the Interstate Fishery Management Plan for the American Eel includes a provision for states to submit an Aquaculture Plan to allow for the harvest of glass eels. In December 2015, NC submitted an aquaculture plan for 2016 which was reviewed by the TC. After amending the plan to reflect the recommendations of the TC, it was presented to the American Eel Management Board and approved in February 2016. Due to delays in NC permitting, fishing began late in the season and no glass eels were captured. Therefore, NC amended the plan for the TC to consider as a second year pilot program for 2017. Changes in the proposal were outlined by Jason Rock, including a change in harvest dates, an additional primary harvest site, additional reporting of weight and CPUE guidelines, a change in the amount of permit holders and mates, and the removal of warrantless inspections and searches. The TC asked questions and discussed the changes. The addition of the White Oak River as an additional site was received favorably since there has been some previous research in this site that could compliment the data set from the aquaculture plan and could additionally serve as a permanent YOY survey site. The other changes were also accepted by the TC contingent on the following Recommendations:

- 1. A YOY survey should be developed at one of the sites in conjunction with the aquaculture plan (year 3, 2018)**

2. Fyke net mortality should be addressed during the months of January and February when the twenty-four (24) hour soak times are allowed. The use of a live car attached to the fyke net cod end was discussed to alleviate this potential issue.

2) NY Eel Quota proposal

The TC also reviewed a proposal from NY presented by Carol Hoffman to address the quota allocation in Addendum IV. The harvest records that determined NY's quota were based on incomplete data resulting in a potential inequality in allocation to that state. Concerns were expressed from several TC members regarding the reporting of landings from all states and it was reiterated that TC members need to confirm reference period landings in the Addendum IV table. Additionally, there was concern that NY's revised landings could include silver eels from the Delaware River weir fishery, thus overinflating their need for yellow eel allocation. There are no data to address this issue for historical data currently, but NY is working on parsing out the numbers of silver eels for annual landings moving forward. In the meantime, the state-by-state landings data will be updated and revised, if need be, during the 2017 stock assessment update. The TC concluded that a discussion of expanding the coastwide cap, in light of NY situation, should be set aside until the update is performed. The TC made the following Recommendation:

States need to review landings numbers and figures provided in the accompanying document by Hoffman, and communicate any discrepancies by COB Tuesday July 12th

Update on TC tasks from May 2016 and Begin initial planning of September 2016 TC Meeting

The TC members reviewed the tasks they developed in May 2016, confirming most required data have been provided. Additionally, potential agenda items were discussed for an in-person TC meeting during the week of September 12th 2016. TC members recommended that the goals, changes in gear type, and sampling sites of the YOY surveys be revisited and that a protocol for moving sites should be developed. Reevaluating yellow eel abundance surveys was also suggested as a possible topic. Members requested that during the TC meeting that they get updates from Maine on the life cycle survey if possible, CITIES regarding the listing of American eel, and state representatives who are conducting larval surveys, such as NC's Beaufort Bridge Net Survey. Finally, a timetable needs to be constructed for the 2017 stock assessment update. These topics will be explored by the TC chair, vice-chair, SAS chair, and staff in order to develop a productive agenda for the TC meeting in September. Two follow up tasks from this discussion:

- Kirby will send out the updated list of state surveys filled out from May 2016. Please review to ensure it's fully updated and correct.

- Kirby will follow up with Laura Lee for planning the September 2016 meeting and review of YOY surveys.
- Lastly, it was noted that **Compliance reports are due September 1**. Kirby will send out a compliance reminder memo soon.

Atlantic States Marine Fisheries Commission

ADDENDUM IV TO THE INTERSTATE FISHERY MANAGEMENT PLAN FOR AMERICAN EEL



*ASMFC Vision:
Sustainably Managing Atlantic Coastal Fisheries*

Approved October 2014

EXECUTIVE SUMMARY

The Atlantic States Marine Fisheries Commission's American Eel Management Board (Board) initiated the development of Addendum III in August 2012 in response to the 2012 Benchmark American Eel Stock Assessment, which found the American eel population in U.S. waters is depleted. The assessment found the stock is at or near historically low levels due to a combination of historical overfishing, habitat loss and alteration, productivity and food web alterations, predation, turbine mortality, changing climatic and oceanic conditions, toxins and contaminants, and disease. In August 2013, the Board approved some of the measures from Addendum III (predominately the commercial yellow eel and recreational fishery management measures) and split out the remainder of the management measures for further development in Addendum IV. As the second phase of management response to the stock assessment, this Addendum addresses further addresses the commercial glass, yellow, and silver eel fisheries. Specifically, this Addendum modifies the previous management program as follows:

Commercial Glass Eel Fishery Management Program (Section 3.1.1)

- Maine's quota for the 2015-2017 commercial glass eel fishing seasons will be set at 9,688 pounds annually and will be re-evaluated prior to the start of the 2018 fishing season.
- Any state or jurisdiction can request an allowances for commercial harvest of glass eels based on stock enhancement programs implemented after January 1, 2011, subject to TC review and Board approval.
- For any state or jurisdiction managed with a commercial glass eel quota, if an overages occurs in a fishing year, then that state or jurisdiction will be required to deduct their entire overage from the quota the following year, pound for pound.
- Any state or jurisdiction with a commercial glass eel fishery is required to implement daily trip level reporting with daily electronic accounting to the state for both harvesters and dealers in order to ensure accurate reporting of commercial glass eel harvest.
- Any states or jurisdiction with a commercial glass eel fishery must implement a fishery independent life cycle survey covering glass, yellow, and silver eels within at least one river system.

Commercial Yellow Eel Fishery Management Program (Section 3.1.2)

The commercial yellow eel fishery will be regulated through a coastwide catch cap set at 907,671 pounds. Under this cap, there are two management triggers. Upon reaching either of these triggers, the Board is required to alter the management program as specified below in order to ensure the objectives of the management program are achieved.

Management Triggers

1. The coastwide catch cap is exceeded by more than 10% in a given year (998,438 pounds).
2. The coastwide catch cap is exceeded for two consecutive years, regardless of percent over.

Management Response

If either trigger is tripped, then there would be automatic implementation of a state-by-state commercial yellow eel quota. The annual coastwide quota is set at 907,669 pounds, with allocations as specified in Table 1.

Commercial Silver Eel Fishery Management Measures (Section 3.1.3)

The Delaware River silver eel weir fishery is restricted to nine annual permits. These permits will initially be limited to those permitted participants that fished and reported landings from 2010 to 2013. Permits may be transferred.

Sustainable Fishery Management Plans for American Eel (Section 3.1.4)

Fishing Mortality Based Plan – Under an approved fishing mortality plan, states and jurisdictions may petition the Board for alternative management based on the current level of mortality that is occurring on their population.

Transfer Plan – If states or jurisdictions implement quota management for at least one fishery, then a state may develop a Transfer Plan to request a transfer of quota from one fishery to another (e.g. from yellow to glass) based on the life history characteristic inherent to that area (e.g. state, river, or drainage).

Aquaculture Plan - Under an approved Aquaculture Plan, states and jurisdictions may harvest a maximum of 200 pounds of glass eel annually from within their waters for use in domestic aquaculture facilities provided they can objectively show that the harvest will occur from a watershed that minimally contributes to the spawning stock of American eel.

TABLE OF CONTENTS

1. INTRODUCTION.....	1
2. BACKGROUND	1
2.1. Statement of the Problem.....	1
2.2. Life History	1
2.3. Status of Management.....	2
2.3.1. <i>International Management</i>	2
2.3.1.1. European Management	2
2.3.1.2. Canadian Management.....	4
2.3.2. <i>Endangered Species Act Consideration</i>	6
2.4. Status of the Stock	7
2.5. Status of the Fishery.....	8
3. MANAGEMENT MEASURES	11
3.1 Commercial Fishery Management Program	11
3.1.1 Glass Eel Fishery Management Program.....	12
3.1.2 Yellow Eel Fishery Management Program.....	13
3.1.3 Silver Eel Fishery Management Program	15
3.1.4 State Specific Sustainable Fishery Management Plans for American Eel.....	16
4. LAW ENFORCEMENT RECOMMENDATIONS.....	18
5. COMPLIANCE.....	19
6. LITERATURE CITED	20
Appendix A. Determining the coastwide quota and state-by-state allocation.....	21

1. INTRODUCTION

The Atlantic States Marine Fisheries Commission (Commission) has coordinated interstate management of American eel (*Anguilla rostrata*) from 0-3 miles offshore since 2000. American eel is currently managed under the Interstate Fishery Management Plan (FMP) and Addenda I-III to the FMP. Management authority in the exclusive economic zone (EEZ) from 3-200 miles from shore lies with NOAA Fisheries. The management unit is defined as the portion of the American eel population occurring in the territorial seas and inland waters along the Atlantic coast from Maine to Florida.

2. BACKGROUND

2.1. STATEMENT OF THE PROBLEM

The Commission's American Eel Management Board (Board) initiated the development of Draft Addendum III in August 2012 in response to the 2012 American Eel Benchmark Stock Assessment, which found the American eel population in U.S. waters is depleted. The assessment found the stock is at or near historically low levels due to a combination of historical overfishing, habitat loss and alteration, productivity and food web alterations, predation, turbine mortality, changing climatic and oceanic conditions, toxins and contaminants, and disease. Draft Addendum III for Public Comment included a range of options for the commercial glass, yellow, and silver eel fisheries, as well as the recreational fishery. In August 2013, the Board approved some of the measures from Draft Addendum III for Public Comment (predominately the commercial yellow eel and recreational fishery management measures) and split out the remainder of the management measures (commercial glass and silver eel fisheries) for further development in Addendum IV. As the second phase of management in response to the 2012 stock assessment, the goal of Addendum IV is to continue to reduce overall mortality and increase overall conservation of American eel stocks. This Addendum addresses the commercial glass, yellow, and silver eel fisheries.

2.2. LIFE HISTORY

American eel (*Anguilla rostrata*) inhabit fresh, brackish, and coastal waters along the Atlantic, from the southern tip of Greenland to Brazil. American eel eggs are spawned and hatch in the Sargasso Sea. After hatching, leptocephali—the larval stage—are transported at random to the coasts of North America and the upper portions of South America by ocean currents. Leptocephali are then transformed into glass eels via metamorphosis. In most areas, glass eel enter nearshore waters and begin to migrate up-river, although there have been reports of leptocephali found in freshwater in Florida. Glass eels settle in fresh, brackish, and marine waters; where they undergo pigmentation, subsequently maturing into yellow eels. Yellow eel can metamorphose into a silver eel (termed *silvering*) beginning at age three and up to twenty-four years old, with the mean age of silvering increasing with increasing latitude. Environmental factors (e.g., food availability and temperature) may play a role in the triggering of silvering. Males and females differ in the size at which they begin to silver. Males begin silvering at a size typically greater than 14 inches and females begin at a size greater than 16-20 inches (Goodwin and Angermeier 2003). However, this is thought to vary

by latitudinal dispersal. Actual metamorphosis is a gradual process and eels typically reach the silver eel stage during their migration back to the Sargasso Sea, where they spawn and die.

Eels make extensive use of freshwater systems, but they may migrate to and from or remain in brackish and marine waters. Therefore, a comprehensive eel management plan and set of regulations must consider the various unique life stages and the diverse habitats of American eel, in addition to society's interest and use of this resource.

2.3. STATUS OF MANAGEMENT

American eel occupy a significant and unique niche in the Atlantic coastal reaches and tributaries. Historically, American eels were very abundant in East Coast streams, comprising more than 25 percent of the total fish biomass. Eel abundance had declined from historic levels but remained relatively stable until the 1970s. Fishermen, resource managers, and scientists postulated a further decline in abundance based on harvest information and limited assessment data during the 1980s and 1990s. This resulted in the development of the Commission's Interstate Fishery Management Plan (FMP) for American Eel, which was approved in 1999. The FMP required that all states maintain as conservative or more conservative management measures at the time of implementation for their commercial fisheries and implement a 50 fish per day bag limit for the recreational fishery. The FMP also required mandatory reporting of harvest and effort by commercial fishers and/or dealers and specific fisheries independent surveys to be conducted annually by the states.

Since then the FMP was modified three times. Addendum I (approved in February 2006) established a mandatory catch and effort monitoring program for American eel. Addendum II (approved in October 2008) made recommendations for improving upstream and downstream passage for American eels. Most recently, Addendum III (approved in August 2013) made changes to the commercial fishery, specifically implementing restrictions on pigmented eels, increasing the yellow eel size limit from 6 to 9 inches, and reducing the recreational creel limit from 50 fish to 25 fish per day.

2.3.1. INTERNATIONAL MANAGEMENT

Despite data uncertainties with European eels and American eels in Canada, both the European Union and the Department of Fisheries and Oceans Canada have taken recent management actions to promote the rebuilding of local stocks.

2.3.1.1. EUROPEAN MANAGEMENT

While American and European eels (*Anguilla anguilla*) are two separate species, the spawning grounds and early life history habitats are believed to overlap. Therefore oceanographic changes could influence both stocks. Currently, the European eel stock is considered severely depleted (ICES, 2013). Major fisheries occur in the Netherlands, France, Sweden, and the United Kingdom, with total 2012 commercial harvest in the EU estimated at 5.2 million pounds and recreational harvest estimated at 1.1 million pounds (Figure 1; ICES, 2013). In 2007, the European Union (EU) passed legislation which required EU countries to

develop and implement measures to allow 40% of adult eels to escape from inland waters to the sea for spawning purposes. In addition, beginning in 2008, EU countries that catch glass eel (defined as juvenile eels less than 4.7 inches long) were required to use 35% of their catch for restocking within the EU and increase this to at least 60% by 2013.

To demonstrate how they intend to meet the target, EU countries were required to develop national eel management plans at river-basin level. To date, the European Commission has adopted all plans submitted by 19 EU countries, plus a joint plan for the Minho River (Spain/Portugal). Management measures implemented though these plans vary from country to country, but are similar to most management measures considered or implemented in the U.S. The management measures include:

- Seasonal closures
- Size limits (11 – 21.6 inches)
- Recreational bag limit (2 - 5 fish/angler/day)
- Gear restrictions (banning fyke nets, increasing mesh size)
- Reducing effort (e.g. by at least 50%)
- Prohibiting glass, silver or all commercial fishing
- Commercial quotas
- Implementing catch and release recreational fisheries only
- Reducing illegal harvest and poaching
- Increasing fish passage
- Restocking suitable inland waters with glass eels

In 2013 the International Council on the Exploration of the Seas (ICES) completed an evaluation on the implementation of the national management plans (ICES, 2013a). ICES concluded that, given the short time since implementation, restrictions on commercial and recreational fisheries for silver eel has contributed the most to increases in silver eel escapement. The effectiveness of restocking remains uncertain (ICES, 2013a). ICES advises that data collection, analysis, and reporting should be standardized and coordinated to facilitate the production of stock-wide indicators to assess the status of the stock and to evaluate the effect of management regulations.

In response to the evaluation, European Parliament passed a resolution in September 2013 requesting the European Commission present new legislation to further conserve European eel populations. The new law must close the loopholes allowing the continued overfishing and illegal trade; evaluate current restocking measures and their contribution to eel recovery; require more timely reporting on the impact of eel stock management measures; and require member states that do not comply with the reporting and evaluation requirements to reduce their eel fishing effort by 50%. The European Commission's new legislative proposal, which is expected to be presented in early 2015, must aim to achieve the recovery of the stock "with high probability".

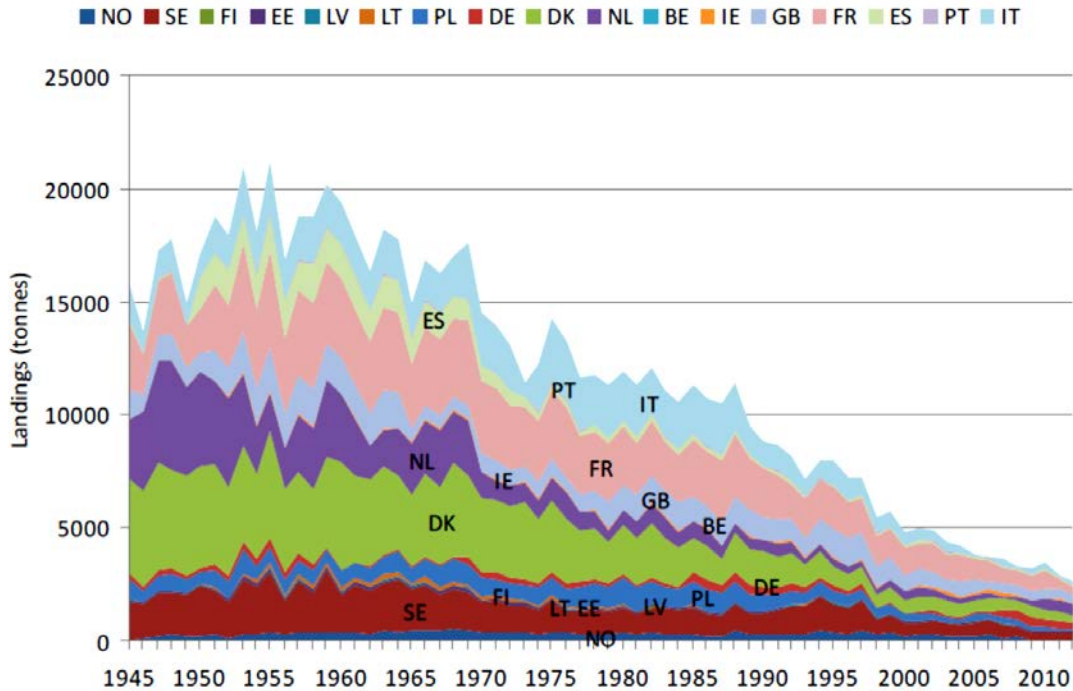


Figure 1. Total landings of European eel (all life stages) from 2013 Country Reports (Note: not all countries reported). NO = Norway, SE = Sweden, FI – Finland, EE = Estonia, LV = Latvia, LT = Lithuania, PL = Poland, DE = Germany, DK = Denmark, NL = Netherlands, BE = Belgium, IE = Ireland, GB = Great Britain, FR = France, ES = Spain, PT = Portugal, IT = Italy. *From ICES, 2013a.*

In November 2013, ICES completed an update on European stock status to provide management advice for the 2014 fishing year (ICES, 2013b). The update found that annual recruitment of glass eel to European waters has increased over the last two years, from less than 1% to 1.5% of the reference level in the “North Sea” series, and from 5% to 10% in the “Elsewhere” series¹, which may or may not be the result of the regulatory changes (Figure 2). However, despite recent increases, production of offspring is very low and there is a risk that the adult stock size is too small to produce sufficient amount of offspring to maintain the stock (ICES, 2013b). The biomass of escaping silver eel is estimated to be well below the target (ICES, 2013b). ICES continues to recommend that all anthropogenic mortality affecting production and escapement of silver eels should be reduced to as close as possible to zero, until there is clear evidence of sustained increase in both recruitment and the adult stock. The stock remains critical and urgent action is needed (ICES, 2013b).

2.3.1.2. CANADIAN MANAGEMENT

American eel are widespread in eastern Canada, but there are dramatic declines throughout its range, including Lake Ontario and the upper St. Lawrence. Although trends in abundance are highly variable, strong declines are apparent in several indices. The American eel was

¹ The North Sea series are from Norway, Sweden, Germany, Denmark, Netherlands, and Belgium. The Elsewhere series are from UK, Ireland, France, Spain, Portugal, and Italy.

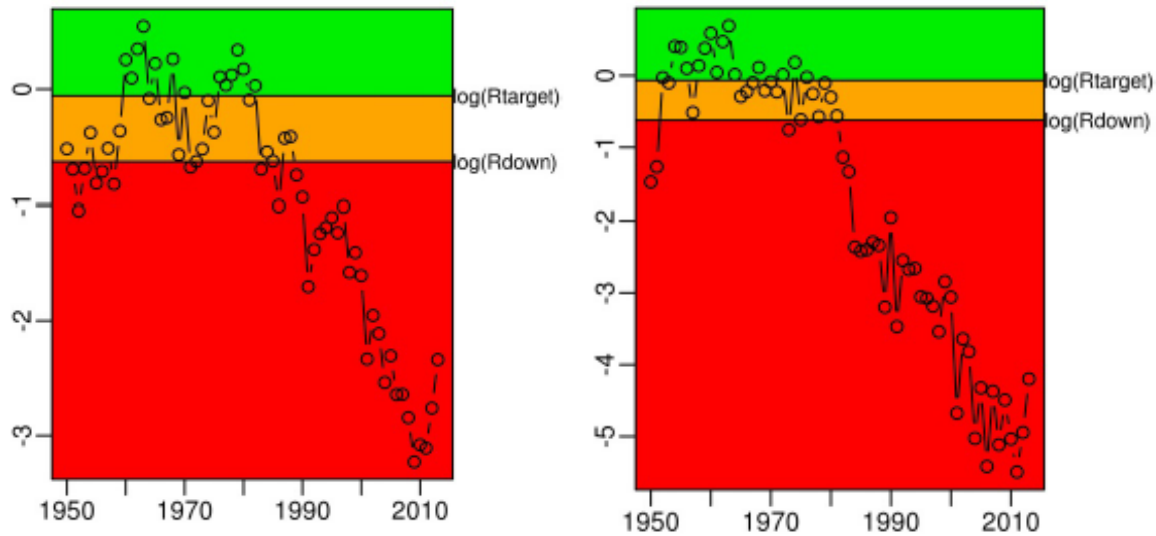


Figure 2. Trends in recruitment (“Elsewhere”, left, and “North-Sea”, right) of European eels with respect to healthy zone (green), cautious zone (orange) and critical zone (red). *From ICES, 2013b.*

first assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2006 and was designated as a species of “Special Concern.” The status was re-examined by COSEWIC in 2012 and it was recommended to list the species as Threatened under the Canadian Species at Risk Act (similar to the U.S. Endangered Species Act). A National Management Plan for American Eel in Canada was developed by the Canadian Eel Working Group which specifies short and long term goals for recovery (DFO, 2010). One of the short-term goals of the plan is to reduce eel mortality from all anthropogenic sources by 50% relative to the 1997-2002 average. Long-term management goals include rebuilding overall abundance of the American eel in Canada to its mid-1980s levels.

Canadian commercial yellow and silver American eel fisheries occur in New Brunswick, Prince Edward Island, Nova Scotia, Newfoundland and Labrador, and Québec (Figure 3). Fishing occurs in both fresh and marine waters, but many rivers and coastal habitats remain unfished. Elver fisheries in Canada occur only in Scotia-Fundy and the south coast of Newfoundland. Overall total reported American eel landings in Canada declined through the early 1960s, increased to a peak in the late 1970s, and have since declined to the lowest level in recent history (Cairns et al, 2014). Winter recreational spear fisheries of yellow eels also occur in the Southern Gulf of St. Lawrence.

Recent management measures to meet the goals of the National Management Plan have included:

- Minimum size limits raised to 20.8 inches (Gulf region), 13.75 inches (Maritimes region) and 11.8 inches (southwestern New Brunswick, Newfoundland and Labrador)
- Reduction to seasons
- Area closures
- Buyouts of licenses
- Glass eel fisheries are not permitted in areas where fisheries exist for larger eels
- Enforcement of regulatory definitions on fyke nets

- Measures to reduce high grading
- License caps, limited entry, and license reductions
- Gear restrictions, including a 1" x ½" escapement panel
- Quota reductions, including 10% cut in glass eel fisheries

The first large-scale eel stocking experiment occurred in the Richelieu River, a tributary to Lake Champlain, in 2005. Since then, a total of seven million elvers have been stocked in Canadian waters. Stocking initiatives can be considered as a potential threat because their effects are uncertain, manifestation of some effects may only be apparent years after, and because of the documented negative effects of stocking of on other fish, particularly salmon (COSEWIC, 2012). Continuing habitat degradation, especially owing to dams and pollution, and existing fisheries in Canada and elsewhere may constrain recovery (COSEWIC, 2102).

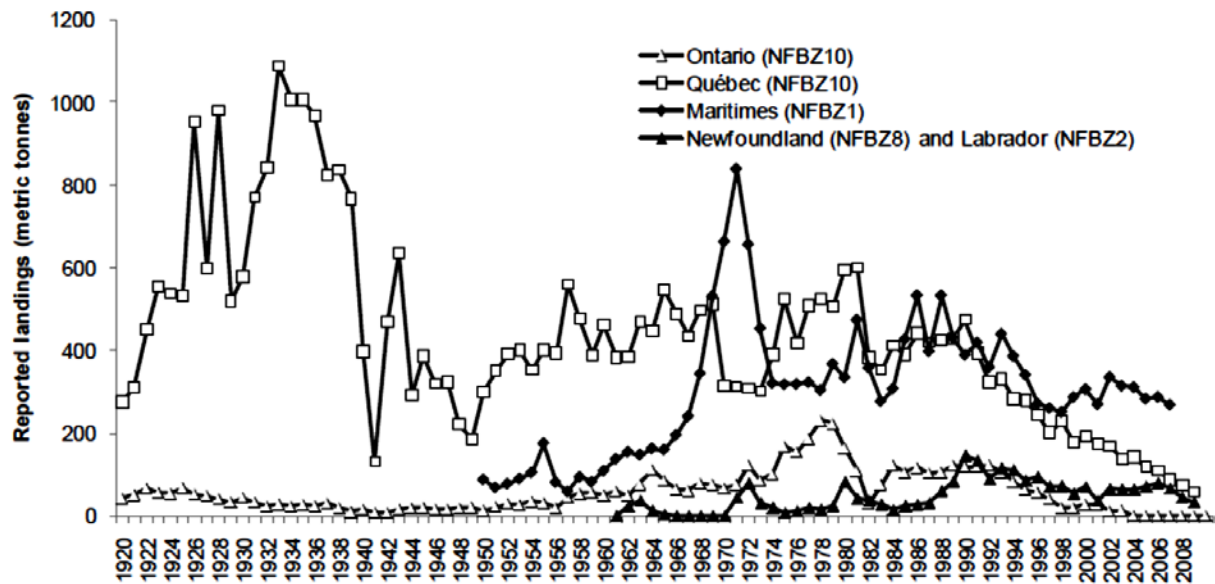


Figure 3. Reported landings of all life stages from Quebec, Ontario, the Maritime Provinces, and Newfoundland and Labrador from 1920 – 2010. *From COSEWIC, 2012.*

2.3.2. ENDANGERED SPECIES ACT CONSIDERATION

American eel were petitioned for listing as threatened under the Endangered Species Act (ESA) in April 2010 by the Center for Environmental Science, Accuracy, and Reliability (CESAR, formally the Council for Endangered Species Act Reliability). The U.S. Fish and Wildlife Service (USFWS) published a positive 90 day finding on the petition in September 2011, stating that the petition may be warranted and a status review will be conducted. CESAR filed a lawsuit in August 2012 against USFWS for failure to comply with the statuses of the ESA, which specifies a proposed rule based on the status review be published within one year of the receipt of the petition. A Settlement Agreement was approved by the court in April 2013 and requires USFWS to publish a 12-month finding by September 30, 2015. The USFWS previously reviewed the status of the American eel in 2007 and found that, at that time, protection under the Endangered Species Act was not warranted.

The five factors on which listing is considered include:

1. Present or threatened destruction, modification, or curtailment of its habitat or range;
2. Over-utilization of the species for commercial, recreational, scientific, or educational purposes;
3. Disease or predation;
4. Inadequacy of existing regulatory mechanisms; and
5. Other natural or manmade factors affecting its continued existence.

2.4. STATUS OF THE STOCK

The Benchmark Stock Assessment was completed and accepted for management use in May 2012. The assessment indicated that the American eel stock has declined in recent decades and the prevalence of significant downward trends in multiple surveys across the coast is cause for concern (ASMFC, 2012). The stock is considered depleted, however no overfishing determination can be made at this time based solely on the trend analyses performed (ASMFC, 2012). The ASMFC American Eel Technical Committee (TC) and Stock Assessment Subcommittee (SAS) caution that although commercial fishery landings and effort have declined from high levels in the 1970s and 1980s (with the recent exception of the glass eel fishery), current levels of fishing effort may still be too high given the additional stressors affecting the stock such as habitat loss, passage mortality, and disease as well as potentially shifting oceanographic conditions. Fishing on all life stages of eels, particularly young-of-the-year and in-river silver eels migrating to the spawning grounds, could be particularly detrimental to the stock, especially if other sources of mortality (e.g., turbine mortality, changing oceanographic conditions) cannot be readily controlled.

In 2014 the TC and Stock Assessment Subcommittee (SAS) completed an update of the young of the year (YOY) indices included in the benchmark stock assessment. The FMP requires states and jurisdictions with a declared interest in the species to conduct an annual YOY survey for the purpose of monitoring annual recruitment of each year's cohort. The benchmark assessment included data only through 2010. Since that time some states have heard anecdotal information about increased recruitment as well as recorded evidence of increased recruitment in their fisheries independent YOY surveys.

Based on the update of the YOY indices, the TC found no change in the YOY status from the benchmark assessment with the exception of one survey in Goose Creek, SC (Table 1). YOY trends are influenced by many local environmental factors, such as rainfall and spring temperatures. While some regions along the coast have experienced high catches in 2011, 2012, and/or 2013, other regions have experienced average or lower catches. For example in 2012, Rhode Island and Florida had below average counts, with Florida having its lowest catch of their time series; New Hampshire, New York, Virginia, and Georgia had average counts; and Maine, Connecticut, New Jersey, Delaware, and Maryland had their highest YOY catches on record. The TC stresses high YOY catches in a few consecutive years do not necessarily correspond to an increasing trend since the YOY surveys can fluctuate greatly. Additionally, due to the limited extent of sampling, trends at the state level may not be reflective of what is actually occurring statewide or coastwide. The YOY indices were only one factor in the determination of the depleted stock status for American eel, so therefore there is no recommended change in the conclusions of the benchmark assessment

and the depleted stock status is still warranted. In November 2014, the International Union for the Conservation of Nature (IUCN) reviewed the status of American eel and listed the species as “endangered” on the IUCN Red List.

Region	State	Site	SA Result	Update
Gulf of Maine	ME	West Harbor Pond	NS	NS
	NH	Lamprey River	NS	NS
	MA	Jones River	NS	NS
	MA	Parker River	NS	NS
Southern New England	RI	Gilbert Stuart Dam	NS	NS
	RI	Hamilton Fish Ladder	NS	NS
	NY	Carmans River	NS	NS
Delaware Bay/ Mid-Atlantic Coastal Bays	NJ	Patcong Creek	NS	NS
	DE	Millsboro Dam	NS	NS
	MD	Turville Creek	NS	NS
Chesapeake Bay	PRFC	Clarks Millpond	NS	NS
	PRFC	Gardys Millpond	NS	NS
	VA	Brackens Pond	NS	NS
	VA	Kamps Millpond	NS	NS
	VA	Warehams Pond	NS	NS
	VA	Wormley Creek	NS	NS
South Atlantic	SC	Goose Creek	NS	↓
	GA	Altamaha Canal	NS	NS
	GA	Hudson Creek	NS	NS
	FL	Guana River Dam	NS	NS

Table 1. Results of the Mann-Kendall trend analysis applied to 2012 Benchmark Stock Assessment (SA) and updated YOY indices developed from the ASMFC-mandated recruitment surveys. Trend indicates the direction of the trend if a statistically significant temporal trend was detected (P-value < α ; $\alpha = 0.05$). NS = not significant.

2.5. STATUS OF THE FISHERY

The American eel fishery primarily targets yellow stage eel. Silver eels are caught during their fall migration as well. Eel pots are the most typical gear used; however, weirs, fyke nets, and other fishing methods are also employed. Yellow eels were harvested for food historically, today’s fishery sells yellow eels primarily as bait for recreational fisheries. From 1950 to 2012, U.S. Atlantic coast landings ranged from a low of approximately 664,000 pounds in 1962 to a high of 3.67 million pounds in 1979 (Figure 4). After an initial decline in the 1950s, landings increased to a peak in the 1970s and early 1980s in response to higher demand from European food markets. In most regions, landings declined sharply by the late 1980s and have fluctuated around one million pounds for the past decade. The value of U.S. commercial yellow eel landings as estimated by NOAA Fisheries has varied from less than a \$100,000 (prior to the 1980s) to a peak of \$6.4 million in 1997.

State reported landings of yellow eels in 2013 totaled 907,671 pounds (Table 2) which represents an 17% decrease (~187,000) in landings from 2012 (1,104,429 pounds). Since 2000, yellow eel landings have increased in the Mid-Atlantic region (NY, NJ, and MD) with the exception of Delaware and the Potomac River. Additionally, yellow eel landings have declined in the New England region (ME, NH, MA, CT) with the exception of Rhode Island. Within the Southern region, since 2000 landings have declined in North Carolina but increase in Florida. In 2013, state reported landings from New Jersey, Delaware, Maryland, and Virginia each totaled over 80,000 pounds of eel, and together accounted for 86% of the coastwide commercial total landings.

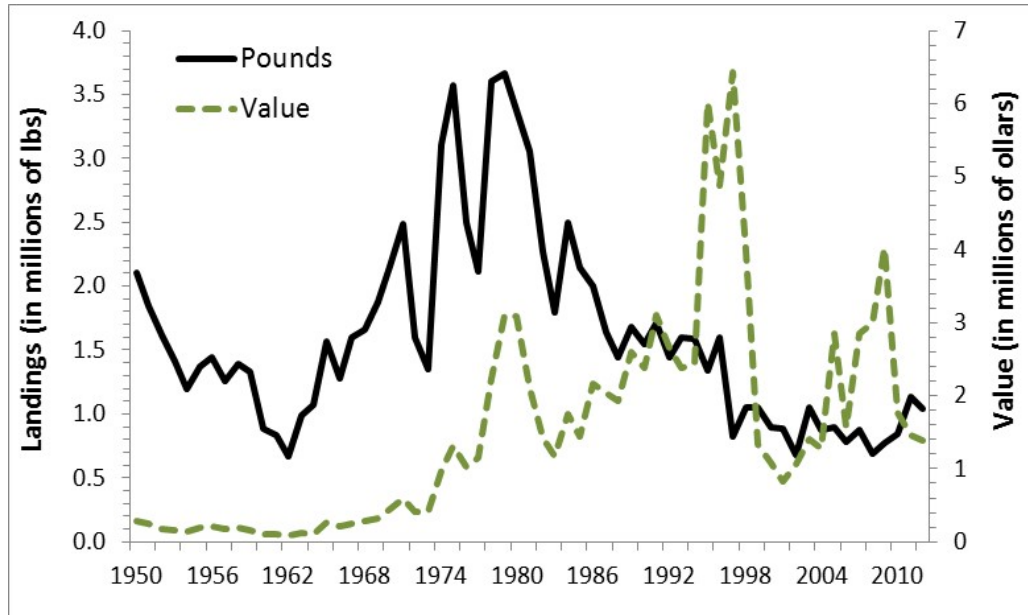


Figure 4. Total commercial landings (in pounds) and value (in millions of dollars) of yellow eels along the U.S. Atlantic Coast, 1950–2012.

Glass eel fisheries along the Atlantic coast are prohibited in all states except Maine and South Carolina. In recent years, Maine is the only state reporting significant harvest (Table 3). Harvest has increased the last few years as the market price has risen to more than \$2,000 per pound, although in 2014 prices were recorded between \$400 and \$650 per pound. Glass eels are exported to Asia to serve as seed stock for aquaculture facilities. Landings of glass eels in 2012 were reported from Maine and South Carolina and totaled 22,215 pounds.

Because eel is managed by the states and is not a target species for the NMFS, landings information for states that rely on the NMFS estimates may be underreported. In addition, at least a portion of commercial eel landings typically come from non-marine water bodies. Even in states with mandatory reporting, these requirements may not extend outside the marine district, resulting in a potential underestimate of total landings. Despite concern about the level of under reporting, reported landings are likely indicative of the trend in total landings over time.

Table 2. Harvest (in pounds) by state of yellow eels from 1998 - 2013. * *Confidential*

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	PRFC	VA	NC	SC	GA	FL	Total
1998	20,671	459	5,606	967	5,606	16,896	94,327	131,478	301,833	209,008	123,819	91,084		*	13,819	1,015,649
1999	36,087	245	10,281	140	10,281	7,945	90,252	128,978	305,812	163,351	183,255	99,939	*		17,533	1,054,121
2000	14,349	310	5,158	25	5,158	5,852	45,393	119,180	259,552	208,549	114,972	127,099	*		6,054	911,824
2001	9,007	185	3867	329	1,724	19,187	57,700	120,634	271,178	213,440	96,998	107,070	*	*	14,218	915,585
2002	11,616	67	3842	234	3,710	26,824	64,600	90,353	208,659	128,595	75,549	59,940	*	*	7,587	681,609
2003	15,312	36	4,047	246	1,868	3,881	100,701	155,515	346,412	123,450	121,043	172,065		*	8,486	1,053,119
2004	29,651	65	5,328	971	1,374	5,386	120,607	141,725	273,142	116,163	123,314	128,875			7,330	953,931
2005	17,189	120	3,073	0	341	25,515	148,127	110,456	378,659	103,628	66,701	49,278			3,913	907,000
2006	17,259	93	3676	1034	3,443	7,673	158,917	120,462	362,966	83,622	82,738	33,581			1,248	876,712
2007	9,309	70	2853	1230	885	15,077	164,331	131,109	309,215	97,361	56,463	34,486			7,379	829,767
2008	7,992	25	6,046	8866	6,012	15,159	140,418	80,003	381,993	71,655	84,789	24,658	*		15,624	843,762
2009	2,525	83	1217	4855	630	13,115	121,471	59,619	324,773	58,863	119,187	65,481			6,824	778,643
2010	2,624	80	277	4642	164	13,220	107,803	68,666	511,201	57,755	78,076	122,104	*	*	11,287	978,004
2011	2,700	129	368	1,521	20	56,963	129,065	90,631	715,162	29,010	103,856	61,960			25,601	1,216,986
2012	10,785	167	532	1,484	3,560	48,637	111,810	54,304	583,057	90,037	122,058	64,110		*	11,845	1,104,429
2013	1,826	106	2,499	2,244	2,638	32,573	89,300	80,811	539,775	32,290	84,385	33,980		*	17,246	919,953

Table 3. Harvest (in pounds) and value of the glass eel fishery in Maine and South Carolina from 2007 - 2013. **South Carolina landings are confidential.*

Year	Maine		South Carolina	
	Landings	Value	Landings*	Value
2007	3,713	\$1,287,485	No activity reported	
2008	6,951	\$1,486,355	No activity reported	
2009	5,119	\$519,559	No activity reported	
2010	3,158	\$584,850	<500	<\$100,000
2011	8,584	\$7,653,331	<500	<\$500,000
2012	20,764	\$38,760,490	<5,000	<\$2,500,000
2013	18,076	\$32,926,991	<5,000	<\$2,500,000

3. MANAGEMENT MEASURES

It is important to emphasize the 2012 American Eel Stock Assessment was a benchmark or baseline assessment that synthesized all available fishery-dependent and independent data, yet it was not able to construct eel population targets that could be related to sustainable fishery harvests. This is not an uncommon result of baseline stock assessments. The development of sustainable population and fishery thresholds will be a priority of future stock assessment. Despite the absence of fishery targets derived from population models, it is clear that high levels of yellow eel fishing occurred in the 1970s and 1980s in response to high prices offered from the export food market (Figure 4). For all coastal regions, peak catches in this period were followed by declining catches in the 1990s and 2000s, with some regions now at historic low levels of harvest. Given high catches in the past could have contributed to the current depleted status, it is prudent to reduce mortality while enhancing and restoring habitat. This approach is further justified in light of the public interest in eel population conservation demonstrated by two recent petitions to list American eel under the Endangered Species Act and the recent listing by the International Union for the Conservation of Nature (IUCN) as endangered on the IUCN Red List.

The provisions of this Addendum are a compliance requirement and are effective upon adoption of the Addendum as specified by the Board. Management measures include all mandatory monitoring and reporting requirements as described in this Section.

3.1 COMMERCIAL FISHERY MANAGEMENT PROGRAM

The 2012 American Eel Stock Benchmark Stock Assessment recommended mortality should be reduced on all life stages. Therefore, this addendum implements management measures to reduce overall mortality in order to maximize the conservation benefit to American eel stocks. States /jurisdictions shall maintain existing or more conservative American eel commercial fishery regulations, unless otherwise approved by the Board. States may always implement more conservative management measures.

3.1.1 GLASS EEL FISHERY MANAGEMENT PROGRAM

The following apply to the glass eel fisheries operating in Maine and South Carolina, unless otherwise noted.

Quota Management (Maine Only)

Maine's commercial glass eel quota for the 2015-2017 commercial glass eel fishing seasons will be set at 9,688 pounds annually. The quota shall be re-evaluated after three years (prior to the start of the 2018 fishing season), incorporating any information collected through Maine's life cycle monitoring program (see below), as well as other available programs, as feasible. Maine's commercial glass eel quota (9,688 pounds) may be extended through Board action. Any other modification (e.g. increase) to the quota amount will be subject to the Commission's addendum process.

Quota management provides a more reliable method to track mortality, increases accuracy of harvest data, and reduces opportunities for illegal harvest. In 2014 Maine pro-actively implemented new regulations to manage the glass eel fishery through output controls (quota management) instead of input control (gear and licenses restrictions). The state worked with industry and tribal representatives to develop a quota (11,479 pounds) that was a 35% reduction from 2012 landings. In 2014, the state landed 9,688 pounds.

Quota Overages

For any state or jurisdiction with a commercial glass eel quota, if an overage occurs in a fishing year, then that state or jurisdiction will be required to deduct the entire overage from the state's quota the following year, pound for pound.

Glass Eel Harvest Allowance Based on Stock Enhancement Programs

Any state or jurisdiction can request an allowance for commercial harvest of glass eels based on stock enhancement programs implemented after January 1, 2011. Examples of stock enhancement programs include, but are not limited to, habitat restoration projects, fish passage improvements, or fish passage construction. Fish passage projects may focus on upstream or downstream passage or both. Stock enhancement programs must show a measurable increase in glass eel passage and/or glass eel survival. Harvest shall not be restricted to the basin of restoration (i.e. harvest may occur at any approved location within the state or jurisdiction). Harvest requests shall not exceed 25% of the quantified contribution provided by the stock enhancement program.

Requests for harvest must be in writing and include a description of the: stock enhancement program, fishery requested, monitoring program to ensure harvest is not exceeded, monitoring program to ensure stock enhancement program targets are annually met, adequate enforcement capabilities, and adequate penalties for violations. The stock contribution percentage may be based on, for example, the amount of available suitable habitat that will become accessible, passage numbers, or other appropriate metrics.

Requests must be submitted to the Board by September 1st of the preceding fishing year. The Board will review and consider approval of the requests after a TC review.. After the first

year of implementation the TC will evaluate the program and provide recommendations to the Board on the overall impact of and adherence to the plan. If the stock enhancement program cannot be assessed one year post-implementation, then a secondary review must occur within three years post-implementation. If changes to that habitat or fishway occurs in subsequent years, the Commission must be notified through the annual compliance report and a review of the harvest allowance may be initiated.

Reporting Requirements

Any state or jurisdiction with a commercial glass eel fishery is required to implement daily trip level reporting with daily electronic accounting to the state for both harvesters and dealers in order to ensure accurate reporting of commercial glass eel harvest. States or jurisdictions commercially harvesting less than 750 pounds of glass eels are exempt from this requirement.

Monitoring Requirements

Any states or jurisdiction with a commercial glass eel fishery must implement a fishery independent life cycle survey covering glass, yellow, and silver eels within at least one river system. If possible and appropriate, the survey should be implemented in the river system where the glass eel survey (as required under Addendum III) is being conducted to take advantage of the long term glass eel survey data collection. At a minimum the survey must collect the following information: fisheries independent index of abundance, age of entry into the fishery/survey, biomass and mortality of glass and yellow eels, sex composition, age structure, prevalence of *A. crassus*, and average length and weight of eels in the fishery/survey. Survey proposals will be subject to TC review and Board approval. States or jurisdictions commercially harvesting less than 750 pounds of glass eels are exempt from this requirement.

3.1.2 YELLOW EEL FISHERY MANAGEMENT PROGRAM

Currently, commercial yellow eel fisheries operate in all states with the exception of Pennsylvania and the District of Columbia. Management measures selected by the Board in Addendum III went into effect January 1, 2014. These measures included a 9 inch minimum size limit for both the commercial and recreational fishery and a ½ by ½ inch minimum mesh requirement for the commercial fishery.

The American Eel TC recommended commercial harvest be reduced from the 1998 – 2010 average (907,669 pounds), specifically a 12% reduction from the 1998-2010 average was seen as an acceptable precautionary approach (798,750 pounds).

Coastwide Catch Cap

The commercial yellow eel fishery is regulated through an annual coastwide catch cap set at 907,671 pounds (1998 – 2010 harvest level).

The use of a coastwide cap provides a flexible management system that responds to fluctuations in market conditions while providing a quantifiable conservation benefit to

American eels. One of the benefits of a catch cap is that it reduces the administrative and legislative burden of implementing a state specific quota system while still controlling the total amount of fishing mortality that is occurring annually. Additionally, a coastwide catch cap does not require a specific allocation by state or jurisdiction, which can be problematic due to the fluctuations in landings as a result of environmental and market conditions. However, under this system states and jurisdiction still need timely reporting in place to ensure that that the cap was not exceeded. Furthermore, a mortality cap may promote a derby style fishery, which could possibly flood the market and drive down prices.

Under the catch cap, there are two management triggers. Upon reaching either of these triggers, the Board is required to alter the management program as specified below in order to ensure the objectives of the management program are achieved.

Management Triggers

1. The coastwide catch cap is exceeded by more than 10% in a given year (998,438 pounds).
2. The coastwide catch cap is exceeded for two consecutive years, regardless of percent over.

Management Response

If either trigger is tripped, then there would be automatic implementation of a state-by-state commercial yellow eel quota. The annual coastwide quota is set at 907,669 pounds, with allocations as specified in Table 4. See Appendix A for a description on the allocation methodology. States and jurisdictions are required to approve regulations that would allow for implementation of a quota management program and timely monitoring of harvest no later than March 2016. This ensures if a management trigger is activated in the first year of implementation (2015) then the required management action could be taken. The quota management program must include a provision to address quota overages and allow quota transfers, as specified below. It is recommended monitoring and reporting requirements are sufficient to prevent repeated overages.

If the state-by-state quota system is implemented and a state or jurisdiction has an overage in a given fishing year, then the state or jurisdiction is required to reduce their following year's quota by the same amount the quota was exceeded, pound for pound. For states that qualify for the automatic 2,000 pound quota, any overages would be deducted from the 2,000 pound allocation.

If the state-by-state quota system is implemented then any state or jurisdiction may request approval from the Board Chair or Commission Chair to transfer all or part of its annual quota to one or more states, including states that receive the automatic 2,000 pound quota. Requests for transfers must be made by individual or joint letters signed by the principal state official with marine fishery management authority for each state involved. The Chair will notify the requesting states within ten working days of the disposition of the request. In evaluating the request, the Chair will consider: if the transfer would preclude the overall annual quota from being harvested, the transfer addresses an unforeseen variation or contingency in the fishery,

and if the transfer is consistent with the objects of the FMP. Transfer requests for the current fishing year must be submitted by December 31 of that fishing year.

The transfer of quota would be valid for only the calendar year in which the request is made. These transfers do not permanently affect the state-specific shares of the quota, i.e., the state-specific shares remain fixed. Once quota has been transferred to a state, the state receiving quota becomes responsible for any overages of transferred quota.

Under both the catch cap and quota systems all New York American eel landings (i.e. from both the yellow and silver eel fisheries) are included, until otherwise shown to preclude it. The Board has the ability to re-visit quota and allocation through subsequent addenda.

Table 4. Recommended Quota Allocation for the Commercial Yellow Eel Fishery. This quota would ONLY be implemented if wither management trigger is tripped.

	Initial Allocation	Final Quota
Maine	0.48%	3,907
New Hampshire	0.01%	2,000
Massachusetts	0.04%	2,000
Rhode Island	0.16%	4,642
Connecticut	0.19%	2,000
New York	4.26%	15,220
New Jersey	10.19%	94,899
Delaware	6.97%	61,632
Maryland	56.72%	465,968
PRFC	4.67%	52,358
Virginia	9.58%	78,702
North Carolina	4.94%	107,054
South Carolina		2,000
Georgia	0.11%	2,000
Florida	1.69%	13,287
Total	100%	907,669

3.1.3 SILVER EEL FISHERY MANAGEMENT PROGRAM

The following measures apply only to the commercial weir fishery in the New York portion of the Delaware River and its' tributaries. New York was granted a one year extension from the requirements as specified under Section 4.1.3 of Addendum III:

Section 4.1.3: States and jurisdictions are required to implement no take of eels from September 1st through December 31st from any gear type other than baited traps/pots or spears (e.g. fyke nets, pound nets, and weirs). These gears may still be fished, however retention of eels is prohibited. A state or jurisdiction may request an alternative time frame for the closure if it can demonstrate the proposed closure dates

encompass the silver eel outmigration period. Any requests will be reviewed by the TC and submitted to the Board for approval.

The American Eel Benchmark Stock Assessment found “fishing on out-migrating silver eels could be particularly detrimental to the stock, especially if other sources of mortality (e.g., turbine mortality, changing oceanographic conditions) cannot be readily controlled.” Conservation efforts on earlier life stages will only delay mortality and provide limited additional benefit to stock health if harvest occurs at later stages.

License Cap

The Delaware River silver eel weir fishery is restricted to nine annual permits. These permits are initially limited to those permitted participants that fished and reported landings from 2010 to 2013. Permits may be transferred thereafter.

3.1.4 STATE SPECIFIC SUSTAINABLE FISHERY MANAGEMENT PLANS FOR AMERICAN EEL

States or jurisdictions may petition the Board to allow for a state specific Sustainable Fishery Management Plan (Plan) for American Eel.

Currently, states and jurisdictions are allowed to petition the Board for an alternative management program, per Section 4.4 of the FMP. This section is not meant to replace Section 4.4 of the FMP, rather it provides guidance on specific types of alternative management the states can to request.

The objective of these programs is to allow states and jurisdictions the ability to manage their American eel fishery (glass, yellow, or silver) to both meet the needs of their current fishermen while providing conservation benefit for the American eel population. Three types of Plans (Fishing Mortality Based Plan, Transfer Plan, and Aquaculture Plan) are presented below. All plans must be submitted to the Board for their review and approval after TC review.

Fishing Mortality Based Plan

Under this scenario, states and jurisdictions may petition the Board for alternative management based on the current level of mortality that is occurring on their population. This Plan shall:

1. Require states or jurisdictions to assess, with some level of confidence, the status of eel abundance and current level of mortality (e.g. fisheries, natural, and other man-made) that is occurring on the American eel populations within their jurisdiction.
2. Once adequately documented, states or jurisdictions may allocate their fishing mortality to any American eel fishery (glass, yellow, or silver) even if the state does not currently participate in that fishery (i.e. a state would be allowed to open up a glass eel fishery if they did not currently have one due to the restrictions of the FMP). This could be applied for commercial, recreational, aquaculture industries and/or research set-aside purposes.

3. States may increase the fishing mortality rate provided it is offset by decreases in other mortality (e.g. though habitat improvements, increased fish passage, reduced turbine mortality, etc.) and there is an overall net gain to conservation (i.e. overall mortality is reduced, spawner escapement increases, etc...).

The format of the Fishing Mortality Based Plan is as follows:

1. Current regulations
2. Proposed change to regulations (e.g. request for fishery, fish passage restrictions, water quality improvements, etc...)
3. Description of fishing monitoring and enforcement capabilities
4. Description and supporting information on eel abundance and current mortality within state or jurisdiction
 - a. Fishing mortality (including but not limited to commercial, recreational, sustenance, and bycatch)
 - b. Natural mortality (including but not limited to predation and disease),
 - c. Other man-made mortality (including but not limited to fish passage, turbines, habitat degradation, and pollution)
 - d. Indices of abundance, age and size structure, and life cycle population metrics
5. Timeline for implementation of regulations, monitoring programs, or other activities
6. Description of conservation benefits of proposed regulatory changes or habitat improvements
7. Description of adaptive management program to evaluate success of proposed regulatory changes or habitat improvements

Transfer Plan

If states or jurisdictions are unable to assess the current level of mortality and abundance with certainty, and the state or jurisdiction implements quota management for at least one fishery, then a state may develop a Transfer Plan to request a transfer of quota from one fishery to another (e.g. from yellow to glass) based on the life history characteristic inherent to that area (e.g. state, river, or drainage). The request shall include: description of quota allocation by fishery; scientific analysis that the transfer will not increase overall eel fishing mortality, overall mortality, or reduce spawner escapement, with some level of confidence; description of monitoring program to ensure quota is not exceeded; and adequate enforcement capabilities penalties for violations.

Aquaculture Plan

States and jurisdictions may develop a Plan for aquaculture purposes. Under an approved Aquaculture Plan, states and jurisdictions may harvest a maximum of 200 pounds of glass eel annually from within their waters for use in domestic aquaculture facilities provided the state can objectively show the harvest will occur from a watershed that minimally contributes to the spawning stock of American eel. The request shall include: pounds requested; location, method, and dates of harvest; duration of requested harvest; prior approval of any applicable permits; description of the facility, including the capacity of the facility the glass eels will be held, and husbandry methods; description of the markets the eels will be distributed to; monitoring program to ensure harvest is not exceeded; and adequate enforcement capabilities penalties for violations. Approval of a request does not guarantee approval of a request in

future years. Eels harvested under an approved Aquaculture Plan may not be sold until they reach the legal size in the jurisdiction of operations, unless otherwise specified.

All Plans are subject to TC and LEC review and Board approval. The Fishing Mortality Based Plan must be submitted by June 1st of the preceding fishing year in order to provide enough time for review for the upcoming fishing season. Transfer and Aquaculture Plans must be submitted by June 1st of the preceding fishing year and approval will be determined by the Board by September 1st. Plans will initially be valid for only one year. After the first year of implementation the TC will evaluate the program and provide recommendations to the Board on the overall impact of and adherence to the plan. If the proposed regulatory changes, habitat improvements, or harvest impact cannot be assessed one year post-implementation, then a secondary review must occur within three to five years post-implementation if the action is still ongoing.

If states use habitat improvements and changes to that habitat occurs in subsequent years, the Commission must be notified through the annual compliance report and a review of the Plan may be initiated. Any requests that include a stocking provision would have to ensure stocked eels were certified disease free according to standards developed by the TC and approved by the Board.

4. LAW ENFORCEMENT RECOMMENDATIONS

The Commission's Law Enforcement Committee has previously weighted in on the enforceability of proposed American eel management options based on the *Guidelines for Resource Managers on the Enforceability of Fishery Management Measures (July 2009)*. These Guidelines rated management strategies using standard terms as follows, from least to most enforceable: Impossible, Impractical, Difficult and Reasonable.

The LEC concluded that status quo measures for all eel fisheries is impractical for enforcement, specifically for the glass eel fishery given the enforcement challenges associated with the prosecution of the glass eel fishery in those states currently closed to harvest of glass eels. A significant amount of illegal harvest of glass eels continues outside the two states where harvest is currently allowed, and illegally harvested eels are being possessed and shipped via those two states. State and federal enforcement agencies are tasked to thwart the illegal harvest and export with reduced staff and resources. Given the monetary value of glass eels and the ability to move illegally harvested eels via legal shipments, enforcement agencies do not have, and are unlikely to obtain the resources necessary to effectively monitor and control a limited glass eel harvest.

The LEC finds that a quota system would be difficult to enforce because of the variety of management strategies associated with quota implementation, enforceability depends largely on how quota systems are managed. Increased complexity of quota systems will generally reduce enforceability. The enforcement of time/area closures for the silver eel fishery is considered reasonable.

The LEC reports continuing illegal harvest of glass eels or elvers in the two states where some legal harvest is permitted, and in a number of states where any harvest of eels below a minimum size is prohibited. This is not unexpected given the high dollar value associated with the fishery. Enforcement agencies are dedicating resources to monitor and enforce regulations through stepped up patrols, coordination with local enforcement authorities, and by communicating the importance of glass eel cases to judiciary officials. Specific changes to regulations or statutes that would enhance field enforcement and/or penalties are encouraged, and those that have been implemented (in Maine, for example) have improved the outcome of arrests and convictions. Because of the cross-state nature of illegal glass eel harvest, strengthening of extradition or bail provisions for criminal violations would enhance the deterrent effect of enforcement actions.

5. COMPLIANCE

States and jurisdictions are required to approve regulations that would allow for implementation of a state-specific quota management program and timely monitoring of harvest no later than March 2016. To ensure this happens, state implementation plans that outline quota management programs and timely monitoring measures for eel fisheries are due for Board review and approval at the Commission's 2015 Annual Meeting.

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Appendix A

Determining the coastwide quota and state-by-state allocation

The coastwide quota and allocation is determined through a five step process. First, the quota is initially set at the 2010 harvest levels (978,004 pounds). This year (2010) was chosen as the baseline as it represents the last year of data that was included in the benchmark stock assessment and the assessment recommends reducing mortality from this level. Second, a 16% reduction is applied, bringing the quota to 821,523 pounds.

Third, the average landings for each states and jurisdiction from 2011 – 2013 is calculated. This time period was chosen in order to maintain the current distribution on fishing effort along the coast. The averages for each state and jurisdiction are totaled and then the percent contribution by each state is determined.

Fourth, in order to increase equity in the distribution of the quota, the following criteria is then applied to each state or jurisdictions allocation:

1. States or jurisdictions be allocated a minimum allocated quota fixed at 2,000 pounds in order to provide all state's a quota level sufficient to cover any directed or bycatch landings without creating an administrative burden. The 2,000 pounds quota is not expected to promote a notable increase in effort in the fishery.
2. No state or jurisdiction is allocated a quota that is more than 2,000 pounds above its 2010 commercial yellow eel harvest.
3. No state or jurisdiction is allocated a quota that is more than a 15% reduction from its 2010 commercial yellow eel harvest.

Through this filtering method the quota is updated to 893,909 pounds.

Lastly, the difference between this amount (893,909 pounds) and the TC recommendation (907,669 pounds) is 13,762 pounds. This difference is split equally among the states that are negatively impacted by the quota in comparison to their 2010 commercial harvest (Rhode Island, New Jersey, Delaware, PRFC, and North Carolina) with the exception of Maryland given their high allocation. Each of the specified states is allocated an equal portion of the 13,762 pounds, not to exceed their 2010 landings. This results in a final coastwide of 907,669 pounds.

Table 1. Quota and allocation calculation process.

	2010 Landings	2011-2013 Harvest Average	Initial Allocation Based on Harvest Average	Initial Quota	After Filtering Method is Applied	Final Quota
Maine	2,624	5,104	0.48%	3,943	3,907	3,907
New Hampshire	80	134	0.01%	82	2,000	2,000
Massachusetts	277	450	0.04%	329	2,000	2,000
Rhode Island	4,642	1,750	0.16%	1,314	3,946	4,642
Connecticut	164	2,073	0.19%	1,561	2,000	2,000
New York	13,220	46,058	4.26%	34,997	15,220	15,220
New Jersey	107,803	110,058	10.19%	83,713	91,633	94,899
Delaware	68,666	75,249	6.97%	57,260	58,366	61,632
Maryland	511,201	612,665	56.72%	465,968	465,968	465,968
PRFC	57,755	50,446	4.67%	38,365	49,092	52,358
Virginia	78,076	103,433	9.58%	78,702	78,702	78,702
North Carolina	122,104	53,350	4.94%	40,583	103,788	107,054
South Carolina	2			0	2,000	2,000
Georgia	103	1,162	0.11%	904	2,000	2,000
Florida	11,287	18,231	1.68%	13,802	13,287	13,287
Total	978,004	1,080,160	100%	821,523	893,909	907,669



PAT McCRORY
Governor

DONALD R. VAN DER VAART
Secretary

BRAXTON C. DAVIS
Director

MEMORANDUM

To: ASMFC American Eel Technical Committee

From: Todd Mathes, N.C. Division of Marine Fisheries

Subject: Changes to the May 2016 NC Aquaculture Plan for the 2017 Sampling Season

Date: May 31, 2016

On February 4, the Atlantic States Marine Fisheries Commission's (ASMFC) American Eel Management Board approved North Carolina's Aquaculture Plan for 2016, allowing up to 200 pounds of glass eels to be harvested for aquaculture purposes. The Board reviewed comments provided by the Technical Committee, Advisory Panel, and Law Enforcement Committee on the various merits of the plan prior to its approval. The Board's approval was contingent on two issues (1) export of glass eels will be prohibited, and (2) the first year of the plan will be conducted as a pilot program. During the first year, North Carolina was instructed to work with its industry to identify viable collection sites for glass eels for its use in aquaculture. During the second year, if approved, the state will need to work with the Technical Committee to determine sampling protocols for obtaining glass eel abundance estimates across the identified collection sites.

Prior to being allowed to harvest glass eels under the N.C Aquaculture Plan for American Eel, the American Eel Farm (AEF) was required to petition the N.C. Marine Fisheries Commission for a declaratory ruling that would allow them to possess American eels less than nine inches total length. On February 18, 2016, the N.C. Marine Fisheries Commission approved the declaratory ruling request made by Mr. Rick Allyn on behalf of the AEF allowing the AEF to possess American eels less than 9 inches that are taken from Coastal Fishing Waters in N.C. according to the N.C Eel Aquaculture Plan for American Eel. Once the ruling was granted, the AEF could not begin fishing activities until the official ruling was issued and received by the AEF.

On March 18, 2016, the AEF was notified they would be able to start fishing effective March 21, 2016 and on March 22, 2016 Mr. Allyn received a copy of the official declaratory ruling. Unfortunately, by the time the AEF received permission to harvest, communications from South Carolina commercial fishermen (personal communication, 2016) and fishery-independent data from the NOAA Beaufort Bridgenet Ichthyoplankton Sampling Program (personal communication, Joel Corush, 2016) indicated the run was likely over by mid-March along the N.C. coast. As of April 14, 2016, after three weeks of fishing, AEF had not harvested any glass eels and stopped fishing.



Based on the reasoning that the AEF was unable to start fishing until such a late date in terms of glass eel recruitment along the coast and the AEF did not harvest any glass eels, on May 3, 2016, North Carolina Division of Marine Fisheries (NCDMF) informed the ASMFC American Eel Management Board (Board) at their May 2016 meeting that NCDMF intended to submit a new aquaculture plan as a second year pilot program. Due to late start and zero harvest by the AEF, there is no new information on American eel recruitment to inform the Technical Committee about designing a young-of-year abundance survey. If the Board approves the second year plan, the AEF will be able to deploy nets during the peak recruitment period for glass eels which will provide useful data to the NCDMF and ASMFC as it relates to American eel recruitment along the N.C. coast.

Modifications to the June 2016 NC Aquaculture Plan

1. The number of individuals allowed to harvest glass eels was reduced from three (3) individuals to only one (1) individual or permittee.
2. January 1 through February 28, 2017, fyke and dip nets for glass eel harvest may be fished at all hours during the week. Fyke nets may have their cod end closed during the day, however from 12:01 pm on Friday through 12:01 pm on Sunday, fyke nets may remain in the water but the terminal portion of a fyke net cod end shall contain a rigid device with an opening not less than three (3) inches in diameter and not exceeding six (6) inches in length that is not obstructed by any other portion of the net and dip nets may not be used. This shift in timing preserves the 48-hour rest period.
3. From March 1 through April 30, 2017, fyke and dip nets for glass eel harvest may only be fished and the fyke net cod ends closed from two hours before sunset through two hours after sunrise.
4. Fyke nets shall be fished at least once every twenty-four (24) hours.
5. Require the American Eel Farm (AEF) to record the actual weight of glass eels harvested immediately after fishing each net rather than an estimated weight.
6. Require the AEF to call in to NCDMF Marine Patrol Communications Center before heading back to the departure site with an actual weight of glass eels harvested rather than an estimated weight.
7. Require the AEF to record the weight of elvers captured and released immediately after fishing each net.
8. Require AEF to provide CPUE data from each piece of gear (individual fyke or dip net) by the 10th of the following month instead of at the end of the harvest season.
9. Under General Condition's section in the January 2016 plan, the 2nd bullet was removed at the request of law enforcement personal which stated: Individuals must agree to warrantless inspections and searches of any gear, vessels, equipment, vehicles, and their person.



10. NCDMF has proposed the White Oak River as a primary site which brings the total number from ten (10) to eleven (11). The White Oak River is a data poor area for NCDMF because of its location and has not been previously sampled for American eels. By allowing AEF to sample in this river system, it provides the NCDMF an opportunity to gain valuable knowledge that would enhance our fisheries information in that system. Another reason the NCDMF has proposed the White Oak River is to provide a larger system that has a greater fresh water influence which would potentially increase the likelihood of encountering glass eels. Even though the river system is approximately 40 miles in length, it is still located outside of the Albemarle/Pamlico Sounds and is one of the smaller river systems located along the central North Carolina coast.



North Carolina Aquaculture Plan for American Eel
Pursuant to Addendum IV to the ASMFC Interstate
Fishery Management Plan for American Eel

North Carolina Department of Environmental Quality
Division of Marine Fisheries
PO Box 769
Morehead City, NC 28557

May 2016

BACKGROUND

Globally, the U.S. is a minor producer of aquaculture products, ranking 15th in a United Nations Food and Agriculture Organization report (FAO 2014). It would be beneficial to expand aquaculture in the U.S. as approximately 91% of seafood (by value) consumed in the U.S. originates overseas. Roughly half of this comes from aquaculture and has driven the U.S. seafood trade deficit to over \$11.2 billion annually (NOAA 2016). By passing the National Aquaculture Act of 1980 (and subsequent amendments), Congress put forth that it was in the national interest and the national policy to encourage the development of aquaculture in the U.S.

In the early 1990s North Carolina was one of several states to impose a 6-inch minimum size limit in part to protect elvers/glass eels for local aquaculture while awaiting recommendations on glass eel/elver fishery development that was expected in the Atlantic States Marine Fisheries Commission fishery management plan for American eel (ASMFC 2000). In October 2014 the ASMFC adopted Addendum IV to the Interstate Fishery Management Plan for American Eel (ASMFC 2014;

http://www.asmfc.org/uploads/file//55318062Addendum_IV_American_Eel_oct2014.pdf).

Addendum IV implemented a provision allowing states and jurisdictions to submit an Aquaculture Plan to allow for the limited harvest of American eel glass eels (hereinafter “glass eels”) for use in domestic aquaculture facilities. Specifically, Addendum IV states:

“Under an approved Aquaculture Plan, states and jurisdictions may harvest a maximum of 200 pounds of glass eel annually from within their waters for use in domestic aquaculture facilities provided the state can objectively show the harvest will occur from a watershed that minimally contributes to the spawning stock of American eel. The request shall include: pounds requested; location, method, and dates of harvest; duration of requested harvest; prior approval of any applicable permits; description of the facility, including the capacity of the facility the glass eels will be held, and husbandry methods; description of the markets the eels will be distributed to; monitoring program to ensure harvest is not exceeded; and adequate enforcement capabilities and penalties for violations.”

Pursuant to Addendum IV to the Interstate Fishery Management Plan for American Eel, the North Carolina Division of Marine Fisheries (NCDMF) is submitting the following Aquaculture Plan for approval. The NCDMF has selected tributaries in watersheds where the state can objectively show American eels in these areas minimally contribute to the spawning stock of American eel. Only one aquaculture operation, the American Eel Farm (AEF), has requested to be included in the Aquaculture Plan for consideration.

POUNDS REQUESTED

North Carolina requests to harvest 200 lb. of glass eels, the maximum amount allowed under the Aquaculture Plan provision of Addendum IV to the Interstate Fishery Management Plan for American Eel.

DATES OF HARVEST

Glass eels shall be harvested from January 1, 2017 through April 30, 2017 or until 200 lb. of glass eels are harvested, whichever occurs first.

DURATION OF HARVEST

Since the intent of the NCDMF is for the May 2016 Aquaculture Plan to serve as a second year pilot program the Plan is only valid for one year. The duration of harvest requested is limited to the 2017 glass eel harvest season. A renewal plan will be submitted by June 1, 2017 and at that time additional harvest years will be requested along with any modifications deemed necessary to ensure the success and continued approval of the plan.

METHOD OF HARVEST

NCDMF will limit the number of individuals authorized to harvest under this plan (1 individual or permittee). Glass eels shall be harvested using either fyke nets or dip nets. Fyke nets shall be constructed as follows:

- Shall be thirty (30) feet or less in length from cod end to either wing tip (net length equals the wing length plus the distance from throat to cod end)
- Shall be fitted with netting that measures 1/8-inch bar mesh or less
- Shall contain a ½-inch or less bar mesh excluder panel that covers the entrance of the net
- Shall have no more than two funnels, one cod end, and two wings

Dip nets shall be constructed as follows:

- Shall be no more than 30 inches wide at the widest point of the net mouth
- Shall be fitted with netting that measures 1/8-inch bar mesh or less

To mitigate the harvest of elvers (fully pigmented eels), all captured eels shall be graded upon capture on the water using a 1/8-inch bar mesh non-stretchable grading screen and any eels that fail to pass through the screen will be immediately returned to the water where captured. Any eels that pass through the screen will be harvested and count toward the 200 lb. annual glass eel harvest limit.

MINIMAL CONTRIBUTION JUSTIFICATION

While we have no quantitative data on the abundance of glass eels, it could be argued the harvest of 200 lb. of glass eels in itself is limited enough to have a minimal impact on the spawning stock of American eel (see Appendix 1). Natural mortality is thought to be very high during the early life stages (leptocephalus, glass eel, and elver) due to the high fecundity of American eel (ASMFC 2000, 2012). Assuming a mortality rate of ~97-98%, of the 200 lb. of glass eels proposed to be harvested, approximately 195 lb. would otherwise perish naturally in the wild.

To mitigate the impact to the spawning stock, proposed harvest sites are located in areas that have been impacted by human activity. Development in and along estuaries, rivers, and

streams may have a negative impact on eel health, growth, and survival. Machut et al. (2007) found the condition (weight) of American eels in six tributaries of the Hudson River in New York was significantly lowered with increasing riparian urbanization. Intense urbanization in the watersheds of these creeks and rivers has hardened the natural landscape, limiting their capacity to infiltrate and store rainfall as they did prior to development. Mallin et al. (1998) conducted a four year review of the tidal creeks of New Hanover County, NC where the authors demonstrated a very close parallel between water quality in the creeks and the amount of impervious surfaces in the watershed. Water quality in coastal waters is negatively impacted when the natural landscape is changed by drainage, hardened surfaces, and vegetation removal. Altering the land cover in an area by adding roofs, driveways, parking lots, yards, ditching, cutting down trees and underbrush all drastically change the hydrology of a watershed. Contaminations by heavy metals, dioxins, chlordane, and polychlorinated biphenyls as well as pollutants from nonpoint sources can bioaccumulate within the fat tissues of the eels, causing dangerous toxicity and reduced productivity (Hodson et al. 1994). Unlike discharge from “point sources,” such as water treatment plants, nonpoint source pollution is becoming increasingly difficult to control and regulate as populations in coastal North Carolina continue to increase.

The Shellfish Sanitation and Recreational Water Quality Section of the Division of Marine Fisheries is responsible for monitoring coastal waters as to their suitability for shellfish harvest, and for monitoring and issuing advisories for coastal recreational swimming areas. All of the proposed sites occur in creeks or rivers that are fully or partially closed to shellfish harvest due to unacceptably high levels of fecal bacteria (<http://portal.ncdenr.org/web/mf/shellfish-closure-maps>) and often suffer from chronic, stream-wide oxygen problems. Despite being able to live in a wide range of temperatures and different levels of salinity, American eel are very sensitive to low dissolved oxygen levels (Hill 1969, Sheldon 1974). Shellfish closures and swimming advisories are indicators of poor water quality and some of these waters are classified as “impaired” (Category 4 or 5) under Section 303(d) of the Clean Water Act by the North Carolina Division of Water Resources (NCDWR; <http://portal.ncdenr.org/web/wq/ps/bpu/watershed-plan-map>). These designations were considered when choosing primary and alternate harvest sites as eels in these waters are likely to experience greater physiological stress and potentially higher mortality compared to eels in other areas.

No harvest sites are located within the Albemarle Sound estuarine system. This region's watershed contains the Chowan, Roanoke, and Pasquotank river basins and is approximately 8,000 square miles, encompasses over 5,000 miles of freshwater rivers and streams, and over 930,000 acres of brackish, estuarine waters. The Chowan, Roanoke, and Pasquotank are three major rivers that flow into the Albemarle Sound estuary (APNEP 2016). On average, the Albemarle Sound area has accounted for approximately 96% of yellow eel landings from 2010 – 2014. By directing glass eel harvest away from this area there should be little impact to the existing yellow eel fishery (which presumably occurs in areas of higher yellow eel abundance). In addition, no sites are located within the Tar-Pamlico River Basin. This basin is approximately 6,000 square miles and encompasses over 2,500 miles of freshwater rivers and streams and over 660,000 acres of brackish, estuarine waters.

Glass eels actively migrate toward land and freshwater and ascend rivers during the winter and spring. It has been demonstrated, in European glass eel, that this change in behavior was caused by the detection of the odor of freshwater, as well as temperature gradients (Facey and Van Den Avyle 1987). By limiting the proposed harvest sites to small coastal systems, large areas of freshwater habitat were removed from consideration, thus reducing the potential impact to the overall spawning stock of American eel.

In addition, North Carolina will direct harvest away from protected areas such as National Wildlife Refuges, National Estuarine Reserves, National Forests, National Seashores, North Carolina Coastal Reserves, North Carolina State Parks, North Carolina Preserves, North Carolina Strategic Habitat Areas, and Natural Heritage Natural Areas.

LOCATION OF HARVEST

North Carolina's internal waters are classified as either inland, joint or coastal fishing waters. The North Carolina Marine Fisheries Commission (NCMFC) and NCDMF have jurisdiction of coastal waters while the North Carolina Wildlife Resources Commission (NCWRC) has jurisdiction of inland waters and both agencies (NCWRC and NCMFC/NCDMF) have authority within joint waters. Other than a few specific regulations, none of which pertain to American eel, commercial activities and recreational activities using commercial gear (devices) occurring in joint waters is under the jurisdiction of the NCMFC/NCDMF. For the purposes of this plan, all glass eel harvest will be restricted to either coastal or joint waters (see Table 1 for the downstream boundary coordinates of the proposed harvest sites).

North Carolina will approve eleven (11) primary sites and three (3) alternate sites should there be little or no success harvesting glass eels at the primary sites. Alternate sites will only be used if attempts have been made to harvest from several primary sites and they are found to be unproductive. This will be determined at the discretion of the NCDMF and will take into account the amount of effort put forth at the primary sites, the number of pounds of glass eels harvested, and the timing within the recruitment season.

Primary Sites

North Carolina proposes to direct glass eel harvest to areas likely to minimally contribute to the spawning stock based on criteria such as basin size, waterbody length, habitat condition, and proximity to the Atlantic Ocean (distance from an inlet). Specifically, primary harvest sites will be located in two small coastal river basins, the Lumber and White Oak (Figure 1). These river basins contain smaller watersheds which include; creeks, streams, lakes, reservoirs, and sections of rivers. Proposed primary harvest sites meet one or more of the following conditions: 1) drainage basin includes residential areas, 2) drainage basin includes industrial areas, 3) drainage basin includes agricultural areas 4) small waterbody less than 7 miles in length, 5) proximity to the Atlantic Ocean, or 6) classified as "impaired" by the NCDWR (Table 2).

Directing glass eel harvest to waterbodies in close proximity to the Atlantic Ocean (via inlets) increases the likelihood of harvesting newly recruited glass eels versus elvers compared to more inland areas. In addition, the number of glass eels per pound is higher compared to the number of elvers in a pound. Therefore, if only glass eels are harvested, the aquaculture facility would have a higher yield (in number of eels) available for grow out. Other benefits from directing glass eel harvest to smaller coastal systems include:

- 1) Decrease potential interaction with parasitic swim bladder nematode (Hein et.al., 2015)
- 2) Increased survival in the aquaculture facility if harvested before first feeding event
- 3) Harvested eels coming from impaired areas have not started to feed and bioaccumulate contaminants

Primary Glass Eel Harvest Sites (~ 6.2 miles average length):

- 1.) Bradley Creek, New Hanover County (~2.5 miles; Figure 2, Figure 14)
- 2.) Futch Creek, New Hanover and Pender counties (~2.1 miles; Figure 3, Figure 14)
- 3.) Goose Creek, Carteret County (~1.2 miles; Figure 4, Figure 15)
- 4.) Howe Creek, New Hanover County (~2.8 miles; Figure 5, Figure 14)
- 5.) Mill Creek, Pender County (~0.9 miles; Figure 6, Figure 16)
- 6.) Queen Creek, Onslow County (~6.8 miles; Figure 7, Figure 17)
- 7.) Sanders Creek, Carteret County (~0.9 miles; Figure 8, Figure 15)
- 8.) Saucepan Creek, Brunswick County (~3.2 miles; Figure 9, Figure 18)
- 9.) Shallotte River, Brunswick County (~6.9 miles; Figure 9, Figure 19)
- 10.) Whiskey Creek, New Hanover County (~1.3 miles; Figure 10, Figure 14)
- 11.) White Oak River, Carteret, Craven, Jones, and Onslow Counties (~40 miles, Figure 11, Figure 20)

Alternate Sites

Proposed alternate harvest sites are small creek systems located near the mouth of the Neuse River (Figure 1) and meet one or more of the following conditions: 1) drainage basin includes residential areas, 2) drainage basin includes industrial areas, 3) drainage basin includes agricultural areas, 4) small waterbody less than 7 miles in length or 5) classified as “impaired” by the NCDWR (Table 3).

Alternate Glass Eel Harvest Sites (Neuse River area) (~3.0 miles average length):

- 1.) Dawson Creek, Pamlico County (~5.4 miles; Figure 12, Figure 21)
- 2.) Orchard Creek, Pamlico County (~1.9 miles; Figure 12, Figure 22)
- 3.) Pierce Creek, Pamlico County (~1.7 miles; Figure 13, Figure 23)

MONITORING PROGRAM

In addition to Aquaculture Operations/Collection Permit General Conditions in rule (NCMFC Rule 15A NCAC 03O .0502) and Aquaculture Operations/Collection Permits Specific Permit Conditions (NCMFC Rule 15A NCAC 03O .0503 F), to monitor and regulate the harvest of glass eels, the NCDMF will issue an Aquaculture Collection Permit (ACP) to the AEF with additional permit conditions specific to the N.C. Aquaculture Plan that only apply while engaged in glass eel harvest (ACP) or grow out (AOP) activities authorized under the N.C. Aquaculture Plan for American Eel. To aid in monitoring and enforcement the NCDMF will limit the number of individuals authorized to harvest under the ACP (1 individual or permittee). The permittee listed on the ACP must possess a valid North Carolina Standard Commercial Fishing License (SCFL) or Retired Standard Commercial Fishing License (RSCFL) issued by the NCDMF. Only the permittee listed on the ACP shall participate in the harvest of glass eels. Any vessels used for glass eel harvest under the ACP shall have a valid North Carolina Commercial Fishing Vessel Registration (CFVR) issued by the NCDMF. Restrictions will be placed on the ACP requiring certain conditions and procedures to be followed, such as:

General Conditions

- Glass eels harvested from N.C. coastal fishing waters shall not be exported until they reach the minimum legal size of nine inches total length.
- No more than one (1) permittee shall be authorized to harvest under the ACP
- No more than two (2) mates will be allowed to assist the permittee while fishing for glass eels
- The permittee and vessel participating in the glass eel harvest must be properly licensed by the NCDMF and abide by all fisheries rules and permit conditions
- Fyke nets and dip nets are the only gear authorized to use for glass eel harvest under the ACP
- No more than fifteen (15) fyke nets and/or dip nets in combination may be fished by the permittee under the ACP
- A fyke net may not be placed within fifty (50) feet of any part of another fyke net
- All gear shall be removed from the water from 12:01 pm on Friday through 12:01 pm on Sunday. This creates a 48-hour rest period to allow glass eels to migrate up these smaller systems to help minimize the impact to the spawning stock.
- January 1 through February 28, 2017, fyke and dip nets for glass eel harvest may be fished at all hours during the week. Fyke nets may have their cod ends closed during the day, however from 12:01 pm on Friday through 12:01 pm on Sunday fyke nets may remain in the water but the terminal portion of a fyke net cod end shall contain a rigid device with an opening not less than three (3) inches in diameter and not exceeding six (6) inches in length that is not obstructed by any other portion of the net and dip nets may not be used. This creates a 48-hour rest period to allow glass eels to migrate up these smaller systems to help minimize the impact to the spawning stock.
- Fyke nets shall be fished at least once every twenty-four (24) hours
- March 1 through April 30, 2017, fyke nets and dip nets for glass eel harvest may only be fished and the cod ends closed from two hours before sunset through two hours after sunrise
- During the March 1 through April 30, 2017 period, from two hours after sunrise through two hours before sunset the gear may remain in the water and the terminal portion of a fyke net cod end contain a rigid device with an opening not less than three (3) inches in diameter and not exceeding six (6) inches in length that is not obstructed by any other portion of the net
- Tamper evident tags shall be used to secure the cod ends of the net closed while the gear is fishing
- Tamper evident tags shall be used to secure the cod ends open when the gear is not fishing
- Immediately report to NCDMF if a net is tampered with including the Net_ID and location of the net and the date and time it was noticed
- Report to NCDMF the Net_ID for each fyke net when removed from the water. If a net is moved, the new coordinates must be reported once the net is reset. If multiple nets are moved the same day, coordinates may be provided once all the nets have been reset. If a net(s) is removed and not reset, it must be reported upon returning to the landing site.
- Purchased American eels (glass eels, elvers, or yellow eels) shall be kept separate from eels that were harvested as glass eels within N.C. and grown out to yellow eels
- All gear and harvest restrictions detailed in the Method of Harvest section will be listed as conditions under the ACP

Before Harvest

Fishermen harvesting glass eels under the ACP shall call-in to NCDMF the following information:

- GPS coordinates of each net once they are set, if multiple nets are set the same day, coordinates can be provided once all the nets have been set.
- Daily:
 - Landing site they will be leaving from and returning to once fishing activity is complete
 - Names of individual(s) involved
 - Number of fyke nets (including assigned Net_ID) and dip nets that will be used
 - Description and registration number of the boat(s) to be used for harvest
 - Description and license plate number of the vehicle(s) to be used for transport

During Harvest

- Require the use of a 1/8-inch bar mesh non-stretchable mesh grading screen to cull the glass eels at the harvest site to limit the harvest of elvers
- Record the time the gear began and ended fishing, and the number of pounds of glass eels harvested from each piece of gear (individual fyke or dip net). These data will be used to calculate catch-per-unit-effort (CPUE).
- Record the weight of elvers captured from each piece of gear

After Harvest

- Require fisherman harvesting glass eels under the ACP to call-in to NCDMF the total harvest in pounds prior to leaving the last harvest site and report an estimated time of arrival (within a 15 minute time frame) at the landing site. Zero pounds shall only be reported if no glass eels are harvested.
- Once all gear is fished, the fisherman must travel directly to the designated landing site
- Once at the designated landing site all eels must be offloaded and transported directly to the AEF facility
- Require AEF to hold all glass eels that perish during transport to the facility and all eels that perish in the facility for inspection
- All glass eels that perish during transport will count against the 200 lb. harvest limit
- Require AEF to call-in or email to NCDMF by 12:00 pm (noon) each day the total harvest for the previous day in pounds to the nearest 0.1 lb. of glass eels received (including those days when no glass eel harvest occurred). Zero pounds shall only be reported if no glass eels are harvested and received.
- Require AEF to provide CPUE data from each piece of gear (individual fyke or dip net) by the 10th of the following month.

The above conditions and procedures will allow the NCDMF to limit the effort (amount of gear and number of individuals) involved in glass eel harvest under the Aquaculture Plan. Dual reporting by the fishermen on the water and by the AEF will allow the NCDMF to monitor the 200 lb. glass eel harvest limit. These controls will allow the NCDMF to ensure the glass eel harvest does not exceed what is authorized in the Aquaculture Plan. Any harvest that exceeds the 200 lb. harvest limit shall be immediately returned to the water where captured.

ENFORCEMENT CAPABILITIES AND PENALTIES FOR VIOLATIONS

The North Carolina Marine Patrol has four officers stationed in Brunswick County, three officers in New Hanover County, two officers in Pender County, three officers in Onslow County, six officers in Carteret County, two officers in Craven County, and two officers in Pamlico County.

Violations of the ACP permit conditions will be addressed according to the NCDMF SOP for Permit Violations and suspensions will be carried out in accordance with NCMFC Rule 15A NCAC 03O .0504 (see Appendix II).

All charges for violations will be charged under N.C. General Statute § 113-187 (d) (4): Violating the provisions of a special permit or gear license issued by the Department. All fines will be at the discretion of the court, however, fines may not always be levied for the first offense.

The call-in requirements under the Monitoring Program section will allow enforcement officers to know when and where lawful harvest is occurring. It will also allow for random inspections to take place at the harvest and landing sites to ensure the conditions of the permit and all applicable NCMFC rules and regulations are being followed. Random inspections will also be performed at the aquaculture facility to ensure the proper records are being kept to account for all eels in the facility as required under N.C. General Statute § 113-170.3 and NCMFC Rule 15A NCAC 03O .0502 (8) (see Appendix III).

SIZE LIMIT EXEMPTION

The intent is to raise the eels as close as possible to the legal minimum size of 9 inches total length prior to sale. Given the difficulty in measuring live eels, prior to sale, all eels shall be graded using a ½-inch by ½-inch non-stretchable mesh grading screen. Any eels that do not pass through the grading screen may be sold and any that pass through the grading screen shall remain in the possession of the AEF until such time as the eels are large enough to not pass through the grading screen. On inspection, a 10% tolerance by number will be allowed for eels that pass through the grading screen.

PRIOR APPROVAL OF PERMITS

The AEF has all necessary permit approvals in place with the exception of an Aquaculture Collection Permit from the NCDMF. This permit will be issued upon approval of the Aquaculture Plan by the ASMFC American Eel Management Board. The permits currently held by the AEF are:

- North Carolina Department of Agriculture Aquaculture Operation Permit valid until 2017
- North Carolina Division of Marine Fisheries Aquaculture Operation Permit renewed annually. To be eligible for an ACP, an Aquaculture Operation Permit is required (see Appendix IV: NC Marine Fisheries Commission (NCMFC) Rule 15A NCAC 03O .0501 (e))
- US Fish & Wildlife Import / Export permit renewed annually
- North Carolina Division of Marine Fisheries Standard Commercial Fishing License
- North Carolina Division of Marine Fisheries Dealer License
- North Carolina Farmer Tax Exempt Permit

As noted in NCMFC Rule 15A NCAC 03O .0501 the appropriate licenses from the Division of Marine Fisheries must be held by the permittee. A North Carolina Standard Commercial Fishing license is required to fish commercial gear such as fyke nets, a Commercial Fishing Vessel Registration (CFVR) is required for vessels used to harvest seafood and a Dealer License is required to sell fish taken from the coastal fishing waters.

DESCRIPTION OF THE MARKET

The AEF indicated they have identified clients for food and bait markets domestically as well as overseas. The long-term intent is to develop and expand the US domestic market as much as possible. For proprietary business reasons specific details were not provided.

DESCRIPTION OF THE FACILITY

American Eel Farm

Design, Capacities and Technical Facts

The AEF, located in Trenton, North Carolina, is a state-of-the-art Recirculated Aquaculture System (RAS) which has been operating since 2003 (<https://www.youtube.com/watch?v=4YnQn7aivw4>). It is a proven Danish system designed overseas for eel grow-out and imported to the US. The AEF was initially operated in North Carolina as the North Carolina Eel Farm (corporate filing date May 21, 2002). The facility has a 13-year operation history. There is no other facility specifically designed to grow out glass eels to yellow eels at a commercial level in the US. The facility has the capacity to grow out in excess of 900 pounds of glass eels. There is historical proprietary data on a large scale commercial level that no current fish farm, University, or government agency in the US can match.

The facility has three separate closed recirculating systems. The two main systems are identical RAS units each containing twelve (12) 1,000 gallon tanks and independent water treatment systems for both RAS units. Each RAS contains twelve (12) raceway tanks with 900 US usable gallons. The tanks are not operated at full capacity since eels are capable of escaping the tanks. Each raceway tank is equipped with a fine mesh screen outlet cover with a motorized brush system, to keep the mesh clean. In each tank there are also water level switches that activate an alarm if the water level gets too high. Each tank is outfitted with aeration and back-up emergency oxygen lines which automatically activate in case of a power outage. Each tank also has the ability to be isolated from the system and individually cleaned if necessary without draining entire system.

There are three automatic feeders for the first three tanks that are ideal for the small eels. As they are graded the larger eels can be fed by hand or additional automatic feeders can be installed.

There is a new (1 year old) Pacific Oxyguard water quality monitoring system that monitors pH and oxygen saturation levels. The system has the ability to send alarms remotely and is programmed to call to a farm manager's cell phone if oxygen levels drop or the pH levels

fluctuate. The system can be expanded by adding more test probes and programming if desired.

This system design is based on proven *Anguilla anguilla*, *A. mossambica*, *A. bicolor* and *A. marmorata* aquaculture techniques. The systems are technically sound, energy efficient, and easy to operate. The system has been successful with American eels as proven by recorded growth rates, low food conversions and low incidence of disease and mortality.

Attached to those 24 tanks is a complete water treatment unit equipped with a HydroTech drum filter type 803 / 40 micron mechanical filtration unit. This unit has a max flow of 31,500 gal/hour or 63,000 gal/hour if both sections are in operation. The two drum filters sieve feces and other large particles out of the water. The filters are continuously sprayed (adjustable timing possible) with water to self-clean. The waste water runoff from this event drains into a small channel within the drum filter and then drains into a system pipe which gravity feeds into the main channel in the tank room that runs the full distance from tank #1 to tank #24 where the waste water is then pumped into a small pond on the property by a sump pump through a 12" PVC drain pipe.

After mechanical filtration, water is gravity fed into 2 parallel 18 foot tall silos (four total for both sections) with patented Inter Aqua Advance (IAA) A/S Moving Bed Bio Reactor (MBBR) technology for biological treatment of the water (removal of ammonia and dissolved organic matter). Each silo has a volume of 1,300 gallons and is 55 % filled with IAA bio-curler bio media. This technology is superior to simple trickling filter bioreactors in that the attached blower motors run constantly to keep the media moving. This also acts as a self-cleaning process within the silos and contributes to the CO₂ stripping process.

With an optimum temperature for the growth of the eel at 24 degree C. or 74 degree F. The water treatment unit will be able to handle up to 250 lb. dry feed per day per section (500 lb. per day total). After the MBBR water flows by gravity into a common pump sump.

The water can be circulated with 3 separate pumps (per section, 6 pumps total), one 3 HP Low Head main pump and two 3 HP medium pressure pumps with 20 psi into two oxygen-cones (per section 4 total) for supersaturating of liquid oxygen into the water. In total the 3 pumps give a minimum flow capacity of 31,500 gal/hour (63,000 gal/hour total).

There is a carbon dioxide stripper for tanks #1 - #24 which has counter flow packed tower technology and utilizes structured packing of vacuum formed sheets of PVC. These packing's will provide maximum wettability, thereby maximizing the stripping effort.

The UV system has recently had the bulbs updated. The water passes through the device and the UV lighting assists in disinfecting the water by destabilizing the DNA of germicidal bacteria. However there have been reports that a UV disinfection system is not needed with eels so this system may be reconsidered.

There is a back-up liquid oxygen system tied into the main oxygen source with two air stones per raceway as a safety net. It is serviced simply by attaching the flow meter to a large liquid oxygen tanks. Should there be the need, the main liquid oxygen source would back feed the tanks with 150 PSI automatically.

The system is supported by three deep water wells all of which are operable and are wired with three phase wiring for better conservation as well as on independent breakers so as to always allow for a water source to be actively supplying water. One is about 300' deep and the other

two about 200'. Additionally, there is public water tied into the facility. There is a heating system that can heat the water entering from the wells prior to entering the main water source if needed by passing heated water through several tubes mounted in the well reserve tanks for both sections. These well reserve tanks are equipped with automated on/off valves allowing water to be called automatically from the well when the water level reaches a preset level.

The water is distributed back to the raceway tanks via a common pipe manifold situated on the wall at the end of the tanks, with a separate valve to each tank for maintenance. A flow rate of 31,500 gal/hour (per system or 63,000 gal/hour total) will give an exchange rate of 3 to 5 times/hour to maintain self-cleaning and an adequate oxygen level in the raceway.

There is a third system which has two large 9,000 gallon tanks supported by similar filtration, aeration and small bio-reactors. This system is separate from the other two. Total capacity for AEF is about 50,000 gallons with about 40,000 being usable. Additionally, there is plenty of room to expand on the flat 2 acre site on which the facility is located. With 226 days a year of sun and a mean annual temperature of 70 degrees there is also a great opportunity to develop a medium to large scale aquaponics system on site.

In addition to the main tank room and the state-of-the-art water treatment room there is a main office area, sales office area, a furnished residential area, a full bathroom with laundry, a feed room, packaging room, a mechanical room, an electrical room, storage rooms and two large covered exterior areas one @ 15' X 85' and the other @ 15' X 50'. The grounds are gated and there is a security system with 16 infrared cameras capable of being viewed remotely. The facility has cable connections for internet and TV as well as two satellites for backup. The steel building construction is insulated with pressed foam to help minimize temperature fluctuations on hot or cool days. There is a heating system but it is not necessary to use when system is running due to local climate and the ground water temp of 68 degrees.

With the general geographic location being the Southeast USA along with the well-insulated building the water temperature for maximum growth rate could be efficiently maintained. Trenton, NC has a climate that is very suitable to aquaculture/agriculture in general. The annual average mean temperature is 70 degrees where the ideal temp for grow-out of eels is 74 degrees. There is no snow fall (very rare) and few days below freezing (very rare).

Eel Grow Out

Eels can be stocked in high densities in the raceway tanks. Stocking densities of 300 kg/m³ or 2(+)³ lb./gal are often seen in eel farms. It is estimated that juvenile eels have an oxygen demand of 300 mg/kg/hour. The liquid oxygen system at the AEF is sufficient to reduce mortality and sustain eels in high densities. Estimated grow out time from the glass eel phase to 9 inches averages around 210 days. Individual eels grow at different rates so total grow out time will be longer. Due to the varying growth rates it is estimated that one-third of the eels will be harvested in 5 - 7 months, another group will be harvested at 8 - 10 months, and the rest will be harvested at 11 - 12 months after harvest.

A large mobile stainless steel grading machine in the main tank room will be used to grade the eels every four to six weeks. A well-managed RAS eel farm can expect a weaning rate of 80 - 90%. Eels feed ratio is greater than 1:1 in most studies depending on the amount of protein in the feed. There are studies in Japan and China that show a faster grow out however this outline is one the AEF is comfortable with.

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TABLES

Table 1. Proposed harvest sites downstream boundaries.

Harvest Site	Point # 1		Point # 2	
	Latitude	Longitude	Latitude	Longitude
Bradley Creek	34° 12.539'N	77° 49.222'W	34° 12.239'N	77° 49.448'W
Futch Creek	34° 18.124'N	77° 44.375'W	34° 17.989'N	77° 44.496'W
Goose Creek	34° 41.564'N	77° 0.326'W	34° 41.361'N	77° 0.966'W
Howe Creek	34° 14.908'N	77° 47.212'W	34° 14.849'N	77° 47.234'W
Mill Creek	34° 20.556'N	77° 42.124'W	34° 20.421'N	77° 42.245'W
Queen Creek	34° 40.202'N	77° 8.442'W	34° 39.850'N	77° 9.110'W
Sanders Creek	34° 42.414'N	76° 57.937'W	34° 42.267'N	76° 58.506'W
Saucepan Creek	33° 54.679'N	78° 22.819'W	33° 54.606'N	78° 22.932'W
Shalotte River	33° 54.612'N	78° 21.777'W	33° 54.828'N	78° 22.365'W
Whiskey Creek	34° 9.462'N	77° 51.201'W	34° 9.280'N	77° 51.424'W
Dawson Creek	34° 59.585'N	76° 45.397'W	34° 59.595'N	76° 45.454'W
Orchard Creek	35° 3.491'N	76° 38.289'W	35° 3.334'N	76° 38.461'W
Pierce Creek	35° 2.447'N	76° 39.734'W	35° 2.371'N	76° 39.785'W
White Oak River	34° 40.929'N	77° 6.737'W	34° 41.241'N	77° 7.028'W

Table 2. Sub Basin and stream characteristics for proposed primary harvest sites.

Sub Basin Unit 14-Digit HUC*	Site Name	Site Type	Sub Basin					Stream							
			Square Acres	Percent Miles	Percent Urban	Percent Agricultural	Percent Developed	Stream Length (approx. miles)	Surface Water Acres	Shellfish Harvest Prohibited - Prohibited Territory Map	Distance to Atlantic Ocean (miles)	Overall Category	Reason Impaired	Coastal/Joint/Inland Waters	
03020106020060	Queen Creek (entrance)	Primary	22,549	35.3	18	13	31	6.8	915	small area not prohibited (entrance)	2.9	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)	coastal (main stem)	
	Queen Creek (lower)							6.8		small area not prohibited (entrance)		Impaired (Cat 4)	Shellfish, Fish Tissue (Hg)		
	Queen Creek (mid) Queen Creek (upper)									prohibited		Impaired (Cat 4)	Shellfish, Fish Tissue (Hg)		
03020106020040	Sanders Creek (lower)	Primary	8,146	12.8	31	8	39	0.9	73	lower section not prohibited	9.3	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)	coastal (main stem)	
	Sanders Creek (mid) Sanders Creek (upper)									prohibited		Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)		
	Goose Creek (lower)	Primary						1.2	233	lower section not prohibited	6.9	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)	coastal (main stem)	
	Goose Creek (upper)									prohibited		Impaired (Cat 5)	Shellfish, Fish Tissue (Hg), Enterococcus		
03030001040010*	Mill Creek (lower)	Primary	51,667	80.8	18	6	24	0.9	112	prohibited	3.2	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)	coastal (main stem)	
	Mill Creek (upper)									prohibited		Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)		
03030001040020*	Futch Creek (lower) Futch Creek (upper)	Primary	44,860	70.2	43	1	44	2.1	155	prohibited	2.6	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)		
	Howe Creek (Moore Creek)	Primary						2.8	305	prohibited	1.3	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg), Enterococcus, Dissolved Oxygen, pH, Turbidity, Chlorophyll a	coastal (main stem)	
	Bradley Creek (lower)	Primary						2.5	275	prohibited	2.2	no data, Category 4 Hg Only	Fish Tissue (Hg)	coastal (main stem)	
	Bradley Creek (upper)									prohibited		Inconclusive Data (Cat 3)	Fish Tissue (Hg)		
	Whiskey Creek	Primary						1.3	72	prohibited	3.5	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg), Enterococcus	coastal (main stem)	
	03040207020060	Shalotte River (lower)	Primary	41,271	64.6	17	10	27	6.9	795	lower section not prohibited	1.3	Impaired (Cat 4)	Shellfish, Fecal Coliform, Fish Tissue (Hg), Mercury, Lead, Nickel, Copper, Zinc, Chromium, Cadmium, Arsenic, Dissolved Oxygen, Water Temperature, pH, Turbidity	coastal (main stem)
	Shalotte River (mid)									prohibited		Impaired (Cat 4)	Shellfish, Fecal Coliform, Fish Tissue (Hg)		
	Shalotte River (upper)									prohibited		Impaired (Cat 4)	Shellfish, Fecal Coliform, Fish Tissue (Hg)		
03040207020090	Saucepan Creek	Primary	6,488	10.2	17	3	20	3.2	86	prohibited	0.7	Impaired (Cat 4)	Shellfish, Fecal Coliform, Fish Tissue (Hg)	coastal (main stem)	
03020106010010	White Oak River (lower)	Primary	41,270	285.1	5	25	30	40	9,475	lower section not prohibited	3.7	Impaired (Cat 4)	Shellfish, Fish Tissue (Hg)	coastal (main stem)	
03020106010020	White Oak River (mid)									prohibited		Impaired (Cat 5)	Shellfish, Fecal Coliform, Fish Tissue (Hg), Mercury, Lead, Nickel, Copper, Zinc, Chromium, Cadmium, Arsenic, Water Temperature, pH, Turbidity	coastal (main stem)	
03020106010040										prohibited		Impaired (Cat 5)	Shellfish, Fecal Coliform, Fish Tissue (Hg)		
03020106010031											prohibited		Impaired (Cat 5)	Shellfish, Fecal Coliform, Fish Tissue (Hg)	
03020106010030											prohibited		Impaired (Cat 5)	Shellfish, Fecal Coliform, Fish Tissue (Hg)	
03020106010060											prohibited		Impaired (Cat 5)	Shellfish, Fecal Coliform, Fish Tissue (Hg)	
03020106010050	White Oak River (upper)									prohibited		Supporting (Cat 2)		inland (upper)	
03020106010070										prohibited		Supporting (Cat 2)		inland (upper)	
03020106020020	White Oak River (upper)									prohibited		Supporting (Cat 2)		inland (upper)	

*Indicates the sub-basin contains multiple waterbodies (streams) and the numbers presented are for the sub-basin as whole and not the individual harvest site.

Table 3. Sub Basin and stream characteristics for proposed alternate harvest sites.

Sub Basin Unit 14- Digit HUC*	Site Name	Site Type	Sub Basin				Stream							
			Acres	Square Miles	Percent Urban	Percent Agricultural	Percent Developed	Stream Length (approx. miles)	Surface Water Acres	Shellfish Harvest Prohibited - Territory Map	Distance to Atlantic Ocean (miles)	Overall Category	Reason Impaired	Coastal/Joint/Inland Waters
03020204060020*	Orchard Creek	Alternate	30,685	48.0	1	4	5	1.9	123	prohibited	35.3	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)	coastal
03020204060010*	Pierce Creek	Alternate	20,349	31.8	4	12	16	1.7	59	prohibited	36.8	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg)	coastal
03020204040010	Dawson Creek (lower)	Alternate	21,288	33.3	5	25	30	5.4	355	prohibited	42.6	Impaired (Cat 5)	Shellfish, Fish Tissue (Hg), Enterococcus, Recreation Advisory	coastal (lower)
	Dawson Creek (mid)											Supporting (Cat 2)		inland (upper)
	Dawson Creek (upper)											Impaired (Cat 5)	Fish Tissue (Hg), Benthos Severe	inland (upper)

*Indicates the sub-basin contains multiple waterbodies (streams) and the numbers presented are for the sub-basin as whole and not the individual harvest site.

FIGURES

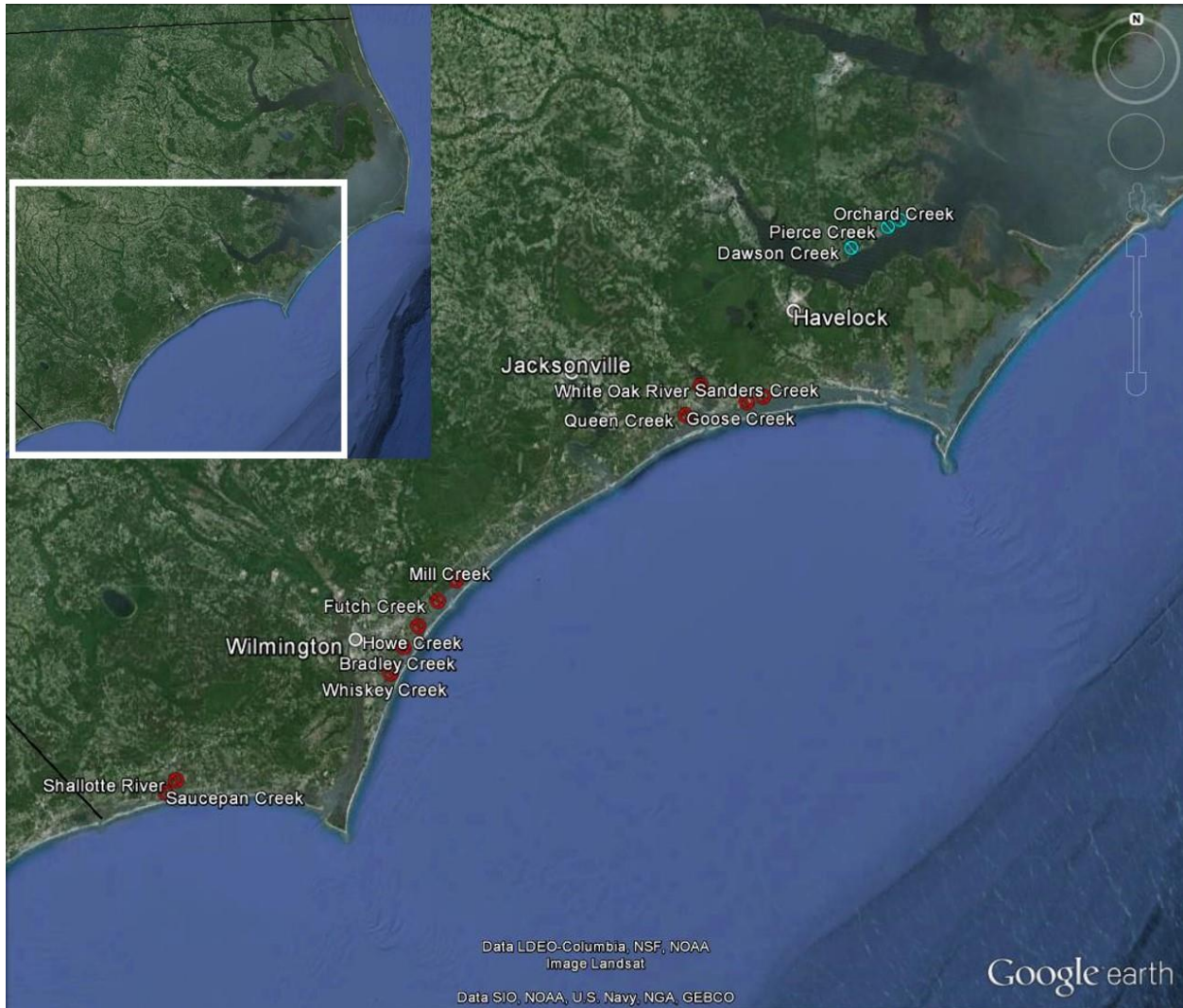


Figure 1. General location of proposed primary (red circles) and alternate (blue circles) harvest sites along the North Carolina coast.

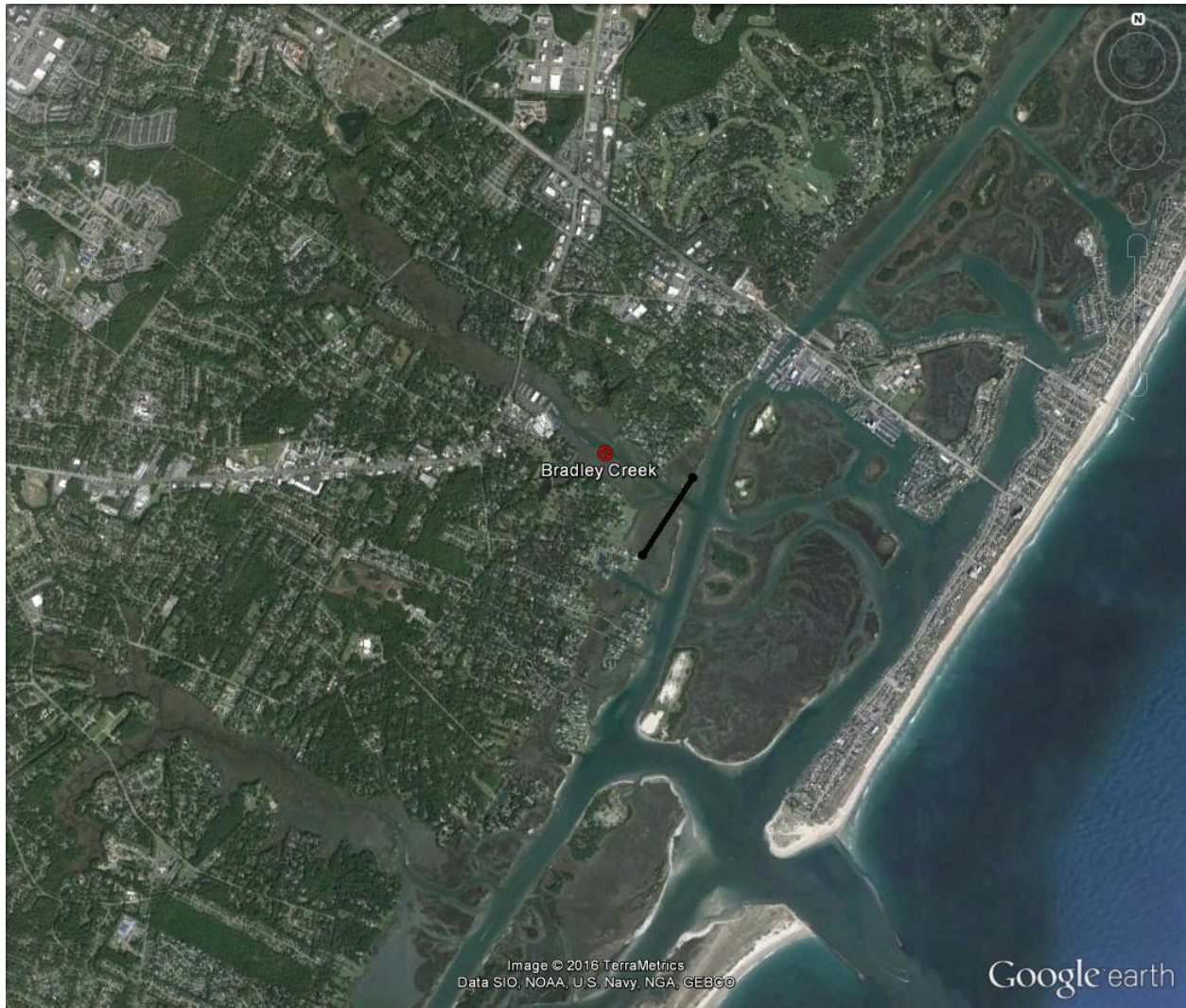


Figure 2. Bradley Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

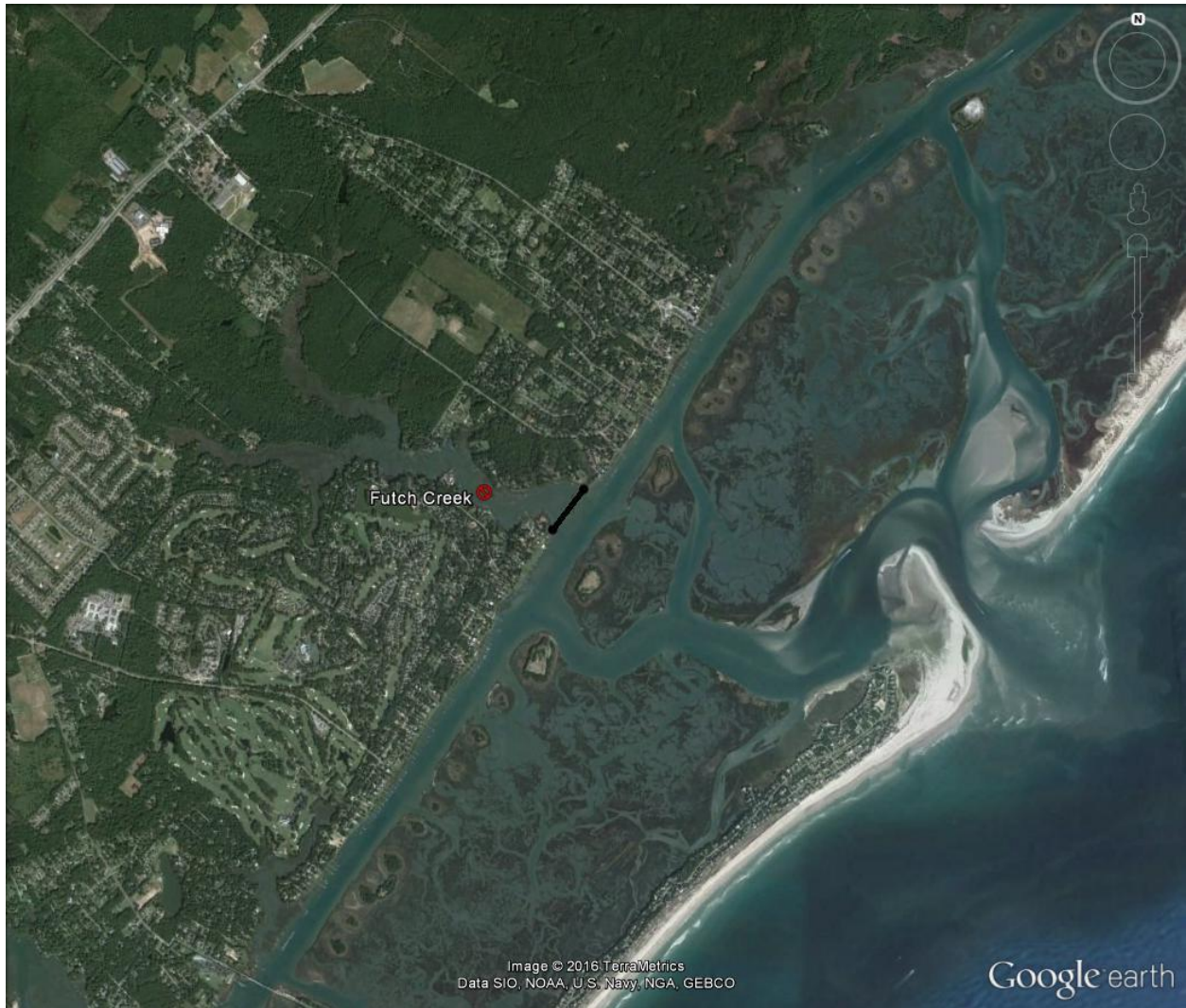


Figure 3. Futch Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

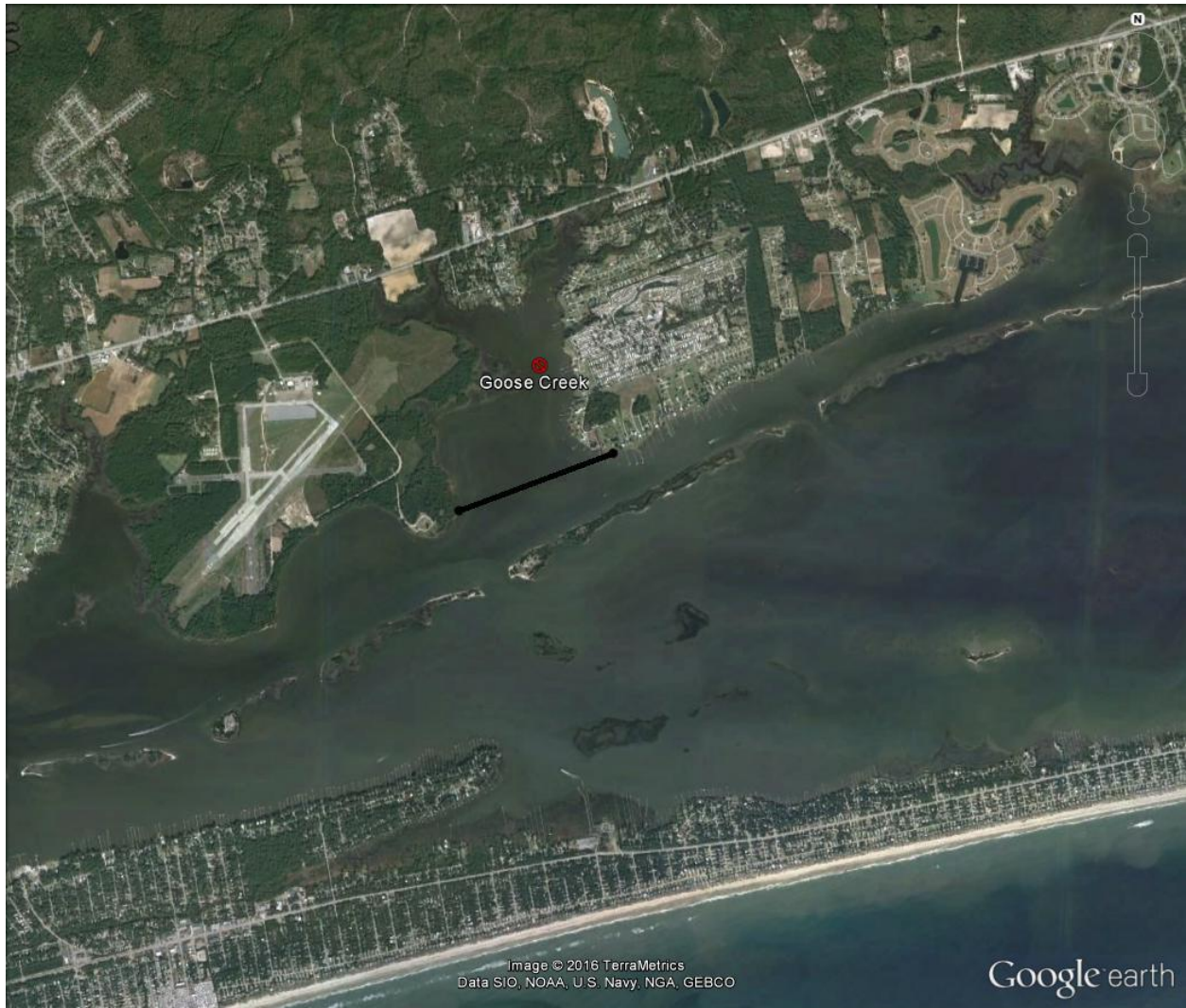


Figure 4. Goose Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

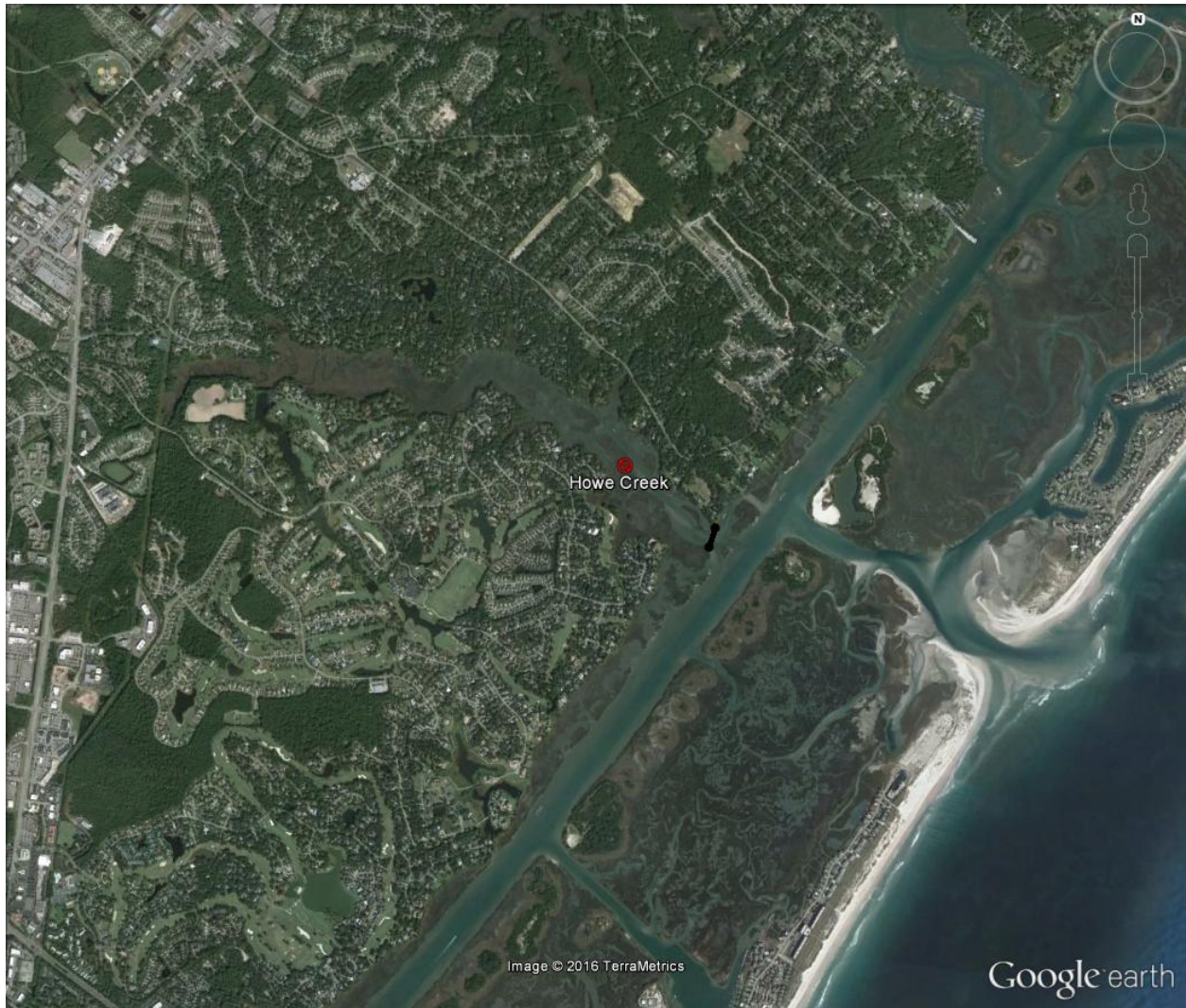


Figure 5. Howe Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

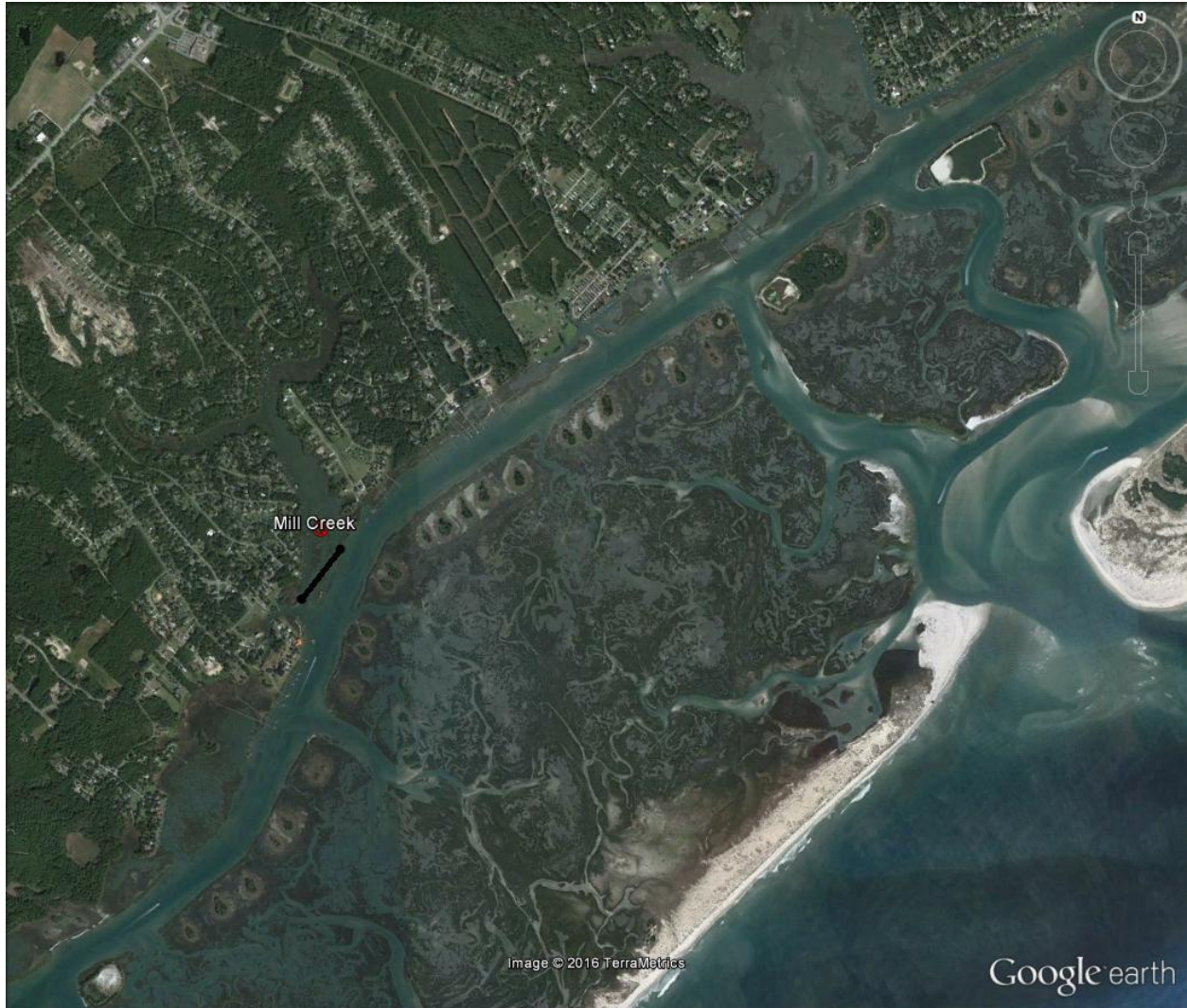


Figure 6. Mill Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

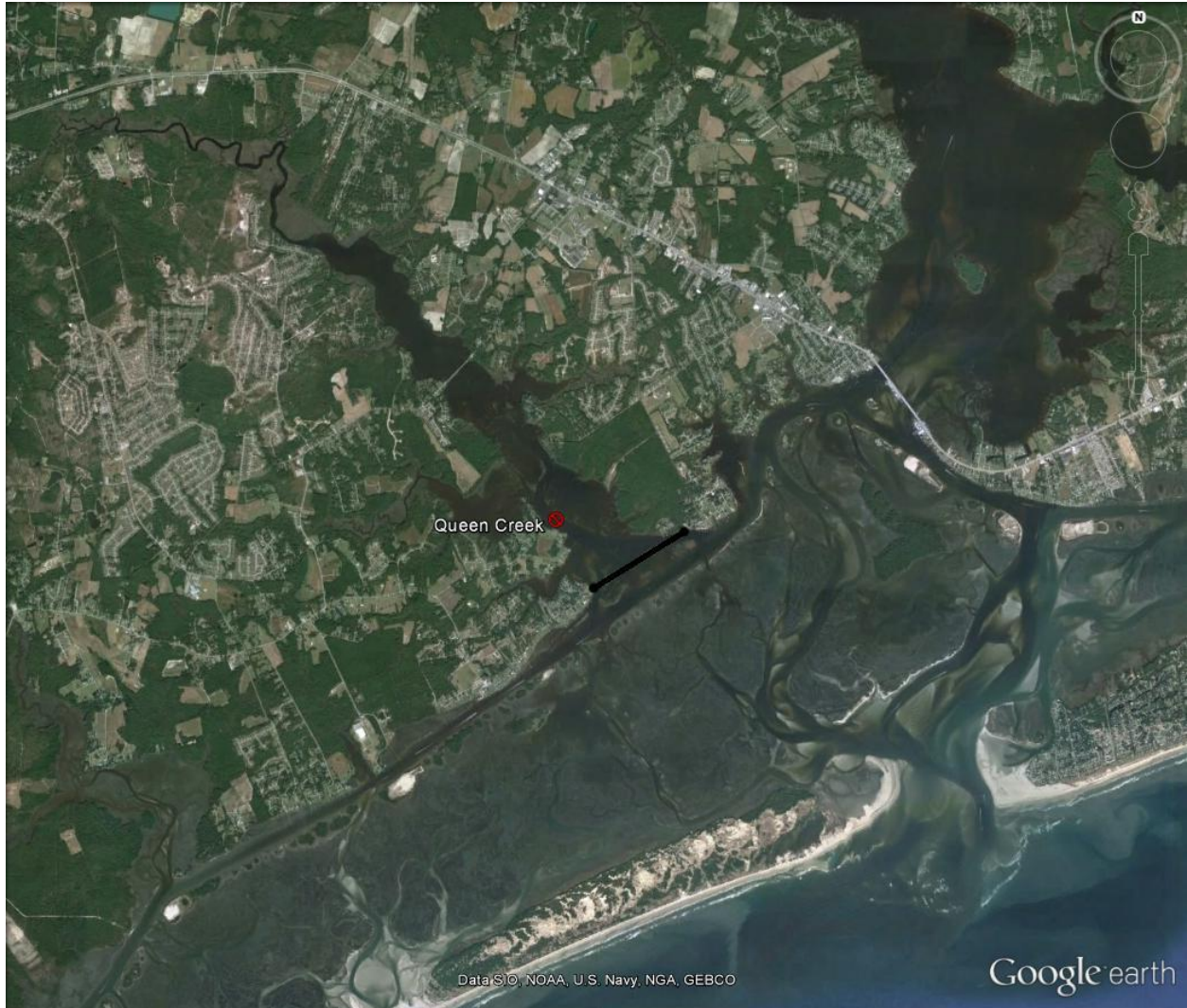


Figure 7. Queen Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

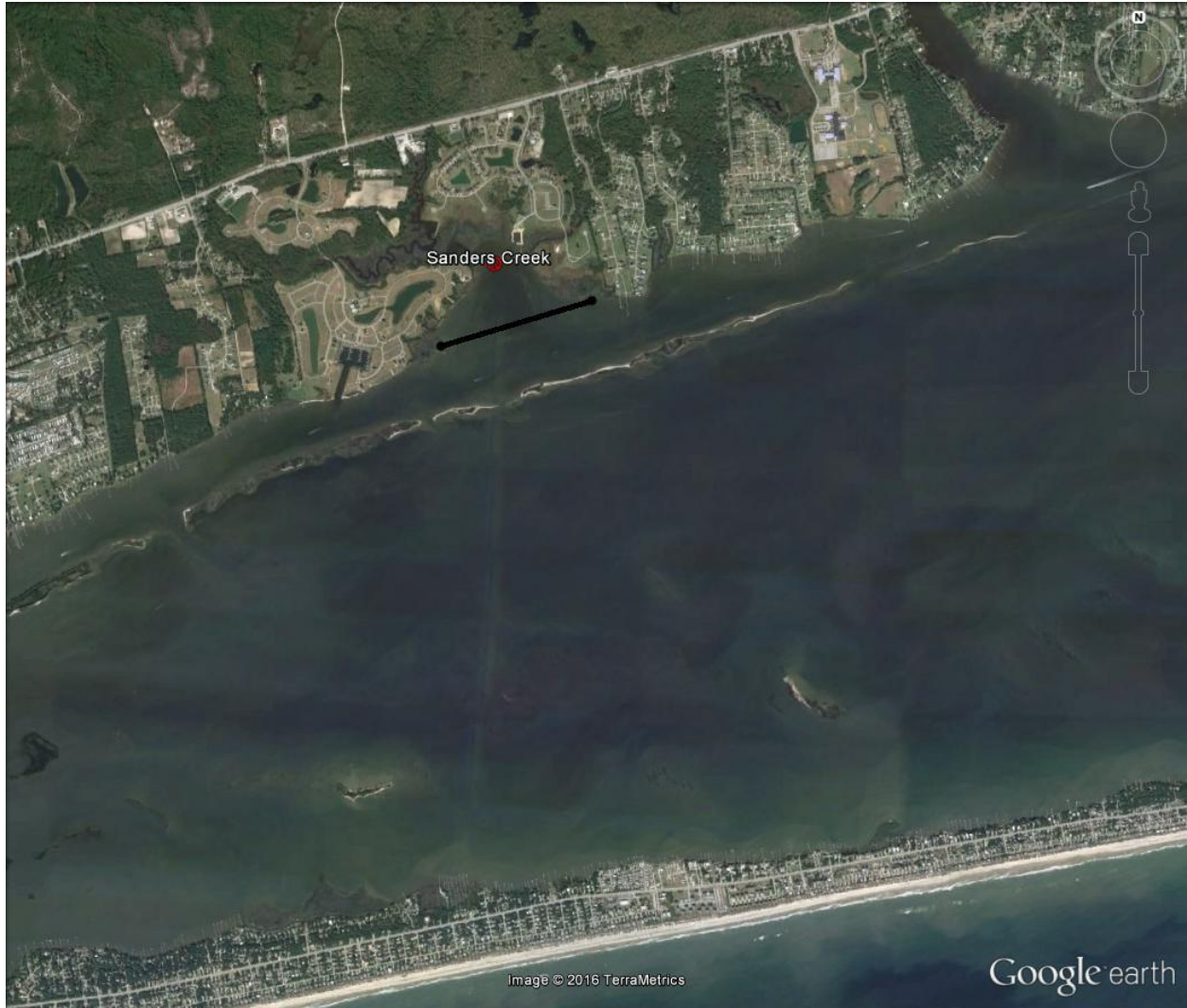


Figure 8. Sanders Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

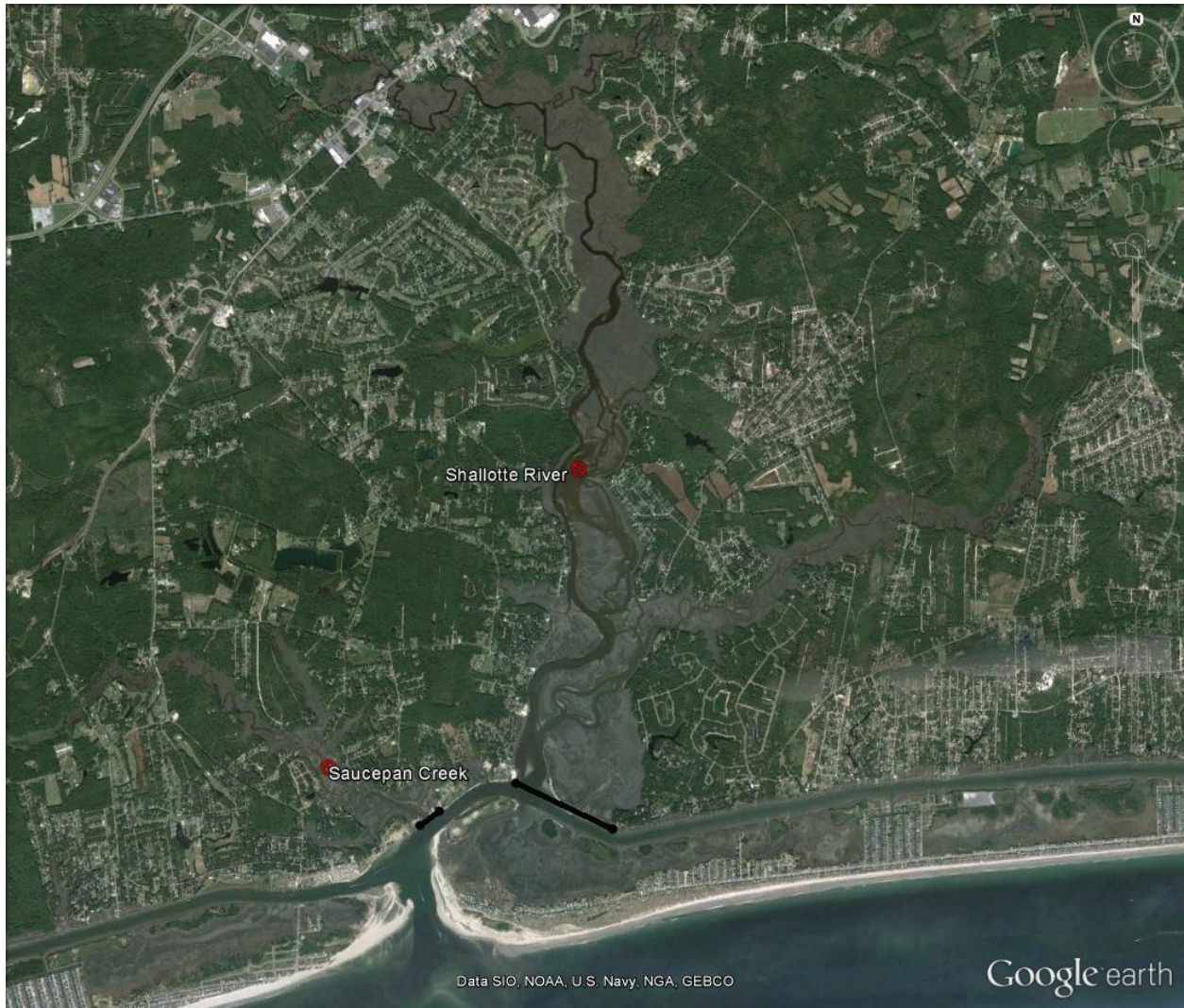


Figure 9. Saucepan Creek and Shallotte River harvest sites. The solid lines represent the downstream glass eel harvest boundaries

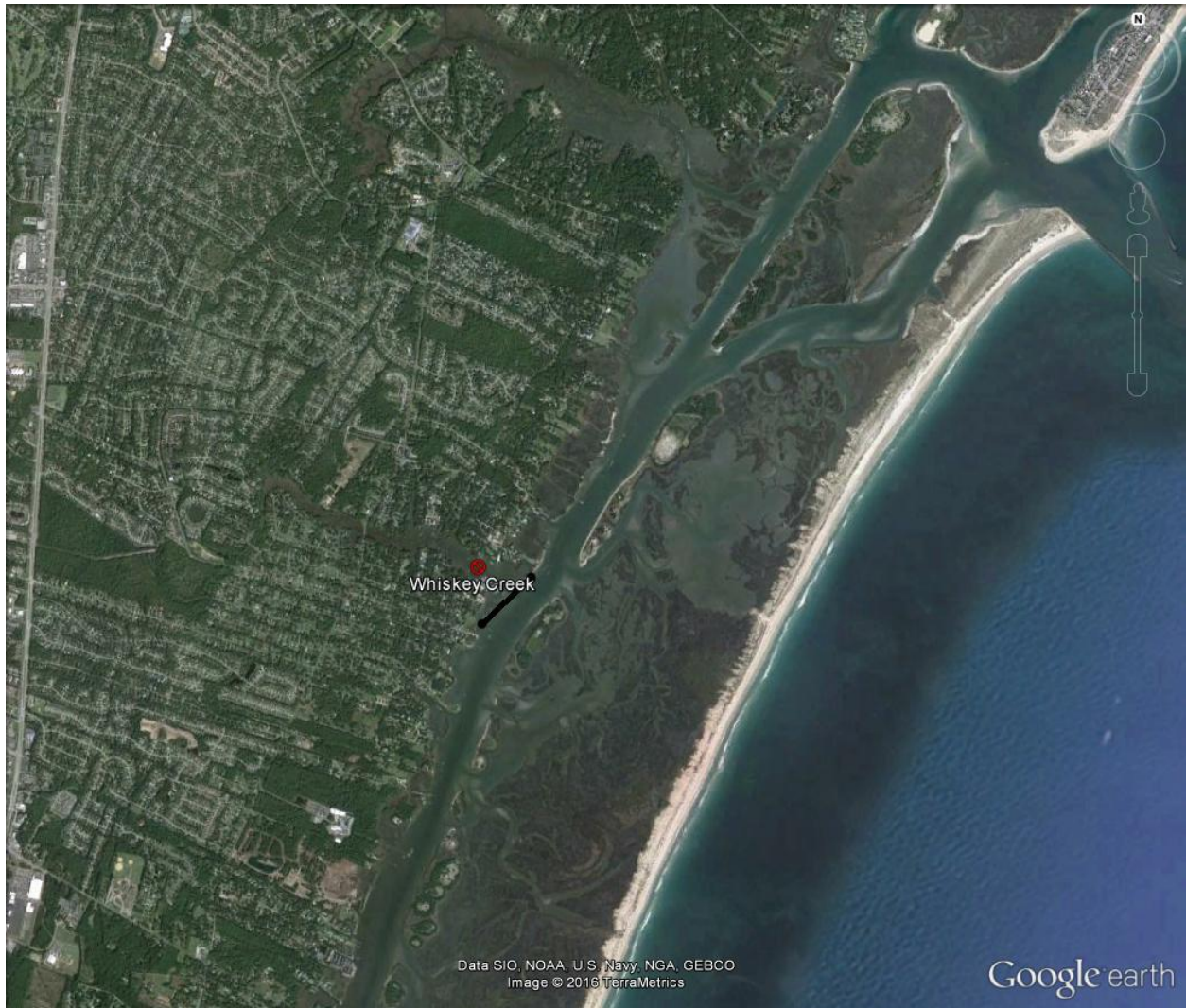


Figure 10. Whiskey Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

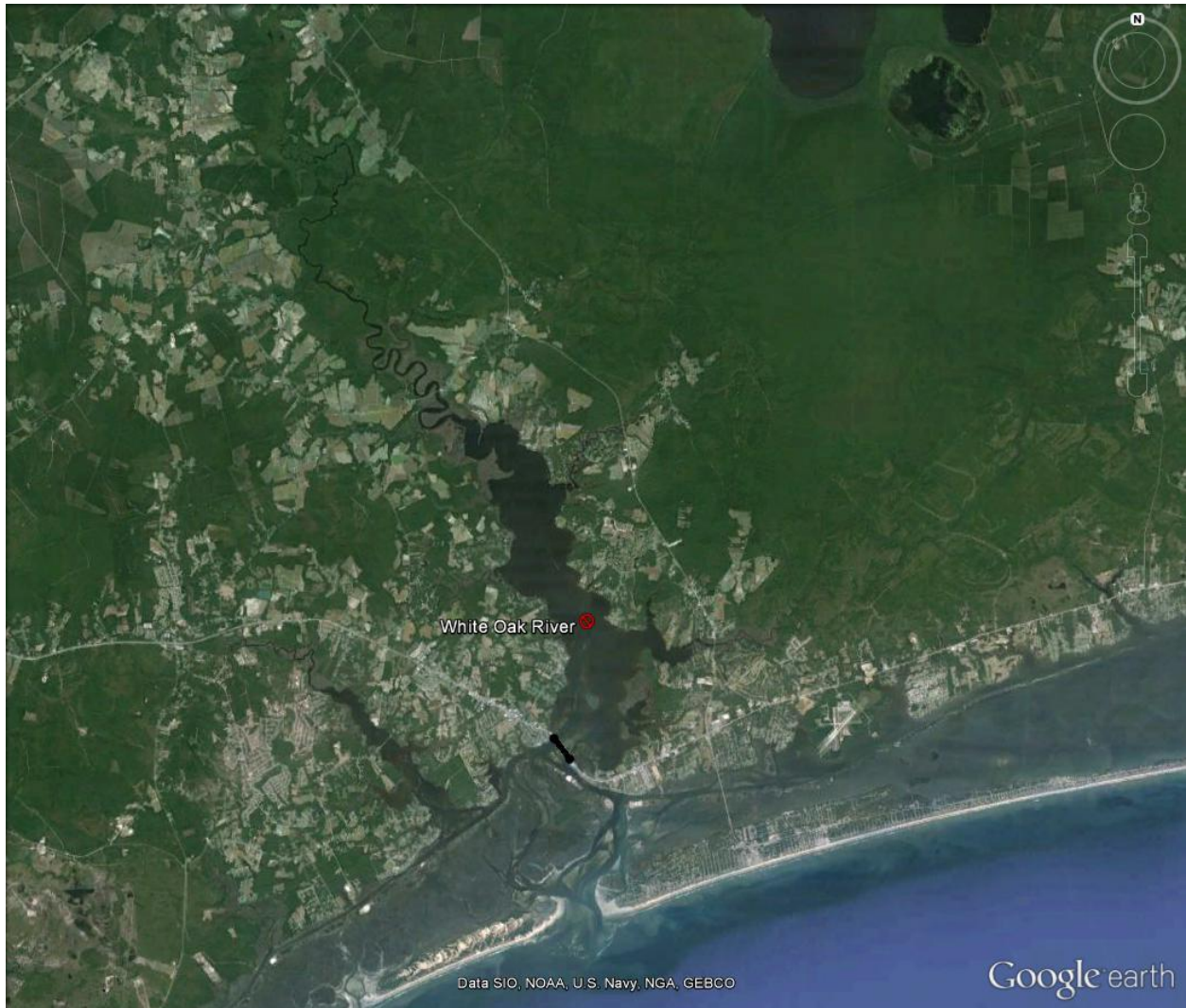


Figure 11. White Oak River harvest site. The solid line represents the downstream glass eel harvest boundary.

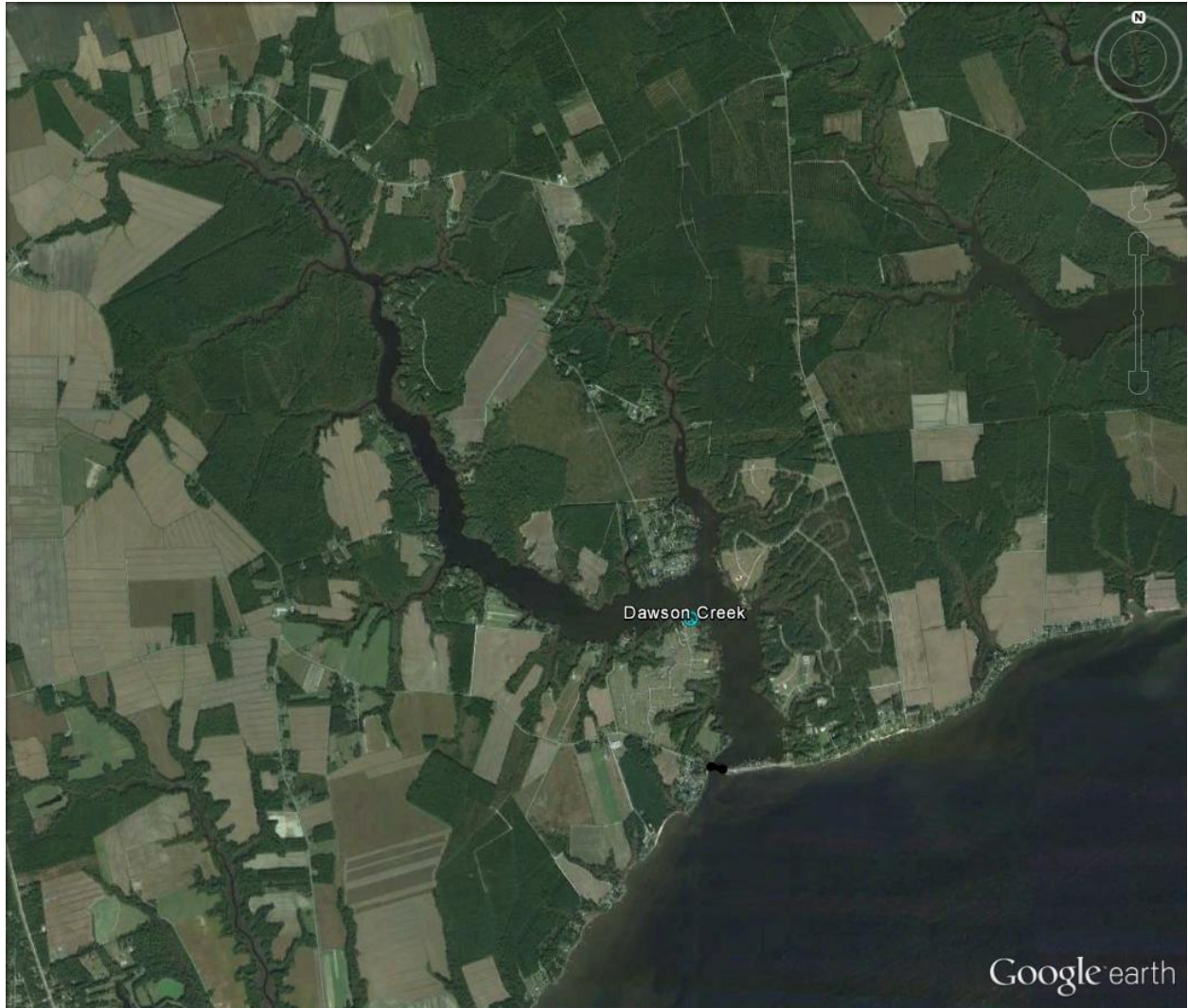


Figure 12. Dawson Creek harvest site. The solid line represents the downstream glass eel harvest boundary.

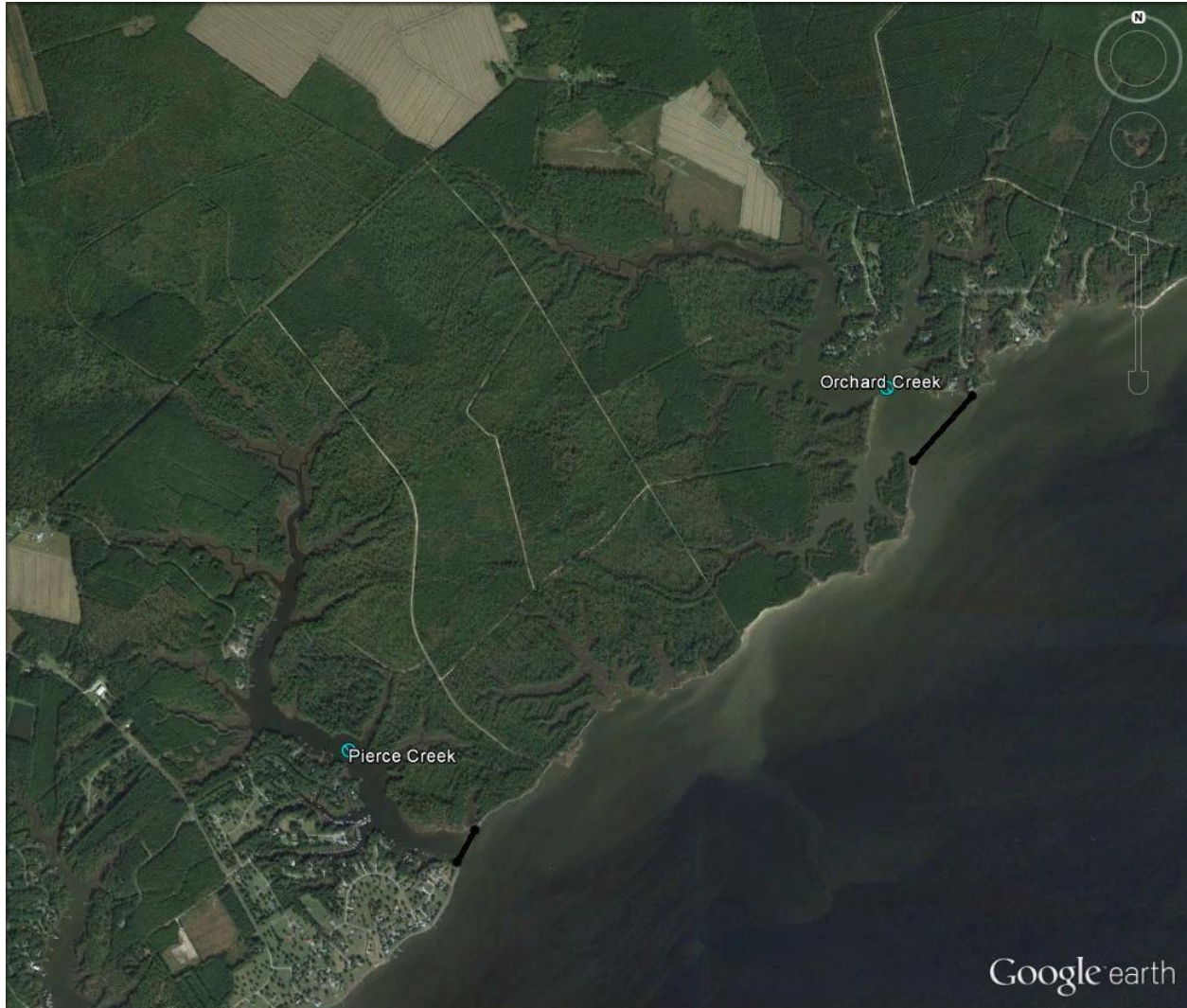


Figure 13. Orchard Creek and Pierce Creek harvest sites. The solid line represents the downstream glass eel harvest boundary.

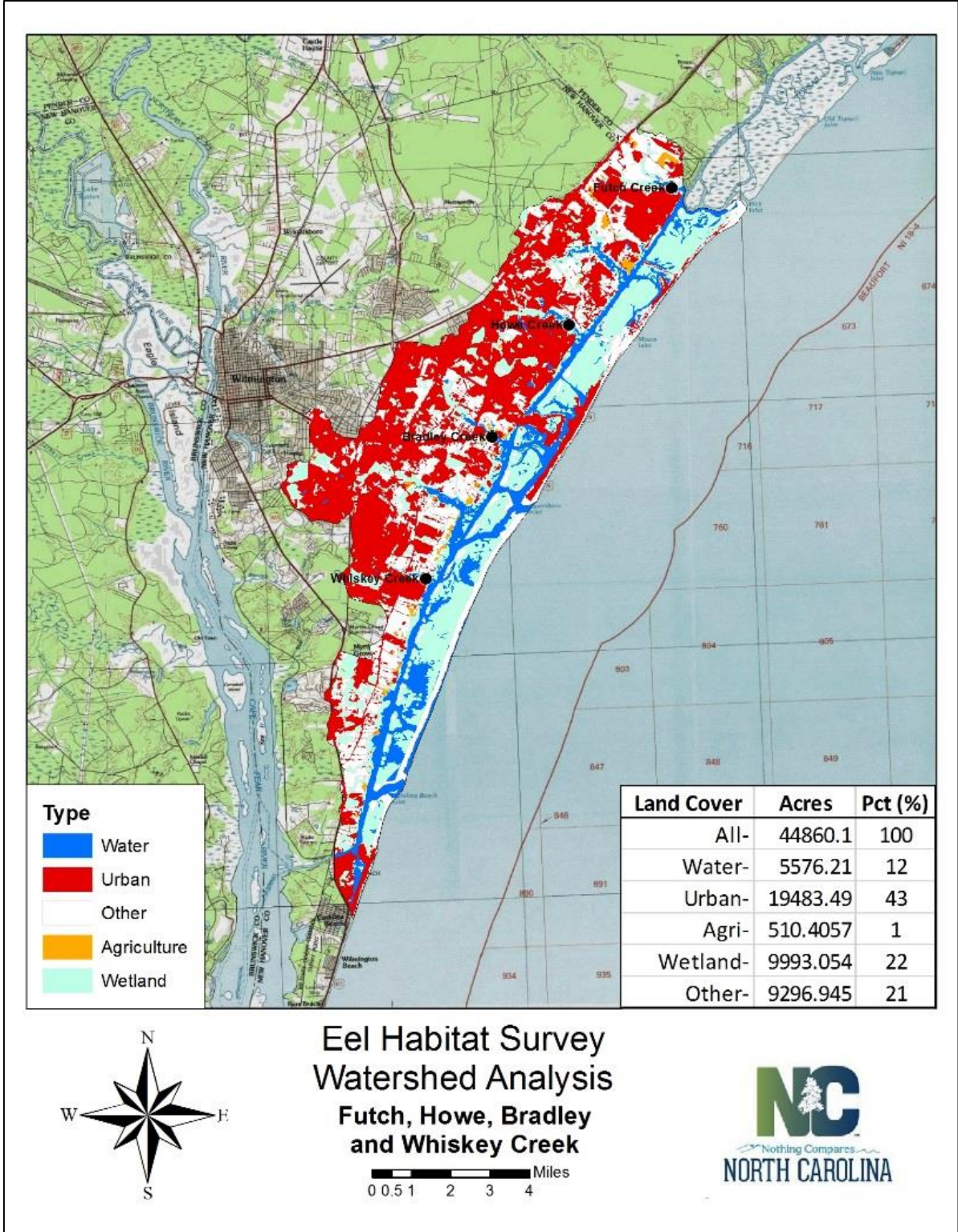


Figure 14. Land use characteristics for the sub-basin containing Bradley, Futch, Howe, and Whiskey creeks.

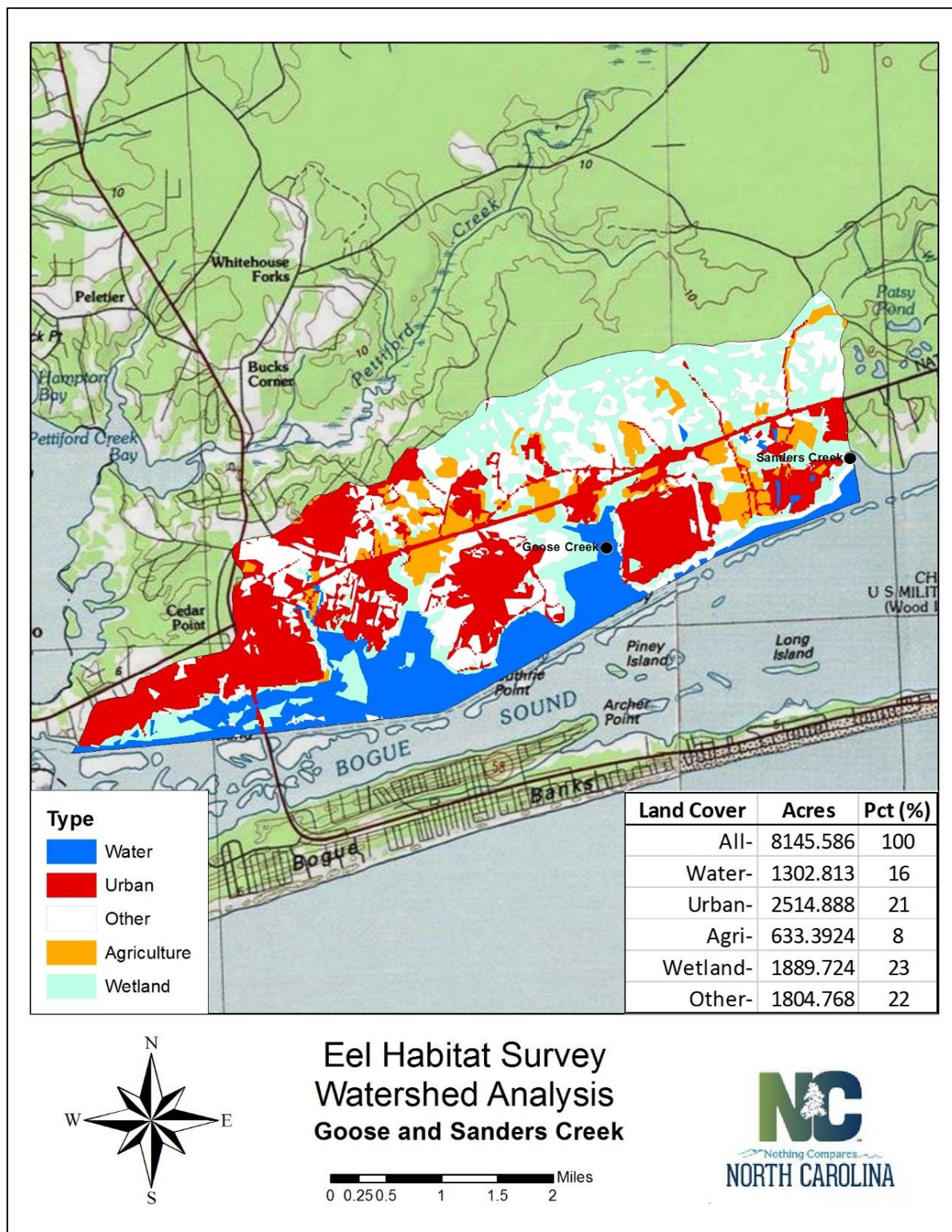


Figure 15. Land use characteristics for the sub-basin containing Goose and Sanders creeks.

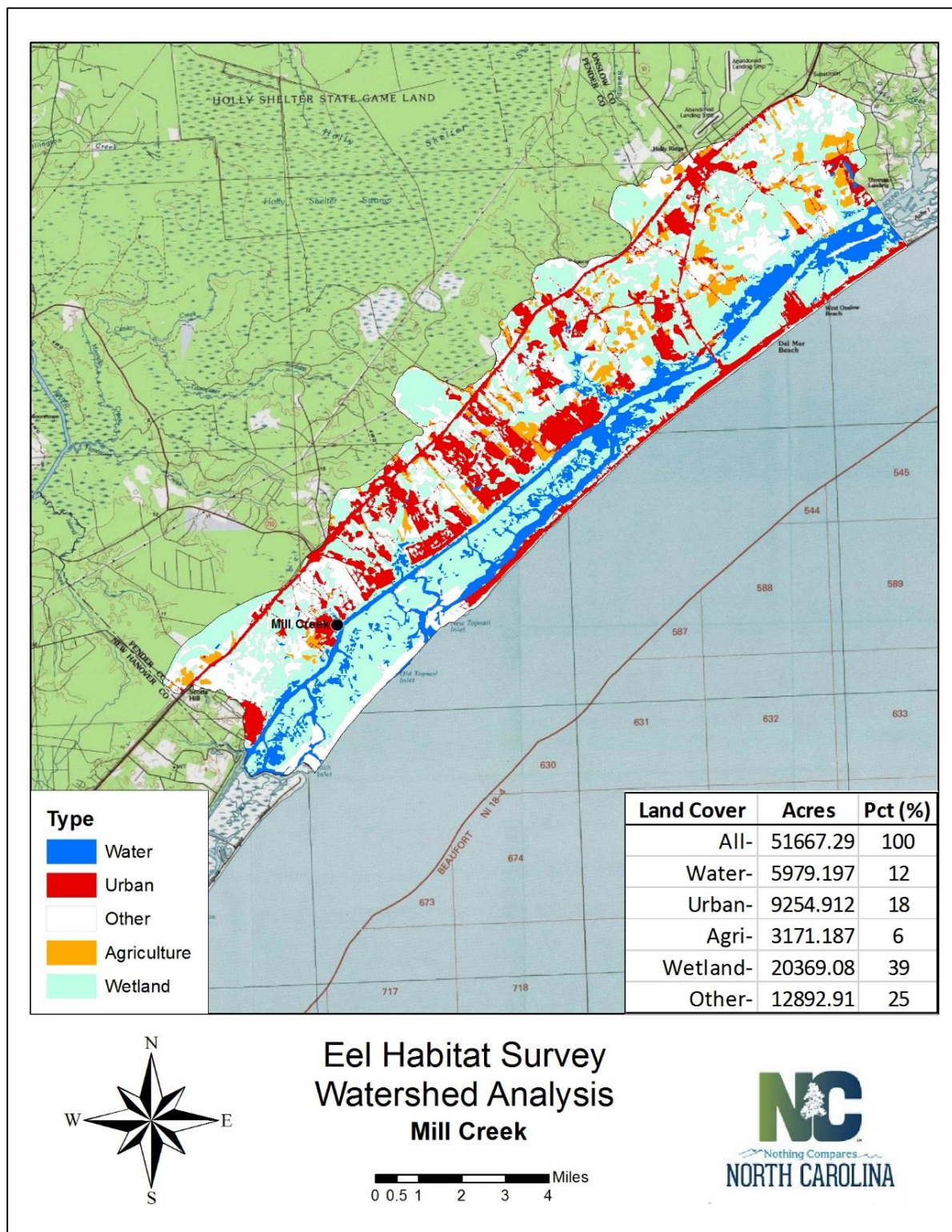


Figure 16. Land use characteristics for the sub-basin containing Mill Creek.

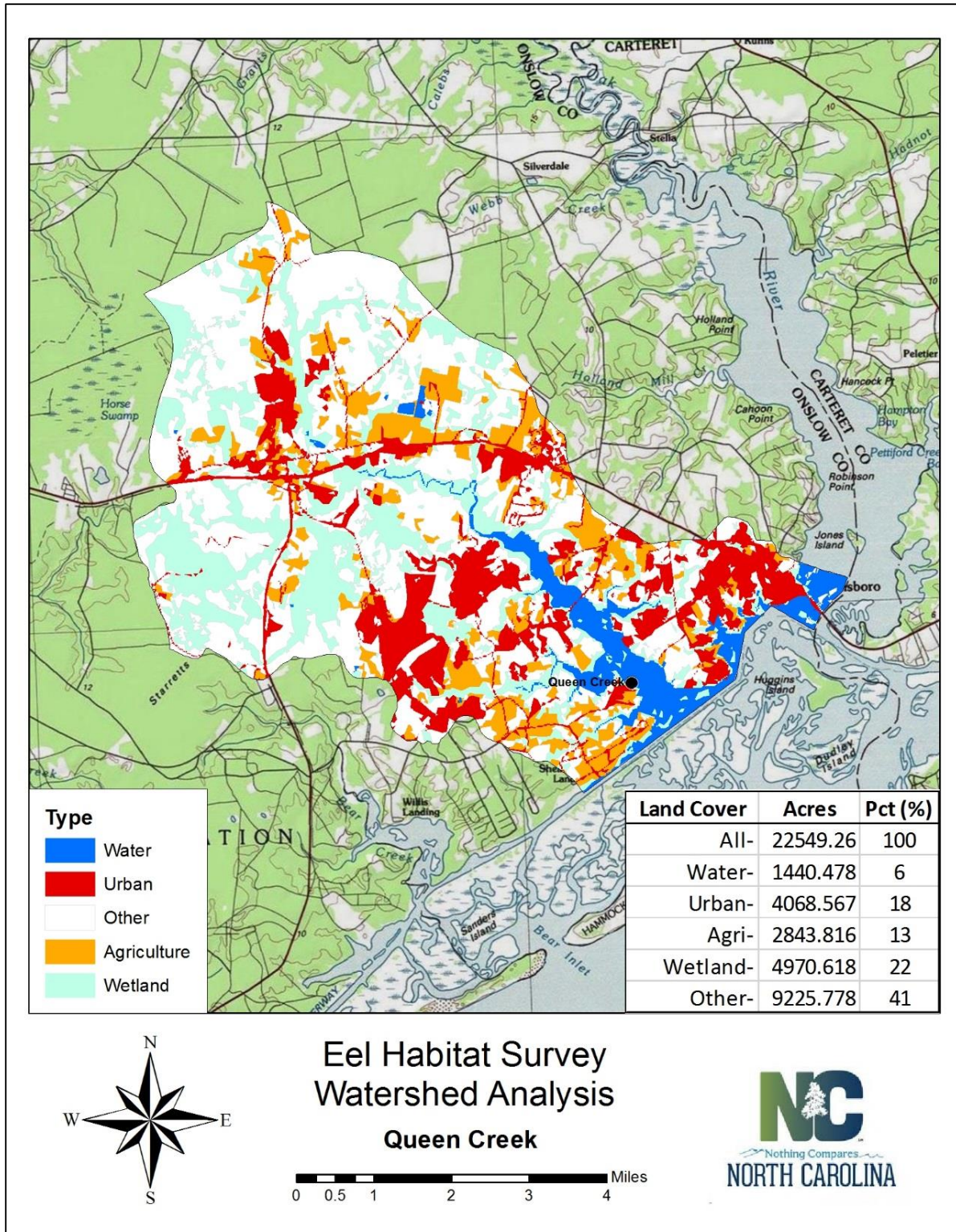


Figure 17. Land use characteristics for the sub-basin containing Queen Creek.

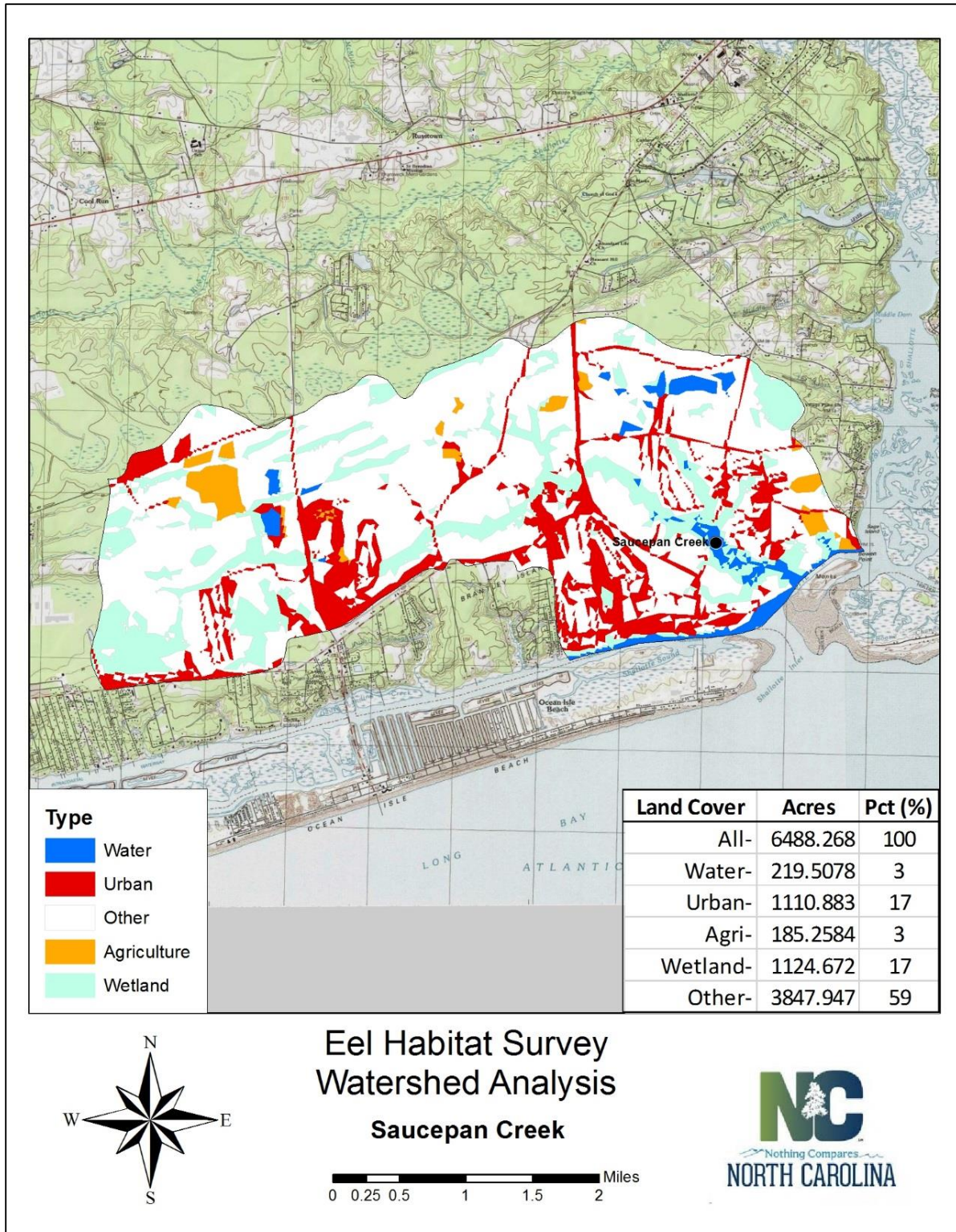


Figure 18. Land use characteristics for the sub-basin containing Saucepan Creek.

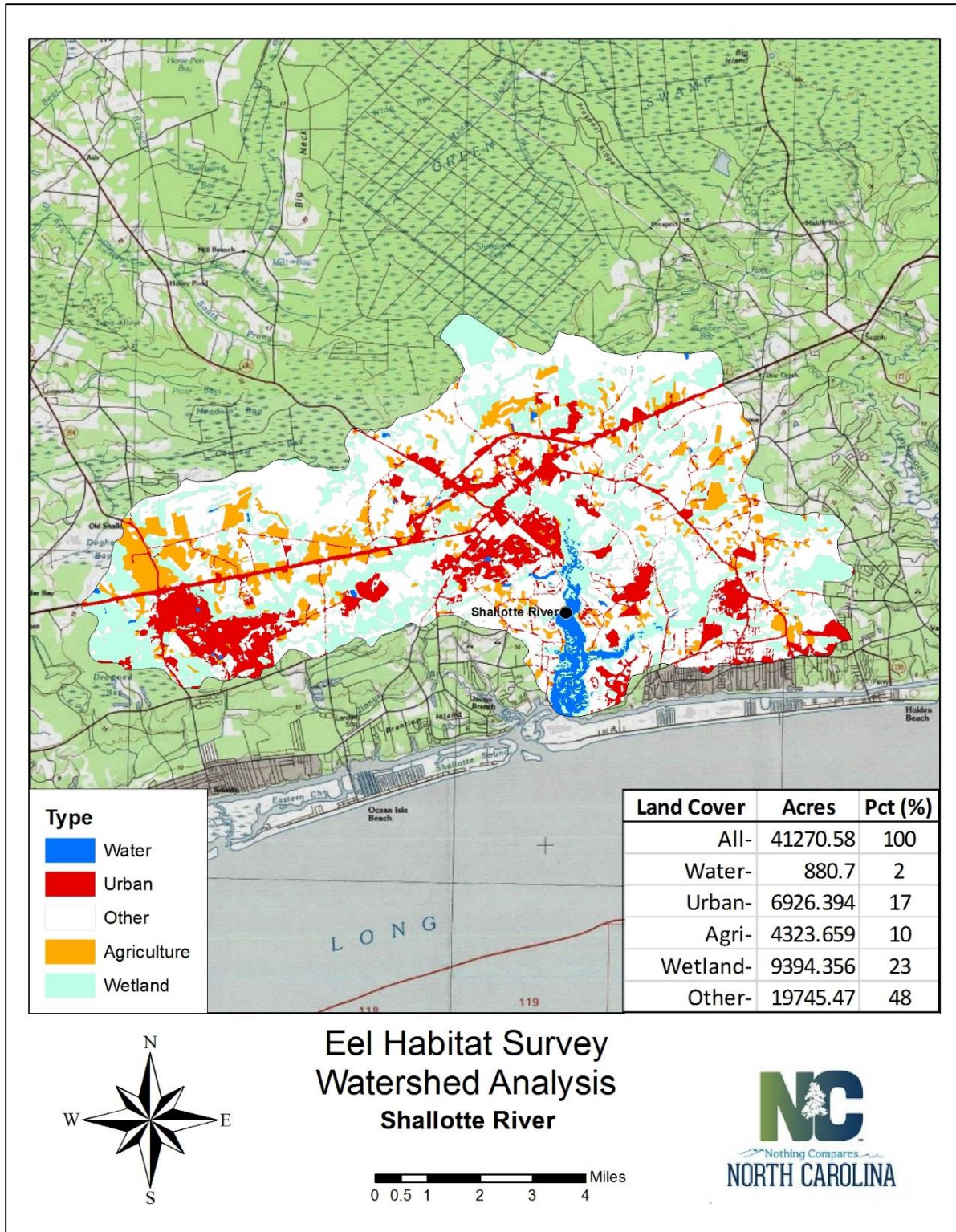


Figure 19. Land use characteristics for the sub-basin containing the Shallotte River.

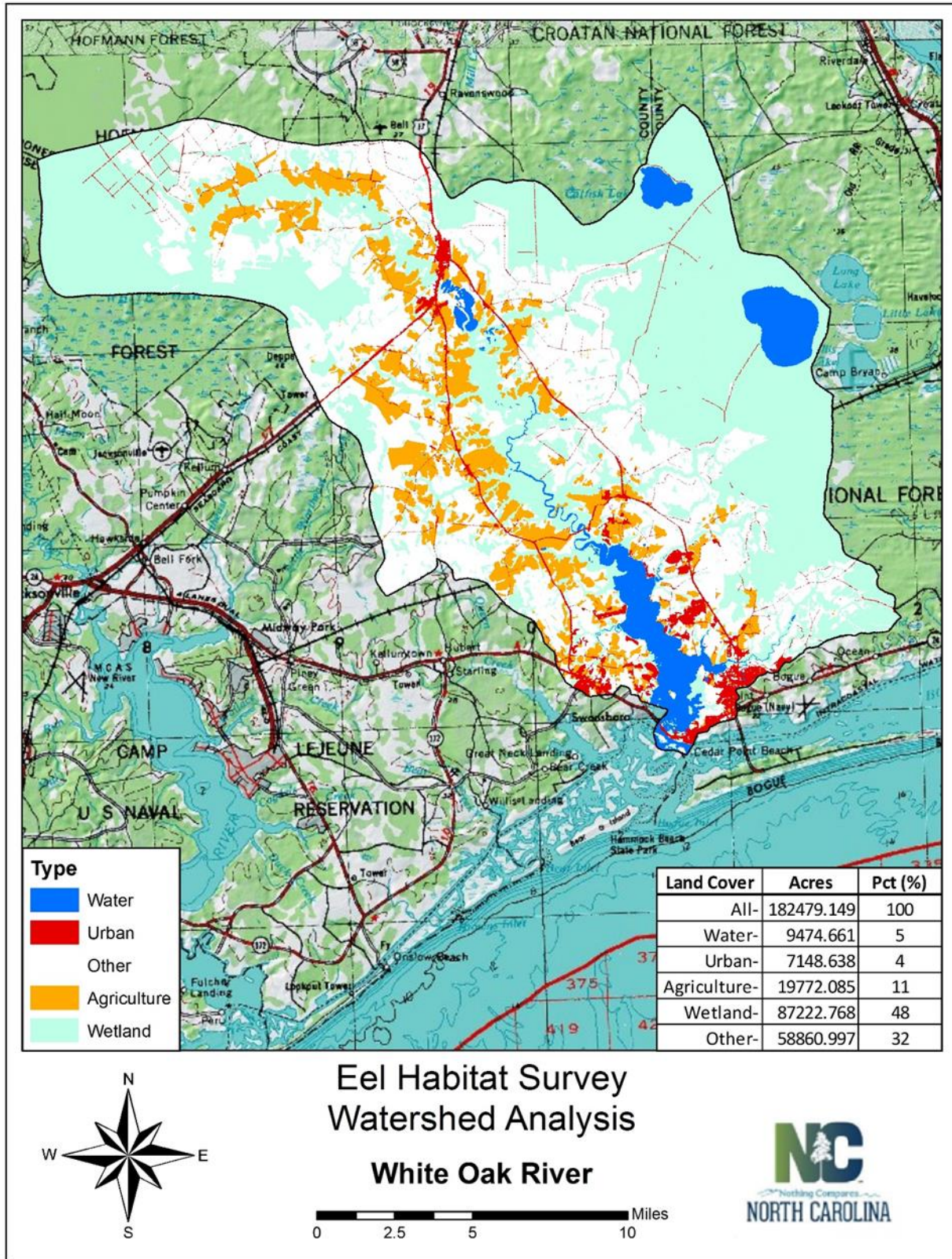


Figure 20. Land use characteristics for the sub-basins containing the White Oak River.

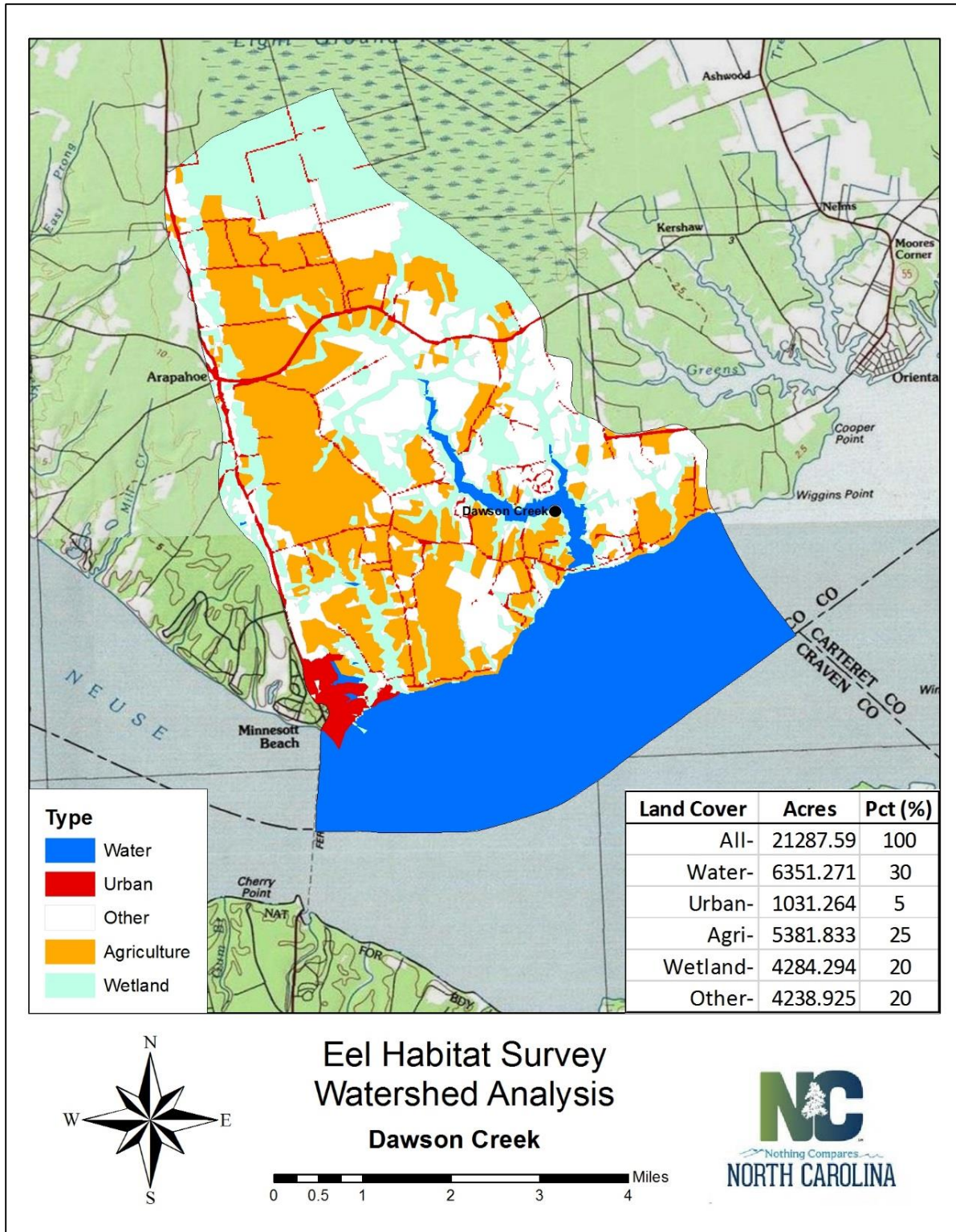


Figure 21. Land use characteristics for the sub-basin containing Dawson Creek.

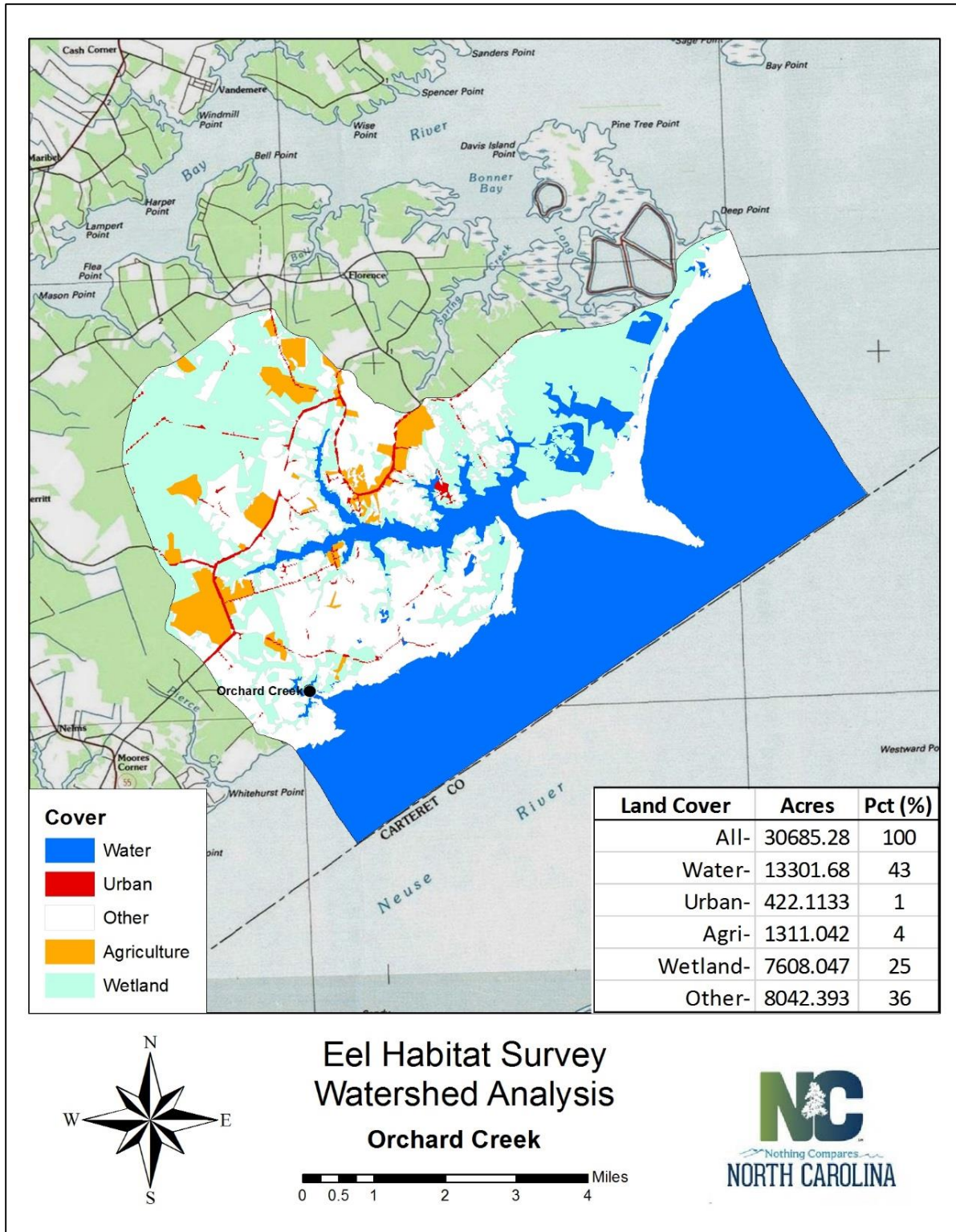


Figure 22. Land use characteristics for the sub-basin containing Orchard Creek

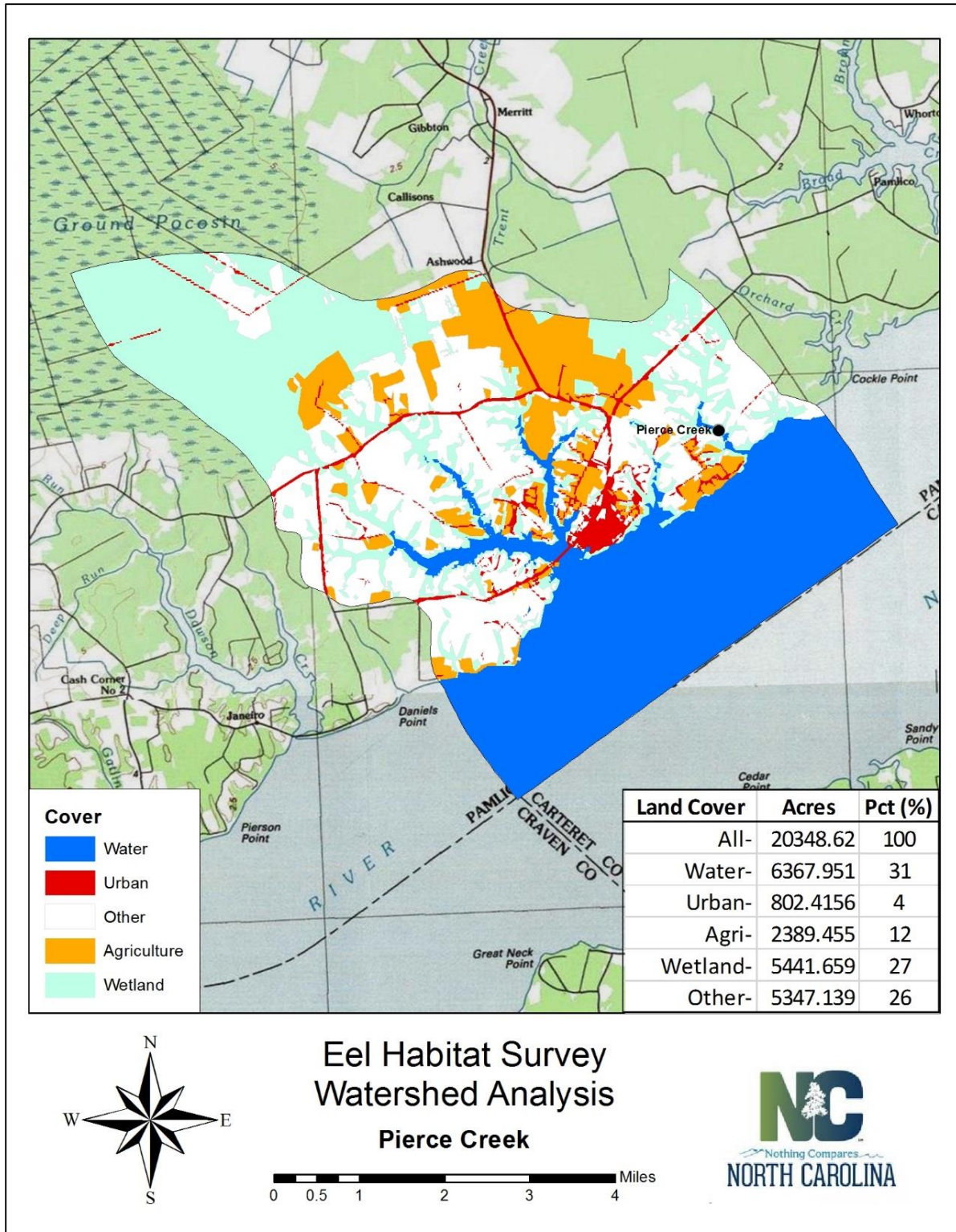


Figure 23. Land use characteristics for the sub-basin containing Pierce Creek.

APPENDIX I

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p. 1

TESTIMONY PRESENTED TO THE COMMITTEE ON MARINE RESOURCES RE: H.P. 137, AN ACT TO RESTRICT THE TAKING OF EELS LESS THAN 6 INCHES IN LENGTH FROM MAINE COASTAL WATERS (EMERGENCY)

by
James D. McCleave
February 23, 1995

INTRODUCTION

The purpose of my testimony is primarily to educate the members of the committee, other legislators and interested persons about the unique life cycle of a truly fascinating and somewhat mysterious fish, the American eel. The unusual life cycle has some important implications for management and conservation of this species, which are different than for most species of fishes. I will present several of these implications. Finally, I do offer an opinion on the soundness of this particular bill.

I am a Professor of Oceanography and a Cooperating Professor of Zoology at the University of Maine, where I have been since 1968. I have conducted research on the biology of the American eel and the European eel since the early 1970s and have published more than 25 scientific papers on them. I also teach about eels in my classes at the University, and I occasionally have participated in workshops on eels with my European colleagues. A copy of my résumé is appended.

I offer this testimony as a friend of the eel, an awesome fish, and as a friend of eel fishers of all types. It is not my intention to support one group of harvesters over another. My conclusions and opinions are biologically based. The economics of the eel fishing and aquaculture industries and the economic consequences of management decisions are left to the realm of other experts.

LIFE CYCLE OF THE AMERICAN EEL

American eels are highly migratory, with spawning and larval development occurring in the ocean, and feeding and growth occurring in estuaries and fresh waters (rivers, streams, ponds, and lakes) [catadromous life cycle].¹ Spawning occurs near the surface over very deep water in a large area of the Sargasso Sea (Figure 1) and only there, meaning there is a single breeding population for the species. The Sargasso Sea is a large portion of the western North Atlantic Ocean east of the Bahamas and south of Bermuda. Spawning occurs in winter. Eggs hatch in a day or two in the warm water, releasing a long-lived larval stage [leptocephalus], which is flattened from side-to-side and shaped somewhat like a willow leaf. The leptocephali drift and swim in the upper few hundred feet of the

¹My language is intended to be understood by the nonspecialist. However, the appropriate scientific terms are included in brackets for completeness and to allow direct reference later in the document.

ocean for several months, growing slowly to a length of 2-2.5 inches. The leptocephali dramatically alter their shape [metamorphose] to resemble a miniature, transparent eel, called a glass eel, during the subsequent autumn and winter. This metamorphosis occurs at sea, perhaps near the edge of the continental shelf. The glass eels enter estuaries and ascend rivers during winter and spring, earlier at the southern end of their range, later at the northern end. (My research group at the University of Maine has contributed substantially to this knowledge.) It is during the spring ascent that glass eels, sometimes termed elvers, are harvested commercially in Maine.

The glass eels in estuaries and fresh waters rapidly develop rather drab pigmentation in their skin, dark on the back and often yellowish on the belly, leading to the name yellow eel for this stage. Growth is generally slow, and yellow eels spend several years in estuaries and inland waters. Growth and age at maturity are not well known. Males probably remain as yellow eels for 4-6 years or more, and grow to about 12-18 inches or so. Females remain as yellow eels for many more years, probably 6-20 years in New England and the Maritime Provinces. During this growth period, yellow eels are fished commercially in estuarine and fresh waters, using baited traps or pots.

During late summer and early autumn, maturing yellow eels undergo a second metamorphosis in preparation for a migration to sea to spawn. The pigment on the belly frequently becomes an iridescent silvery, leading to the term silver eel. Silver eels migrate from fresh waters and estuaries to sea in late summer and autumn in the northern part of their range, including Maine, and later in the southern part of the range. During this migration in Maine, silver eels are fished commercially in fixed weirs or nets set across streams and rivers.

Silver eels migrate to the Sargasso Sea, *spawn once and die*. Little is known of this migration or actual spawning, but it seems likely that autumn migrants are the spawners of the subsequent winter. Evidence of the timing and location of spawning comes from the distribution in space and time of small leptocephali. (My research group at the University of Maine has contributed substantially to this knowledge.)

The yellow stage of the American eel ranges from the eastern Gulf of Mexico, all along the east coast of the US, through the states and provinces bordering the Gulf of Maine, to the states and provinces bordering the Gulf of St. Lawrence, to Newfoundland and Labrador. Yet all spawning of the resulting silver eels occurs in the Sargasso Sea.

POINTS OF EMPHASIS FROM THE LIFE CYCLE

- There is a single breeding population for the entire species regardless of where the yellow eels resided [panmixis]. All genetic evidence suggests that a female from Maine is as likely to spawn with a male from Georgia as with a male from Nova Scotia.
 - ◊ This means there is no 'homing' of offspring from eels of the Penobscot or Kennebec Rivers to those rivers.

- Glass eels entering the Maine rivers are just the same genetically as those entering elsewhere within the range.
- There is a single spawning by a female in her lifetime [semelparity]. An adult female may have to grow for 15 years before reaching maturity and spawning *once*.
- Females develop large numbers of eggs [high fecundity], probably 400,000-3,000,000 eggs per female increasing with female size.
- Nearly all the eggs produced by a female and fertilized by a male will die before reaching maturity [high mortality]. This is natural in fecund species; otherwise the earth would be covered with eels.
- Females are much larger at sexual maturity than males [sexual dimorphism].
 - Most females are larger than 20 inches (50 cm) at maturity.
 - Most males are less than 18 inches (45 cm) at maturity.
- Determination of whether an eel becomes a male or female is not completely under genetic (chromosomal) control, but the process of sexual determination is not fully understood.

HYPOTHESES RELEVANT TO CONSERVATION

There are two hypotheses, for which there is some scientific evidence, which are important to decisions on conservation of the species. Both hypotheses follow logically from an overriding hypothesis that eels encountering more productive waters have a greater tendency to become males, while those encountering less productive waters have a greater tendency to become females. (There is a body of life history theory that supports this different life history strategy for males and females.)

- There is a gradual increase in the proportion of eels that become females from the estuary toward the headwater streams, i.e. increasing up a given drainage. Within a river drainage, more productive waters are generally found in the lower reaches, especially the estuary.
 - If correct, this means that Merrymeeting Bay has a lower proportion of females than the higher waters of the Kennebec River.
- There is a gradual increase in the proportion of eels that become females from the southern part of the range to the northern part of the range [a cline]. Along the range of the eel, more productive waters are generally found to the south, less productive waters to the north, including Maine.

- If correct, this means that Maine is likely to have a greater proportion of female eels within its population than, say, Georgia.

MY OPINION ON EEL MANAGEMENT-CONSERVATION

Because of the wide range of the species, and because the species is a single breeding population, one political jurisdiction alone cannot conserve the species. However, Maine can act responsibly from an understanding of the eel's life history.

I will now argue against this bill. The first line of reasoning is on the basis of prudent interpretation of the implications of the life cycle. The second line of reasoning is on the basis of a scenario for interpretation of the high fecundity-high mortality consequences in this species.

From both lines of reasoning, I am led to the conclusion that *there is no biological basis underlying the restriction of harvest proposed by this legislation*. For certain, in my mind, there is *no emergency*. This is not to state that development of sound management and conservation practices are not needed.

IMPLICATIONS FROM THE LIFE CYCLE

In a one-time spawning [semelparous], fecund species with a long lifetime before that one reproduction, prudent conservation strategy would increasingly protect females the closer they get to reproduction. Mortality is high in a fecund species, but the rate of mortality declines exponentially with size. Mortality rate in leptocephali must be enormous; mortality rate in glass eels must be enormous as well. However, mortality rate in females larger than, say, 15 inches is probably very low. (Here I refer to natural mortality, not mortality from people's activities of fishing, damming, polluting, etc.)

Maine, acting in prudent fashion, might choose to protect preferentially maturing females. I stress females because only females produce young. One male may mate with many females, but only females bear eggs.

If the cline in increasing proportion of females from south to north is correct, Maine and the Maritime Provinces might give increased thought to protecting females. A greater proportion of the reproductive potential may be in the northern part of the species' range.

If there is an increasing proportion of females farther up a drainage, it may be prudent to harvest differentially fewer eels farther up drainages.

Weir fisheries, pot fisheries with mesh-size limits, and eel-size limits all shift the harvest toward a greater percentage of females. Because of the sexual dimorphism, the larger the mesh or the larger the size limit, the greater the pressure is transferred to prereproductive females. Further, because females are longer lived than males, greater fishing pressure is transferred to prereproductive females. This is exactly opposite from the desirable effect. It is more logical, if anything, to place a maximum size limit on the harvest of eels. Such a measure

is clearly against conventional wisdom for managing fishes, but this is an unconventional species.

States and provinces that do not allow weir fisheries prudently protect females, whether they know it or not. Only Maine and, to a very limited degree, New York allow weir fisheries for eels.

Likewise, states and provinces that restrict commercial fishing in fresh waters prudently protect females, whether they know it or not. Most states have a substantial or complete restriction on such fishing. Not Maine.

On the other hand, most states and provinces have minimum size limits on commercial eel harvest, generally 4 inches, 6 inches or 8 inches. I do not believe these jurisdictions made those regulations on any basis other than transfer of practices from management of other species, such as trout or bass. In the extreme, Prince Edward Island has a minimum size limit of 18 inches for eels. Other Maritime Provinces are considering similar regulations. This practice would ensure that nearly all harvested eels would be females, a completely counterproductive measure.

Just because other jurisdictions have similar regulation, we should not make the assumption that the regulations have biological basis. Maine should strive gain the information necessary to base regulations in accord with the life cycle of the eel.

IMPLICATIONS FROM MORTALITY RATES

Management of commercial and recreational harvest of fishes (or tolerance of dams and pollution) has always been based on the assumption that there are compensatory mechanisms within the biology of the species, i.e. mechanisms that allow increased survival or increased reproduction of the nonharvested individuals, so the population does not decline. This is the concept of sustainable yield. The key to success of this approach is to understand what the compensatory mechanisms are and when they occur in the life cycle with respect to when harvest occurs.

Again, the eel is unique because of its high-fecundity, high-mortality characteristic. It seems unlikely to me that major compensatory mechanisms are to be found in the oceanic stages of the life cycle. The leptocephali probably have the highest mortality. Food limitation and inability to reach the continental shelf may be the critical factors, neither of which is under control of the leptocephali. Silver eels on migration to the Sargasso Sea to spawn probably have the lowest mortality, and they also have little opportunity for compensating mortality earlier in the life cycle.

In the elver-yellow eel stages, there is high mortality, but there is also the greatest likelihood of compensatory mechanisms for added mortality due to human activities. Because this is the growth phase, competition for food may occur among individual eels, causing starvation or at least slowing the growth. Reduced density of eels *may* result in higher survival, greater growth rate, and perhaps higher fecundity. On the other hand, not all outcomes of reduced density are

predictable. Because the mechanisms of gender determination are not known for eels, reduced density could increase the ratio of females to males (a positive compensatory mechanism) or decrease the ratio of females to males (a negative compensatory effect). However, most density-dependent effects are negative and have positive compensatory mechanisms.

I illustrate the subtle effects of compensatory mechanisms with a *hypothetical* numerical example. For the example, assume an average female has a fecundity of 1,000,000 eggs. Only one female and (less than) one male need to survive from those million eggs and reproduce to maintain a stable population. In the first scenario, I assume there is a compensatory mechanism for harvesting that can occur anytime after harvesting, regardless of when the harvesting occurs. In the second scenario, I assume there is a slightly greater compensatory mechanism in the yellow eel stage (likely, as described above).

- Scenario 1. Minor compensatory mechanism any time.
 - ◊ Fecundity 1,000,000 eggs produced by average female.
 - ◊ Assume 99.9% die at sea as leptocephali, leaving 1,000 glass eels.
 - ◊ Assume 99.2% of those die becoming silver eels, leaving 8 to migrate seaward.
 - ◊ Assume a harvest of half the migrating silver eels (4), leaving 4 migrants.
 - ◊ Assume 50% of those die, leaving 2 successful spawners.
 - ◊ Fecundity 1,000,000 eggs.
 - ◊ 99.9% die as leptocephali, leaving 1,000 glass eels.
 - ◊ Harvest half the migrating glass eels, leaving 500.
 - ◊ 99.2% die before becoming silver eels, leaving 4 to migrate.
 - ◊ 50% of those die leaving 2 successful spawners.
 - ◊ Conclusion: In this scenario, it does not matter when in the life cycle eels are harvested as long as the allowed harvest is set by actual mortality rates, rather than the hypothetical ones used in the examples here. Alternatively, harvest of a combination of life stages is possible, again as long as actual mortality rates are applied.
- Scenario 2. Greater compensatory mechanism in yellow eel stage.
 - ◊ Fecundity 1,000,000 eggs.
 - ◊ 99.9% die as leptocephali, leaving 1,000 glass eels.
 - ◊ Harvest half the migrating glass eels, leaving 500.
 - ◊ Now, if there is compensation such that mortality is reduced in the yellow eels stage by only 1%, 98.2% die before becoming silver eels, leaving 9 to migrate seaward.
 - ◊ Harvest half the migrating silver eels (4 or 5), leaving 4 to migrate.

- ◊ 50% of those die leaving 2 successful spawners.
- ◊ Conclusion: In this scenario, harvest of glass eels has no effect on the harvest of silver eels because of a compensatory mechanism in the yellow eel stage. Again harvest size needs to be determined with actual mortality rates.

CONCLUSIONS

I conclude from the two previous sections that there is no biological basis for assuming that harvest of glass eels *per se* is detrimental to the conservation of the American eel. Under certain conditions, the harvest of glass eels could have less detrimental effect on conservation than harvest of silver eels. Under certain conditions, the harvest of glass eels could occur while having little or no detrimental effect on harvest of silver eels.

I also conclude that the current regulatory structure for eels in the States and Provinces in the eel's range is not based upon sound biological principles. However, unregulated or unsoundly regulated commercial fishing in Maine and other jurisdictions is distinctly unwise. By testifying in opposition to this bill, I am not implying that there is not cause for concern and for possible regulations on commercial fishing for eels.

SCIENTIFIC RECOMMENDATIONS FOR CONSERVATION AND MANAGEMENT

In the short term for decision making in Maine, the following steps are important.

- Mortality rates and sources of mortality in the glass eel, yellow eel and early silver eels stages need to be determined to allow estimates of how much harvest could be allowed in what stages of life without deleterious effect on the stock.
 - ◊ Determine sources and rates of natural mortality, and determine whether there is density-dependent mortality, which involves determination of food-webs and predator-prey relations.
 - ◊ Determine sources and rates of anthropogenic mortality at different stages, which includes fishing mortality and nonfishing mortality (fish passage at dams, pollution, hydroelectric turbines, etc.).
- Fishing mortality needs to be determined from the activities of the fishing industry.
 - ◊ A licensing system for fresh waters and tidal waters specific to commercial fishing for eels should be instituted.
 - ◊ A reporting system for commercial catches by life-cycle stage or gear needs to be associated with the licensing system.

- Growth rates of males and females and fecundity of females of various sizes needs to be determined to allow assesment of harvest practices on the reproductive potential of the migrants that do migrate to sea to spawn.
- The distribution of sex ratio throughout selected drainages needs to be determined to allow assessment of harvest practices on abundance of females and males.

In the long term for decision making over the geographic range of the eel, the following steps are important.

- The mechanism of gender determination in eels needs to be understood, so effects of harvest practice on sex ratios can be determined.
- The distribution of sex ratio over the geographic range needs to be determined, so harvest practice could be adjusted over the range as appropriate to the life cycle.

APPENDIX II

NC Marine Fisheries Commission Rule 15A NCAC 03O .0504:

15A NCAC 03O .0504 SUSPENSION/REVOCAION OF PERMITS

(a) For violation of specific permit conditions (as specified on the permit), permits may be suspended or revoked according to the following schedule:

- (1) violation of one specific condition in a three year period, permit shall be suspended for 10 days;
- (2) violation of two specific conditions in a three year period, permits shall be suspended for 30 days;
- (3) violation of three specific conditions in a three year period, permits shall be revoked for a period not less than six months.

If the permit condition violated is the refusal to provide information upon request by Division staff, either by telephone, in writing or in person, the Fisheries Director may suspend the permit. Such permit may be reinstated 10 days after the requested information is provided.

(b) All permits will be suspended or revoked when the permittee's license privilege has been suspended or revoked as set out in G.S. 113-171. The duration of the suspension or revocation shall be the same as the license suspension or revocation. In the event the person makes application for a new permit during any period of license suspension, no new permit will be issued during the suspension period. In case of revocation of license privileges, the minimum waiting period before application for a new permit to be considered will be six months.

(c) Permit designees shall not be permitted to participate in a permit operation during any period they are under license suspension or revocation.

(d) Upon service of a notice of suspension or revocation of a permit, it is unlawful to fail to surrender any permit so suspended or revoked.

Appendix III

NC General Statute 113-170.3:

G.S. 113-170.3. Record-keeping requirements.

- (a) The Commission may require all licensees under this Article to keep and to exhibit upon the request of an authorized agent of the Department records and accounts as may be necessary to the equitable and efficient administration and enforcement of this Article. In addition, licensees may be required to keep additional information of a statistical nature or relating to location of catch as may be needed to determine conservation policy. Records and accounts required to be kept must be preserved for inspection for not less than three years.
- (b) It is unlawful for any licensee to refuse or to neglect without justifiable excuse to keep records and accounts as may be reasonably required. The Department may distribute forms to licensees to aid in securing compliance with its requirements, or it may inform licensees of requirements in other effective ways such as distributing memoranda and sending agents of the Department to consult with licensees who have been remiss. Detailed forms or descriptions of records, accounts, collection and inspection procedures, and the like that reasonably implement the objectives of this Article need not be embodied in rules of the Commission in order to be validly required.
- (c) The following records collected and compiled by the Department shall not be considered public records within the meaning of Chapter 132 of the General Statutes, but shall be confidential and shall be used only for the equitable and efficient administration and enforcement of this Article or for determining conservation policy, and shall not be disclosed except when required by the order of a court of competent jurisdiction: all records, accounts, and reports that licensees are required by the Commission to make, keep, and exhibit pursuant to the provisions of this section, and all records, accounts, and memoranda compiled by the Department from records, accounts, and reports of licensees and from investigations and inspections, containing data and information concerning the business and operations of licensees reflecting their assets, liabilities, inventories, revenues, and profits; the number, capacity, capability, and type of fishing vessels owned and operated; the type and quantity of fishing gear used; the catch of fish or other seafood by species in numbers, size, weight, quality, and value; the areas in which fishing was engaged in; the location of catch; the time of fishing, number of hauls, and the disposition of the fish and other seafood. The Department may compile statistical information in any aggregate or summary form that does not directly or indirectly disclose the identity of any licensee who is a source of the information, and any compilation of statistical information by the Department shall be a public record open to inspection and examination by any person, and may be disseminated to the public by the Department. (1997-400, s.5.1; 2001-213, s. 2.)

NC Marine Fisheries Commission Rule 15A NCAC 03O .0502:

15A NCAC 03O .0502 PERMIT CONDITIONS; GENERAL

The following conditions apply to all permits issued by the Fisheries Director:

- (1) it is unlawful to operate under the permit except in areas, at times, and under conditions specified on the permit;
- (2) it is unlawful to operate under a permit without having the permit or copy thereof in possession of the permittee or his or her designees at all times of operation and the permit or copy thereof shall be ready at hand for inspection, except for Pound Net Permits;
- (3) it is unlawful to operate under a permit without having a current picture identification in possession and ready at hand for inspection;
- (4) it is unlawful to refuse to allow inspection and sampling of a permitted activity by an agent of the Division;
- (5) it is unlawful to fail to provide complete and accurate information requested by the Division in connection with the permitted activity;
- (6) it is unlawful to hold a permit issued by the Fisheries Director when not eligible to hold any license required as a condition for that permit as stated in 15A NCAC 03O .0501;
- (7) it is unlawful to fail to provide reports within the timeframe required by the specific permit conditions;

- (8) it is unlawful to fail to keep such records and accounts as required by the rules in this Chapter for determination of conservation policy, equitable and efficient administration and enforcement, or promotion of commercial or recreational fisheries;
- (9) it is unlawful to assign or transfer permits issued by the Fisheries Director, except for Pound Net Permits as authorized by 15A NCAC 03J .0504;
- (10) the Fisheries Director, or his agent, may, by conditions of the permit, specify any or all of the following for the permitted purposes:
 - (a) species;
 - (b) quantity or size;
 - (c) time period;
 - (e) location;
 - (d) means and methods;
 - (f) disposition of resources;
 - (g) marking requirements; or
 - (h) harvest conditions.
- (11) unless specifically stated as a condition on the permit, all statutes, rules and proclamations shall apply to the permittee and his or her designees; and
- (12) as a condition of accepting the permit from the Fisheries Director, the permittee agrees to abide by all conditions of the permit and agrees that if specific conditions of the permit, as identified on the permit, are violated or if false information was provided in the application for initial issuance, renewal or transfer, the permit may be suspended or revoked by the Fisheries Director.

APPENDIX IV

NC Marine Fisheries Commission Rule 15A NCAC 03O .0501:

15A NCAC 03O .0501 PROCEDURES AND REQUIREMENTS TO OBTAIN PERMITS

- (a) To obtain any Marine Fisheries permit, the following information is required for proper application from the applicant, a responsible party, or person holding a power of attorney:
- (1) Full name, physical address, mailing address, date of birth, and signature of the applicant on the application. If the applicant is not appearing before a license agent or the designated Division contact, the applicant's signature on the application shall be notarized;
 - (2) Current picture identification of applicant, responsible party, or person holding a power of attorney. Acceptable forms of picture identification are driver's license, North Carolina Identification card issued by the North Carolina Division of Motor Vehicles, military identification card, resident alien card (green card), or passport; or if applying by mail, a copy thereof;
 - (3) Full names and dates of birth of designees of the applicant who will be acting under the requested permit where that type permit requires listing of designees;
 - (4) Certification that the applicant and his designees do not have four or more marine or estuarine resource convictions during the previous three years;
 - (5) For permit applications from business entities:
 - (A) Business Name;
 - (B) Type of Business Entity: Corporation, partnership, or sole proprietorship;
 - (C) Name, address, and phone number of responsible party and other identifying information required by this Subchapter or rules related to a specific permit;
 - (D) For a corporation, current articles of incorporation and a current list of corporate officers when applying for a permit in a corporate name;
 - (E) For a partnership, if the partnership is established by a written partnership agreement, a current copy of such agreement shall be provided when applying for a permit; and
 - (F) For business entities, other than corporations, copies of current assumed name statements if filed and copies of current business privilege tax certificates, if applicable; and
 - (6) Additional information as required for specific permits.
- (b) A permittee shall hold a valid Standard or Retired Standard Commercial Fishing License in order to hold a:
- (1) Pound Net Permit;
 - (2) Permit to Waive the Requirement to Use Turtle Excluder Devices in the Atlantic Ocean; or
 - (3) Atlantic Ocean Striped Bass Commercial Gear Permit.
- (c) A permittee and his designees shall hold a valid Standard or Retired Standard Commercial Fishing License with a Shellfish Endorsement or a Shellfish License in order to hold a:
- (1) Permit to Transplant Prohibited (Polluted) Shellfish;
 - (2) Permit to Transplant Oysters from Seed Oyster Management Areas;
 - (3) Permit to Use Mechanical Methods for Shellfish on Shellfish Leases or Franchises;
 - (4) Permit to Harvest Rangia Clams from Prohibited (Polluted) Areas; or
 - (5) Depuration Permit.
- (d) A permittee shall hold a valid:
- (1) Fish Dealer License in the proper category in order to hold Dealer Permits for Monitoring Fisheries Under a Quota/Allocation for that category; and
 - (2) Standard Commercial Fishing License with a Shellfish Endorsement, Retired Standard Commercial Fishing License with a Shellfish Endorsement or a Shellfish License in order to harvest clams or oysters for depuration.
- (e) Aquaculture Operations/Collection Permits:
- (1) A permittee shall hold a valid Aquaculture Operation Permit issued by the Fisheries Director to hold an Aquaculture Collection Permit.
 - (2) The permittee or designees shall hold appropriate licenses from the Division of Marine Fisheries for the species harvested and the gear used under the Aquaculture Collection Permit.
- (f) Atlantic Ocean Striped Bass Commercial Gear Permit:

- (1) Upon application for an Atlantic Ocean Striped Bass Commercial Gear Permit, a person shall declare one of the following gears for an initial permit and at intervals of three consecutive license years thereafter:
 - (A) gill net;
 - (B) trawl; or
 - (C) beach seine.

For the purpose of this Rule, a “beach seine” is defined as a swipe net constructed of multi-filament or multi-fiber webbing fished from the ocean beach that is deployed from a vessel launched from the ocean beach where the fishing operation takes place.

Gear declarations shall be binding on the permittee for three consecutive license years without regard to subsequent annual permit issuance.
 - (2) A person is not eligible for more than one Atlantic Ocean Striped Bass Commercial Gear Permit regardless of the number of Standard Commercial Fishing Licenses, Retired Standard Commercial Fishing Licenses or assignments held by the person.
- (g) Applications submitted without complete and required information shall not be processed until all required information has been submitted. Incomplete applications shall be returned to the applicant with deficiency in the application so noted.
- (h) A permit shall be issued only after the application has been deemed complete by the Division of Marine Fisheries and the applicant certifies to abide by the permit general and specific conditions established under 15A NCAC 03J .0501, .0505, 03K .0103, .0104, .0107, .0111, .0401, 03O .0502, and .0503 as applicable to the requested permit.
- (i) The Fisheries Director, or his agent may evaluate the following in determining whether to issue, modify, or renew a permit:
- (1) Potential threats to public health or marine and estuarine resources regulated by the Marine Fisheries Commission;
 - (2) Applicant’s demonstration of a valid justification for the permit and a showing of responsibility as determined by the Fisheries Director; and
 - (3) Applicant’s history of habitual fisheries violations evidenced by eight or more violations in 10 years.
- (j) The Division of Marine Fisheries shall notify the applicant in writing of the denial or modification of any permit request and the reasons therefor. The applicant may submit further information, or reasons why the permit should not be denied or modified.
- (k) Permits are valid from the date of issuance through the expiration date printed on the permit. Unless otherwise established by rule, the Fisheries Director may establish the issuance timeframe for specific types and categories of permits based on season, calendar year, or other period based upon the nature of the activity permitted, the duration of the activity, compliance with federal or state fishery management plans or implementing rules, conflicts with other fisheries or gear usage, or seasons for the species involved. The expiration date shall be specified on the permit.
- (l) For permit renewals, the permittee’s signature on the application shall certify all information as true and accurate. Notarization of signature on renewal applications shall not be required.
- (m) For initial or renewal permits, processing time for permits may be up to 30 days unless otherwise specified in this Chapter.
- (n) It is unlawful for a permit holder to fail to notify the Division of Marine Fisheries within 30 days of a change of name or address, in accordance with G.S. 113-169.2.
- (o) It is unlawful for a permit holder to fail to notify the Division of Marine Fisheries of a change of designee prior to use of the permit by that designee.
- (p) Permit applications are available at all Division Offices.



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfmc.org

MEMORANDUM

July 15, 2016

To: American Eel Management Board
From: Law Enforcement Committee
RE: Review of Changes to North Carolina Aquaculture Permit

The Law Enforcement Committee (LEC) of the Atlantic States Marine Fisheries Commission (ASMFC) met via conference call on July 8, 2016 to review and provide comments on proposed changes to the previously approved aquaculture proposal for the State of North Carolina. The following members were in attendance:

LEC: Capt. Steve Anthony (NC); Capt. Grant Burton (FL); Deputy Chief Jon Cornish (ME); Lt. Mike Eastman (NH); Asst. Director Larry Furlong (PA); Special Agent-in-Charge Honora Gordon (USFWS); Capt. Jamie Green (VA); Capt. Tim Huss (NY); Capt. Rob Kersey (MD); Capt. Bob Lynn (GA); Capt. Doug Messeck (DE); Maj. Pat Moran (MA); Director Kyle Overturf (CT); Lt. Colby Schlaht (USCG); Lt. Jason Snellbaker (NJ);

LEC ALTERNATES: Eric Provencher (NOAA OLE)

OTHER ATTENDEES: David Borden (RI)

STAFF: Ashton Harp; Toni Kerns; Kirby Rootes-Murdy; Mark Robson; Megan Ware

The LEC was briefed on the substantive changes to the permit and permit conditions from the first year of implementation. The LEC commented on the original proposal in its memo of January 15, 2016 to the American Eel Management Board. During the above-referenced conference call, the North Carolina representative to the LEC reported on the shared learning experiences of their enforcement officers and the vendor in a new program. There were no significant concerns or questions raised regarding the proposed changes to the aquaculture collection program in North Carolina, and the LEC continues to support the plan as one that has taken reasonable steps to ensure adequate enforcement and monitoring of collection activity.

The LEC appreciates the opportunity to review and provide advice concerning this proposal.