

Atlantic States Marine Fisheries Commission

American Eel Management Board

*August 6, 2019
1:30 - 2:30 p.m.
Arlington, 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 (<i>M. Gary</i>) | 1:30 p.m. |
| 2. Board Consent | 1:30 p.m. |
| • Approval of Agenda | |
| • Approval of Proceedings from October 2018 | |
| 3. Public Comment | 1:35 p.m. |
| 4. Update on Board Working Group Recommendations on Addressing Coastwide Cap Overages (<i>K. Rootes-Murdy</i>) | 1:45 p.m. |
| 5. Review and Consider Approval of 2020 Aquaculture Proposals (<i>K. Rootes-Murdy</i>) Action | 1:55 p.m. |
| 6. Other Business/Adjourn | 2:30 p.m. |

The meeting will be held at the Westin Crystal City, 1800 S. Eads Street, Arlington, Virginia; 703.486.1111

Sustainable and Cooperative Management of Atlantic Coastal Fisheries

MEETING OVERVIEW

American Eel Management Board

August 6, 2019

1:30 – 2:30 p.m.

Arlington, Virginia

Chair: Marty Gary (PRFC) Assumed Chairmanship: 10/17	Technical Committee Chair: Jordan Zimmerman (DE)	Law Enforcement Committee Representative: Cloutier
Vice Chair: Lynn Fegley (MD)	Advisory Panel Chair: Mari-Beth DeLucia	Previous Board Meeting: October 22, 2018
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 October 2018 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. Update on Board Working Group Recommendations on Addressing Coastwide Cap Overages (1:45 – 1:55 p.m.)

Background

- In 2018, the Board approved Addendum V. To address management of the new Coastwide Cap and removal of state allocations, a Board Working Group was formed to develop a Coastwide Cap Overage Policy.
- The Board Working Group met multiple times from December 2018-July 2019 to develop a draft Coastwide Cap Overage Policy.

Presentation

- Update on Board Working Group Draft Policy on Coastwide Cap Overages by K. Rootes-Murdy

5. Consider 2020 Aquaculture Proposals (1:55 p.m. – 2:30 p.m.) Action

Background

- Maine and North Carolina submitted aquaculture proposals for the 2020 fishing season. North Carolina is submitting a two year proposal starting in fall 2019. **(Briefing Materials)**
- The Technical Committee met on July 15th to review the proposals **(Briefing Materials)**

Presentations

- Overview of Maine and North Carolina aquaculture proposals by K. Rootes-Murdy
- Technical Committee Report by K. Rootes-Murdy

Board actions for consideration at this meeting

- Approval of Maine and North Carolina aquaculture proposals

6. Other Business/ Adjourn

American Eel

Activity level: Low

Committee Overlap Score: Medium (SAS overlaps with BERP, Atlantic herring, horseshoe crab)

Committee Task List

- TC –July 2019: review of Maine’s aquaculture proposal
- TC – September 1st: Annual compliance reports due

TC Members: Jordan Zimmerman (DE, TC Chair), Ellen Cosby (PRFC, Vice Chair), Ryan Harrell (GA), Kimberly Bonvechio (FL), Bradford Chase (MA), Chris Adriance (DC), Robert Atwood (NH), Sheila Eyler (USFWS), Alex Haro (USGS), Wendy Morrison (NOAA), Carol Hoffman (NY), Todd Mathes (NC), Patrick McGee (RI), Jennifer Pyle (NJ), Troy Tuckey (VIMS), Danielle Carty (SC), Keith Whiteford (MD), Gail Wippelhauser (ME), Tim Wildman (CT), Kirby Rootes-Murdy (ASMFC)

SAS Members: Greg Hinks (NJ), Bradford Chase (MA), Matt Cieri (ME), Sheila Eyler (USFWS), Laura Lee (NC), John Sweka (USFWS), Troy Tuckey (VIMS), Keith Whiteford (MD), Kristen Anstead (ASMFC), Kirby Rootes-Murdy (ASMFC)

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

**The Roosevelt Hotel
New York, New York
October 22, 2018**

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 Martin Gary..... 1

Approval of Agenda..... 1

Approval of Proceedings, August 2018 1

Public Comment 1

**Presentation on Convention on International Trade in Endangered Species Workshop and Discuss
Next Steps..... 1**

Update from the October CITES Meeting..... 4

Review and Population of the Advisory Panel..... 10

Adjournment.....11

INDEX OF MOTIONS

1. **Approval of Agenda** by Consent (Page 1).
2. **Approval of Proceedings of August 2018** by Consent (Page 1).
3. **Move to add Richard Stoughton (SC) and Lawrence Voss (DE) to the American Eel Advisory Panel** (Page 10). Motion by Robert Boyles; second by John Clark. Motion carried (Page 10).
4. **Move to adjourn** by consent (Page 11).

ATTENDANCE

Board Members

Pat Keliher, ME (AA)	Andy Shiels, PA, proxy for J. Arway (AA)
Steve Train, ME (GA)	John Clark, DE, proxy for D. Saveikis (AA)
Sen. David Watters, NH (LA)	Craig Pugh, DE, proxy for Rep. Carson (LA)
Cheri Patterson, NH, proxy for D. Grout (AA)	Roy Miller, DE (GA)
G. Ritchie White, NH (GA)	Russell Dize, MD (GA)
Sarah Ferrara, MA, proxy for Rep. Peake (LA)	Lynn Fegley, MD, proxy for D. Blazer (AA)
Dan McKiernan, MA, proxy for D. Pierce (AA)	Bryan Plumlee, VA (GA)
Raymond Kane, MA (GA)	Sen. Monty Mason, VA (LA)
Phil Edwards, RI, proxy for J. McNamee (AA)	Pat Geer, VA, proxy for S. Bowman (AA)
Eric Reid, RI, proxy for Sen. Sosnowski (LA)	Mike Blanton, NC, proxy for Rep. Steinburg (LA)
David Borden, RI (GA)	Chris Batsavage, NC, proxy for S. Murphey (AA)
Justin Davis, CT, proxy for P. Aarrestad (AA)	Sen. Ronnie Cromer, SC (LA)
Sen. Craig Miner, CT (LA)	Robert Boyles, SC (AA)
Bill Hyatt, CT (GA)	Spud Woodward, GA (GA)
Maureen Davidson, NY, proxy for J. Gilmore (AA)	Doug Haymans, GA (AA)
Emerson Hasbrouck, NY (GA)	Rep. Thad Altman, FL (LA)
Sen. Phil Boyle, NY (LA)	Jim Estes, FL, proxy for J. McCawley (AA)
Mike Falk, NY, Legislative proxy	Chris Wright, NMFS
Heather Corbett, NJ, proxy for L. Herrighty (AA)	Mike Millard, USFWS
Tom Fote, NJ (GA)	Martin Gary, PRFC
Loren Lustig, PA (GA)	

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

Ex-Officio Members

Rene Cloutier, Law Enforcement Representative

Staff

Bob Beal	Jessica Kuesel
Toni Kerns	Kristen Anstead
Kirby Rootes-Murdy	

Guests

Laura Noguchi, USFWS	Deborah Hahn, Assn. of Fish and Wildlife Agencies
Thomas Leuteritz, USFWS/DSA	

The American Eel Management Board of the Atlantic States Marine Fisheries Commission convened in the Terrace Ballroom of the Roosevelt Hotel, New York, New York; Monday, October 22, 2018, and was called to order at 3:55 o'clock p.m. by Chairman Martin Gary.

CALL TO ORDER

CHAIRMAN MARTIN GARY: Welcome to the Annual Meeting, 2018. My name is Marty Gary; I'm with Potomac River Fisheries Commission, I am your Board Chair. Lynn Fegley from the state of Maryland is our Vice-Chair for this Board; and also to complete the introductions. Seated to my left is Thomas Leuteritz; Chief Branch of Conservation Science Policy for the U.S. Fish and Wildlife Service, and to my right is Laura Noguchi, Chief of Wildlife Trade and Conservation Branch, also with the U.S. Fish and Wildlife Service.

To my left is Major Rene Cloutier; he is our liaison for Law Enforcement for this species board. Also to my right we have Kristen Anstead; who is the Stock Assessment Scientist assigned to this species, and also Kirby Rootes-Murdy, Senior Fishery Management Plan Coordinator. The last introduction is we have one new Board member; scanning the roster, Mr. William Hyatt, for the state of Connecticut. Mr. Hyatt, announce yourself; thank you and welcome.

APPROVAL OF AGENDA

CHAIRMAN GARY: All that having been said we have the first item of our agenda is the approval of the agenda. Are there any additions or modifications to the agenda as presented? Seeing none; the agenda is approved.

APPROVAL OF PROCEEDINGS

CHAIRMAN GARY: Our next item on the agenda is the approval of the proceedings from August, 2018. Are there any modifications to those proceedings as presented? Seeing none; the approval of the meeting minutes from the August, 2018 meeting are approved.

PUBLIC COMMENT

CHAIRMAN GARY: I've been told there has not been anyone to sign up for public comment; but I'll put it out there again. Does anyone from the public like to make comment on items that are not on the agenda? Seeing none; we have no public comment, and we'll move on to our next step in the agenda.

PRESENTATION ON CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES WORKSHOP AND DISCUSS NEXT STEPS

CHAIRMAN GARY: We have a presentation; co-presented by Thomas Leuteritz and Laura Noguchi.

This is for the Convention of International Trade and Endangered Species of Flora and Fauna. After Thomas and Laura make their presentation, we'll have a brief verbal update by Ms. Deb Hahn from the Association of Fish and Wildlife Agencies; which will be followed by question and answers. Laura and Thomas, are you all ready for yours?

MS. LAURA NOGUCHI: We are ready. Good afternoon; we are happy to be here. This is going to be a pretty quick CITES 101; is what we've been asked to give. I will try to run through it fairly quickly; and then hopefully time for questions at the end. What is CITES; the Convention on International Trade and Endangered Species of Wild Fauna and Flora? This is a treaty; an agreement among nations on regulation of international wildlife trade. It establishes a legal framework that countries around the world recognize. The purpose of CITES is to ensure that international trade in wild fauna and flora is legal and sustainable. This is the point where I say; CITES is not the ESA, and the ESA is not CITES.

CITES is focused on trade; and species that are impacted by trade. Quickly how CITES works; regulates the import/export introduction from the sea that's species taken on the high seas and brought into a country, of live and dead animals and plants and their parts and derivatives, those that are listed.

International trade is regulated through a system of permits and certificates that have to be presented when entering or leaving a country. Those permits and certificates can only be issued when certain conditions have been met. Basically, the framework species are listed in one of three CITES appendixes. Appendix 1, the most restrictive, these are species that are threatened with extinction.

For the most part commercial trade is prohibited in Appendix 1 species. Appendix 2, not necessarily threatened with extinction; but they may become so if they're not regulated. To add a species to CITES Appendix 1 or Appendix 2, requires a two-thirds majority vote of parties present at a CITES meeting of the Conference of the Parties.

Appendix 3, this is a unilateral decision by a country to add something to this appendix. It does not need a vote; it can be done at any time by any country. Just a little more detail about, I probably have already run through this; Appendix 1, threatened with extinction, about 1,000 species listed on Appendix 1, this is pandas, tigers, pangolins, critically endangered species.

Requires both an export permit to be issued by the exporting country, and an import permit to be issued by the importing country, and there are findings required on both sides. CITES Appendix 2, this is where most species are listed under CITES; 30,000, way more than the other two, and trade is allowed, commercial trade is allowed, but it is regulated.

It requires an export permit only; issued by the country of export. There is no requirement for an import permit under the treaty. The European Union has a stricter domestic measure where they do require import permits for CITES Appendix 2; but that again is a stricter measure on their part. Appendix 3 is really focused on legal trade; as opposed to non-detrimental trade.

There is no non-detriment finding required; it's really the purpose is to be able to ensure that

trade is legal, specimens have been legally acquired and the trade is being conducted in a legal manner. At just a very basic minimum, all CITES parties once you sign onto the treaty ratify the treaty; you are required to designate at least one management authority and one scientific authority.

The management authority is empowered to issue permits and communicate with the Secretariat and with other parties on your behalf; you as a party. The scientific authority, among other things, advises the management authority about whether or not trade will be detrimental to the survival of the species. The other basic requirement is you have to be able to prohibit trade in violation of the convention. These two key findings that I have mentioned that have to be made before you can issue an export permit. When something is listed on Appendix 2, before the United States or any other CITES party can issue an export permit, we have to be able to determine; the management authority needs to be able to determine that the specimen to be exported was legally acquired.

We also need to have advice from the scientific authority – Thomas works in our scientific authority – that the export of those specimens will not be detrimental to the survival of the species. The management authority cannot issue a permit until those two findings have been made.

Effective implementation requires a permitting system; an effective permitting system, control at the borders, national control of import and export, and measures in place, laws, regulations to stop international trade, a presence at the border, be able to confiscate specimens and penalize that type of illegal trade.

Common misconceptions, CITES deals only with international trade in species that are listed in the appendices; it doesn't cover all aspects of CITES conservation. It doesn't ban trade; it regulates trade. It does not regulate domestic trade. Again, not a listing of the world's endangered species; it's

only those species that are or may be affected by international trade are listed on the CITES appendices.

Just quickly, CITES implementation in the United States. It's the Endangered Species Act; even though I just said the ESA is not CITES and CITES is not the ESA, it's the Endangered Species Act that authorizes the Secretary of the Interior and through the Fish and Wildlife Service to be the management authority and the scientific authority for CITES.

Our regulations, our CITES implementing regulations, are based on the Convention; the text of the Convention, and current resolutions that have been adopted by the parties at meetings of the Conference of the Parties. Our regulations, should you want to look at them, are at 50CFR Part 23. They're available online; you can get on the ECFR, Title 50, Part 23, they're all right there.

In the United States we have one management authority and one scientific authority. Other countries, many other countries, have many. They will have a management authority for timber, for sturgeon, for whatever, plants, terrestrial species; in the U.S. one management authority, one scientific authority.

The most important point here is that the findings of the scientific authority cannot be disregarded by the management authority. Permits have to be denied if the scientific authority findings are negative. In the U.S. we also have a broad collaborative consultative process to implement CITES.

This is a graphic showing our CITES Interagency Coordination Committee. Fish and Wildlife Service at the center; because we are the ones who are tasked with implementing the treaty, and you also see that APHIS, the Animal and Plant Health Inspection Service, and Customs and Border Protection are also in red up there, because they have authority to enforce CITES at the borders for plants. Fish and Wildlife Service enforces for

animals; CDP and APHIS for plants. But all of these other agencies are involved to one degree or another. We work really closely with the National Marine Fisheries Service; obviously for marine species. The U.S. Trade Representative, our Office of the Solicitor, the Forest Service, Department of Justice, Department of State, our International Affairs Program in the Department, and also the states, through AFWA, are integrally involved in our process.

The CCC, this is the consultative body that we have, meets on a regular basis. The purpose is to connect the Service with other agencies, other federal agencies that have a nexus to CITES through their work. We try to make sure that they are aware of what's going on in CITES; and we are aware of what they're doing that may impact CITES or CITES decisions.

The idea is to provide an opportunity for other federal agencies and for the states through AFWA, to participate in the decision making process. We use this as a framework for developing U.S. negotiating positions for CITES meetings; and our decision making leading up to that. Coming up in May of 2019, is the next meeting of The Conference of the Parties.

This will be where all the parties, most of the parties, are present. The purpose is to review implementation; what's going right, what's going wrong, resolve policy issues, and amend those Appendix 1 and Appendix 2. There will be proposals to amend both of those; they will be decided up at the COP. It's an opportunity to work together; to ensure that trade is carried out in accordance with the treaty.

Just a little bit about the benefits of CITES. It establishes a legal framework to regulate international trade; to prevent overexploitation, and it does promote cooperation between importing and exporting countries. Within countries, it's an opportunity to work with other agencies that may be involved in the trade or with

the trade; National Marine Fisheries Service for example, Forrester Service, et cetera.

It does encourage analysis of population status of native species, species in trade, and the effects of international trade on wild populations. I do just want to mention briefly our public process that we have. It's very much a public process; as we get ready for a meeting of The Conference of the Parties.

As I said, the next one is coming up in May. I think we published our first Federal Register Notice asking for input over a year ago. I'm looking at Thomas, he probably knows exactly. You may or may not know that we received recommendations to list; to take a proposal to list American eel in Appendix 2, from the Wildlife Conservation Society and the Species Survival Network, I believe.

We have analyzed the recommendations that we got; and we have just last month, or the first part of this month, perhaps published another Federal Register Notice to alert the public that we have taken all their suggestions into consideration, and we have ranked them all as likely to take forward, unlikely to take forward, or undecided. We published a Federal Register Notice that says that we are unlikely to take a proposal forward to list the American eel in Appendix 2. That is a decision that ultimately will be made by people at a higher pay grade than Thomas and me. It goes up into the Department, up to the Assistant Secretary level probably. But we have no indication at this point that there is any interest in taking an Appendix 2 proposal forward for American eel. That's a really quick run through of how CITES works; and happy to take any questions.

UPDATE FROM THE OCTOBER CITES MEETING

CHAIRMAN GARY: Thank you, Laura. Before we take questions from the Board; I would like to invite to the speaker's podium Ms. Deb Hahn from the Association of Fish and Wildlife Agencies. Deb, you're there, and Deb has an update from the October CITES meeting. Deb.

MS. DEBORAH HAHN: Yes, thank you Marty, I appreciate it. Thank you for a few minutes. I do work for the Association of Fish and Wildlife Agencies; and just quickly for those that don't know, the 50 state Fish and Wildlife Agencies are members of ours. Some of those agencies include the Marine Agencies, some do not.

I also work with four regional state agency representatives in the northeast; it's Rick Jacobson from Connecticut, and in the southeast it's Buddy Baker from Louisiana. What we do is we attend CITES meetings. We work closely with Fish and Wildlife Service; and we communicate with Marty and Kirby and Bob about kind of what is going on with American eel, and what actions may or may not be taken through CITES.

I'm just going to follow up with Laura, and say that this year at the 2018, July Animals Committee Meeting; they did pass a set of draft recommendations that will be considered at the May and June Conference of the Parties in 2019 that Laura mentioned. I believe those were in your agenda; but just to give you a flavor of what those draft recommendations are.

They talk about collaborating and cooperating with other range states on shared stocks. They talk about establishing monitoring programs and developing abundance indices, improving traceability for *Anguilla* species. They talk about implementing conservation and management measures and related legislation; realizing that this is for all non-CITES listed *Anguilla* eel species, including the American eel.

Then the last one is that they ask the parties to report on progress at the 32nd Animals Committee, which will be held in 2021. If these recommendations are passed in May of '19, then the U.S. Fish and Wildlife Service, Laura and Thomas, will be required to report back on how we in the U.S. have taken these recommendations forward.

The other thing at our October CITES meeting, we learned that the European Union is highly unlikely to also bring a proposal forward to list American eel in Appendix 2; and to our knowledge there are no other parties that are considering bringing a proposal forward for American eel for The Conference of the Parties in 2019.

We also had a side conversation with some of our Canadian colleagues about their interest in discussing how we might increase communication and collaboration on our shared stocks; based on those draft recommendations I mentioned earlier. Then the last thing that was raised was that the International Union for the Conservation of Nature, or IUCN, their Anguillaed Eel Specialist Group is going to assess 16 species of eel starting in November of this year. The intent is to present an updated red list assessment in 2019 for those 16 species of eel; which includes American eel. With all that said, and understanding kind of where the CITES parties are right now; that we do not believe, very unlikely there would be a listing proposal brought forward in May.

I think the opportunity for the Eel Board to discuss is your ability to position yourself to address some of those draft recommendations in 2021; if they are approved. Then also, to be prepared to address any potential future listing proposals that would come forward for the 2022 Conference of the Parties of CITES.

CHAIRMAN GARY: Thank you, Deb. Before we open it up to questions for Thomas, Laura, or Deb, just a couple of observations, I think we heard pretty clearly that either from domestically or from the European Union Parties, the possibility of a proposal for Appendix 2 listing, it's pretty remote. We can have some dialogue in the very narrow amount of time we have before our hard stop at five o'clock; and talk about maybe what we want to do related to Appendix 2.

Maybe the better course of action might be to talk as Deb was saying, about where we position ourselves through communication, collaboration,

and then ultimately perhaps talk about the data that's going to be generated as part of the stock assessment process. As I understand it, now I'll lean to Kristen to confirm or deny, but I don't see the American eel listed on the schedule for a benchmark update. That's something maybe that we want to consider adjusting; Kristen.

DR. KRISTEN ANSTEAD: Currently the stock assessment schedule goes through 2021; as developed by AFC and approved by the Policy Board. American eel is not on it right now. I will remind you we did a benchmark in 2012; and an update to that benchmark in 2017. Theoretically, based on that time scale, we would think about doing a benchmark in 2022. But that's obviously the will of the Board.

If you wanted to get ahead of some of these other deadlines, if you are interested in moving forward with that that would be something that we would discuss with ASC and the American eel TC about data availability and staff time, and then it would go in front of the Policy Board. But currently through 2021, American eel is not on the stock assessment schedule.

CHAIRMAN GARY: Thank you, Kristen, for that clarification. I'll turn to the Board now to see where you would like to go forward with this discussion. Again, we have our two presenters and we have Deb from American Fish and Wildlife Association; and feel free to ask them questions.

But again, I think we should probably reserve some time to determine whether or not we want to look at the assessment schedule for eels; to better position ourselves in advance of what Deb was explaining to us, in terms of the timeline, as the process for CITES moves forward. I'll open it up to the Board now for questions. John.

MR. JOHN CLARK: Just a process question. It was said that the European Union was unlikely to move ahead also with an Appendix 2 listing. Does this mean that any country can ask for a species that doesn't occur in that country to be listed? In

our situation with the American eel spanning several countries, do all the countries where the species occurs have to agree to a listing?

MS. NOGUCHI: It's a great question. Any country, any CITES party can bring a listing proposal. It is much more difficult to do it if you are not a range country. It has happened; but it is much more difficult. CITES parties are required when they bring a listing proposal to consult with other range countries.

This is part of the reason we are so confident that the eel in particular is not going to bring a listing proposal. The deadline for submission of proposals is December 24 of this year; and they have not consulted with us. They have consulted with us on other species listing proposals that they're thinking of bringing forward; but not this one.

The way it would play out at a CITES meeting, always they try to achieve consensus. However, there is voting in CITES, where there isn't consensus there will be a vote. It's quite possible that you will not support a listing that comes into effect; and then you as a CITES party, figure out how to implement it.

CHAIRMAN GARY: Thank you, Laura, for the clarification on the shorter timeline. There is a deadline of December 24, as Laura noted; other questions? Lynn.

MS. LYNN FEGLEY: I just had a curiosity question. In the United States, and I expect that sharks are among this number. Are there other marine commercial fished species that are CITES listed, and does anyone know what the impacts of an Appendix 2 CITES listing are on a commercial fishery? I'm just kind of curious. Our constituents tend to ask that question; and I don't know how to answer it.

MS. NOGUCHI: That's another great question; and Thomas might have some comments here as well. There are sharks listed that are commercially

exploited for their fins mostly. We have non-detriment findings in place for those; hammerhead sharks in particular. We have been issuing export permits. I don't believe that this has been a particular burden on the industry. It's a learning process right, going from no regulation to having to go through the process; but I feel like we are moving forward pretty well with that. Thomas, do you have any?

MR. THOMAS LEUTERITZ: Of course NOAA is heavily involved with that process; so there is expertise coming in those decisions from there.

MS. NOGUCHI: When we make a non-detriment finding, and Thomas, it's his group that does, for the sharks in particular. If they can demonstrate that they have taken those sharks in accordance with the management plan that NMFS has in place; then that works for non-detriment.

CHAIRMAN GARY: Pat.

MR. PATRICK C. KELIHER: Thank you for the presentation; it was very helpful. I'm happy to hear that you don't have any requests for listings. In the state of Maine, obviously we became aware of this issue; as far as the exportation of elvers, a very valuable fishery to the state of Maine, one that we have invested a tremendous amount of time and energy, both from a science, but also for an enforcement standpoint.

A couple points, you had a graph up there that showed CITES and all of your partners around the outside; and it said the states. I'm assuming your interaction with the states is solely through AFWA, is that correct?

MS. NOGUCHI: That's partially correct. In cases where we have species that are listed, paddlefish is a pretty good example, so all sturgeon, all Acipenseriformes are listed under CITES Paddlefish are Appendix 2. There is a fair amount of Paddlefish caviar; and we work directly with the state DNRs, to make a legal acquisition finding in particular. We will go to each individual state.

We need to know what laws they have in place. When we get an application to export, we want to know where was it taken, when was it taken, and we will consult with the state to make sure they have the proper permits, they were fishing in the proper place, their logbooks were up to date that kind of thing. We will work directly with the state governments as well.

CHAIRMAN GARY: Follow up, Pat.

MR. KELIHER: Thank you for that. This is no disrespect to AFWA; because I have complete respect for the organization and the work that you do. But the state of Maine's Department of Resource is not a member of AFWA; and I think it's very important for the Atlantic States Marine Fisheries Commission to be part of that circle, when it comes to sturgeon, eels, and other very valuable species.

The issue around elvers is all about export. We had some issues in the state of Maine regarding what we thought was a fail-proof system of a swipe card; to control chain of custody. People got around it. By going around it that tells us the next weak link is at the airport; with U.S. Fish and Wildlife Service inspections.

Mr. Chairman, at some point I would like to make a recommendation to this Board to send a letter to the U.S. Fish and Wildlife Service; to express our concern about exports in general, as it pertains to elvers. If the U.S. Fish and Wildlife Service is unwilling to inspect a load of eels; other than looking at the paperwork, we have a very weak link.

Major Cloutier could speak to this all night long. If we can't get the U.S. Fish and Wildlife Service to open packages to verify the weight; then there is a breakdown in the system for that export. I think that's going to be very important for all the parties; the state of Maine, ASMFC, AFWA, working with CITES and the U.S. Fish and Wildlife Service, to kind of fix that last bottleneck in the process of exporting live elvers overseas.

MS. NOGUCHI: Just quickly, thank you for that comment. I can't really speak for the Office of Law Enforcement; but I do know that they are very actively engaged in illegal trade in eels, both here in the U.S. and also globally. It's a major global issue. As a matter of fact they offered that they would come, and they would be happy to come and give a briefing on some of the investigations that they have undertaken.

The issue of inspections at the ports, I know that this is a difficult issue. We only have so many inspectors; and it's impossible to inspect everything, right. But targeted inspections and targeted operations definitely can happen. I will certainly take your comments back. But I know that this is something that our Office of Law Enforcement is very focused on now.

CHAIRMAN GARY: Pat, we'll come back to that as an action item and revisit that before the meeting. Senator Watters.

SENATOR DAVID H. WATTERS: Just a comment on an earlier question; and perhaps Laura will correct me, but I do believe sea turtles are included as a CITES species. I did want to mention to my fellow legislators and legislative proxies here, aside from the immediate question of eels, in reference to CITES that I passed wildlife trafficking legislation this year; Senate Bill 451.

While CITES deals with international importation and the federal government deals with interstate. If you want to deal with intrastate possession and sale of CITES listed endangered species, you have to pass the state statute on it. We did a list of about 15 species; yes, Ivory is heavy orientation for that.

We didn't do sea turtles because that wasn't a fishery that we're involved in New Hampshire. But I do encourage you all to take a look at what you might need to do within your state statute, to make sure that loophole in CITES and in controlling this trade of endangered species,

including some marine species, is not occurring in your states.

CHAIRMAN GARY: Any other questions? Cheri.

MS. CHERI PATTERSON: I just had a question on if CITES designates American eel under Appendix 2 species; what is the timing involved in complying with any restrictions that might come of that?

MS. NOGUCHI: Listing proposals that are adopted at a Conference of the Parties go into effect 90 days after the close of that meeting of the Conference of the Parties. Sometimes there is a delayed implementation. There was for the sharks, in particular. This was a group of species that had not been regulated before.

There was a feeling that parties needed time to get up to speed on how they were going to do it. But I would imagine with something like eel, because there are already eels in trade, it would probably be the standard is 90 days after the close of the meeting.

CHAIRMAN GARY: Are there any other questions? John Clark.

MR. CLARK: Thanks to your reminders earlier about this issue. Kirby, if you could just review, the FMP in 2000, one of the recommendations was to have American eel listed under Appendix 3 of CITES; and that didn't happen. I was just wondering if you could review how the whole process evolved back then.

MR. KIRBY ROOTES-MURDY: I can speak to what I've communicated to you, John, which is that in the FMP that was passed back in 1999, and came into effect in 2000. There was a recommendation to have American eel listed under Appendix 3. My understanding is that recommendation that was put in the FMP was made on behalf of Fish and Wildlife Service.

Going back through the proceedings to try to see where that landed; there was a note in June of

2000 that Fish and Wildlife was going to move forward with a proposed rule regarding that. But I don't have any other additional information after that. It did not come up in a subsequent proceeding of the Board over the next year or two; specific to an Appendix 3 listing.

MR. CLARK: In that case can the Fish and Wildlife Service, do you know what happened, Laura?

MS. NOGUCHI: I don't actually know the details of that. It's been proposed to use both to list it under the ESA, at least twice. I know there have been 90 day findings and however many year findings; and they've never gone forward with it, and also the Appendix 3 listing. I do not know why we didn't go forward.

If people feel that that is a way that they would like to go, the advantage of it of Appendix 3 is that you can list something or delist it as you wish at any time as a party; but also because it gets directly at the illegal trade. It can help states that have laws in place to implement and enforce those laws; so that is really the benefit of Appendix 3.

CHAIRMAN GARY: Other questions. All right, thank you to Thomas, Laura, and Deb for your presentations today. I think the next question before the Board is; given the fact that we have a situation where it's highly unlikely that a proposal is going to come forward. Does the Board want to take a position?

If so, I would like to hear that feedback now. If not, the next course of action I think is probably to look at where we position ourselves going forward in the CITES process; and potentially look at the stock assessment schedule for American eel. Is there a desire on the Board to take a position on this Appendix 2; in advance of this May meeting coming up? Pat.

MR. KELIHER: I would recommend that we do not take a position in advance of the upcoming meetings; but request that staff, i.e. Kirby, keep a

close eye on this and report to the Board as new information comes forward.

CHAIRMAN GARY: I have Lynn and then Cheri.

MS. FEGLEY: Just one quick clarifying question to follow up on Pat's comment. Can these proposals be life stage specific, or is it for the species as a whole?

MS. NOGUCHI: That's another really good question. For Appendix 1 and Appendix 2 it is the entire species; it's all parts and products. Appendix 3 is a little bit different. I don't know about animals, for plants. Plants are also different; you can specify certain parts and products. Animals, it's the whole thing, yes.

CHAIRMAN GARY: Cheri Patterson.

MS. PATTERSON: I think I got this answer from Bob; but for the benefit of the rest of the table here. How long would it take to conduct a stock assessment for American eel?

DR. ANSTEAD: For a benchmark, if it were to be done due in 2021, I would like to get the process started in 2019. It's nice to have two years to start requesting the data; to start getting everybody's schedules aligned. That is not necessarily how long all the work would take; but I think 2019 would be a good notice for our TC members and our data providers to kind of get on the same page with deadlines and work.

CHAIRMAN GARY: Other questions? There is no objection to Pat's comment, then that's the direction we'll take with the Board. At this point, before I come back to Pat's other suggestion; to address the timing of the eel assessment, the stock assessment benchmark. Is there a desire from the Board to proceed to advance the time table; as Kristen just suggested? Lynn.

MS. FEGLEY: I guess I'm wondering, do we have any new information; if we were to start in 2019 to complete an assessment in 2021. Is there any

new information that would allow a better assessment? I shouldn't say better, but an assessment that allows us to define whether or not we're overfishing or overfished; and if we don't have that new information is it likely to really be helpful in this sort of case?

DR. ANSTEAD: Yes, I think that's a really good question, and I think that is one that would ideally be posed to the TC or the SAS. I know when we were approaching the update timeline, which was done in 2017, we did ask the TC. You know these research recommendations that you flagged during the benchmark that said should be completed before a next benchmark, has enough work been done?

Ultimately the TC said no. But let's do an update to stay on it. I think we would have to have a similar conversation; but the terminal year of the last benchmark was 2010. There is potential for some new data, maybe some new modeling approaches. But that is really a conversation for the full TC and SAS to have.

CHAIRMAN GARY: Senator Watters.

SENATOR WATTERS: I think that some of the questions that are raised suggest the logic of trying to move forward on the assessment. There is so much we don't know about eels; and also we are going to have to be facing whether climate change is going to have any impacts on their spawning and their habitat. If there is some movement at CITES, if we don't have a stock assessment to anticipate that we won't have the information to argue whether or whether not it is indeed necessary for a listing of endangered, and for us to take a position on that.

CHAIRMAN GARY: Any other further discussion? Put it out to the Board this way, perhaps. Following Kristen comments, is there any opposition to having that dialogue with the Technical Committee and coming back to the Board at a future meeting? Hearing none; perhaps that's the direction that we will go. Now

I'm going to come back and revisit Pat Keliher's comments about advancing a letter. Pat, if you could clarify that for us again.

MR. KELIHER: Laura's comments in regards to the Office of Enforcement with U.S. Fish and Wildlife Service are very accurate. They've done a lot of work with eels; at least that I know of what they've done domestically. Abroad I'm not sure; but I'm certain it's very active. We meet with Northeast Officers on an annual basis; Marine Patrol is very active with them about their cases.

I think potentially having the Board send a letter to the Office of Law Enforcement, expressing our gratitude for the work that they've done; and request their possibly expanded involvement when it comes to importation of eels, working directly with ASMFC Law Enforcement Committee in particular.

I'm not sure if we would go as far as referencing Maine Marine Patrol; but I do know that based on the work that we're going to do this legislative session, where we will have a bill in place to require every exported shipment be inspected by a Maine Marine Patrol Officer during weigh up. Because we will have exactly what is being shipped out of the state of Maine; and it could then be re-reviewed and inspected at the airport again by inspection agents.

I think it's kind of the missing link; because if they are using those shipments to then add to. It's one thing if they're putting them in boxes and shipping them out and saying they're guppies. We don't have any control. But to ensure that this legal activity is not infiltrated with illegal eels; is very important. I think some sort of a letter stating that to the Office of Law Enforcement; and asking for cooperation and giving our cooperation in return, would be prudent at this time.

CHAIRMAN GARY: Before we make a final decision on that Dan.

MR. DAN McKIERNAN: Just a question for Pat. Pat, what airports are we talking about?

MR. KELIHER: J.F.K. is the big shipping airport; but I know some shipments have gone out of Boston as well and possibly even Newark.

CHAIRMAN GARY: Is there any objection to Pat's suggestion of sending a letter from the Board? Hearing none; then we'll proceed with that. We'll work with staff to do such. Laura would like to make a comment.

MS. NOGUCHI: I just appreciate your comments; and I want to say that in addition to a stock assessment and having that understanding of the health of the population. Getting the illegal trade under control is a really big piece. I appreciate that you recognize that. I did read your minutes from the August, 2018 meeting before I came here; and I understand the problems, at least partially the problems that you're facing. But in terms of staving off a CITES listing; getting the illegal trade under control is really key.

REVIEW AND POPULATION OF THE ADVISORY PANEL

CHAIRMAN GARY: The next item on our agenda is the Review and Population of the Advisory Panel; and Tina, you'll be handling that.

MS. TINA BERGER: Good afternoon, thank you. I would present for your consideration and approval Richard Stoughton, commercial fyke net fisherman from South Carolina, and Lawrence Voss, a commercial potter out of Delaware, to add to the American Eel Advisory Panel, thank you.

CHAIRMAN GARY: Robert.

MR. ROBERT H. BOYLES, JR.: I would move that we accept those appointments as presented.

CHAIRMAN GARY: Seconded by John Clark. **Is there any opposition to these AP nominations? Seeing none; passed.**

ADJOURNMENT

CHAIRMAN GARY: That brings us up to our last item on the agenda, Other Business, and is there any other business to bring before this Board today? Seeing none; the American Eel Management Board is adjourned.

(Whereupon the meeting adjourned at 4:40 o'clock p.m. on October 22, 2018)

**State of Maine Aquaculture Plan for American Eel Pursuant to
Addendum IV to the ASMFC Interstate Fishery Management Plan**



Maine Department of Marine Resources
32 Blossom Lane
Augusta, ME 04330

MAY 2019



Photo By American Unagi, LLC

Table of Contents

<i>Background</i>	3
<i>Pound Requested</i>	3
<i>Location of Harvest</i>	4
<i>Rates of Harvest</i>	4
<i>Methods of Harvest</i>	5
<i>Minimal Contribution</i>	<i>Error! Bookmark not defined.</i>
<i>Monitoring Program</i>	5
<i>Penalties for Violation</i>	6
<i>Prior Approval of Permits</i>	7
<i>Description of Market (s)</i>	7
<i>Description of facilities (design, capabilities, and technical facts)</i>	7
<i>References</i>	9
<i>Maine Revised Statutes Title 12: Conservation</i>	10

Background

The Maine Department of Marine Resources (MDMR) supports the development of domestic aquaculture in Maine. With Maine's existing fishery management measures and eel management infrastructure the state is in a good place to implement a domestic aquaculture quota into its current management plan. Connecting Maine's fishery to a domestic aquaculture provides year-round jobs directly in eel grow-out, supports indirect jobs throughout the local seafood and marine-related industries, and produces an eel product grown under the high standards of US aquaculture production.

The MDMR solicited interested parties to participate in this quota request and has selected to work with American Unagi for 2019. Over the course of the last four years, American Unagi has utilized recirculating aquaculture system (RAS) technology, specifically using designs developed and successfully utilized for eels in Europe. This has allowed the company to grow high-value American eels in a controlled environment, certify sustainability and source, and provide a level of product supply to growing customer segments that prefer locally grown/sourced and fully traceable seafood products. Given the success of the last four years of pilot production, American Unagi is scaling production to 240 MT and is requesting a domestic aquaculture quota for the commercial facility.

In October 2014, the ASMFC adopted Addendum IV to the Interstate Fishery Management Plan for American Eel. 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 MDMR is submitting the following Aquaculture Plan for approval. While only one aquaculture operation, American Unagi, has requested to be included in the Aquaculture Plan for consideration, future plans may consider additional operations.

Pound Requested

American Unagi is requesting 200 pounds for the 2020 fishing year.

Location of Harvest

The Aquaculture Plan proposal requirements have been modified based on the following criteria (as recommended by the Technical Committee):

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 eels annually from within their waters for use in domestic aquaculture facilities. Site selection for harvest will be an important consideration for applicants and reviewers. Suitable harvest locations will be evaluated with a preference to locations that have:

- (1) established or proposed glass eel monitoring,
- (2) are favorable to law enforcement and
- (3) watershed characteristics that are prone to relatively high mortality rates.

Watersheds known to have features (ex. impassible dams, limited area of upstream habitat, limited water quality of upstream habitat, and hydropower mortality) that would be expected to cause lower eel productivity and/or higher glass eel mortality will be preferred targets for glass eel harvest. This is not an exclusive requirement, because there will be coastal regions with interest in eel aquaculture where preferred watershed features do not occur or are not easily demonstrated. In all cases, the applicant should demonstrate the above three interests were prioritized and considered.

American Unagi is planning to source the glass eels from several regions in Maine's watersheds to limit the impacts to individual river systems and be consistent with the statewide approach of the exiting fishery. In addition to data for regulatory measures, having full traceability and accountability of the facility's eels is important to the company's end market so the fishermen, volume, and harvest location will be identified for all eels entering the facility.

In 2019, American Unagi obtained glass eels from the Medomak River, Pemaquid River, Megunticook Stream, and Somes Pond outlet. None of these sites have established or proposed glass eel monitoring. The only glass eel monitoring in Maine occurs at West Harbor Pond, where the eel life cycle study is occurring. Removing glass eels from that site would compromise Maine's required study. The four sites listed are commonly fished for glass eels, and are routinely monitored by Marine Patrol Officers. Megunticook Stream has a steep gradient and multiple dams without upstream or downstream passage and Somes Pond is small. These two location would likely not produce a large number of adult eels.

Rates of Harvest

Aquaculture harvest will be limited to the current glass eel fishing season per State of Maine. By law, the elver season occurs between March 22 and June 7 (Appendix A; 12 M.R.S.A. §6575).

Methods of Harvest

A licensed harvester will be required to fish for all eels used for domestic aquaculture. License are issued by the Department of Marine Resources (Appendix A; 12 M.R.S.A. §6505-A, and §6302-A). For the aquaculture quota, one or more individuals will be issued a specialty aquaculture fishing allowance by MDMR Commissioner that permits the harvester to harvest glass eels for aquaculture purposes beyond the limits of their personal harvest quotas.

Glass eels shall be harvested only by dip net or elver fyke net, with size and construction being in compliance with current Maine law (Appendix A; 12 M.R.S.A. §6001). A license issued under this section must identify the number and types of nets that the license holder may use (Appendix A; 12 M.R.S.A. §6505-A). Elver fyke nets must display a tag issued by the Department when they are submerged (Appendix A; 12 M.R.S.A. §6505-B)

Additional harvest measures include a prohibition on fishing in the middle third of any waterway, within 150 feet of a fishway or a dam with a fishway, and specific area closures where fishing for elvers is prohibited (Appendix A; 12 M.R.S.A. §6575-B; §6575-C; §6575-F; §6575-G).

Finally, no person may fish for, take, possess or transport pigmented eels. All catches shall be screened and graded immediately upon harvest, whereas all eels failing to pass through 1/8" bar mesh net, as well as all bycatch will be returned to the water.

Monitoring Program

The Maine glass eel fishery has been managed under a Total Allowable Catch (TAC) established by the Atlantic States Marine Fisheries Commission (ASMFC) since 2014. In 2014, the TAC was 11,749 lbs, which was determined by calculating a 35% reduction from the 2013 Maine landings of elvers. The TAC was subsequently dropped to 9,688 lbs for the 2015-2018 seasons. This TAC was based on the actual Maine landings achieved during the 2014 season. Landings have typically approached the TAC, except for the 2015 season, when poor weather prevented fishermen from filling their quotas. By law, 21.9% of the annual TAC is allocated to the four federally recognized Indian Tribes in the state.

Concurrent with the implementation of the TAC, Maine implemented an individual quota system for state license holders, calculated based on harvester reported landings during the 2011, 2012, and 2013 seasons. The individual quota system is monitored through the use of a "swipe" card.

The swipe card system was created in 2013 to enable Maine to monitor the elver quota. The system was designed to allow dealers to enter data daily and allow MEDMR staff to quickly analyze that data within 24 hours of receipt. Additionally, the swipe card system was developed as the mechanism to monitor the individual fishing quota of harvesters.

Swipe cards are issued annually to each elver license by a Marine Patrol Officer. At that time, the license holder signs an acknowledgement form that indicates their understanding of their individual quota and

the penalties associated with exceeding their quota. Harvester sales are checked daily against their quota, and when the harvester's quota is reached or exceeded, the swipe card is deactivated by MEDMR Landings Program staff.

Each elver dealer has a swipe card reader for the permanent facility, as well as all vehicles used to transport elvers. Dealers are required to submit swipe card transaction reports (including negative reports) by 2 p.m. for each day of the elver season (March 22nd to June 7th). If dealers are delinquent with two days' worth of reports the swipe card system will not allow dealers to purchase elvers from harvesters until they submit all outstanding reports or create a negative report for the missing days. A dealer to dealer program was added in 2015. The dealer to dealer program required a card swipe each time dealers moved elvers to another location or dealer. The dealer to dealer program uses the same hardware and software as the harvester to dealer system, and is also subject to daily reporting including negative reports.

For the aquaculture quota, MDMR will issue separate aquaculture account to the assigned harvesters for a total allocation of 200 pounds. When the facility is assigned its quota it will designate the licensed harvesters that will be collecting the 200lbs. The aquaculture facility will be required to hold an elver dealer permit and license its buying station, transport vehicles, and facility. The permitted aquaculture facility will be the only dealer allowed to swipe aquaculture quota cards in addition to regular individual harvester cards. The data collection on these transitions from harvester to facility will include the harvester's name, harvest site, harvest method, date, and pounds. When the 200 pound quota is achieved, cards will be deactivated.

Due to the nature of the production, the facility will also be able to provide a status report to MDMR on glass eel survival when eels are moved from glass eel intake system into production facility at approximately four months from arrival (see facility description for more details).

Penalties for Violation

Since 2012, Maine has made numerous law changes to close any remaining loopholes and create the proper penalties for elver violations. The majority of elver violations were criminalized in 2014, changing from a civil violation, to a Class D crime with a \$2000 fine. At the same time, mandatory license revocations were imposed for the second violation of several elver offenses, including untagged gear, fishing out of season, or exceeding the individual fishing quota. In addition to the \$2000 fine, individuals who exceed their quota are subject to a "pecuniary gain" fine, where they must pay back to the State the value of any elvers that were taken in excess of their quota. The Department is authorized to deny the renewal of the license of an individual who has failed to pay their pecuniary gain fine in its entirety prior to the following elver season.

Harvester, dealers, and aquaculture facilities may have random inspection of the facility and places of harvest conducted to ensure all rules and regulations under conditions of permit(s) are being adhered to. An aquaculture facility permit would hold to these same penalties and loss of license for violations.

Regardless of specific penalties that may be provided in law, the Commissioner also has the authority to suspend any licenses or certificates issued by the Department if a person is convicted or adjudicated in court of violating any marine resources law or regulation. In addition, the Commissioner may pursue license suspension without criminal conviction or civil adjudication through an administrative process.

Prior Approval of Permits

American Unagi was first approved to hold and grow eels by MDMR in 2014. During the course of operating the pilot facility, American Unagi has worked closely with the State regulators on permitting for its operations. The company holds the necessary permits to buy, culture, and sell American eels.

For purchasing elvers from licensed Maine harvesters, American Unagi holds a MDMR Elver dealer license that is renewed annually. Under this permit, the company has permitted a buying station, transport vehicle, and facility. For sale of grown product, the company holds a MDMR Wholesale Dealer Permit that is renewed annually. Prior to November 1st, all eel aquaculture was permitted under MDMR, but as of November 1, 2017, the state of Maine has shifted the responsibilities for permitting land-based aquaculture facilities from the Department of Marine Resources to the Department of Agriculture, Conservation, & Forestry (DACF). The DACF is underway developing interim guidance for licensing and American Unagi is currently working closely with the State during this transition.

Description of Market (s)

American Unagi has already been supplying domestic outlets for the eel produced in its pilot facility. The company is planning to expand its sale of live and further develop processed products for domestic consumption. For propriety reasons, specific details are not being provided.

Description of facilities (design, capabilities, and technical facts)

The company is building a 240MT commercial scale land-based recirculating aquaculture plant in midcoast Maine. Following the formula for success of eels and RAS, American Unagi engaged a worldwide leader in RAS design in eels to assist in assessing the feasibility of its commercial plant, develop a schematic design, provide detailed operations and equipment costs to develop the plant.

The farm consists two separate systems: a glass eel system and a grow-out system. When glass eels are brought in they will go into the glass eel system which also serves as quarantine area. This recirculated system includes 18 round tanks of 2.25 meter diameter and 100 cm deep. Every 12 minutes the water is filtered and then recycled. The outlet of the fish tank is equipped with a brushing machine, basically a cylindrical screen that is constantly brushed to prevent clogging. The brushing machine is fed with water from the bottom center of the tank, pulling up dead and dying fish and feces. Glass eels are held in this system for 1-4 months as they are acclimated to commercial aquaculture diet. Once the glass eel reach a weight of 3-5 gram they are size graded and moved into the grow-out system. This system has a two series of tanks split into “nursery” and “grow-out”. The first series of nursery tanks hold the eels from 3-

5 grams until around 20 grams. The eels are then moved to the largest series of tanks within the same systems, where they are grown to market size.

Each system has its own filtration equipment. The waste water leaving the tanks is first sieved with a drumfilter; a rotating sieve that is equipped with a sieve cloth with 36-40 micron openings. Once the screen gets clogged with solids it automatically starts a rinsing cycle, spraying the waste into a gutter that is collected and processed. From the drumfilter the water is pumped into a biofilter for the stripping of carbon dioxide and for conversion of ammonia (NH₃) into the relatively harmless nitrate (NO₃). The biofilter is a moving bed biological reactors (MBBR's). These are energy efficient, compact, and are more efficient in maintain heat than other biofilters. From the biofilter the water flows by gravity through a MHO oxygen reactor to add pure oxygen and then by gravity back to the fish tanks.

A monitoring /control system is used for guarding pH, temperature and oxygen. All fish tanks are equipped with water level sensors. Together with some pressure sensors these are connected to an alarm system that dials out to cell phones. Additionally, our facility is equipped with video surveillance for both security and monitoring purposes.

During the course of the aquaculture process there is some expected mortalities and the losses are anticipated in the production planning. In American Unagi's experience, the largest period of mortality occurs during weaning process after glass eels first arrive. While the company has seen as little as 1% loss, it anticipates as high as 10% loss into its production planning to accommodate for this expected mortality. Therefore to produce, 240 MT annually the company will stock up to 620 lbs of glass eels, with 200 lbs of this being secured under the domestic aquaculture permit and the remaining 420 thru the standard quota system. Each year when the glass eels are stocked into facility the first one to four months they are kept separate from previous year classes. During the this intake period the company tracks growth, survival, and numbers for the years glass eels that would be available to MDMR for review and tracking.

During the production process the eels are size graded every 6-8 weeks. Given eel is a non-domesticated species there is a very big variance between the performance of different individuals. A fast grower may reach market weight in just 6 months but other fish may still weigh a few grams after one year. As a result of the growth variation the farm population in the grow-out tanks will comprise of 2-3 year classes of eel. As part of operating a successful aquaculture facility, meticulous records of growth, survival, and biomass are a necessary part of the business so during the course of the grow-out the farm maintains records of current eels onsite. In addition to supporting the successful operation of the business, these records are also used to support that best management practices are being followed.

References

Cote, Caroline L., P-A. Gagnaire, V. Bourret, G. Verreault, M. Castonguay, and L. Bernatchez. 2012. Population genetics of the American eel (*Anguilla rostrata*): $F_{ST} = 0$ and North Atlantic Oscillation effects on demographic fluctuations of a panmictic specie. *Molecular Biology* 2012.

Jessop, B.M. 2000. Estiamtes of population size and instream mortality rate of American eel elvers in a Nova Scotia River. *Transactions of the American Fishereis Sciiety* 29: 514-526.

Oliveira, K. and J.D. McCleave. 2000. Variation in population and life history traits of the American eel, *Anguilla rostrate*, in four rivers in Maine. *Environmental Biology of Fishes* 59: 141-151.

Maine Revised Statutes Title 12: Conservation

§6001. DEFINITIONS

13-F. Elver. "Elver" means a member of the species *Anguilla rostrata* in that stage of its life cycle when it is less than 6 inches in length.

[1995, c. 536, Pt. A, §1 (NEW) .]

13-G. Elver fyke net. "Elver fyke net" means a fyke net that is 30 feet or less in length from cod end to either wing tip, is fitted with netting that measures 1/8-inch bar mesh or less, contains a 1/2-inch or less bar mesh excluder panel that covers the entrance of the net, and consists of not more than one funnel end, one cod end and 2 wings.

[1997, c. 575, §1 (AMD) .]

13-H. Elver dip net. "Elver dip net" means a dip net with a hoop of not more than 30 inches in diameter and fitted with netting that measures 1/8 inch bar mesh or less.

[1999, c. 7, §1 (AMD) .]

40-A. Sheldon eel trap. "Sheldon eel trap" means a box trap with a netted wing 10 feet or less in length used to intercept and direct elvers into the trap.

§6302-A. TAKING OF MARINE ORGANISMS BY FEDERALLY RECOGNIZED INDIAN TRIBES

1. Tribal exemption; commercial harvesting licenses. A member of the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians who is a resident of the State is not required to hold a state license or permit issued under section 6421, 6501, 6502-A, 6505-A, 6505-C, 6535, 6601, 6602, 6701, 6702, 6703, 6731, 6745, 6746, 6748, 6748-A, 6748-D, 6751, 6803, 6804 or 6808 to conduct activities authorized under the state license or permit if that member holds a valid license issued by the tribe, nation or band or the agent of the band to conduct the activities authorized under the state license or permit. A member of the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians issued a tribal license pursuant to this subsection to conduct activities is subject to all laws and rules applicable to a person who holds a state license or permit to conduct those activities and to all the provisions of chapter 625, except that the member of the tribe, nation or band:

A. May utilize lobster traps tagged with trap tags issued by the tribe, nation or band or the agent of the band in a manner consistent with trap tags issued pursuant to section 6431-B. A member of the tribe, nation or band is not required to pay trap tag fees under section 6431-B if the tribe, nation or band or the agent of the band issues that member trap tags; [2011, c. 598, §17 (AMD).]

B. May utilize elver fishing gear tagged with elver gear tags issued by the tribe, nation or band or the agent of the band in a manner consistent with tags issued pursuant to section 6505-B. A member of the tribe, nation or band is not required to pay elver fishing gear fees under section 6505-B if the tribe, nation or band or the agent of the band issues that member elver fishing gear tags; and [2011, c. 598, §17 (AMD).]

C. Is not required to hold a state shellfish license issued under section 6601 to obtain a municipal shellfish license pursuant to section 6671. [1997, c. 708, §1 (NEW); 1997, c. 708, §3 (AFF).]

[2013, c. 254, §1 (AMD) .]

2. Tribal exemption; sustenance or ceremonial tribal use. Notwithstanding any other provision of law, a member of the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians who is a resident of the State may at any time take, possess, transport and distribute:

A. Any marine organism, except lobster, for sustenance use if the tribal member holds a valid sustenance fishing license issued by the tribe, nation or band or the agent of the band. A sustenance fishing license holder who fishes for sea urchins may not harvest sea urchins out of season; [2011, c. 598, §17 (AMD).]

B. Lobsters for sustenance use, if the tribal member holds a valid sustenance lobster license issued by the tribe, nation or band or the agent of the band. The sustenance lobster license holder's traps must be tagged with sustenance use trap tags issued by the tribe, nation or band or the agent of the band in a manner consistent with trap tags issued pursuant to section 6431-B; however, a sustenance lobster license holder may not harvest lobsters for sustenance use with more than 25 traps; and [2011, c. 598, §17 (AMD).]

C. Any marine organism for noncommercial use in a tribal ceremony within the State, if the member holds a valid ceremonial tribal permit issued to the tribal member by the Joint Tribal Council of the Passamaquoddy Tribe or the governor and council at either Passamaquoddy reservation, by the Penobscot Reservation Tribal Council, by the Aroostook Band of Micmacs Tribal Council or its agent or by the Houlton Band of Maliseet Indians Tribal Council or its agent. [2013, c. 254, §2 (AMD).]

For purposes of this subsection, "sustenance use" means all noncommercial consumption or noncommercial use by any person within Passamaquoddy Indian territory, as defined in Title 30, section 6205, subsection 1, Penobscot Indian territory, as defined in Title 30, section 6205, subsection 2, Aroostook Band Trust Land, as defined in Title 30, section 7202, subsection 2, or Houlton Band Trust Land, as defined in Title 30, section 6203, subsection 2-A, or at any location within the State by a tribal member, by a tribal member's immediate family or within a tribal member's household. The term "sustenance use" does not include the sale of marine organisms.

A member of the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians who takes a marine organism under a license or permit issued pursuant to this subsection must comply with all laws and rules applicable to a person who holds a state license or permit that authorizes the taking of that organism, except that a state law or rule that sets a season for the harvesting of a marine organism does not apply to a member of the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians who takes a marine organism for sustenance use or for noncommercial use in a tribal ceremony. A member of the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians issued a license or permit under this subsection is exempt from paying elver gear fees under section 6505-B or trap tag fees under section 6431-B and is not required to hold a state shellfish license issued under section 6601 to obtain a municipal shellfish license pursuant to section 6671. A member of the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians who fishes for or takes lobster under a license or permit issued pursuant to this subsection must comply with the closed periods under section 6440.

[2013, c. 254, §2 (AMD) .]

3. Lobster, sea urchin, scallop and elver licenses; limitations. Pursuant to subsection 1:

A. The Passamaquoddy Tribe and Penobscot Nation may each issue to members of its tribe or nation, as the case may be, up to 24 commercial lobster and crab fishing licenses in any calendar year, including all licenses equivalent to Class I, Class II or Class III licenses and student licenses, but not including apprentice licenses. Licenses issued under this paragraph are subject to the eligibility requirements of section 6421, subsection 5; [2011, c. 598, §17 (AMD).]

A-1. The Aroostook Band of Micmacs or its agent may issue to members of the band up to 10 commercial lobster and crab fishing licenses in any calendar year, including all licenses equivalent to Class I, Class II or Class III licenses and student licenses, but not including apprentice licenses. Licenses issued under this paragraph are subject to the eligibility requirements of section 6421, subsection 5; [2011, c. 598, §17 (NEW).]

A-2. The Houlton Band of Maliseet Indians or its agent may issue to members of the band up to 10 commercial lobster and crab fishing licenses in any calendar year, including all licenses equivalent to Class I, Class II or Class III licenses and student licenses, but not including apprentice licenses. Licenses issued under this paragraph are subject to the eligibility requirements of section 6421, subsection 5; [2013, c. 254, §3 (NEW).]

B. The Passamaquoddy Tribe may not issue to members of the tribe more than 24 commercial licenses for the taking of sea urchins in any calendar year. Sea urchin licenses must be issued by zone in accordance with section 6749-P; [2011, c. 598, §17 (AMD).]

C. The commissioner shall adopt rules authorizing the Penobscot Nation to issue to members of the nation commercial sea urchin licenses if the commissioner determines that sea urchin resources are sufficient to permit the issuance of new licenses. The commissioner may not authorize the Penobscot Nation to issue more than 24 commercial sea urchin licenses to members of the nation in any calendar year; [2011, c. 598, §17 (AMD).]

C-1. The commissioner shall adopt rules authorizing the Aroostook Band of Micmacs or its agent to issue to members of the band commercial sea urchin licenses if the commissioner determines that sea urchin resources are sufficient to permit the issuance of new licenses. The commissioner may not authorize the Aroostook Band of Micmacs or its agent to issue more than 24 commercial sea urchin licenses to members of the band in any calendar year; [2011, c. 598, §17 (NEW).]

C-2. The commissioner shall adopt rules authorizing the Houlton Band of Maliseet Indians or its agent to issue to members of the band commercial sea urchin licenses if the commissioner determines that sea urchin resources are sufficient to permit the issuance of new licenses. The commissioner may not authorize the Houlton Band of Maliseet Indians or its agent to issue more than 24 commercial sea urchin licenses to members of the band in any calendar year; [2013, c. 254, §3 (NEW).]

D. The Penobscot Nation may not issue to members of the nation more than 20 commercial licenses for the taking of scallops in any calendar year, except that the commissioner shall by rule allow the Penobscot Nation to issue additional commercial licenses to members of the nation for the taking of scallops if the commissioner determines that scallop resources are sufficient to permit the issuance of new licenses; [2011, c. 598, §17 (AMD).]

D-1. The Aroostook Band of Micmacs or its agent may not issue to members of the band more than 10 commercial licenses for the taking of scallops in any calendar year, except that the commissioner shall by rule allow the Aroostook Band of Micmacs or its agent to issue additional commercial licenses to members of the band for the taking of scallops if the commissioner determines that scallop resources are sufficient to permit the issuance of new licenses; [2011, c. 598, §17 (NEW).]

D-2. The Passamaquoddy Tribe may not issue to members of the tribe more than 20 commercial licenses for the taking of scallops in any calendar year, except that the commissioner shall by rule allow the Passamaquoddy Tribe to issue additional commercial licenses to members of the tribe for the taking of scallops if the commissioner determines that scallop resources are sufficient to permit the issuance of new licenses; [2013, c. 8, §1 (NEW).]

D-3. The Houlton Band of Maliseet Indians or its agent may not issue to members of the band more than 10 commercial licenses for the taking of scallops in any calendar year, except that the commissioner shall by rule allow the Houlton Band of Maliseet Indians or its agent to issue additional commercial licenses to members of the band for the taking of scallops if the commissioner determines that scallop resources are sufficient to permit the issuance of new licenses; [2013, c. 254, §3 (NEW).]

E. The Penobscot Nation may not issue to members of the nation commercial licenses for the taking of elvers in any calendar year that exceed the following limits:

- (1) Eight licenses that allow the taking of elvers with 2 pieces of gear; and
- (2) Forty licenses that allow the taking of elvers with one piece of gear.

The commissioner shall by rule allow the Penobscot Nation to issue additional commercial licenses to members of the nation for the taking of elvers if the commissioner and the Penobscot Nation determine that elver resources are sufficient to permit the issuance of new licenses; [2015, c. 391, §3 (AMD).]

E-1. The Passamaquoddy Tribe may issue to members of the tribe commercial licenses for the taking of elvers with one piece of gear; [2015, c. 391, §4 (AMD).]

F. The Aroostook Band of Micmacs or its agent may not issue to members of the band more than 8 commercial licenses for the taking of elvers in any calendar year, except that the commissioner shall by rule allow the Aroostook Band of Micmacs or its agent to issue additional commercial licenses for the taking of elvers to members of the band if the commissioner determines that elver resources are sufficient to permit the issuance of new licenses; and [2013, c. 8, §1 (AMD).]

G. The Houlton Band of Maliseet Indians or its agent may not issue to members of the band more than 16 commercial licenses for the taking of elvers in any calendar year except that the commissioner shall by rule

allow the Houlton Band of Maliseet Indians or its agent to issue additional commercial licenses for the taking of elvers to members of the band if the commissioner determines that elver resources are sufficient to permit the issuance of new licenses. [2015, c. 391, §5 (RPR).]

The Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs, Houlton Band of Maliseet Indians and Department of Marine Resources shall report on the status of the sea urchin, scallop and elver fisheries to the joint standing committee of the Legislature having jurisdiction over marine resources matters by January 15th of each even-numbered year.

Rules adopted pursuant to this subsection are routine technical rules as defined in Title 5, chapter 375, subchapter 2-A.

§6302-B. ELVER QUOTA FOR FEDERALLY RECOGNIZED INDIAN TRIBES IN THE STATE

If the commissioner adopts an elver individual fishing quota system pursuant to section 6505-A, subsection 3-A, this section governs the allocation of the elver quota to federally recognized Indian tribes in the State. [2013, c. 485, §3 (NEW).]

1. Annual allocation. In accordance with section 6505-A, the commissioner shall annually allocate 21.9% of the overall annual quota of elver fishery annual landings to the federally recognized Indian tribes in the State. If the Passamaquoddy Tribe, the Penobscot Nation, the Aroostook Band of Micmacs and the Houlton Band of Maliseet Indians reach an agreement regarding the division of this 21.9% portion of the overall annual quota among them and communicate in writing that agreement to the commissioner prior to March 1st of the year in which the quota is allocated, the commissioner shall allocate that portion of the quota in accordance with that agreement. If no agreement is reached, the commissioner shall allocate that portion of the quota in accordance with the following:

- A. To the Passamaquoddy Tribe, 14% of the overall annual quota; [2013, c. 485, §3 (NEW).]
- B. To the Penobscot Nation, 6.4% of the overall annual quota; [2013, c. 485, §3 (NEW).]
- C. To the Houlton Band of Maliseet Indians, 1.1% of the overall annual quota; and [2013, c. 485, §3 (NEW).]
- D. To the Aroostook Band of Micmacs, 0.4% of the overall annual quota. [2013, c. 485, §3 (NEW).]

In making any allocations under this subsection, the commissioner shall reserve a portion no greater than 10% of each allocation in order to ensure that the quota is not exceeded.

[2013, c. 485, §3 (NEW) .]

2. Individual allocations. The following provisions govern the allocation of the quotas established under subsection 1 to members of each of the federally recognized Indian tribes.

A. The commissioner may enter into an agreement with a federally recognized Indian tribe in the State that does not provide for individual allocations of the quota established under subsection 1 to members of that tribe, nation or band. If the commissioner enters into an agreement pursuant to this paragraph, the following provisions apply.

- (1) An elver transaction card under section 6305 must be issued to each person to whom the tribe, nation or band issues a license under section 6302-A, subsection 3.
- (2) The holder of a license issued under section 6302-A, subsection 3 must meet the reporting requirements established by rule pursuant to section 6173.
- (3) The quota established under subsection 1 applies to all elvers taken under licenses issued by the tribe, nation or band under section 6302-A, subsection 3.
- (4) When the quota established under subsection 1 is reached, the department shall notify the tribe, nation or band. When the quota established under subsection 1 is reached, the holder of a license issued by the tribe, nation or band under section 6302-A, subsection 3 may not thereafter take, possess or sell elvers. Taking, possessing or selling elvers after the quota established under subsection 1 is reached is deemed a

violation by the license holder of the prohibition on fishing in excess of the person's individual quota in section 6505-A, subsection 3-A. [2015, c. 391, §6 (NEW).]

B. This paragraph governs the allocation of the quotas established in subsection 1 to members of a federally recognized Indian tribe in the State when the commissioner has not entered into an agreement with members of the tribe, nation or band under paragraph A that applies to members of that tribe, nation or band.

(1) If there is no agreement under paragraph A between the commissioner and the Passamaquoddy Tribe, the Passamaquoddy Tribe shall allocate to each person to whom it issues a license under section 6302-A, subsection 3, paragraph E-1 a specific amount of the quota allocated to the Passamaquoddy Tribe under subsection 1, paragraph A and shall provide documentation to the department of that allocation for each individual license holder. The Passamaquoddy Tribe shall allocate all of the quota that it has been allocated and may not alter any individual allocations once documentation has been provided to the department.

(2) If there is no agreement under paragraph A between the commissioner and the Penobscot Nation, the Penobscot Nation shall allocate to each person to whom it issues a license under section 6302-A, subsection 3, paragraph E a specific amount of the quota allocated to the Penobscot Nation under subsection 1, paragraph B and shall provide documentation to the department of that allocation for each individual license holder. The Penobscot Nation shall allocate all of the quota that it has been allocated and may not alter any individual allocations once documentation has been provided to the department.

(3) If there is no agreement under paragraph A between the commissioner and the Houlton Band of Maliseet Indians, the Houlton Band of Maliseet Indians shall allocate to each person to whom it issues a license under section 6302-A, subsection 3, paragraph G a specific amount of the quota allocated to the Houlton Band of Maliseet Indians under subsection 1, paragraph C and shall provide documentation to the department of that allocation for each individual license holder. The Houlton Band of Maliseet Indians shall allocate all of the quota that it has been allocated and may not alter any individual allocations once documentation has been provided to the department.

(4) If there is no agreement under paragraph A between the commissioner and the Aroostook Band of Micmacs, the Aroostook Band of Micmacs shall allocate to each person to whom it issues a license under section 6302-A, subsection 3, paragraph F a specific amount of the quota allocated to the Aroostook Band of Micmacs under subsection 1, paragraph D and shall provide documentation to the department of that allocation for each individual license holder. The Aroostook Band of Micmacs shall allocate all of the quota that it has been allocated and may not alter any individual allocations once documentation has been provided to the department. [2015, c. 391, §6 (NEW).]

The department shall issue an elver transaction card under section 6305 to a person licensed by the Passamaquoddy Tribe under section 6302-A, subsection 3, paragraph E-1, the Penobscot Nation under section 6302-A, subsection 3, paragraph E, the Houlton Band of Maliseet Indians under section 6302-A, subsection 3, paragraph G or the Aroostook Band of Micmacs under section 6302-A, subsection 3, paragraph F only upon receipt of adequate documentation specifying the individual quota allocated to that person by the tribe, nation or band under this subsection.

[2015, c. 391, §6 (RPR) .]

3. Overage. If the total weight of elvers sold by persons licensed by the Passamaquoddy Tribe, Penobscot Nation, Aroostook Band of Micmacs or Houlton Band of Maliseet Indians exceeds the quota allocated under subsection 1 to that tribe, nation or band, the commissioner shall deduct the amount of the overage from any future allocation to that tribe, nation or band. If the overage exceeds the overall annual quota allocated to that tribe, nation or band for the following year, the overage must be deducted from the overall annual quota allocations to that tribe, nation or band in subsequent years until the entire overage has been accounted for.

[2013, c. 485, §3 (NEW) .]

4. Emergency prohibition. The commissioner may adopt emergency rules to prohibit the Passamaquoddy Tribe, the Penobscot Nation, the Aroostook Band of Micmacs or the Houlton Band of Maliseet Indians from fishing for elvers under a license issued under this Title if the commissioner finds that the tribe, nation or band has

authorized fishing for elvers in a way that the commissioner determines will cause the tribe, nation or band to exceed the annual allocation set forth in subsection 1.

[2015, c. 391, §7 (NEW) .]

SECTION HISTORY

2013, c. 485, §3 (NEW). 2015, c. 391, §§6, 7 (AMD).

§6505-A. ELVER FISHING LICENSE

(CONTAINS TEXT WITH VARYING EFFECTIVE DATES)

1. License required. Except as provided in section 6302-A and section 6302-B, a person may not engage in the activities authorized under subsection 1-A unless the person is issued one of the following elver fishing licenses under this section:

- A. A resident elver fishing license for one device; [2003, c. 452, Pt. F, §11 (NEW); 2003, c. 452, Pt. X, §2 (AFF).]
- B. A resident elver fishing license for 2 devices; [2003, c. 452, Pt. F, §11 (NEW); 2003, c. 452, Pt. X, §2 (AFF).]
- C. A nonresident elver fishing license for one device; [2013, c. 468, §23 (AMD).]
- D. A nonresident elver fishing license for 2 devices; [2013, c. 468, §23 (AMD).]
- E. A resident elver fishing license with crew for one device; [2013, c. 468, §23 (NEW).]
- F. A resident elver fishing license with crew for 2 devices; [2013, c. 468, §23 (NEW).]
- G. A nonresident elver fishing license with crew for one device; or [2013, c. 468, §23 (NEW).]
- H. A nonresident elver fishing license with crew for 2 devices. [2013, c. 468, §23 (NEW).]

The department may not issue a license under paragraph E, F, G or H until January 1, 2015.

[2013, c. 485, §5 (AMD) .]

1-A. Licensed activity. The holder of an elver fishing license or elver fishing license with crew may fish for, take or possess elvers. The holder of an elver fishing license or elver fishing license with crew may transport and sell within state limits elvers that the license holder has taken. The holder of an elver fishing license with crew is liable for the licensed activities under this subsection of an unlicensed crew member assisting that license holder pursuant to subsection 1-B. Only the license holder to whom a tag is issued may empty an elver fyke net.

[2013, c. 468, §24 (NEW) .]

1-B. License limitations. An elver fishing license with crew authorizes the license holder to engage in the licensed activities under subsection 1-A. The holder of an elver fishing license with crew may engage one unlicensed crew member to assist the license holder only in certain activities as authorized by rule, and the unlicensed crew member may assist only under the direct supervision of the license holder.

[2013, c. 468, §24 (NEW) .]

1-C. Elver transaction card issued. The department may issue an elver transaction card to each license holder under this section and to each license holder under section 6302-A, subsection 3, paragraphs E, E-1, F and G in accordance with section 6302-B. The department may charge each license holder an annual fee for the elver transaction card that may not exceed \$35. Fees collected under this subsection must be deposited in the Eel and Elver Management Fund under section 6505-D. The license holder shall use the elver transaction card to meet electronic reporting requirements established by rule pursuant to section 6173. The elver transaction card must include the license holder's name and license number.

[2017, c. 250, §2 (AMD) .]

1-D. Use of elver transaction card required. The holder of an elver fishing license issued under this section or section 6302-A, subsection 3, paragraph E, E-1, F or G may not sell or transfer elvers the license holder has taken to an elver dealer licensed under section 6864 unless the holder of the elver fishing license presents to the elver dealer the elver transaction card issued to that person under subsection 1-C.

[2013, c. 468, §24 (NEW) .]

1-E. Elver transaction card limited. A person may not possess an elver transaction card unless that person holds a license issued under this section or section 6302-A, subsection 3, paragraph E, E-1, F or G and the elver transaction card was issued to that person pursuant to subsection 1-C.

[2013, c. 468, §24 (NEW) .]

1-F. Licenses issued. The commissioner may issue up to 425 elver fishing licenses each year under this section.

[2017, c. 250, §3 (NEW) .]

2. Eligibility. An elver fishing license may be issued only to an individual who:

A. [1999, c. 534, §1 (RP).]

B. [1999, c. 534, §1 (RP).]

C. Possessed an elver fishing license in the previous calendar year; [2011, c. 549, §3 (AMD).]

D. [2005, c. 533, §1 (RP).]

E. Did not possess an elver fishing license in the previous calendar year because the commissioner had suspended the person's license privileges for a length of time that included the previous calendar year; or [2011, c. 549, §3 (AMD).]

F. Becomes eligible to obtain an elver fishing license pursuant to the elver lottery under subsection 2-C. [2017, c. 250, §4 (AMD).]

[2017, c. 250, §4 (AMD) .]

2-A. Elver license lottery.

[2005, c. 533, §2 (RP) .]

2-B. Elver lotteries.

[2017, c. 250, §5 (RP) .]

2-C. Elver license lottery. The commissioner shall establish an elver fishing license lottery under which a person may become eligible for that license under subsection 2, paragraph F. An applicant to the lottery must submit a lottery application together with a \$35 nonrefundable application fee no later than January 15th of the same calendar year as the lottery. An applicant may not submit more than 5 elver fishing license lottery applications per lottery year. In any year in which a lottery is held, the lottery must be held on or before February 15th.

The commissioner may adopt rules to implement the elver fishing license lottery, including provisions for the method and administration of the lottery. Rules adopted pursuant to this subsection are routine technical rules as defined in Title 5, chapter 375, subchapter 2-A.

Twenty-five dollars of the application fee collected under this subsection must be deposited in the Eel and Elver Management Fund established in section 6505-D and used to fund a life-cycle study of the elver fishery. Ten dollars of the application fee may be used by the department to fund the costs of administering the elver fishing license lottery.

[2017, c. 250, §6 (NEW) .]

3. Limits on issuance.

[2013, c. 8, §3 (RP) .]

3-A. Elver fishing quotas. The commissioner may adopt rules to establish, implement and administer an elver individual fishing quota system in order to ensure that the elver fishery annual landings do not exceed the overall annual quota established by the Atlantic States Marine Fisheries Commission. Except as provided in section 6575-L, a person issued a license under this section or section 6302-A, subsection 3, paragraph E, E-1, F or G may not take, possess or sell elvers in excess of the weight quota allocated to that person under the quota system. The rules must:

A. Establish an overall annual quota for the State; [2013, c. 485, §7 (NEW).]

B. Establish the amount of the overall annual quota under paragraph A that is allocated to persons licensed under this section and specify a formula to establish individual quotas for persons licensed under this section. The formula may take into account the amount of elvers a person licensed under this section lawfully harvested in previous seasons based on final harvesting reports. The rules must specify the date by which harvester reports are considered final for the purpose of determining individual quotas; and [2013, c. 485, §7 (NEW).]

C. Provide, in accordance with section 6302-B, that 21.9% of the overall annual quota under paragraph A is allocated to the federally recognized Indian tribes in the State and establish the amount of that portion of the overall annual quota allocated to the Passamaquoddy Tribe, the Penobscot Nation, the Houlton Band of Maliseet Indians and the Aroostook Band of Micmacs. [2013, c. 485, §7 (NEW).]

If persons issued licenses under this section collectively exceed the overall annual quota allocated to those persons pursuant to paragraph B, the number of pounds by which the license holders exceeded that overall annual quota must be deducted from the following year's overall annual quota allocated to persons licensed under this section. If the overage exceeds the overall annual quota allocated to persons licensed under this section for the following year, the overage must be deducted from the overall annual quota allocated to persons licensed under this section in subsequent years until the entire overage has been accounted for.

The commissioner may adopt or amend rules on an emergency basis if immediate action is necessary to establish and implement the elver individual fishing quota in advance of the beginning of the elver fishing season.

Rules adopted pursuant to this subsection are routine technical rules as defined in Title 5, chapter 375, subchapter 2-A.

[2015, c. 131, §1 (AMD) .]

4. (TEXT EFFECTIVE UNTIL 1/1/18) Fees. Fees for elver fishing licenses are:

A. For a person who is a resident, \$205; [2017, c. 250, §7 (AMD).]

B. For a person who is a nonresident, \$542; [2017, c. 250, §7 (AMD).]

C. For a person who is a resident with crew, \$405; and [2017, c. 250, §7 (AMD).]

D. For a person who is a nonresident with crew, \$1,426. [2017, c. 250, §7 (AMD).]

One hundred and fifty dollars of each license fee collected under paragraphs A and B and \$300 of each license fee collected under paragraphs C and D accrue to the Eel and Elver Management Fund established in section 6505-D.

[2017, c. 250, §7 (AMD) .]

4. (TEXT REPEALED 1/1/18) Fees.

[2017, c. 284, Pt. EEEEE, §31 (AFF); 2017, c. 284, Pt. EEEEE, §7 (RP) .]

4-A. (TEXT EFFECTIVE 1/1/18) License fee. Fees for elver fishing licenses are:

A. For a resident elver fishing license for one device, \$55; [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

B. For a resident elver fishing license for 2 devices, \$63; [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

C. For a nonresident elver fishing license for one device, \$392; [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

D. For a nonresident elver fishing license for 2 devices, \$400; [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

E. For a resident elver fishing license with crew for one device, \$105; [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

F. For a resident elver fishing license with crew for 2 devices, \$113; [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

G. For a nonresident elver fishing license with crew for one device, \$1,126; and [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

H. For a nonresident elver fishing license with crew for 2 devices, \$1,134. [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

[2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF) .]

4-B. (TEXT EFFECTIVE 1/1/18) License surcharge. In addition to the license fee established in subsection 4-A, the commissioner shall assess a surcharge on each license issued under this section as follows:

A. For an elver fishing license issued under subsection 4-A, paragraphs A to D, \$150; and [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

B. For an elver fishing license issued under subsection 4-A, paragraphs E to H, \$300. [2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF).]

The surcharge fees collected under this subsection must be deposited in the Eel and Elver Management Fund established under section 6505-D.

[2017, c. 284, Pt. EEEEE, §8 (NEW); 2017, c. 284, Pt. EEEEE, §31 (AFF) .]

5. Gear. A person issued a license under this section may utilize one elver fyke net, one Sheldon eel trap or one dip net to fish for or take elvers without paying the fee required for a first net or trap pursuant to section 6505-B. A license issued under this section must identify the number and types of nets that the license holder may use pursuant to this section , section 6505-B and section 6575-B.

[2015, c. 391, §8 (AMD) .]

5-A. Possession of elvers. The holder of an elver fishing license may possess elvers only during the open season established in section 6575 and for up to 6 hours beyond the end of the open season.

[2013, c. 301, §10 (NEW) .]

6. Minimum age. A person who is under 15 years of age may not fish for or take elvers.

[2001, c. 421, Pt. B, §28 (AMD); 2001, c. 421, Pt. C, §1 (AFF) .]

7. Nonresident licenses; reciprocity with other states. A nonresident is eligible to purchase an elver fishing license only if the nonresident documents to the commissioner that the nonresident's state of residence allows Maine residents to purchase an elver license and fish for elvers in that state.

[1999, c. 7, §5 (NEW) .]

8. Violation.

[2013, c. 49, §8 (RP) .]

8-A. Violation. A person who violates this section commits a Class D crime for which a fine of \$2,000 must be imposed, none of which may be suspended. Violation of this section is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2013, c. 49, §9 (NEW) .]

SECTION HISTORY

1995, c. 536, §A8 (NEW). 1997, c. 297, §§1,2 (AMD). 1999, c. 7, §§2-5 (AMD). 1999, c. 534, §§1-3 (AMD). 2001, c. 421, §§B27-29 (AMD). 2001, c. 421, §C1 (AFF). 2003, c. 20, §WW7 (AMD). 2003, c. 452, §F11 (AMD). 2003, c. 452, §X2 (AFF). 2005, c. 533, §§1,2 (AMD). 2007, c. 615, §15 (AMD). 2009, c. 213, Pt. G, §6 (AMD). 2011, c. 549, §§3-5 (AMD). 2013, c. 8, §§2, 3 (AMD). 2013, c. 49, §§8, 9 (AMD). 2013, c. 301, §§9, 10 (AMD). 2013, c. 468, §§23-25 (AMD). 2013, c. 485, §§5-7 (AMD). 2015, c. 131, §1 (AMD). 2015, c. 391, §8 (AMD). 2017, c. 250, §§2-7 (AMD). 2017, c. 284, Pt. EEEEE, §§7, 8 (AMD). 2017, c. 284, Pt. EEEEE, §31 (AFF).

§6505-B. ELVER GEAR FEES

1. Elver fyke net and Sheldon eel trap fee. A person may not submerge an elver fyke net or a Sheldon eel trap in the waters of the State to fish for or take elvers unless the net or trap owner pays annually the following fees:

A. Fifty dollars per net or trap for the use of an elver fyke net or Sheldon eel trap, except that the fee under this paragraph does not apply to an elver fyke net or Sheldon eel trap a person utilizes pursuant to section 6505-A, subsection 5. [2017, c. 284, Pt. EEEEE, §9 (AMD).]

B. [1999, c. 7, §6 (RP).]

C. [1999, c. 7, §6 (RP).]

[2017, c. 284, Pt. EEEEE, §9 (AMD) .]

2. Tags for elver fyke net and Sheldon eel trap. A person may not submerge an elver fyke net or Sheldon eel trap in the coastal waters of the State to fish for or take elvers unless a tag issued by the department is affixed to the shoreside wing of the net or trap and is clearly visible. The department may issue a replacement tag when an owner issued a tag documents that a net or trap has been damaged or lost.

[2001, c. 421, Pt. B, §30 (AMD); 2001, c. 421, Pt. C, §1 (AFF) .]

3. Dip net fee. A person may not utilize a dip net to fish for or take elvers without paying a fee of \$50 per dip net annually.

This subsection does not apply to a dip net a person utilizes pursuant to section 6505-A, subsection 5.

[2017, c. 284, Pt. EEEEE, §10 (AMD) .]

4. Payment with license. The fees required under subsections 1 and 3 must be paid upon application for an elver fishing license under section 6505-A.

[1995, c. 536, Pt. A, §8 (NEW) .]

5. Disposition of fees. Fees collected under this section accrue to the Eel and Elver Management Fund established in section 6505-D.

A. [2017, c. 284, Pt. EEEEE, §11 (RP).]

B. [2017, c. 284, Pt. EEEEE, §11 (RP).]

[2017, c. 284, Pt. EEEEE, §11 (AMD) .]

6. Violation. A person who violates this section commits a Class D crime for which a fine of \$2,000 must be imposed, none of which may be suspended. Violation of this section is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2013, c. 49, §10 (AMD) .]

SECTION HISTORY

1995, c. 536, §A8 (NEW). 1997, c. 297, §§3-5 (AMD). 1997, c. 575, §2 (AMD). 1999, c. 7, §6 (AMD). 2001, c. 421, §B30 (AMD). 2001, c. 421, §C1 (AFF). 2009, c. 213, Pt. G, §§7-9 (AMD). 2011, c. 549, §6 (AMD). 2013, c. 49, §10 (AMD). 2017, c. 284, Pt. EEEEE, §§9-11 (AMD).

§6505-D. EEL AND ELVER MANAGEMENT FUND

1. Fund established. The Eel and Elver Management Fund, referred to in this section as the "fund," is established as a dedicated, nonlapsing fund.

[1995, c. 536, Pt. A, §8 (NEW) .]

2. Permissible uses. The commissioner may use the fund to research and manage the State's eel and elver resources, to enforce the laws related to eels and elvers and to cover the costs associated with determining eligibility for elver fishing licenses.

[2011, c. 266, Pt. A, §17 (AMD) .]

3. Plan required.

[2011, c. 266, Pt. A, §18 (RP) .]

SECTION HISTORY

1995, c. 536, §A8 (NEW). 1999, c. 309, §2 (AMD). 2011, c. 266, Pt. A, §§17, 18 (AMD).

Article 5: ELVER AND EEL LIMITATIONS

§6575. OPEN SEASON; ELVER HARVESTING

1. Open season. It is unlawful for a person to fish for or take elvers within the waters of the State except during the open season from noon on March 22nd to noon on June 7th.

[2015, c. 391, §9 (AMD) .]

1-A. Federally recognized Indian tribes; violation. It is unlawful for a person to fish for or take elvers in violation of rules adopted by the commissioner under section 6302-B, subsection 4.

[2015, c. 391, §10 (NEW) .]

2. Setting nets and traps. It is unlawful for a person to immerse or leave immersed an elver fyke net or a Sheldon eel trap in any river, stream or brook of the waters of the State at any time other than the open season for elver fishing.

[1999, c. 7, §7 (AMD) .]

3. Locating nets. It is unlawful for a person to designate or claim by any means a location in which to set an elver fyke net or a Sheldon eel trap at any time other than the open season for elver fishing.

[1999, c. 7, §7 (AMD) .]

4. Nets of certain sizes.

[1999, c. 7, §7 (RP) .]

5. Violation. A person who violates this section commits a Class D crime for which a fine of \$2,000 must be imposed, none of which may be suspended. Violation of this section is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2013, c. 49, §11 (NEW) .]

SECTION HISTORY

1995, c. 536, §A9 (NEW). 1995, c. 536, §A13 (AFF). 1997, c. 91, §4 (AMD). 1999, c. 7, §7 (AMD). 2013, c. 49, §11 (AMD). 2015, c. 391, §§9, 10 (AMD).

§6575-A. CLOSED PERIOD; ELVER HARVESTING

(REPEALED)

SECTION HISTORY

1995, c. 536, §A9 (NEW). 1995, c. 536, §A13 (AFF). 1997, c. 575, §3 (AMD). 1999, c. 7, §8 (AMD). 2011, c. 549, §7 (AMD). 2013, c. 49, §12 (RPR). 2013, c. 468, §26 (AMD). 2015, c. 391, §11 (RP).

§6575-B. METHOD OF ELVER FISHING; LIMITS ON GEAR

1. Gear. It is unlawful for a person to fish for or take elvers by any method other than by dip net, elver fyke net or Sheldon eel trap.

[1995, c. 536, Pt. A, §9 (NEW) .]

2. Number of elver fyke nets and Sheldon eel traps.

[1999, c. 7, §9 (RP) .]

2-A. Number of nets and Sheldon eel traps.

[1999, c. 534, §4 (RP) .]

2-B. Type and amount of gear. It is unlawful for a person to immerse elver fishing gear other than the types and amounts listed on the person's license pursuant to section 6505-A, subsection 5. A person may not immerse an amount of elver fishing gear that exceeds the amount of elver fishing gear listed on the person's license for the previous elver fishing season. A person may elect which types of gear are listed on the person's license prior to the issuance of the license for that elver fishing season. The commissioner may adopt rules to implement this subsection. Rules adopted pursuant to this subsection are routine technical rules as defined in Title 5, chapter 375, subchapter 2-A.

A. [2015, c. 391, §12 (RP).]

B. [2005, c. 533, §3 (RP).]

C. [2005, c. 533, §3 (RP).]

[2015, c. 391, §12 (AMD) .]

3. Rebuttable presumption. It is a rebuttable presumption that an elver fyke net, Sheldon eel trap or elver dip net immersed in any waters of the State at any time of the year is immersed for the purpose of fishing for or taking elvers.

[1999, c. 7, §11 (AMD) .]

4. Prohibition on fishing from boats. It is unlawful for a person to set or tend an elver fyke net or a Sheldon eel trap from a boat or to fish for or take elvers from a boat. A person may transport an elver fyke net, a Sheldon eel trap or a dip net by boat.

[1995, c. 536, Pt. A, §9 (NEW) .]

5. Use of dip nets. It is unlawful for a person to use a dip net to fish for or take elvers while standing in the coastal waters of the State.

[1997, c. 575, §4 (AMD) .]

6. Prohibition on fishing from artificial platforms. A person may not build or use an artificial platform to fish for elvers. This subsection does not prohibit fishing for elvers from piers or floats established for purposes other than elver fishing.

[1999, c. 7, §12 (NEW) .]

7. Bycatch release. A person immediately shall return alive into the waters of the State any species other than elver that is caught in an elver fyke net.

[1999, c. 7, §12 (NEW) .]

8. St. Croix River; use of fyke nets prohibited.

[2015, c. 391, §13 (RP) .]

SECTION HISTORY

1995, c. 536, §A9 (NEW). 1997, c. 91, §5 (AMD). 1997, c. 575, §4 (AMD). 1999, c. 7, §§9-12 (AMD). 1999, c. 534, §§4,5 (AMD). 2005, c. 533, §3 (AMD). 2013, c. 468, §27 (AMD). 2015, c. 391, §§12, 13 (AMD).

§6575-C. CLOSED AREAS; ELVER FISHING

1. Dams with fishways.

[2013, c. 49, §13 (RP) .]

2. River herring traps. A person may not fish for or take elvers within 50 feet of a licensed river herring trap.

[2011, c. 598, §25 (AMD) .]

3. Portion of rivers, streams and brooks. A person may not:

A. Fish for or take elvers at any time within the middle 1/3 of a river, stream, brook or other watercourse, as measured at mean high tide, within the coastal waters of the State; or [2003, c. 452, Pt. F, §14 (NEW); 2003, c. 452, Pt. X, §2 (AFF).]

B. Obstruct the middle 1/3 of any river, stream, brook or other watercourse, as measured at mean low tide, within the coastal waters of the State. [2003, c. 452, Pt. F, §14 (NEW); 2003, c. 452, Pt. X, §2 (AFF).]

[2003, c. 452, Pt. F, §14 (RPR); 2003, c. 452, Pt. X, §2 (AFF) .]

4. Dip nets near elver fyke nets. A person may not fish for or take elvers with a dip net in the mouth of an elver fyke net. For the purposes of this subsection, "mouth of an elver fyke net" means that area within an elver fyke net that is net-side of a straight line that runs from one meshed wing tip of the net to the other meshed wing tip.

[2003, c. 452, Pt. F, §15 (AMD); 2003, c. 452, Pt. X, §2 (AFF) .]

5. Fyke net placement. A person may not place or set an elver fyke net or take elvers from an elver fyke net when any portion of the net, including any anchoring device, is located within an imaginary line between the wing ends of another elver fyke net. Cod end anchoring devices may not exceed 10 feet in length and wing end anchoring devices may not interfere with or create a hazard to navigation within the middle 1/3 of a navigable watercourse. A marine patrol officer may open the cod end of a net that is located in violation of this subsection.

[1999, c. 7, §13 (NEW) .]

6. Obstructing elver fyke nets. A person may not set an elver fyke net or place an obstruction near an elver fyke net in a manner that interferes with the operation of an elver fyke net.

[1999, c. 7, §13 (NEW) .]

7. Rulemaking; gear placement. If necessary to conserve the elver resource, the commissioner may adopt rules pursuant to section 6171 relating to placement of elver fishing gear based on the configuration of specific rivers, streams, brooks or other watercourses. Rules adopted pursuant to this subsection are routine technical rules as defined in Title 5, chapter 375, subchapter II-A.

[1999, c. 7, §13 (NEW) .]

SECTION HISTORY

1995, c. 536, §A9 (NEW). 1997, c. 91, §6 (AMD). 1997, c. 575, §5 (AMD). 1999, c. 7, §13 (AMD). 2003, c. 452, §§F13-15 (AMD). 2003, c. 452, §X2 (AFF). 2011, c. 598, §25 (AMD). 2013, c. 49, §13 (AMD).

§6575-D. MOLESTING ELVER FISHING GEAR

1. Prohibition. Except as provided in subsection 1-A, a person other than a marine patrol officer or the license holder issued a tag for an elver fyke net may not utilize, transfer, alter, possess or in any manner handle the net unless that person has been issued a license to fish for elvers with an elver fyke net under section 6302-A, subsection 3, paragraph E, E-1, F or G or section 6505-A or a license to fish for elvers with crew with an elver fyke net under section 6505-A and the license holder issued the tag for the elver fyke net is present and assisting in setting, tending or removing the net.

A. [1999, c. 7, §14 (RP).]

B. [2013, c. 468, §28 (RP).]

[2013, c. 468, §28 (AMD) .]

1-A. Restriction on emptying net or trap; exception. A person other than the license holder identified on the tag for an elver fyke net or a Sheldon eel trap may not empty that net or trap unless that person has been issued an elver fishing license for the same gear type and has been issued written permission by a marine patrol officer to tend that net or trap. A marine patrol officer may issue a person written permission for the person to tend the license holder's net or trap only for the purpose of releasing captured elvers into the waters of the State if the license holder is temporarily unable to tend that net or trap because of a disability or personal or family medical condition. If the license holder is unable to tend that net or trap for more than 2 consecutive weeks, the net or trap must be removed from the water.

[2013, c. 468, §28 (NEW) .]

2. Violation. A person who violates this section commits a Class D crime for which a fine of \$2,000 must be imposed, none of which may be suspended. Violation of this section is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2013, c. 49, §14 (AMD) .]

SECTION HISTORY

1995, c. 536, §A9 (NEW). 1999, c. 7, §14 (AMD). 2001, c. 421, §B34 (AMD). 2001, c. 421, §C1 (AFF). 2011, c. 549, §8 (AMD). 2013, c. 49, §14 (AMD). 2013, c. 468, §28 (AMD).

§6575-F. WEST SIDE OF ORLAND RIVER CLOSED TO ELVER FISHING

A person may not fish for or take elvers within the portion of the Orland River between the west bank and the center of the river from the southernmost point of land on Fish Point to the dam in Orland. [1999, c. 18, §1 (NEW).]

SECTION HISTORY

1999, c. 18, §1 (NEW).

§6575-G. DAMS WITH FISHWAYS; ELVER FISHING

1. Dams with fishways. A person may not fish for or take elvers within 150 feet of any part of a dam with a fishway or within 150 feet of a fishway.

[2013, c. 49, §15 (NEW) .]

2. Violation. A person who violates this section commits a Class D crime for which a fine of \$2,000 must be imposed, none of which may be suspended. Violation of this section is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2013, c. 49, §15 (NEW) .]

SECTION HISTORY

2013, c. 49, §15 (NEW).

§6575-H. SALE AND PURCHASE OF ELVERS

1. Sale of elvers. A person may not sell elvers except as follows.

A. A person may not sell elvers except to a person who holds a valid elver dealer's license under section 6864 or a person who, pursuant to section 6864, subsection 9, is an authorized representative of a person holding a license issued under section 6864. [2013, c. 301, §12 (NEW).]

B. A person may not accept payment for elvers in any form other than a check or cashier's check that identifies both the buyer, by whom the landings will be reported, and the seller, each of whom must be a person holding a license issued under section 6864, a person who, pursuant to section 6864, subsection 9, is an authorized representative of a person holding a license issued under section 6864 or a person holding a license issued under section 6302-A, subsection 3, paragraph E, E-1, F or G or section 6505-A. [2013, c. 468, §29 (AMD).]

[2013, c. 468, §29 (AMD) .]

1-A. Purchase of elvers. A person who holds a valid elver dealer's license under section 6864 or a person who, pursuant to section 6864, subsection 9, is an authorized representative of a person holding a license issued under section 6864 shall post at the point of sale the price that that buyer will pay.

[2013, c. 485, §8 (NEW) .]

2. Violation. A person who violates this section commits a Class D crime for which a fine of \$2,000 must be imposed, none of which may be suspended. Violation of this section is a strict liability crime as defined in Title 17-A, section 34, subsection 4-A.

[2013, c. 49, §15 (NEW) .]

SECTION HISTORY

2013, c. 49, §15 (NEW). 2013, c. 301, §12 (AMD). 2013, c. 468, §29 (AMD). 2013, c. 485, §8 (AMD).

§6575-I. ASSISTING IN ILLEGAL HARVEST OF ELVERS

(REPEALED)

SECTION HISTORY

2013, c. 301, §13 (NEW). 2013, c. 468, §30 (RP).

§6575-J. SEIZURE OF ILLEGALLY HARVESTED ELVERS

In addition to any other penalty imposed, elvers that are purchased or possessed that were taken in violation of any law or rule pertaining to elvers are subject to seizure by any officer authorized to enforce this Part. The entire bulk pile containing illegally harvested elvers may be seized. For the purposes of this section, "bulk pile" means all elvers in the possession of a holder of an elver fishing license, an elver dealer's license or an elver exporter's license who fished for, took, possesses or bought elvers in violation of any law or rule regulating elvers under this Part. [2017, c. 250, §8 (AMD).]

SECTION HISTORY

2013, c. 301, §13 (NEW). 2017, c. 250, §8 (AMD).

§6575-K. ELVER INDIVIDUAL FISHING QUOTA

1. Prohibition on possession or sale of elvers in excess of elver individual fishing quota. A person may not possess or sell a weight of elvers that exceeds the elver individual fishing quota that person has been allocated for the fishing season pursuant to section 6505-A, subsection 3-A, plus any additional quota the person may be authorized to take under section 6575-L.

[2015, c. 131, §2 (AMD) .]

2. Prohibition on fishing after elver individual fishing quota has been reached. Except as provided in section 6575-L, this section applies to fishing after a person's elver individual fishing quota has been reached. A person who has sold a weight of elvers that meets or exceeds that person's elver individual fishing quota may not fish for or possess elvers for the remainder of the season, except that such a person who has been issued a license to fish for elvers may in accordance with section 6575-D assist another person who has been issued a license to fish for elvers who has not met or exceeded that person's elver individual fishing quota as provided in section 6505-A, subsection 3-A. All gear tagged by a license holder who has met or exceeded that person's elver individual fishing quota must be removed. A marine patrol officer may seize the elver transaction card of a license holder who has met or exceeded that person's elver individual fishing quota.

[2015, c. 131, §2 (AMD) .]

3. Violation. An individual who in fact violates this section commits a crime in accordance with section 6204 for which a fine of \$2,000 must be imposed, none of which may be suspended.

[2013, c. 485, §9 (NEW) .]

SECTION HISTORY

2013, c. 485, §9 (NEW). 2015, c. 131, §2 (AMD).

§6575-L. TEMPORARY MEDICAL TRANSFER

The commissioner may authorize a temporary medical transfer of the elver individual fishing quota allocated to a person under section 6505-A in accordance with this section. The holder of an elver fishing license who requests a temporary medical transfer under this section must maintain a valid elver fishing license during the duration of the temporary medical transfer. [2015, c. 131, §3 (NEW).]

1. Temporary medical transfer requested prior to March 1st. Notwithstanding section 6505-A, subsection 3-A, the commissioner may authorize a temporary medical transfer that permits the holder of an elver fishing license issued under section 6505-A to transfer the entire annual quota allocated to that person to another person holding an elver fishing license issued under section 6505-A if the following criteria are met:

A. The transferor reported elver landings in the prior fishing year; [2015, c. 131, §3 (NEW).]

B. The transferor is unable to fish the quota allocated to the transferor because the transferor has experienced a substantial illness or medical condition. The transferor shall provide the commissioner with documentation from a physician describing the substantial illness or medical condition; and [2015, c. 131, §3 (NEW).]

C. The transferor requests a temporary medical transfer in writing before March 1st of the fishing year for which it is being requested, except that the commissioner may adopt rules that provide a method for authorizing a temporary medical transfer requested after March 1st to address emergency medical conditions. [2015, c. 131, §3 (NEW).]

Rules adopted pursuant to this subsection are routine technical rules as defined in Title 5, chapter 375, subchapter 2-A.

[2015, c. 1, §5 (COR) .]

SECTION HISTORY

RR 2015, c. 1, §5 (COR). 2015, c. 131, §3 (NEW).



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

STEPHEN W. MURPHEY
Director

MEMORANDUM

TO: ASMFC American Eel Technical Committee

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

DATE: July 10, 2019

RE: Update on N.C. American Eel Aquaculture Plan (May 2017) for the 2019 harvest season

2019 Glass Eel Harvest Activities

In December 2018, the American Eel Farm (AEF) agreed to the aquaculture permit conditions submitted to them by NCDMF. Working under the approved May 2017 N.C. Aquaculture Plan, the AEF fished fyke nets from January 2, 2019 through April 19, 2019 and harvested 13.82 pounds of glass eels (Table 1). Dip nets were only used on one occasion, and Irish eel ladders were not used. The AEF did not receive any citations in 2019.

In June 2019, after successfully raising the eels for three months, the AEF suffered a total loss (100% mortality) of the eels harvested under the N.C. Aquaculture Plan allegedly due to bad food.

2019 Glass Eel Harvest Results

- The AEF fished fyke nets for 14 of 22 weeks during the open season; the AEF started fishing the first week of the glass eel season (open - Jan. 1, 2019) and stopped fishing six weeks prior to the end of the season (close - May 30, 2019).
- Fyke nets were fished 73 out of 129 days available to be fished (56.6%) (In order to create a 48-hour rest period, there was no fishing allowed from 12:01 pm Friday through 12:01 pm Sunday throughout the season).
- Dip nets (2) were only used on one occasion and captured 3.5 pounds of glass eels.
- All fishing effort was in the internal Coastal and Joint waters of creeks and canals surrounding Lake Mattamuskeet (Figure 1).
- 13.82 pounds of glass eels were harvested (Table 1).
- 980 glass eels were released alive (Table 1).
- 186.18 pounds of unused glass eel quota remained.
- 160 elvers were released alive (Table 1).

- The maximum number of fyke nets fished per week was 17, with a mean of 9.7 fyke nets deployed throughout the entire harvest period.
- CPUE data – limited utility due to: 1) changing harvest locations, 2) different net dimensions, 3) gear modifications (crab protection), 4) inconsistent fishing effort, 5) periods of no fishing, and 6) weight includes water.

May 2019 N.C. Aquaculture Plan – Proposal - (2-year plan, 2019/2020 and 2020/2021 harvest seasons)

Table 2 outlines the May 2017 and May 2019 N.C. Aquaculture Plan sections side by side for comparative purposes to better see the modifications that were made.

Table 1. American Eel Farm (AEF) summary catch and effort statistics for the 2019 glass eel harvest season. * No weekly fishing activity, fyke nets were removed on 4/19/2019. † 3.2 pounds came from dip nets (n=2).

Week date (Sun - Fri)	Number of fyke nets deployed			Total number		Average number of hours fished (min : max)	Total pounds of glass eels		Total number of glass eels		Total number of elvers	Glass eel CPUE (pound/hour)	Glass eel CPUE (number glass eels/hour)
	Mean	Min	Max	days fished	hours fished		harvest	released	harvest	released	released		
1-4 Jan	2.5	0	3	3	119.1	39.7 (39.1 : 40.5)	0	0.02	0	55	0	0.0002	0.46
6-11 Jan	9.7	4	11	6	1,086.3	98.7 (70.7 : 117.6)	0	0.07	0	225	14	0.0001	0.21
13-18 Jan	5.0	0	8	5	496.5	67.1 (44.2 : 90.6)	0	0.09	0	280	7	0.0002	0.56
20-25 Jan	4.7	0	11	4	466.0	42.4 (12.6 : 74.1)	0	0.06	0	180	11	0.0001	0.39
27 Jan-1 Feb	13.7	0	17	5	1,537.5	90.4 (70.8 : 99.3)	1.10	0.08	3,332	240	58	0.0008	2.32
3-8 Feb	14.2	0	17	5	1,537.4	61.5 (11.8 : 101.7)	7.15†	0	21,658	0	42	0.0047	14.09
10-15 Feb	12	0	16	5	1,397.7	87.4 (75.8 : 98.8)	0	0	0	0	0	0.0000	0.00
17-22 Feb	16	16	16	6	1,798.3	112.4 (107.4 : 118.8)	0.40	0	1,212	0	0	0.0002	0.67
24 Feb-1 Mar	11.7	0	14	5	1,375.8	98.3 (97.1 : 100.9)	0.72	0	2,170	0	1	0.0005	1.58
3-8 Mar*	-	-	-	-	-	-	-	-	-	-	-	-	-
10-15 Mar	11.7	0	14	5	1,253.5	89.5 (88.9 : 90.5)	1.20	0	3,675	0	10	0.0010	2.93
17-22 Mar	14	14	14	6	1,567.4	112.0 (108.6 : 114.9)	0.25	0	757	0	0	0.0002	0.48
24-29 Mar	7	7	7	6	873.3	124.8 (123.5 : 126.5)	1.50	0	4,544	0	7	0.0017	5.20
31 Mar-5 Apr	7	7	7	6	791.8	113.1 (112 : 114.2)	1.50	0	4,544	0	10	0.0019	5.74
7-12 Apr*	-	-	-	-	-	-	-	-	-	-	-	-	-
14-19 Apr	7	7	7	6	865.3	123.6 (123.0 : 124.8)	0	0	0	0	0	0.0000	0.00
21-26 Apr*	-	-	-	-	-	-	-	-	-	-	-	-	-
28 Apr-3 May*	-	-	-	-	-	-	-	-	-	-	-	-	-
5-10 May*	-	-	-	-	-	-	-	-	-	-	-	-	-
12-17 May*	-	-	-	-	-	-	-	-	-	-	-	-	-
19-24 May*	-	-	-	-	-	-	-	-	-	-	-	-	-
26-30 May*	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	9.7	0	17	73	15,165.8		13.82	0.33	41,891	980	160	0.0009	2.827

Table 2. Comparison between the current (May 2017) N.C. Aquaculture Plan and the proposed (May 2019) Aquaculture Plan highlighting the modifications.

Section	Current Aquaculture Plan (May 2017)	Proposed Aquaculture Plan (May 2019)	Comment
Dates of Harvest	January 1 - May 30	November 1 - March 31	change in harvest period
General Conditions	...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...	...from 3:00 pm on Friday through 3:00 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...	change in time when nets must be left open
General Conditions	Catch per unit effort (CPUE) data will be collected for each piece of gear. Information collected will include: approximate time the gear began and <u>ended</u> fishing and the number of glass eels harvested. All CPUE data will be reported to the eel biologist by the 10th of the following month.	Catch per unit effort (CPUE) data will be collected for each piece of gear. Information collected will include: approximate time the gear began and ended fishing and the actual number or weight (includes water weight) to the nearest 0.1 pounds of glass eels harvested, and for dip nets the number used. All CPUE data will be required to be reported to the eel biologist for the previous weeks effort and harvest by 5:00 pm the following Saturday.	- added language to require reporting the <u>actual</u> number of glass eels harvested -added language to require the reporting of the number of dip nets used in the harvest of glass eels - change in CPUE reporting (weekly)
After the Harvest		Require AEF to call-in to NCDMF with the total harvest in pounds (or actual number of glass eels if weighing is impractical) prior to leaving the landing site. Zero pounds shall only be reported if no glass eels are harvested.	requirement added by request of NC DMF Marine Patrol
After the Harvest	Require AEF to call-in or email to NCDMF by 5:00 pm 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 call-in or email to NCDMF by 5:00 pm each day the total harvest for the previous day in pounds to the nearest 0.1 lb. of glass eels (or actual number of glass eels if weighing is impractical) received (including those days when no glass eel harvest occurred). Zero pounds shall only be reported if no glass eels are harvested and received.	added language to require reporting the <u>actual</u> number of glass eels harvested if weighing is impractical

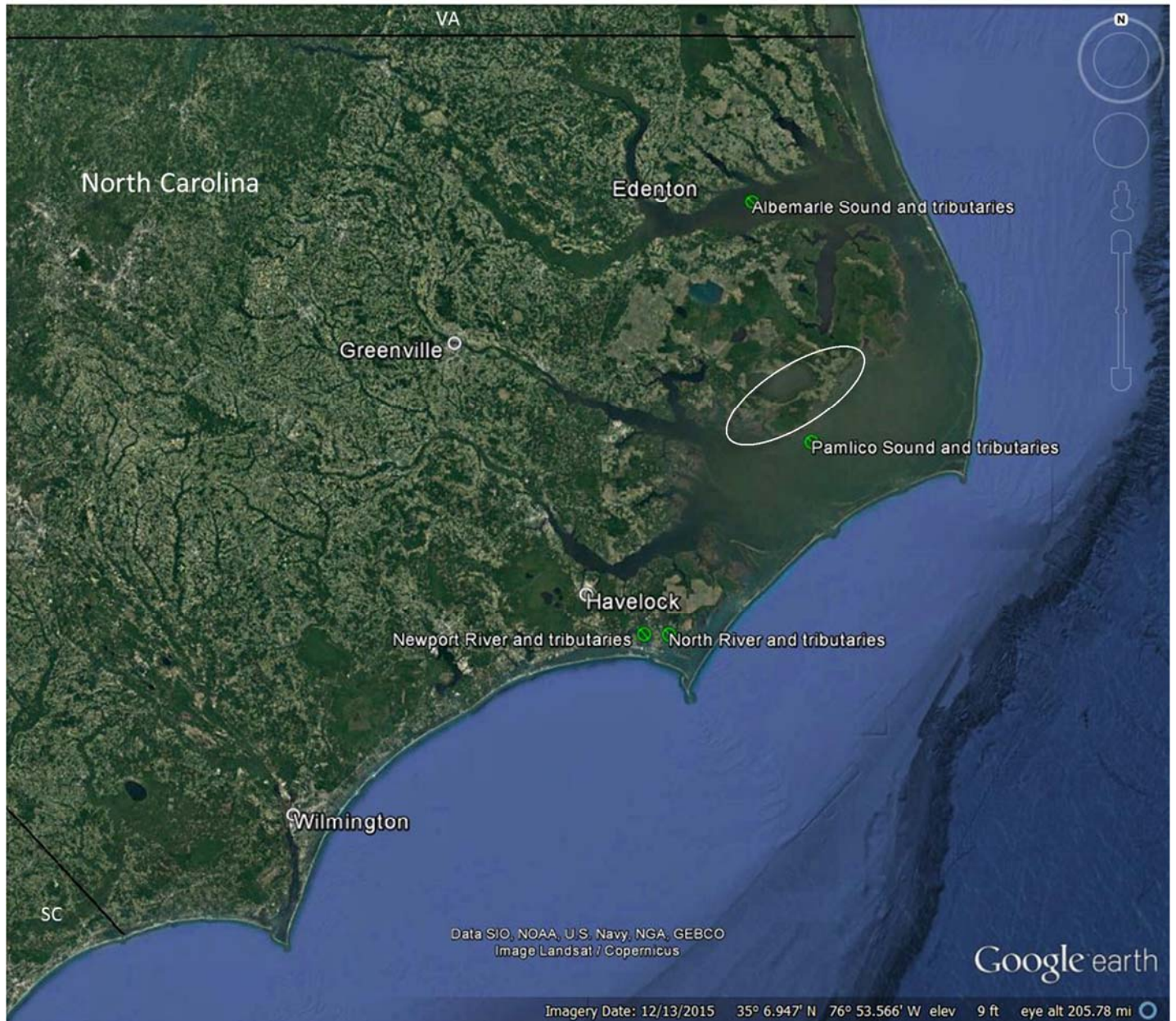


Figure 1. General location of harvest areas (white oval) along the North Carolina coast. All fishing effort in 2019 occurred in the internal Coastal and Joint waters of creeks and canals surrounding Lake Mattamuskeet.

North Carolina Aquaculture Plan for American Eel

Pursuant to Addendum V 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

Submitted on behalf of the American Eel Farm
Trenton, NC

May 24, 2019

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 and reduce regulations of aquaculture in the U.S. However, nothing has changed in the past 37. The US is producing about 1% of the annual global production.

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). The April 2000 American eel FMP (Report #36) also shows that the states of New York, Rhode Island, Delaware, Maryland and PRFC also took the same measure to protect aquaculture development between 1992 – 1995.

In January 2019, the ASMFC adopted Addendum V to the Interstate Fishery Management Plan for American Eel (ASMFC 2019);

Addendum V 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 V states:

“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 eels annually from within their waters for use in domestic aquaculture facilities. Site selection for harvest will be an important consideration for applicants and reviewers. Suitable harvest locations will be evaluated with a preference to locations that have (1) established or proposed glass eel monitoring, (2) are favorable to law enforcement and (3) watershed characteristics that are prone to relatively high mortality rates. Watersheds known to have features (ex. impassible dams, limited area of upstream habitat, limited water quality of upstream habitat, and hydropower mortality) that would be expected to cause lower eel productivity and/or higher glass eel mortality will be preferred targets for glass eel harvest. This is not an exclusive requirement, because there will be coastal regions with interest in eel aquaculture where preferred watershed features do not occur or are not easily demonstrated. In all cases, the applicant should demonstrate that the above three interests were prioritized and considered.”

Pursuant to Addendum V to the Interstate Fishery Management Plan for American Eel, the North Carolina Division of Marine Fisheries (NCDMF) is submitting the following Aquaculture Plan on behalf of the American Eel Farm (AEF) for approval. The NCDMF considered preferred watershed features when selecting approved harvest areas and watersheds, however within North Carolina’s coastal region this is not easily demonstrated. 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 November 1, through March 31, annually or until 200 lb. of glass eels are harvested, whichever occurs first.

DURATION OF HARVEST

The duration of harvest requested is for a two (2) year period. A renewal plan may be submitted by June 1, 2021 and at that time additional harvest years may be requested along with any modifications deemed necessary to ensure the success and continued approval of the plan. The division will update the Board annually concerning status of and compliance with the plan.

METHOD OF HARVEST

NCDMF will limit the number of individuals authorized to harvest under this plan (3 individuals). Glass eels shall be harvested using either fyke nets, dip nets or Irish eel ladders. 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

Irish eel ladders:

- Location and construction shall need NCDMF final approval (see Appendix I for design details)

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 can be harvested and would then count toward the 200 lb. annual glass eel harvest limit.

THE CURRENT AND PAST STATUS FOR AQUACULTURE PURPOSES

For more than three or four decades, nearly 100% of our nations' natural resource of glass eels have been exported overseas to the Asian markets with most of these eels being placed in Chinese fish farms for grow out. Products are then made (mostly kabiaki unagi) and sent back to the US. There have been many cases over the years where the Food and Drug Administration (FDA) has banned eel products due to unapproved growth hormones as well as other unapproved chemicals being found when tested.

American Eel Farm (formally North Carolina Eel Farm) has been the only exception. Throughout the early to the late 2000's glass eels were purchased from Maine fisherman and brought to the farm for grow out. There was a time when the former owner paid just \$60/pound.

Currently, nearly 100% of the glass eels harvested in Maine and South Carolina are exported. Limited grow out data on any commercial level is being collected, limited value-added job opportunities for US employees are realized, and limited US markets are being developed.

MINIMAL CONTRIBUTION

While we have no quantitative data on the abundance of glass eels, it could be argued the harvest of 200 lb. of glass eels is limited enough to have a minimal impact on the spawning stock of American eel (see Appendix II). 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.

The American eel has a broad geographic distribution range from the Caribbean to Canada and is found in many US interior states as well. It is well known that globally there is no successful commercial hatchery for the *Anguilla rostrata*. It is also accepted by the scientific community that the species dates well back in history and has the characteristic of panmixia (*Conclusive evidence for panmixia in the American eel, Cote*). *Anguilla rostrata*'s panmictic population allows for all individuals to be a potential partner. This provides for a very large single biomass spanning along the entire eastern seaboard of the US.

ATLANTIC SEABOARD WATERSHED

The **Atlantic seaboard watershed** is a watershed of North America along both:

- The Atlantic Canada (Maritimes) coast south of the Gulf of Saint Lawrence Watershed, and
- The East Coast of the United States north of the watershed of the Okeechobee Waterway. The relatively narrow continental area is demarcated on the south by drainage to the Okeechobee Waterway (which drains both westward to the Gulf and eastward to ocean), the Eastern Continental Divide (ECD) to the west, and the Saint Lawrence divide to the north. US physiographic regions of this watershed are the Atlantic Plain and the Appalachian Mountains & Highlands. Major sub-watersheds of the Atlantic Seaboard are the following (north-to-south):

Sub-watersheds adjacent to the Saint Lawrence divide

- Chedabucto Bay: 2,148 square miles (5,560 km²)
- Gulf of Maine: 69,115 square miles (179,010 km²)

- Long Island Sound: 16,246 square miles (42,080 km²)
- Lower New York Bay: >14,000 square miles (36,000 km²)

Other notable sub-watersheds

- Delaware Bay: 14,119 square miles (36,570 km²) — larger than several, but not adjacent to either divide
- Chesapeake Bay: 64,299 square miles (166,530 km²) — adjacent to both divides (at the Triple Divide point)

Sub-watersheds adjacent to the Eastern Continental Divide

- Albemarle Sound: >14,380 square miles (37,200 km²)
- Winyah Bay: >7,221 square miles (18,700 km²)
- Santee River: >4,531 square miles (11,740 km²)
- Savannah River: 9,850 square miles (25,500 km²)
- St. Johns River: 8,840 square miles (22,900 km²)
- Biscayne Bay: >2,800 square miles (7,300 km²)
- Kissimmee River: >3,000 square miles (7,800 km²)

The catch data of the American eel shows that the majority of wild caught adults come from the Chesapeake Bay and the Delaware Bay water basins. The figure is about 800,000 pounds per year from both. Catch data also reflects that the overwhelming majority of glass eels are harvested in Maine from the Gulf of Maine watershed. Any harvesting in the North Carolina watershed of Albemarle Sound for glass eels would clearly have little impact on the biomass migrating along the eastern seaboard with help from the Gulf Stream and Labrador currents.

Additionally, it is understood that the voting members of ASMFC took into consideration that all states may have applications for an aquaculture quota and included that language in Addendum IV. The language was revised in Addendum V. That would be a total of 3,000 pounds harvested from the biomass migrating out of the Sargasso Sea. Currently there are only two ASMFC approved aquaculture plans (North Carolina and Maine). Primarily due to the ideal conditions for aquaculture that exist in the southeast and specifically the state of North Carolina.

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.

GLASS EEL HARVEST SITES

- 1.) Albemarle Sound and tributaries
- 2.) Pamlico Sound and tributaries
- 3.) Newport River and tributaries
- 4.) North River and tributaries

NCDMF MONITORING PROGRAM

In addition to Aquaculture Operations/Collection General Permit Conditions in rule (NCMFC Rule 15A NCAC 03O .0502) and Aquaculture Operations/Collection Specific Permit Conditions (NCMFC Rule 15A NCAC 03O .0503F), 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 (3 individuals). 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. The permittee listed on the ACP shall provide names and licensing data for all designees 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 or sold until they reach the minimum legal size of nine inches total length.
- No more than one (1) permittee and two (2) designees shall be authorized to harvest under the ACP.
- No more than two (2) mates will be allowed to assist the permittee or designees while fishing for glass eels.
- The permittee/designee(s) and any 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, dip nets, and Irish eel ladders are the only gear authorized to use for glass eel harvest under the ACP.
- No more than thirty (30) fyke nets and/or dip nets and/or Irish eel ladders in any combination may be fished by the permittee/designee(s) under the ACP.
- A fyke net may not be placed within fifty (50) feet of any part of another fyke net.
- November 1 through March 31, 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 3:00 pm on Friday through 3:00 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 eight (8) 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.
- Immediately report to NCDMF if a net is tampered with and location of the net and the date and time it was noticed.
- Report to NCDMF when each fyke net is 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.
- Catch per unit effort (CPUE) data will be collected for each piece of gear. Information collected will include: approximate time the gear began and ended fishing and the actual number or weight (includes water weight) to the nearest 0.1 pounds of glass eels harvested, and for dip nets the number used. All CPUE data will be required to be reported to the eel biologist for the previous weeks effort and harvest by 5:00 pm the following Saturday.

BEFORE HARVEST

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

- Daily:
 - Landing site they will be leaving from and returning to once fishing activity is complete.
 - Number of fyke nets, dip nets, and Irish eel ladders that will be used and their assigned net ID number (net numbers used may also be reported after the harvest.
 - Names of individual(s) involved shall be reported at the beginning of the season and any changes or additions would be immediately reported.
 - Description and registration number of the boat(s) to be used for harvest shall require a one time and report and if any changes occur they would need to be reported.
 - Description and license plate number of the vehicle(s) to be used for harvest shall require a one time and report and if any changes occur they would need to be reported.

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

AFTER HARVEST

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

- Daily:
 - 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.
 - Require AEF to call-in to NCDMF with the total harvest in pounds (or actual number of glass eels if weighing is impractical) prior to leaving the landing site. Zero pounds shall only be reported if no glass eels are harvested.
 - Require AEF to call-in or email to NCDMF by 5:00 pm each day the total harvest for the previous day in pounds to the nearest 0.1 lb. of glass eels (or actual

number of glass eels if weighing is impractical) 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 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.

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. These controls will allow the NCDMF to ensure the glass eel harvest does not exceed what is authorized in the Aquaculture Plan. Any glass eels captured that exceeds the 200 lb. harvest limit shall be immediately returned to the water where captured.

ENFORCEMENT CAPABILITIES AND PENALTIES FOR VIOLATIONS

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 III).

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 IV).

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 2022
- 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 V: NC Marine Fisheries Commission (NCMFC) Rule 15A NCAC 03O .0501 (e))
- North Carolina Division of Marine Fisheries Standard Commercial Fishing License
- North Carolina Division of Marine Fisheries Dealer License

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
1633 NC HWY 41 West
Trenton, NC 28585

History, 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

Below are two You Tube links that show videos of the facility:

<https://www.youtube.com/watch?v=4YnQn7aivw4>

<https://www.youtube.com/watch?v=1wUiwzmzO-TI>

It is a proven Danish system designed overseas by Inter-Aqua Advance for eel grow-out and imported to the US by William Bokolar and Marty Bouw to US into the state of VA. The state of VA granted an 800 kilogram harvester permit for glass eels in 1999 as outlined in the ASMFC American eel April 2000 FMP Report #36 for this facility.

The AEF was initially operated in North Carolina as the North Carolina Eel Farm (corporate filing date May 21, 2002). It was purchased from the original owners by George Koonce and transported to Jones County. The original location suffered hurricane damage and was moved to its current location. The facility has a 15-year operation history in North Carolina. There is no other facility specifically designed to grow out glass eels to yellow eels at a commercial level in

NC. The facility has the capacity to easily 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. Water is purified, restructured and super oxygenated.

Raceway Tanks

Each section contains 12 raceway tanks. The facility has two separate treatment sections and 2 10,000 gal temporary storage tanks with filtration and aeration. Each raceway tank is equipped with a fine screen outlet complete with a tertiary motorized brush system, to keep the mesh clean. In each tank, there are also level switches that give alarm for high water level. These large rectangular fiberglass tanks hold about 1,000 gallons of water. Here is the home of the eels while we are their stewards.

Each tank is outfitted with aeration provided by large Sweetwater pumps and back-up emergency oxygen lines which automatically activate in case of a power outage. Each tank also can be isolated from the system and individually cleaned if necessary without draining the 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.

Monitoring Systems

There is a new Pacific Oxyguard water quality monitoring system that monitors pH, oxygen saturation levels, water levels and temperature. The system can send alarms remotely and is programmed to call a farm manager's cell phone as well as four other programmed numbers if any levels drop or change as per settings logged into system. 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.

Mechanical Filtration

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 settling pond on the property by a sump pump through a 12 inch PVC drain pipe.

Biological Filtration

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. Nitrifying bacteria create a film on the media and converts ammonia to a nitrate. It is safe for the fish and excellent for growing plants.

With an optimum temperature for the growth of the eel at 24 degrees C. or 74 degrees 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).

CO² Stripper

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 packings will provide maximum wettability, thereby maximizing the stripping effort.

Ultraviolet Lighting (UV)

Water flows through the center of a cylindrical housing. The water passes through the device and the UV lighting assists in disinfecting the water by destabilizing the DNA of germicidal bacteria. The water is surrounded by UV bulbs in special waterproof housings. The DNA in the bacteria is "blown-up". The UV system has recently had the bulbs updated. However, there have been reports that a UV disinfection system is not needed with eels so this system may be reconsidered.

Super Oxygenation

The water is injected through a top mount opening into 10 foot tall oxygen cones (4 total). As it spills into the pool below a vortex is created and splashing occurs. The water is restructured as bubbles are produced. Liquid Oxygen is injected into these bubbles under 20 PSI pressure (PV=nPT). 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 26 tanks with 150 PSI automatically.

Water Supply

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 feet deep and the

other two about 200 feet deep. Jones County is part of the North Atlantic Coastal Plain aquifer and is conveniently located where the Castle Hayne, Pee Dee and Black Creek aquifers intersect. Additionally, there is public water tied into the facility.

Water Softening System

There is a large commercial grade water softening system that all water passes through prior to entering any portion of the facility. The purpose is to change the molecular structure of the Ferrous Iron from the ground water to prevent it from becoming Ferric Iron once oxidized. The rust colored sediment that can cause operating issues.

Valve System

The facility has many valves which assist in directing water flow. This enables the operator to isolate any section, component or well source.

There is 440 volt electric service at pole. 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, employee dining, 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 at 15 X 85 feet and the other at 15 X 50 feet. 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. The roof was replaced with a steel roof about six years ago. 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(+) 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.

REFERENCES

- APNEP's river basins. Retrieved from Albemarle-Pamlico National Estuary Partnership website: <http://portal.ncdenr.org/web/apnep/basinsanddrivers> accessed on January 6, 2016.
- ASMFC (Atlantic States Marine Fisheries Commission). 2000. Interstate fishery management plan for American eel (*Anguilla rostrata*). ASMFC, Fishery Management Report No. 36, Washington, D.C. 93 p.
- ASMFC. 2012. American Eel Benchmark Stock Assessment. Stock Assessment Report 12-01 of the Atlantic States Marine Fisheries Commission. 342 pp.
- ASMFC. 2019. Addendum V to the fishery management plan for American eel. Approved January 2019. ASMFC, Washington, D.C.
- Facey, D.E. and M.J. Van Den Avyle. 1987. Species profiles: life histories and environmental requirements of coastal fishes and invertebrates (North Atlantic)--American eel. U.S. Fish Wildl. Ser. Biological. Rpt. 82 (11.74) U.S. Army Corps of Engineers, TR EL-82-4. 28 pp.
- FAO. 2014. The State of World Fisheries and Aquaculture 2014. Rome. 223 pp.
- Hein, Jennifer L., I. de Buron, W.A. Roumillat, W.C. Post, A.P. Hazel, and S.A. Arnott. 2015. Infection of newly recruited American eels (*Anguilla rostrata*) by the invasive swimbladder parasite *Anguillicolodescrassus* in a US Atlantic tidal creek. ICES Journal of Marine Science. Accepted May 5, 2015.
- Hill, L.J. 1969. Reactions of the American eel to dissolved oxygen tensions. Tex. J. Sci. 20:305-313.
- Hodson, P.V., M. Castonguay, C.M. Couillard, C. Desjardins, E. Pellitier and R. McLeod. 1994. Spatial and temporal variations in chemical contamination of American eel (*Anguilla rostrata*) captured in the estuary of the St. Lawrence River. Can. J. Fish. Aquat. Sci. 51:464-478.

Machut, L.S., K.E. Limburg, R.E. Schmidt, and D. Dittman. 2007. Anthropogenic impacts on American eel demographics in Hudson River tributaries, New York. *Transactions of the American Fisheries Society* 136(6):1699–1713.

Mallin, M.A., Posey, M.H., Moser, M.L., Shank, G.C., McIver, M.R., Alphin, T.D., Ensign, S.H. & Merritt, J.F. 1998 "Environmental assessment of the Lower Cape Fear River system, 1997-1998". CMSR report 98-02, Center for Marine Science Research, University of North Carolina at Wilmington. Wilmington, N.C. 28403.

NOAA. 2016. Aquaculture in the United States. Retrieved from NOAA website: http://www.nmfs.noaa.gov/aquaculture/aquaculture_in_us.html. Accessed on January 19, 2016.

Sheldon, W.W. 1974. Elver in Maine: techniques of locating, catching, and holding. *Maine Dept. Mar. Res.* 27 pp.

FIGURES

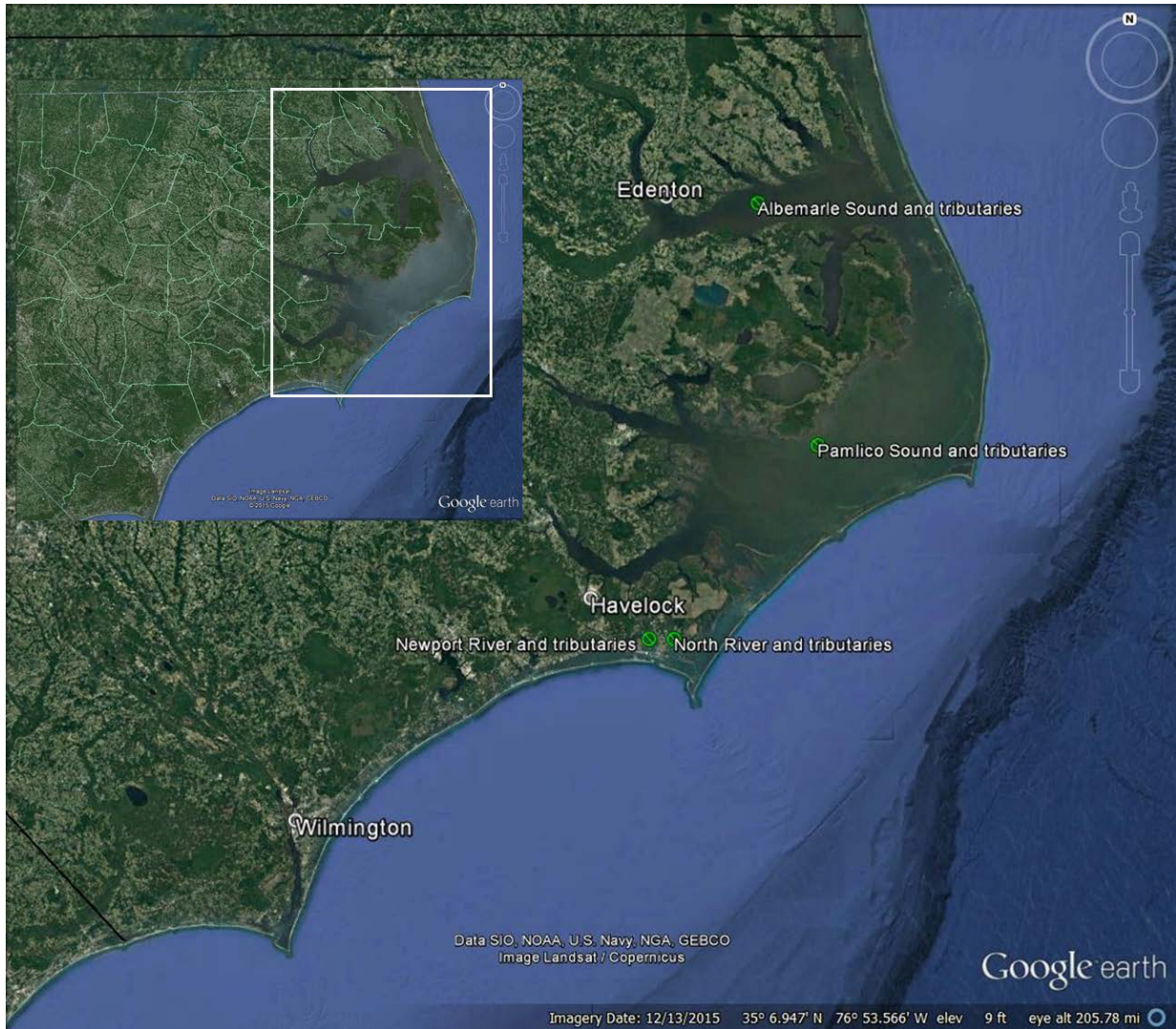
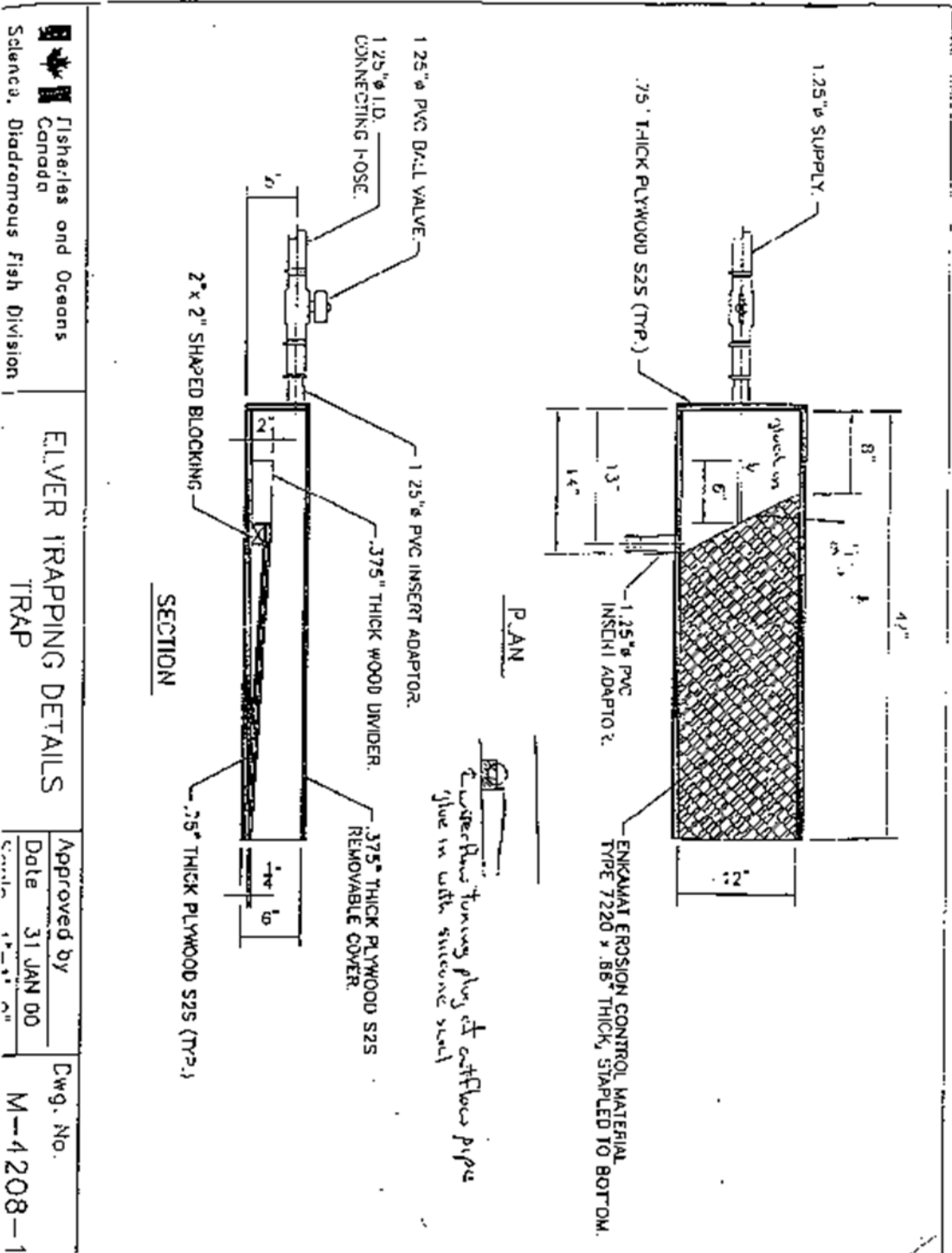


Figure 1. General location of proposed harvest areas (green circles) along the North Carolina coast.

APPENDIX I



Fisheries and Oceans Canada
Science, Diadromous Fish Division

ELVER TRAPPING DETAILS
TRAP

Approved by
Date 31 JAN 00

Dwg. No.
M-4208-1

APPENDIX II

Oct 28 13 11:24a

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 III

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

15A NCAC 03O .0504 SUSPENSION/REVOCATION 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 IV

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 V

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.

Section	Current Aquaculture Plan	Proposed Aquaculture Plan	Comment
Dates of Harvest	January 1 - May 30	November 1 - March 31	change in harvest period
General Conditions	...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...	...from 3:00 pm on Friday through 3:00 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...	change in time when nets must be left open
General Conditions	Catch per unit effort (CPUE) data will be collected for each piece of gear. Information collected will include: approximate time the gear began and ending fishing and the number of glass eels harvested. All CPUE data will be reported to the eel biologist by the 10th of the following month.	Catch per unit effort (CPUE) data will be collected for each piece of gear. Information collected will include: approximate time the gear began and ended fishing and the actual number or weight (includes water weight) to the nearest 0.1 pounds of glass eels harvested, and for dip nets the number used. All CPUE data will be required to be reported to the eel biologist for the previous weeks effort and harvest by 5:00 pm the following Saturday.	- added language to require reporting the <u>actual</u> number of glass eels harvested -added language to require the reporting of the number of dip nets used in the harvest of glass eels - change in CPUE reporting (weekly)
After the Harvest		Require AEF to call-in to NCDMF with the total harvest in pounds (or actual number of glass eels if weighing is impractical) prior to leaving the landing site. Zero pounds shall only be reported if no glass eels are harvested.	requirement added by request of NC DMF Marine Patrol
After the Harvest	Require AEF to call-in or email to NCDMF by 5:00 pm 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 call-in or email to NCDMF by 5:00 pm each day the total harvest for the previous day in pounds to the nearest 0.1 lb. of glass eels (or actual number of glass eels if weighing is impractical) received (including those days when no glass eel harvest occurred). Zero pounds shall only be reported if no glass eels are harvested and received.	added language to require reporting the <u>actual</u> number of glass eels harvested if weighing is impractical



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

MEMORANDUM

July 19, 2019

To: American Eel Management Board
From: American Eel Technical Committee
RE: Technical Committee Review of Aquaculture Proposals

Attendees: Jordan Zimmerman (DE; Chair), Ellen Cosby (PRFC; Vice-Chair), Sheila Eyler (USFWS), Danielle Carty (SC), Patrick McGee (RI), Marty Gary (PRFC), Robert Atwood (NH), Ryan Harrell (GA), Gail Wippelhauser (ME), Wendy Morrison (NOAA), Todd Mathes (NC), Troy Tuckey (VIMS), Kim Bonvechio (FL), Jen Pyle (NJ), Keith Whiteford (MD), Brad Chase (MA), Carol Hoffman (NY)

Public: Sara Rademaker (American Unagi), Fisherman's Voice

Staff: Kirby Rootes-Murdy and Kristen Anstead

The Commission's American Eel Technical Committee (TC) met via conference call on Monday July 15, 2019 to discuss the following items:

1. North Carolina's Aquaculture Proposal
2. Maine's Aquaculture Proposal
3. Update on USGS GIS Project
4. Update on Canada DFO Data Workshop

Call Summary and Recommendations:

1. North Carolina's Aquaculture Proposal for 2020-2021

Beginning with the 2016 fishing year, NC DMF has submitted an application on behalf of NC's American Eel Farm (AEF) to harvest 200 lbs of glass eels for use in aquaculture as allowed under the Aquaculture Plan provisions of Addendum IV (2014) and Addendum V (2018) to the Interstate Fishery Management Plan. Todd Mathes (NC DMF) presented an update on the 2019 fishing season as well as a new two year proposal from AEF to harvest 200 lbs annually. Mathes reported that AEF fishermen fished fyke nets 14 of 22 possible weeks primarily from January 1-March 30, 2019 and ended 6 weeks early. Dip nets were only used on one occasion. Fishing occurred in canals and tributaries surrounding Lake Mattamuskeet. In total, 13.82 lbs of glass eels (approximately 42,000 eels) were harvested and approximately 980 glass eels were released alive. CPUE data was collected but caveats include differences in net dimensions, changing harvest locations, gear modifications, inconsistent fishing effort, periods of no fishing, and recorded weights that included water.

M19-58

No citations were given to AEF fishermen in 2019. In June, there was a total mortality event attributed to bad food given to the eels; no eels were raised and brought to market.

For the 2020-2021 proposal, much of the aquaculture plan remains the same from the previous plan (May 2017) with the following updates:

- The proposal changes the start of the fishing year from Jan 1 to Nov 1, ending on March 31 instead of May 30. This would mean the fishing season would overlap two calendar years starting this fall;
- The time when nets must be left open was changed from 12:01 p.m. to 3:00 p.m.;
- Language was added to require reporting the actual number of glass eels harvested and require the reporting of the number of dip nets used in the harvest of glass eels
- Change to weekly CPUE reporting;
- Requirement added for the AEF to call-in to NCDMF with total harvest prior to leaving the landing site; and
- Language was added to require reporting the actual number of glass eels harvested if weighting is impractical after harvest

The TC discussed the proposal and asked Mathes questions to confirm that no American eels made it to market due to the mortality event and glass eels released at the beginning of the season reflected production needs to harvest some minimum amount before starting to bring the eels back to the facility. There were many questions regarding the change of the start date from January 1st, 2020, to November 1st, 2019, for the fishing season. Mathes stated that AEF was interested in exploring the availability of glass eels during November and December based on some indication from South Carolina eel fishermen as well as data from the Beaufort Bridge Ichthyoplankton Sampling Program that glass eels may be present then. Danielle Carty (SC DNR) stated that the peak of harvest for glass eels in SC's commercial fishery is February-April and that they rarely see glass eels before January. There was a minority concern expressed from the TC that starting fishing prior to January 1st fishing could open enforcement considerations despite low potential for NC harvest. Ultimately, the TC approved the proposal as is because the data collected could provide information regarding glass eels in the region during part of winter that has been previously unknown. Additionally the TC indicated it was unlikely AEF would find glass eels at that time of year.

It should be clear that proposal's November 1, 2019 would shift the fishing season to cover two calendar years. If approved, the new proposal could have harvest in one calendar year count towards two separate 200 lb harvest allowances for aquaculture. Addendum IV indicates that aquaculture proposals can propose harvest up to 200 pounds annually; the Board will need to determine whether to accommodate a proposal specifying harvest to a fishing season that occurs over two calendar years.

2. Maine's Eel Aquaculture Proposal for 2020

Sara Rademaker of American Unagi (AU) presented a report to the TC on the 2019 fishing season, which was their first year applying and getting approved, and a proposal for the 2020 season to harvest 200 lbs of glass eels. Rademaker stated that several commercial eel fishermen in Maine were contracted to fish for glass eels for AU, and all of the fishermen worked together to help this program run smoothly. Each fisherman had ten or twenty pound allotments to fish their fyke nets, and they took their catch to a buying station with a swipe card system, as required by ME DMR. It was a slow start to the season due to a cold spring in the region and most of the fishing took place from mid-April through May. AU made the decision to only use 130 lbs of their 200 lbs. quota in 2019 so as to not stress the facility and production in their first year with aquaculture quota. Law enforcement visited the facility and had no issues with the program.

For the 2020 season, Rademaker requested 200 lbs. of glass eels. AU plans on working with licensed commercial fisherman again and believes that they are better equipped to harvest more eels this year.

The TC approved the proposal for the 2020 fishing year.

In regard to both proposals, and any proposals that come to the TC in future years, Brad Chase (MA DMF) recommended the following with full TC support:

- 1.) To provide more information related to the Addendum V language on "suitable harvest locations", add a table to proposals with information on harvest sites. Possible table fields if available: watershed name, tributary name, drainage area, average seasonal discharge, river mile, tidal amplitude, years sampled, presence of hydropower, number and river mile of impassible dams and passible dams.
- 2.) Add section (1-2 paragraphs with table) on previous year's harvest to annual aquaculture proposals.
- 3.) Require CPUE reporting for all approved plans that have similar provisions as NC with enhanced reporting by location and set numbers. Include an abbreviated table of this reporting in the annual reporting/proposals. The goal would be to gain standardized fyke net catch and effort information at locations with consistent aquaculture harvest that could augment the state's monitoring of glass eel.

3. Update on USGS GIS Project

Kristen Anstead (ASMFC) updated the TC on a collaboration between ASMFC and USGS. Recently, John Young (USGS Leetown Science Center) approached ASMFC with a proposal to develop a habitat or GIS modelling framework for American eel to address several of the research recommendations from the stock assessment. In the initial phase, the TC compiled a spreadsheet of all available data sets from each respective state and jurisdiction and indicated the level of data available (i.e., environmental variables collected, biosampling data, location data). Young et al. reviewed the data summaries and requested several in raw form to explore some modelling approaches for the Delaware

River basin/Chesapeake Bay drainage area. Anstead has been working with TC members to get the raw data and will continue to keep the TC informed as the project progresses.

4. Report on Canada DFO Data Workshop

Anstead updated the TC on a workshop she and Kirby Rootes-Murdy (ASMFC) attended regarding a range-wide assessment for American eel by Canada's Department of Fisheries and Oceans (DFO). DFO received some funding to compile their fishery-dependent and – independent data across provinces and discuss all available data throughout American eel's range, similar to an ASMFC data workshop. At the workshop, participants discussed data strengths and weaknesses and methods currently used by the ASMFC (i.e., ARIMA, DBSRA) that could be applied in Canada. An assessment workshop will be held in October to review the model development by DFO staff and Laura Lee (Previous Stock Assessment Subcommittee Chair) will represent ASMFC. Anstead and Rootes-Murdy will continue to keep the TC updated on any collaboration between or meetings with DFO.