

January 2016

## American Eel: A Symposium. Session Five

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### Recommended Citation

Charles Norchi, Dr. David VanderZwaag, Dr. John Dettmers, Rachel White Sears, Laura Hussey-Bondt & Mike Waine, *American Eel: A Symposium. Session Five*, 21 *Ocean & Coastal L.J.* 113 (2016).

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## American Eel: A Symposium. Session Five

### **Authors**

Charles Norchi, Dr. David VanderZwaag, Dr. John Dettmers, Rachel White Sears, Laura Hussey-Bondt, and Mike Waine

**AMERICAN EEL: A SYMPOSIUM  
SESSION FIVE: LAW AND POLICY**

***Moderator:***

*Professor Charles Norchi<sup>1</sup>*

***Panelists:***

*Dr. David VanderZwaag<sup>2</sup>*

*Dr. John Dettmers<sup>3</sup>*

*Rachel White Sears<sup>4</sup>*

*Laura Hussey-Bondt<sup>5</sup>*

*Mike Waine<sup>6</sup>*

**Charles Norchi:**

This is our last panel before we have our concluding session where we will look at future directions. This panel is Law and Policy. We have five distinguished speakers starting with Professor David VanderZwaag.

**SUSTAINING AMERICAN EELS: NAVIGATING THE INTERNATIONAL LAW AND POLICY  
SEASCAPE.**

**David VanderZwaag:**

Summarizing the international law and policy context is not easy. [There is] a tangled array of global agreements, guidelines and soft law documents. The FAO (Food & Agriculture Organization) has produced over twenty technical guidelines for fisheries alone. For aquaculture, additional sets of guidelines [have been published] – including [a publication on] the ecosystem approach to aquaculture – so [the situation] is quite complicated. We have already covered some of the agreements or at least they should be covered in the next session. [These include the] Convention of Migratory Species (CMS) and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Since we have talked about the Sargasso Sea Commission already, my task is made a bit easier for this symposium. . . . In about twelve minutes or less [I will give a] two-part speed cruise.

First, a selected survey of global law and policy coordinates [will be given. Key conventions include the 1982 U.N. Law of the Sea Convention (UNCLOS)<sup>7</sup> and the Convention on Biological Diversity (CBD). “Soft law” documents include, among others, the] FAO Code of

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<sup>7</sup> United Nations Convention on the Law of the Sea, Dec. 10, 1982, 1833 U.N.T.S. 397 [hereinafter UNCLOS].

Conduct for Responsible Fisheries, and the United Nations Declaration on the Rights of Indigenous Peoples. [Second, a few brief glimpses will be provided regarding limited bilateral transboundary cooperation. For example, tangentially relevant] to the American eel [are the] Gulf of Maine Council on the Marine Environment [and the] Transboundary Resources Steering Committee . . . .

UNCLOS is relevant in two main ways to the American eel. [First,] it sets out general marine conservation responsibilities. One very important one is that States must protect and preserve the marine environment.<sup>8</sup> We have a recent advisory opinion from the International Tribunal for the Law of the Sea that [concluded] this is not just about pollution; this actually deals with living [marine] resources as well. When you think about preserve, [consider] what that actually means in terms of arctic ice melting, things that we should not be doing as humans to the marine environment. Obviously, there are going to be human uses so [the end result may] not be total preservation, but it is pushing in that direction. For ecological integrity to be protected, states must take all necessary measures to protect and preserve fragile ecosystems and the habitat of depleted, threatened or endangered species and other forms of marine life.<sup>9</sup> [Although] not [explicitly] stated, [this supports] the ecosystem approach. [The ecosystem approach] was not [an accepted] concept back then, but it is inherent in the language of the Convention.

There is a specific obligation for catadromous species.<sup>10</sup> We have seen that the American eel is kind of “slippery,” but it probably falls in this category over all. The coastal state in whose waters the catadromous species spends a greater part of its life cycle has management responsibility and must ensure ingress and egress of migrating fish. That [covers the] dam issues. [The responsibility is] you must, not you should, so that is a really key obligation. High seas harvesting is prohibited. Of course, . . . that is not a big deal with eels [as they are not fished on the high seas]. In the Exclusive Economic Zone (EEZ), fisheries will be subject to other fisheries conservation obligations set out under the Convention. Where catadromous fish migrate through the EEZ of another state, the coastal state and the other state concerned are required to manage such fish by agreement. Such agreement must ensure the species’ rational management. [The Convention] does not define what rational management means, but if you look at that article very closely, it says you do not have to have shared fisheries [to trigger the cooperative obligation]. It is when fish migrate at whatever stage, including juvenile. [What] this seems to be suggesting is that there should be a bilateral agreement between the U.S. and Canada, assuming that you have at some stage eels going across the EEZ of one or the other country.

This gets into the science issues. Where do the migratory paths really go? It is interesting to start thinking about. I call it “slipping through the cracks of the Law of the Sea Convention” because the American eel is certainly [a slippery] species for both governance and science. The drafters clearly did not have in mind a possibility of the single panmictic breeding population requiring broader inter-regional cooperation. They were [mainly] concerned about those states that are adjacent [and the requirement of direct] cooperation of the coastal state when the species go through the EEZ of another country.<sup>11</sup> The Convention really missed out on the American eel, [you might say].

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<sup>8</sup> *Id.* at art. 192.

<sup>9</sup> *Id.* at art. 194(5).

<sup>10</sup> *Id.* at art. 67.

<sup>11</sup> *Id.*

The Convention on Biological Diversity (CBD) [sets] two courses . . . that stand out. [First are] biodiversity targets (twenty altogether) [adopted under the CBD] in 2010. A couple are very important for fisheries. Target 6 – by 2020 all fish and invertebrates are managed and harvested sustainably, legally, and applying the ecosystem based approaches. So here you get the ecosystem based approach [as a goal] under the Convention. Overfishing is to be avoided. Recovery plans or measures are to be in place for all depleted species. Fisheries [should] have no significant adverse impact on threatened species [and vulnerable] ecosystems. Impacts of fisheries on species and ecosystems are [to be held] within safe ecological limits. Target 12 – by 2020, the extinction of [known threatened] species has been prevented and their conservation status has been improved and sustained. [This is] not exactly a real clear target, but a very ambiguous target you might say. [Nevertheless, managers] have to think about threatened species [and their recovery], again assuming the American eel would fall under [the threatened] category at least from a scientific standpoint.

[The CBD Secretariat convened] a workshop [in 2012] that looked at [identifying] ecologically or biologically significant areas [in the Western Caribbean and Western Mid-Atlantic region]. The Sargasso Sea [was named] as one of the EBSAs. As David [Cairns] mentioned yesterday, [the designation] does not have any immediate impact – it simply kind of flags it for the world community that this is an important hot spot, if you will, of biodiversity and it really needs to have further action taken to protect it. The Sargasso Sea Commission [has promise to move EBSA protection efforts forward].

The FAO Code of Conduct and its guidelines<sup>12</sup> [provide] a “principled overlay” of fisheries management responsibilities. Four principles are especially important, [even though] these aren’t the only ones . . . . First [is] the precautionary approach. Based on the Code, absence of adequate scientific information should not be used [as a] reason to postpone or fail to take conservation and management measures.<sup>13</sup> Precautionary reference points should be established [for fisheries] based on the best scientific evidence available.<sup>14</sup> Target reference points [should identify where managers] want to go as an objective. Limit reference points [should set out the stock status to be avoided. Managers are urged to plan ahead as to response measures if a limit reference point is exceeded, for example, development of a recovery plan.] The Code [adopts] a diluted form of precaution . . . . [Drafters] did not want to reverse the onus of proof to fishers to show there will not be significant harm before they can fish. You find [considerable] language in the guidelines that follow up on this and are quite diluting of the precautionary approach. They even talk about the burden of proof should be appropriate. What does that mean? The guidelines do not give a whole lot of guidance [but] you do have the reference points being very key. Of course, for the American eel this is a big challenge – where do you set these reference points? It is a very slippery species in terms of not having usual population dynamics [found] for most fish species.

[Second is the] ecosystem approach. The Code does not actually specifically use the term but it is [evident in various] articles. [Management measures should not only] ensure the conservation of target species but also the species [belonging to] the same ecosystem [or associated with or dependent upon the target species].<sup>15</sup> Selective and environmentally safe fishing gear

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<sup>12</sup> Food and Agriculture Organization of the United Nations, Code of Conduct for Responsible Fisheries (1995), <http://www.fao.org/docrep/005/v9878e/v9878e00.htm> [hereinafter FAO Code].

<sup>13</sup> *Id.* at art. 7.5.1.

<sup>14</sup> *Id.* at art. 7.5.3.

<sup>15</sup> *Id.* at art. 6.2.

practices should be developed and applied.<sup>16</sup> All critical fisheries habitats in marine and fresh water ecosystems (wetlands, mangroves, nursery, and spawning areas) should be protected and rehabilitated.<sup>17</sup> Management [measures] should protect endangered species.<sup>18</sup> This is key – fisheries should be managed as a biological unity over the entire areas of distribution.<sup>19</sup> [For the] American eel, [this suggests a] management framework [covering a] broad geographical region. [In the light of] the transboundary nature of many aquatic ecosystems, states should encourage bilateral and multilateral scientific research cooperation.<sup>20</sup>

[A third principle is] integrated coastal area management.<sup>21</sup> [The FAO has issued a specific set of guidelines on the topic emphasizing the need to ensure fisheries are considered in the] broader [context of] coastal [area] management [and planning].

Finally, [there is the principle of] social equity. Due recognition should be given in fisheries management [to the] traditional practices and interests of indigenous people and local fishing communities.<sup>22</sup> [The recently-adopted] FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries [emphasize the need to ensure] socially and culturally appropriate tenure rights to fishing resources . . . . FAO [documents are] sometimes quite politicized. You would think they could just say guidelines, but they said “voluntary” guidelines. [The guidelines provide] a moral direction for . . . fisheries [management and emphasize the need to take] seriously indigenous rights and also rights of local communities and their livelihoods. Livelihoods should be given priority over commercial fisheries . . . .

The U.N. Declaration on the Rights of Indigenous Peoples<sup>23</sup> [also recognizes] various rights [relevant to] fisheries. . . . [These include: the] right to be consulted before adoption and implementation of legislative or administrative measures that may affect an indigenous community;<sup>24</sup> the right to be secure in the enjoyment of their own means of subsistence and development;<sup>25</sup> [and the] right to own, use and control the lands, territories and resources possessed by reason of traditional ownership or other traditional occupation or use. . . .<sup>26</sup> Traditional uses of resources have to be recognized. These are just a few of the rights. . . .

The Gulf of Maine Council on the Marine Environment [was established in 1989] by the Premiers of New Brunswick and Nova Scotia, and the Governors of Massachusetts, Maine and New Hampshire. It has raised public awareness to a limited extent of the [plight of] American eels. [The Council] issued a 2007 report – American Eels: Restoring a Vanishing Resource in the Gulf

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<sup>16</sup> *Id.* at art. 6.6.

<sup>17</sup> *Id.* at art. 6.8.

<sup>18</sup> *Id.* at art. 7.2.2(d).

<sup>19</sup> *Id.* at art. 7.3.1.

<sup>20</sup> *Id.* at art. 6.4.

<sup>21</sup> *Id.* at art. 6.9.

<sup>22</sup> *Id.* at art. 7.6.6.

<sup>23</sup> Declaration on the Rights of Indigenous Peoples, G.A. Res. 61/295, Annex, U.N. Doc. A/Res/61/295 (Oct. 2, 2007), [http://www.un.org/esa/socdev/unpfii/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf).

<sup>24</sup> *Id.* at art. 19.

<sup>25</sup> *Id.* at art. 20.

<sup>26</sup> *Id.* at art. 26(2).

of Maine.<sup>27</sup> [The Council] has included restoration of coastal and ocean habitats as a goal [in the Council's five-year] action plans. [Under the] 2007 to 2012 [action plan], 49 new habitat restoration projects were funded – [with an] estimated 145 miles of streams opened to a fish passage. Their more recent action plan – 2012 to 2017 – pledges continuation of habitat restoration as [a central] emphasis. [There is] actually a habitat restoration program under the Gulf of Maine Council. . . . [The Council] does not deal with fisheries management and it is largely driven by the states and provinces with federal departments coming in as observers.

There is also the Canada-U.S. Transboundary Resources Steering Committee established in 1995 [through] an informal agreement . . . between the fisheries officials in the two countries. [The Committee has] facilitated federal coordination of scientific research and fisheries management in the Gulf of Maine region. . . . [The Committee] focuses most of [its] energies on developing scientific advice [through a Transboundary Resource Assessment Committee (TRAC)] and allocating quotas for three important commercial fish stocks on Georges Bank, . . . (cod, haddock, and yellowtail flounder). There is a Species at Risk Working Group under the Steering Committee and the [Working Group has developed a] Canada-U.S. transboundary species at risk matrix which tracks listing and recovery efforts for marine species at risk for the two countries. American eel is listed on the matrix. . . . [However,] no discussions on cooperative recovery have occurred to date because neither country has proceeded with formal listing under species at risk legislation. . . .

In conclusion, lots of international law and policy exists on paper. The following presentation should shed further light on the extent to which “principled governance” is being put into practice. [There certainly are other principles, such as] public participation, intergenerational equity, [and community-based management, but time limitations do not allow a broader treatment].

**Charles Norchi:**

Onto our next speaker: John Dettmers of the Great Lakes Fishery Commission.

**THE GREAT LAKES FISHERY COMMISSION AND THE CONSERVATION OF EELS**

**John Dettmers:**

What I want to do over the next ten or fifteen minutes is just to give you a perspective from the Great Lakes region about American eel conservation. And management also touching a bit on what David [VanderZwaag] just eluded to – the idea about how we do governance within Great Lakes fishery management. My goal here is to, first of all, talk to you about the importance of American eels to the Great Lakes; how we do great lakes fishery management – a very quick overview; [and] existing efforts within the Great Lakes region about eel management.

Historically, in the Great Lakes region, as European settlers came in and the explorers started taking notes, there is very clear evidence that eels were very abundant in the interior around Lake Ontario, the St. Lawrence River. Lots and lots of eels there migrating, present and they served as very important resources for the native peoples and for the early settlers. Again, the important

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<sup>27</sup> GULF OF MAINE COUNCIL ON THE MARINE ENVIRONMENT, AMERICAN EELS: RESTORING A VANISHING RESOURCE IN THE GULF OF MAINE (2007), [http://www.gulfofmaine.org/council/publications/american\\_eel\\_low-res.pdf](http://www.gulfofmaine.org/council/publications/american_eel_low-res.pdf).

food source and medicine for First Nations. We heard Shelley [Denny] and Amber [Giles] talk about that yesterday and an important component of the commercial fishery.

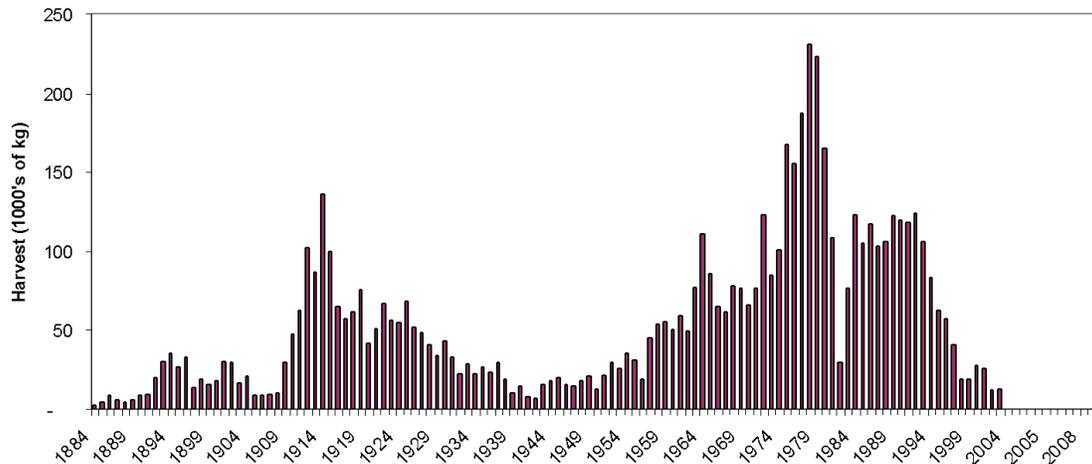
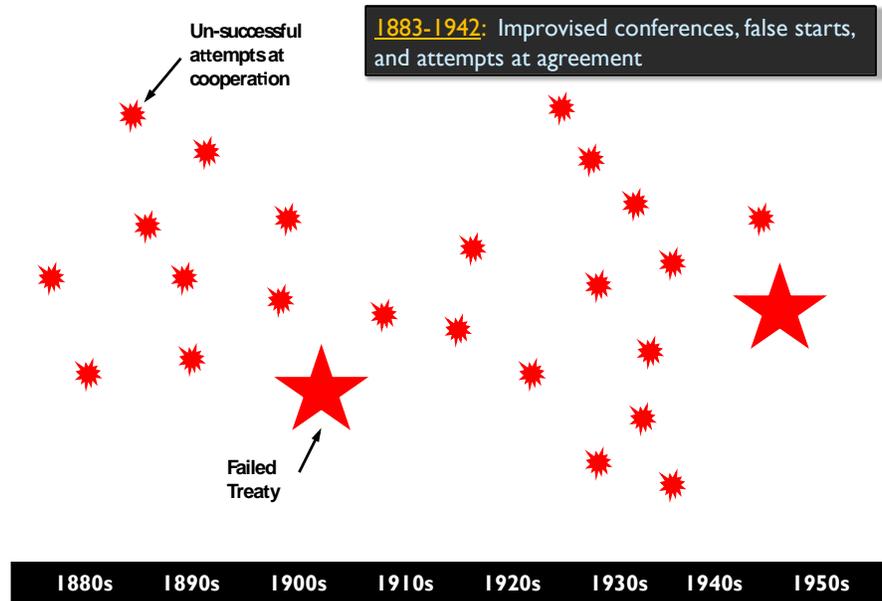


Figure 1. Commercial landings of eels in Lake Ontario.

[In Figure 1] you see commercial landings in Ontario waters of Lake Ontario. A couple of important things to point out: note that there was an early peak around 1914 or 1915 and another peak in the 1980s and then a severe drop off after about the mid-1990s. New York closed its commercial fisheries for eels in Lake Ontario in 1982 due to the concerns about contaminants in their waters. Ontario closed commercial fisheries in 2004 largely because eels were just no longer present. In addition to fishery data, we also have fishery independent data because of these two dams at Beauharnois – just upstream Montreal and the Moses-Saunders dam at the border of New York and Ontario. Those dams were put into place at the time of construction of the St. Lawrence Seaway in the late 1950s. Since the 1970s, what has happened is that an eel ladder was present in Ontario waters since 1974. New York Power Authority added one in 2006 very nice time series dating from the mid-1970s of eel recruitment upstream into the upper St. Lawrence River and Lake Ontario. What you can see very clearly is that . . . 800,000 – a million eels were moving upstream up until the mid-1980s and then a complete drop-off back here in the early-2000s from 800,000 to a million, 5-6,000 fish a year passing upstream at the ladder slightly better now somewhere between 30-50,000 fish over the last 7 or 8 years but that is a far cry from where we were. So that is about 95% reduction from peak levels. Huge concern for those of us in the Great Lakes region. We are also, of course, concerned about downstream passage. The idea that these dams cover the entire run of the river and turbines are there chewing things up pretty dramatically. Outmigration is extensively limited because of that as well. That is why we are interested in and concerned about eels from a Great Lakes perspective.



*Figure 2. Attempts at Agreement.*

Let's talk a little bit about how we do management in the great lakes. It is, as you know, complex. We have two federal governments. We have the province of Ontario. We have eight Great Lake states. We have some tribal entities in the U.S. that all participate and have management authority to one degree or another. There is recognition that cooperation was needed as early as the mid-1880s, but all of these paint splotches represent failed attempts at cooperation. There were also attempts in 1908 and 1944 to establish treaties to promote cooperation. Those treaties failed largely because of concerns about giving up jurisdictional authority.

These attempts at cooperation continued on for about another ten years until the Great Lakes Fishery Commission was established by Canada and the U.S. It has three primary duties: one is to coordinate fisheries management, also to coordinate fisheries research, and to control the invasive sea lamprey. So how does coordination of fisheries research work from a fishery commission perspective? The parties at play developed a non-binding agreement called a Joint Strategic Plan for Management of Great Lakes Fisheries. The idea here is the recognition that there are lots of jurisdictions of all types. They need to work together to understand the resource, translate science into management and balance competing interests without absolving jurisdictional authority. So the sentiment here was that it is more important to work together on a voluntary basis than it is to go it alone.

The participants work together through that process. They are, what we call Lake Committee meetings, where publicly each lake committee reports out on an annual basis its progress toward neutrally agreed upon fish community objectives. In our view, this is a very successful agreement despite its nonbinding nature. There are about four key principles here. One, because of that nonbinding nature we do things by consensus – that does slow things down but it also allows for complete and full deliberation of the issues. [Two,] accountability is extremely important because as a group everybody is coming together to be accountable to their own agencies but also to the issues of the lakes as a whole. [Three,] to do that effectively you have to share

information openly and completely. And [four,] the idea of ecosystem-based management is extremely important. That is just a very brief overview. . . .

Let me talk a little bit about where the Great Lakes are in terms of existing efforts with eel management. Conservation stocking was thought about, proposed, accepted and between 2006 and 2010 over four million eels were stocked from the Maritime Provinces into the upper St. Lawrence River and Lake Ontario. The objectives here were to assess relative abundance, biomass growth, sex ratios, determine the current distribution of those stocked fish within Lake Ontario and its tributaries and determine the possibility of small silver eel migrating downstream successfully to spawn. Just a brief overview of the results, stocked eels did survive – they dispersed and they grew rapidly, but some interesting and perhaps unpredicted results occurred. One is that stocking resulted in a relatively high proportion of males, at times up to 40 or 50%, and remember, this pod segment of the eel population is almost exclusively large females. Unfortunately, despite extensive testing of fish that were to be stocked and moved, the parasite *Anguillicoloides crassus* appeared, in relatively low prevalence (1-2%,) but it is there, so that is a concern. Then we see the effect of the stocking phenotype here. . . . Out-migrants – very different sizes, males, females, fecundity differences – all sorts of questions there that make us think conservation stocking, although well intended, may not make sense given the construct of what was important from this population segment to the eel population as a whole.

New York and Ontario are also working extensively with hydropower agencies to look at opportunities to improve downstream passage. This Eel Passage Research Center is managed by the Electric Power Research Institute (EPRI). Funding is generated by Ontario Power, Hydro Quebec and New York Power Authority. Each of those agencies is providing on the neighborhood of 1.2 million [dollars] over the course of five years to investigate this. A French power utility is considering joining this effort and Duke Power Company is a funder at a lower level over five years. Current projects are to measure water currents and flows above the Iroquois Dam and Beauharnois Dam, and testing guidance techniques at flumes, and they include sound electricity and electromagnetic forces, as well as to write a white paper on the use of light as a guidance technique. So, we are trying to deal with the cards that have been handed to us and play that as effectively as we can, recognizing that options are pretty limited. . . .

**Charles Norchi:**

Our next speaker is Rachel White [Sears], who is an attorney at law. Rachel is going to offer some commentary on the U.S.

**COMMENTARY ON THE U.S.A. LEGAL FRAMEWORK**

**Rachel White Sears:**

Good morning. I am delighted to be here to talk with you all about this important and pretty fascinating topic. I am going to cover some insights from the so-called legal seascape and hopefully by the end of this presentation you won't all be crying and in the fetal position under the table because there is a lot of statutory language that is coming up here but please bear with me because I think it is important to properly cite the laws that govern eel management in the U.S. I also should note that this presentation would have been very different but for the decision not to list the eel as

an endangered species. So, that has changed the trajectory of the conversation and made my job a little bit easier today, I guess. Let's get into it.

Here is a 30,000 foot view, so to speak, of the management framework in the United States. We have a multi-actor governance framework and, as many of you know, obviously in the U.S., we have the federal government and then state governments and local and tribe governments, as well. In this framework, the states retain their management authority within their territorial sea, which goes from the shore to three miles and the states have pretty broad authority within the space to govern, unless their actions infringe on a federal fisheries management plan in which case we run into some preemption issues or they can also govern in the exclusive economic zone where no federal plan exists. The states coordinate their efforts through the commission of the Atlantic states. From 3 to 200 miles off shore then we get into federal waters where the feds claim exclusive management authority of those fisheries resources in the EEZ. In the federal system there are a number of councils that manage those fisheries from 3 to 200 miles off shore in federal waters, and then also there are federally recognized tribes in the United States that, as sovereigns, regulate the resources on their lands and rivers, lakes and streams, *et cetera*.

Here is the evolution of federal law in the United States. In the 1970s Congress passed a Magnuson Fisheries Conservation and Management Act.<sup>28</sup> The main purpose of the act is to regulate fishery resources in federal waters off of the coast of the United States. . . . This act was basically the foundation for fisheries governance in the EEZ. The main thrust really is to conserve and manage the fisheries as a continuing resource through a mix of federal and state management. Federal Fisheries Management Plans (FMPs)<sup>29</sup> are proposed by state councils but the final regulations are promulgated by a secretary of commerce at the federal level. That is done through the National Marine Fisheries Service (NMFS)<sup>30</sup> or NOAA fisheries. Under the Act, there are eight Regional Fisheries Management Councils (or we will call them "councils" for short) that promulgate FMPs.<sup>31</sup> These must be consistent with national standards that are set out by the Act for management and conservation.<sup>32</sup> The fisheries off the Atlantic coast, specifically where we are, are managed by three councils: the New England, Mid Atlantic, and South Atlantic.<sup>33</sup> Every FMP is subject to final approval by the commerce secretary. I should note that some federal rules may apply in state waters because of the preemption issue that I mentioned earlier. When any agency acts in the United States, whether it is federal or state, their decisions are given a great amount of deference by the courts. There are provisions in this Act for judicial review of agency rules and of statutes, but under what we call Chevron deference in the United States - which is basically a way of saying whatever the agency's final decision is as long as its backed up by a substantial amount of evidence and it is not completely arbitrary or capricious, it will be upheld. So it is really important to participate in the rule making process before we get to the regulation stage because once those are in there it is very hard to overturn here, which is great for the agencies because there is a lot of work that goes into those regulations as well.

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<sup>28</sup> Fishery Conservation and Management Act, Pub. L. No. 94-265, § 101, 90 Stat. 331 (1976) (codified at 16 U.S.C. §§ 1801-82) [hereinafter MSA].

<sup>29</sup> *Id.* at § 1852.

<sup>30</sup> *Id.* at § 1854(a).

<sup>31</sup> *Id.* at § 1852.

<sup>32</sup> *Id.* at § 1851.

<sup>33</sup> *Id.* at § 1852(a)(1)-(3).

The purpose of the councils is to conserve and manage the fisheries resources from 3 to 200 miles off shore. They develop FMPs for the fisheries in their jurisdictions.<sup>34</sup> They submit those to the NMFS, which may adopt them through notice and comment rulemaking.<sup>35</sup> There is an act in the United States called the Administrative Procedures Act (APA)<sup>36</sup> and that governs how agencies promulgate regulations here. After a notice and comment rulemaking period the regulations go into effect. Of course, the Secretary of Commerce is going to give great deference to the council's plans and then, of course, they comply with national standards<sup>37</sup> and are subject to review in district courts<sup>38</sup> – which are trial courts that exist across the country. There is also in all of these regulations a pressure valve release, I guess you could call it, where you can promulgate emergency regulations, bypassing the traditional notice and comment rulemaking procedure with a minimum of formalities.<sup>39</sup> These are used, for example, when there is only one way of achieving a quota or something like that and you have to bypass and implement something very quickly. The councils also originate the amendments to the plans<sup>40</sup> and their members are comprised of voting members from the state, public, such as commercial and recreational fishing, nonprofits, academia, NMFS, and then also include non-voting members that are the Coast Guard, Fish and Wildlife, State Department and the Commission.<sup>41</sup>

Just briefly, . . . this is a very short list, there are probably other federal laws that may have played a role in eel management. One we have talked about is the Endangered Species Act.<sup>42</sup> There was a 2007 United States request to list that was at that time decided no listing it again in 2015. That does not apply now but that is something again in the future maybe an act that eventually plays a role. NEPA (National Environmental Policy Act)<sup>43</sup> is a federal statute that requires agencies to consider the environmental impacts of federal actions, which is a legal term of art that we will not get into but just know that it is out there. Finally, the Lacey Act<sup>44</sup> which I will touch on a little later in the presentation. Basically it prohibits transport of illegally taken resources and has been used historically a lot for the taking of things like bear gallbladders and illegally caught caviar. But as the enforcement community is catching on about some of the poaching issue and fisheries, they are starting to use the Lacey Act as a federal hook for enforcement. It comes with some very scary, stiff penalties. If you are prosecuted under the Lacey Act as opposed to state law which usually has lesser fines and less time in jail. If we catch the “really big offenders,” the Lacey Act is a possibility for enforcement there and of course deterrence of other bad behavior.

Under the state and tribal legal framework, states have authority over fishing within the boundaries of the state which extends to 3 miles outward from the coast.<sup>45</sup> States are the most active participants in the U.S. in terms of eel management. They delegate their authority by an

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<sup>34</sup> *Id.* at §§ 1852-54.

<sup>35</sup> *Id.*

<sup>36</sup> Administrative Procedure Act, 5 U.S.C. § 551 (2006).

<sup>37</sup> MSA § 1853.

<sup>38</sup> *Id.* at 1855(f).

<sup>39</sup> *Id.* at 1855(c).

<sup>40</sup> *Id.* at 1852.

<sup>41</sup> *Id.* at 1852(a)(1).

<sup>42</sup> Endangered Species Act of 1973, 16 U.S.C. §§1531-1543.

<sup>43</sup> National Environmental Policy Act of 1969, 42 U.S.C.A. § 4321 (2006).

<sup>44</sup> Lacey Act, 16 U.S.C. §§ 3371-3378.

<sup>45</sup> MSA §1856(a)(1)-(2)

interstate compact – which we will talk about a little bit more on the next slide – through the commission. The tribes as sovereigns can also regulate a non-member access to resources on their reservations. They can do the same things as states such as issue licenses and that sort of thing.

[The commission was] formed in 1942.<sup>46</sup> It is composed of representatives from each state on the Eastern Seaboard.<sup>47</sup> They are also responsible for implementing what I will call CMPs (Coastal Fishery Management Plans)<sup>48</sup> just to separate them from the federal council plans. The CMPs do not require separate federal approval but the states are required to enforce them. If the states do not enforce a commission plan, the Secretary of Commerce from the federal side of things can step in and enforce it directly.<sup>49</sup> The commission was created by Congress out of a concern that multi-state and federal – the management system at that point in the early 1990s have created a disparate inconsistent and intermittent regulation that was harming conservation and the sustainable use of fishery resources as a whole. So the commission is reflective of more of a federalist model where the responsibility for management rests with the states but they carry out a cooperative system of fisheries management with the federal government and through the commission.

Each state has its own management structure, but I am going to focus on Maine because that is our host state and also where I grew up and live and where I practice law. It is one of two states only on the East coast that allows for elver fishing, as we know, so it is kind of interesting to look at what the state's powers are or what are the types of things that states regulate as opposed to federal or interstate management. For example, in the Maine Revised Statutes (M.R.S.) in Title Twelve,<sup>50</sup> we have a whole set of rules set out or core statutes set out by the Maine legislature that govern things like issuing of licenses. In Maine, the state-issued swipe card program is also provided for by statutes. All of these statutes are written into regulations through the Department of Marine Resources. It is interesting to see what is provided for in the statutes that is interpreted and translated into regulations. Then if there are arguments about these things they end up in our court system or through an administrative review panel. The states also can: set sale and purchase rules, fees for licensing, *et cetera*, designating an open season for the fishery, they can specify what types of gear you can use. This covers both elver and more mature eels, but eels caught in nets and Sheldon traps. They can specify the types of gear for personal use, catching, designating closed areas.

In Maine, this can be violated, the closed areas can be violated in two different ways with respect to elvers. You can either violate state law by fishing or taking elvers within 150 feet of any part of a dam with a fishway or by fishing for or taking elvers within 150 feet of a fishway. It doesn't define the word "dam," but there is another definition of the word "dam" elsewhere in the statutes that has been interpreted to apply here. Those are important distinctions, you will see, because this became an issue in a recent case in Maine. Finally, there are some eel and elver management funds that Maine has set up where the license fees, or a portion of them, are put into this fund to help conservation and management of the eel in Maine.

I will end with some storytelling which I always think is fun. There are three cases, all very recent, having to do with eel fishing; actually they are all in Maine. The first one is a federal case

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<sup>46</sup> Atlantic States Marine Fisheries Commission Compact, Pub. L. No. 77-539, 56 Stat. 267 (1942).

<sup>47</sup> *Id.* at Art. III.

<sup>48</sup> Atlantic Coastal Fisheries Cooperative Management Act, 16 USC §5104(a)(1).

<sup>49</sup> *Id.* at § 5103.

<sup>50</sup> 12 M.R.S. §§ 6501-6505 (2012).

and this involves the Lacey Act which I was mentioning earlier. Under the Lacey Act, “it is unlawful for any person to import, export, transport, sell, receive, acquire or purchase any wildlife that is taken, possessed, transported or sold in violation of any law.” That includes both federal and state law. *U.S. v. Sheldon*<sup>51</sup> is – I think the case is still at indictment guilty plea phase it is very early on – but the allegation is that the defendant, Sheldon, was driving between South Carolina and Maine and buying and selling illegally harvested elvers in violation of the Lacey Act. One of the quotes – they sent out a couple of agents to talk to him and they were selling him elvers that they were portraying as illegally caught, although of course we want to note they were obtained legally. These are undercover investigators posing as eel fishermen and he is telling them, “well I could get in a jam if I know that the eels that you are selling are coming from another state.” So that is helping the government prove the knowledge factor in the Lacey Act – that you knowingly do this. Sheldon has been indicted for the penalties associated with it – I think are up to five years in prison and a \$250,000 fine – they are pretty significant. Generally the federal cases are reserved for much larger violations of state law and federal law.

A couple of other cases, I call these elver stage learnings about the loss of the species because, as being promulgated or passed, these statutes . . . it is going to take a little bit of time for the courts to start interpreting what it means. For example, in *State v. Stanley*,<sup>52</sup> which is a 2015 case, the State charged the defendant, Stanley, for fishing for elvers within 150 feet of a dam with a fishway. When he was out fishing, there was an agent hiding in the woods who had actually put a wooden stake out in the river 150 feet from the fishway and he saw that Stanley was fishing about 100 feet in from the fish way and wrote up a citation for fishing within 150 feet of a dam with a fishway. There was no dam there. So the problem is that they charged him with the wrong crime basically. So this went up on appeal and the [Maine Supreme Judicial Court sitting as the] Law Court said there was no dam there; they did not prove that there was a dam. They charged him with the wrong thing. They could have charged with the other part of the statute that was just fishing within 150 feet of a fishway – that would have worked. Because it was the wrong charge he was acquitted on appeal. Initial learnings from that case in terms of properly charging.

The second case, *Bailey v. Department of Marine Resources*<sup>53</sup> is another case that was decided this year where Mr. Bailey received his elver fishing quota in May of 2014, set at four pounds for that season. He wanted to appeal this decision and he didn’t do it within thirty days. I think he sent it in or had his lawyer get in touch with the Maine Department of Marine Resources at some point in May. That is more than thirty days after he would have received his initial quota and because the Law Court, which is our highest court in Maine, concluded that issuing the swipe card was a final agency action in setting his quota – which was done on March 1<sup>st</sup> – that his failure to appeal it within thirty days<sup>54</sup> required dismissal of his claim. Anyway, point being that even if you have some very specific wording that you eventually get through either the regulatory process or through the legislative process with statutes there is still room for legal interpretation in the courts and we are still kind of figuring out as we go how we are going to manage these things in Maine. So that is an example of state level rules and implementation.

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<sup>51</sup> See Stephen Rappaport, *Elver dealer may face federal charges for buying illegal eels*, THE ELLSWORTH AMERICAN (May 7, 2015), [www.ellsworthamerican.com/featured/elver-dealer-may-face-federal-charges-for-buying-illegal-eels](http://www.ellsworthamerican.com/featured/elver-dealer-may-face-federal-charges-for-buying-illegal-eels).

<sup>52</sup> *State v. Stanley*, 2015 ME 56, 115 A.3d 1236.

<sup>53</sup> *Bailey v. Dept. of Marine Resources*, 2015 ME 128, 2015 WL 5808794.

<sup>54</sup> 5 M.R.S. § 11002(3).

**David Freestone:**<sup>55</sup>

Could you just explain how the swipe card works?

**Rachel White Sears:**

Actually it is something that Meredith, who was pinch-hitting for Pat Keliher, brought up the other night. My understanding is that fishermen are issued swipe cards and whenever they go to sell their catch, it is basically like a debit card. It then uploads – I do not know the specifics of how the information is transferred to the State. The season for elvers is only two months long or three months long. It is a very short period of time. The State’s core concerns from the Commission [are] that [we would figure out] illegal harvesting and poaching of elvers in Maine too late after the season had closed. . . . If you are going to continue to allow elver fishing you need to have more of a real time data transfers so that we can track where we are with this quota rather than saying, “oops, we blew through it three months ago we had no idea.” So it is just a faster way of reporting.

**Charles Norchi:**

Laura Hussey-Bondt is going to talk to us about the Canadian Management Framework.

#### **THE CANADIAN MANAGEMENT FRAMEWORK FOR AMERICAN EEL**

**Laura Hussey-Bondt:**<sup>56</sup>

I am with the Department of Fisheries and Oceans Canada. I am the Fisheries Manager responsible for eel fisheries as well as a few other fisheries for Maritimes Region. I will explain to you in a minute where the Maritimes region is. My aim today is just to give a quick overview of the eel fisheries in Canada with a bit more detail on the fisheries that I am responsible for in Maritimes Region. As well, I just want to talk about a couple of . . . fisheries management does generally happen on a regional basis, but I am going to talk about a couple of National level things that are having an impact on the way we manage eel fisheries in Canada as well.

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<sup>55</sup> Executive Secretary, Sargasso Sea Commission.

<sup>56</sup> Senior Advisor, Fisheries and Oceans Canada



*Figure 3. Department of Fisheries and Oceans Canada Regions.*

[Figure 3] is a map of the Department of Fisheries and Oceans regions. We are divided into administrative regions. For eel purposes, we are talking about Ontario, which is of course the Eastern most Province in our Central and Arctic region. Quebec which is a region all its own. Newfoundland and Labrador. Things are a little bit complicated down here because Nova Scotia and New Brunswick are actually divided sort of based on the waters where people are fishing more or less. The Gulf of Saint Lawrence coast sides of New Brunswick and Nova Scotia as well as Prince Edward Island are a part of what we call the Gulf Region, and then the Atlantic coast sides of Nova Scotia and New Brunswick are the Maritimes region and that is the region where I am from. Interesting to note as well is that the eel fisheries are actually managed provincially in both Ontario and Quebec, but it is the Federal DFO that manages things in the Atlantic Provinces.

In general, there are currently active commercial and recreational fisheries for large eels in Quebec, New Brunswick, Nova Scotia, [Prince Edward Island], and Newfoundland and Labrador. Throughout this presentation, I am going to talk about commercial fisheries and I am also including commercial communal fisheries, which is just basically where we issue licenses to aboriginal groups as opposed to individuals. The management of eel fisheries does vary by Province and or DFO Region. There are some commonalities, but there are some differences as well. Overall, the large eel fisheries are non-quota fisheries. They are managed through effort controls like gear limits and seasons. . . .

Then we do have also the elver fishery, which we talked about a little bit yesterday in Maritimes region, and that is managed through a combination of a quota system and effort controls as well. There is also a single elver license in Newfoundland which is a bit of a different circumstance. It is an aquaculture license so there is an operation there where they are harvesting elvers [that are then grown to a larger size at a facility] there. The other component of our fisheries is the food, social, and ceremonial fisheries, which Amber [Giles] and Shelley [Denny] talked a little bit about yesterday. Those are fisheries by aboriginal groups and those happen in Gulf and Maritimes and Newfoundland Regions.

To give you an idea of kind of the scope of the fisheries in Canada, there are a fair number of licenses for large eel fisheries – there are almost 1700. But you will note that in any given year the number of licenses that are actually active in the fishery is quite limited. It is only sort of a

fraction of the total number of licenses that exist. There are some issues there in terms of latent capacity, but suffice it to say that the total fishing effort is not necessarily reflective of the total number of licenses that we have. Landings in 2013 were about 400 tons for large eel and the value was about \$2.5 million Canadian.

The elver fishery of course is a bit of a different fishery. We only have nine licenses and actually this slide is not a single year but it is an average of five years between 2010 and 2014. That is because the total landings and value of elvers tends to vary significantly from year to year. In that five year period, the total landings were anywhere between one and a half tons to five tons and the total value fluctuated from between \$1.5 million Canadian to almost \$23 million Canadian. It can change quite a bit from year to year, so this is sort of the average for the last five years. Obviously a lot less landed, given the size of the animals involved, and a pretty valuable fishery – \$11.5 million.

I will run through regionally quickly just to give a quick picture of the fisheries in the different regions. In Ontario, there basically is not a fishery anymore. We have talked already a bit about how the range is constricted in that area. There has been no commercial or recreational fishery there for about ten years. American eel is listed under [Ontario's] provincial Endangered Species Act there so there cannot be a fishery there anymore. That fishery is pretty much done. In Quebec, also there still is a commercial fishery, but it is a much more limited fishery than it used to be. There was a pretty significant license buyback program there and some fisheries closures I think, so it is a little bit more limited in Quebec as well. In the Gulf Region, which again is those gulf coast sides of New Brunswick, Nova Scotia, and [Prince Edward Island], a fair number of licenses, again not necessarily reflective of the total effort, but there is still a fairly significant commercial fishery in that region as well as the recreational and FSC fisheries (Food, Social, and Ceremonial fisheries). Newfoundland, as well, a commercial fishery, that single elver license, as well as recreational and FSC fisheries. And Maritimes region where we do have a fair number of large eel licenses as well as the nine elver licenses and recreational and FSC fisheries.

Now I will get into the details a little bit about how we manage eel fisheries in Maritimes Region. It is a limited entry fishery, meaning there is a limited number of licenses and we have not created any new licenses since 1993. Those licenses are transferrable however, so that total number will remain unless something changes. Managed primarily, as I said by sort of effort controls, so the gear type and amount is restricted by license and it does vary by license but normally traps and pots are the most common gear types used in the fishery by far. There are handfuls of licenses for other gear types but those are the main ones. That sort of total gear complement by license does vary quite a bit – just to give you an average, an idea of the amount of gear that is being used, the average complement could be somewhere in the neighborhood of 50-100 pots or 20-30 fyke nets or traps, that would be about average I would say. There are seasons set for the fishery, those are set by regulation,<sup>57</sup> and gear tending and spacing requirements through a combination of regulations and license conditions, and there is mandatory catch reporting for the fisheries.

The recreational fishery for eel is not a big fishery. We do not have total landing records for the fishery because it is not a fully licensed fishery. It is not considered to be a significant amount of landings, it is not a really popular species to catch recreationally, but there is a recreational fishery. There is not a license required for angling or spearing in tidal waters – inland requires a provincial fishing license. We do have this legacy item – the department did used to issue a recreational license for pots and traps. But that is something we do not do anymore and as

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<sup>57</sup> Maritime Provinces Fishery Regulations, SOR/93-55.

of 1997 those existing licenses were made terminal, which basically means they die with the license holder, so that is something that is being phased out. The recreational fishery there is a bag limit and the minimum size restriction that applies across the Maritime region – 35 centimeters – applies to that fishery as well.

Looking at the elver fishery, that fishery is managed each license holder . . . . The commercial large eel fishery the sort of area that you are limited to is more generally by county but for the elver fishery it is by specific river. So, each license holder has a specific list of rivers on their license that they are able to fish; they are all different rivers, there is no overlap. You can only have one elver fisher fishing in one river at one time. The policies do avoid overlap with the large eel fisheries as well, so we do not add rivers to elver licenses if there is a large eel fishery occurring on that river. We talked a bit about this yesterday as well, but each license holder has an overall quota. Normally that is, well as Genna [Carey] had mentioned yesterday, the 900 kilograms that would be dry weight. We work with the wet weight in the Department so that is actually 1200 kilograms. There is a 25% difference, but that is just one more thing that makes eel more confusing. In wet weights it's 1,200 kilograms per license holder, with one exception. One license holder has a smaller allocation. For a total quota for elvers for the region would be 9,960 kilograms wet weight which is I think is 7,470 kilograms dry weight. In addition to that as I mentioned there are river caps as well. None of this quota is transferrable. If you do not catch all your quota on one river that cannot be transferred to another river and, likewise, quotas cannot be transferred between license holders. So, once you hit those ceilings on your rivers – that is that. In practice, the landings in the elver fishery have always remained well below that total quota, in part due to the river cap system where usually there are some rivers where the caps get reached and other rivers where they do not. It is a bit of a kind of a double ceiling that you are dealing with. There are also of course the same sort of gear restrictions in the eel license conditions similar to what you would see in the large eel fishery. The monitoring requirements for elver fishery – for obvious reasons, it's a pretty valuable fishery so the more incentive I guess for illegal activity to be occurring, but the monitoring requirements are a lot stricter for the elver than for the eel. They are required to do daily hail-ins and hail-outs on the days that they are fishing to let us know that they are fishing, where they are fishing, at the end of the 24 hour period sort of what their catches were, that sort of thing. There is third party catch monitoring. So the way the fishery works is as they are fishing on rivers as soon as elvers are caught they have to be transported immediately to a holding facility that's identified in the license conditions for each license holder. There is sort of a handful of monitoring of elvers actually coming into the holding facility, [and monitoring] every time there is a sale, so that you have elvers leaving the holding facility. All of those shipments are monitored by a third party catch monitor. We keep running tallies of fish coming in and what is in the holding facility and all that sort of thing. In general, we try to kind of keep tabs on who is involved in the fishery. Our enforcement branch has lists of the vehicles and license plate numbers. So that we can easily identify the people who are allowed to be participating in this fishery, and then, by inference, anybody that we do not have on our list, then we know that they are not allowed to be participating in this fishery.

That is sort of a picture of the fishery from kind of a regional level, specifically my region. There have been some efforts however in Canada to look at coordinating management across at a national level. There is a Canadian Eel Working Group that was kind of formed and it is a combination of DFO as well as Ontario and Quebec provincial governments because, as I mentioned, they are the responsible authorities for eel fisheries in those regions. There have been periodic meetings and in 2006 there was actually a national American Eel Management Plan that

was drafted by that group. David [Cairns] talked a little about this yesterday, but that never really got adopted in a real official concrete way. However, that management plan has influenced how we have done management in years since. In particular, the short term goal that was identified in that plan was to reduce eel mortality from all sources by 50% relative to the 1997 to 2002 average. And that was a goal that was more officially adopted and it was announced by the Minister in 2004 as something to kind of guide our eel fisheries. In the years since then that has sort of fallen apart a little bit just in terms of when you really start to tease out what that means it gets a lot harder to pin down in terms of how do you assess where you are with regard to that goal – are you just looking at landings, in which case fluctuations in population will actually change this mortality rate and things like that.

What that means in practice is a little bit hard to nail down. However, the intent in all regions has been to take steps to reduce eel mortality sort of to the extent that we can and that includes measures such as . . . Ontario, Quebec of course there have been a lot of fisheries closures and also there was a big license buyback program there so fisheries there have been significantly reduced. In Gulf Region, there has been a suite of measures taken including: increases to minimum size, the season was shortened, there was a spear fishery on [Prince Edward Island] that was closed and there was also some increased enforcement of gear restrictions that was going on to make sure that the effort controls that are in place were being respected.

In Maritimes Region, there was a minimum size increase, there was a reduction in the quotas for the elver fishery, and stricter catch reporting requirements were put into place. We also had a program that we developed – we were trying to look at ways . . . there was sort of a bit of an effort a while back to get rid of some of these eel licenses that weren't being used and it was tremendously unpopular and it did not really get anywhere. So we have been looking for more creative ways to reduce effort in our fishery. One of those is: we started a project a while back in one part of our region in South Western Nova Scotia where we offered the option to exchange your large eel license for a green crab license. Green crab is an invasive species in our region. We are not concerned about increasing effort on it. We would just as soon see the thing eradicated. It is something that is used for bait and stuff so they can actually sell it. We have had some buy-in through that program and it is something that we are actually looking at. We have made it sort of a more permanent program now in South West Nova Scotia and it is something that we might be expanding to some other parts of our region as well. It is also worth noting that because of the requirement for elver fishers, we will not let them fish elvers on rivers where there is currently large eel fishing. Because of that, we have actually seen a number of cases where elver fishers have gone in and basically bought out the existing large eel fishers in some areas to get access to those river systems. In that way it sort of worked out for us a bit in that we are sort of removing effort from one fishery. Not that we are adding rivers; the number of rivers is static for the elvers license holders, but there is a process where you can apply to change rivers in some cases. So we have this new fishery that has sort of evolved in the last two or three decades and this is one way where it is able to balance out with the total effort in regards to eels.

In Newfoundland and Labrador region, there was a gear reduction program as well as a reduction in the total number of licenses. There was a size limit increase there as well, [and] they were more strictly enforcing some of their reporting requirements.

All in all, in all the regions we have sort of taken our marching orders that we are to reduce eel mortalities through fisheries and we have been doing that in a number of ways.

Of course the other big factor right now that is and will influence how we manage eels in Canada is [eel is] currently in the assessment process for possible listing under the Species at Risk

Act.<sup>58</sup> Should the decision be made to list American eel, then the prohibitions of the Act automatically come into play which means you cannot kill, harm, harass, capture or take an individual or possess, collect, sell, buy or trade.<sup>59</sup> Essentially, once something is listed under the Act there is no longer any commercial fishing of any kind taking place. There is some possible provision for food, social and ceremonial fishing as long as it's not something that is thought to jeopardize the recovery of the species but there is no commercial fishery for eel once something is listed. Then there are requirements for a recovery strategy and action plan once something is listed, which since the fishery would already be closed, we would focus more on things like hydroelectric facilities and including fish passage and things like that. That said, when we are consulting on possible listings, we usually go forward with a couple of scenarios: the listing scenario, where we list everything that is going to happen if it was listed; and also, a non-listing scenario. Basically, what we are presenting is sort of two options: you list it under the Act and it gets managed that way; or it is not listed and we continue managing under the tools that we have under the Fisheries Act and fisheries management tools like that. Recognizing that if we are in a listing assessment process there are conservation concerns so the status quo is not going to float anymore.

So additional steps need to be taken so we always go forward with: if we continue to manage under the Fisheries Act, these are some of the things that we are proposing will come into play. Some of the things that we have been talking about under that are to actually work on developing and implementing a precautionary approach framework including reference points and harvest control rules for eel fisheries in Canada that would be sort of a National approach. Some of you may know there is sort of a defined policy on the precautionary approach for fisheries management in Canada which sort of sets out a set way that we do that. You can find that policy online, I won't get into it. Some other things we would do is, you know a number of measures where we basically try to reduce the effort further in a number of our fisheries we would look at. We are sort of in the process anyway of trying to improve the quotas we have set for our elver fishery just to make sure that we have increased confidence that the levels we are setting are appropriate to not adversely impact the eel population. Also, as part of that, of course, there are measures aimed at improving fish passage and reducing mortality at things like hydro facilities but that is sort of outside my purview, though our fisheries protection program at DFO would be involved somewhat on that side of things. That is sort of the outline of where we are at and what might be coming down the pipes for eel fisheries in Canada.

**Charles Norchi:**

Now for the Atlantic States Marine Fisheries Commission, Mike Waine.

**U.S. OVERVIEW OF AMERICAN EEL MANAGEMENT**

**Mike Waine:**

Thank you for inviting the Atlantic States Marine Fisheries Commission. I will be talking today about the overview of management in the United States for American eel. Just to sort of walk you through my talk this morning: it will be an overview of our commission which you heard

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<sup>58</sup> Species at Risk Act, S.C. 2002, c. 29.

<sup>59</sup> *Id.* at §§ 32(1)-(2).

a little bit about; American eel in the U.S. Atlantic Fishery; the U.S. Stock Status; management plan; and future directions. I'm basically going to take you on sort of a management life history tour here as I move through the talk.

Who are we? We are a compact with all the states. The idea is cooperative management. These are for marine diadromous species that basically have a migration that at some point occupies more than one state. We came together through a compact, as you heard a little about from Rachel. That was in 1993; we had the Atlantic Coastal Fisheries Cooperative Management Act. That is what actually gave us the authority to do this management. Our jurisdiction is in state waters, so that is zero to three miles and in the rivers for all the diadromous species. Eels are not the only one we manage. We have some anadromous species as well.

Our management is done through a management board. Ultimately, this is a compact of all of the states – all the states from Maine to Florida, that is fifteen, and then we have our two federal partners. I want to make the distinction that the management is done ultimately through this compact of all the states and NOAA fisheries and U.S. Fish and Wildlife Service serve as members on our board. So they are voting members, but ultimately the management authority is through the commission. We have three commissioners that represent each state.

This is our management board. The three commissioners from each state – there is an Administrative Commissioner, which is usually the Director of Marine Fisheries within that state. They understand the fisheries that go on and can really relate directly to the stake-holders because they manage them directly within the state. There is a governor's appointee; the governor appoints a commissioner for that state. And then there is a legislative representative, which would either be a representative or a senator within the state. We do have a proxy system so a commissioner can appoint a proxy to sit in for them. Ultimately, we use Robert's Rules of Order. If you are not familiar, a commissioner would make a motion, it gets seconded, it gets debated by the entire board, and then there is a vote. Each state, so those three representatives, represent one vote on that board. They have to caucus amongst themselves and decide how they are going to vote. The federal partners also have a vote as well. Majority rules, that is how we pass our management.

This management is actually supported by multiple committees that the commission coordinates. We have a technical committee, one member from each of the states, these are state agency personnel. Gail [Wippelhauser] happens to be our TC member from the State of Maine. Ultimately, they help us do all the scientific and technical work to support the species management. This includes conducting surveys for our fishery independent data. They do age gross studies. There is basically a variety of technical work that they do at the state level. Most importantly they conduct our stock assessments they give us an idea of what the status of the resource is for the various species that we manage.

The other group that is an integral part is our advisory panels. Once again, approximately one individual appointed for each state, sometimes there is more than one if we have recreational and commercial importance, and ultimately these are members that are active in the fishery within their state. They understand the gear types. They understand the species and how it works. It is history, where it is, what works best in terms of management practice. So we rely on their input to help us construct management options that work well for the fishery.

We also have a law enforcement committee. . . . I am sure you can imagine what that committee does. They essentially just help us understand how enforceable these management options or regulations would be prior to us going to that implementation phase so we can ensure that the management measures that are being put in place could actually be enforced by the states.

I am going to walk through sort of our management process and try to relate it a little bit to eels without spoiling the rest of my talk. . . . The way this usually works is . . . a science-based management process. What happens is a stock assessment is conducted by the Eel Technical Committee. That stock assessment hopefully provides information on the status of the resource relative to some reference points and that's ultimately what drives whether management action would occur. So if the stock is not in a healthy state and the board wants to take management action to help conserve the resource, then they would initiate that at one of their quarterly board meetings. The board meets once a quarter and ultimately after the initiation of that management action, I specifically would work with the Eel Advisory Panel – that is industry members involved in the fishery and the Law Enforcement Committee – to put together some management options to respond to whatever it is that came out of the stock assessment. If we need to take management action to reduce fishing mortality, let's find some management approaches that we can do that.

An integral part of this process is public input, so we do not just rely on the individuals that are specifically input into our process, we also take these management measures out to the public. Often, in every single state, we have a public hearing that we hold and we get input across the entire management unit of the fishery from industry, environmental . . . . There is a lot of input that occurs during that process. Ultimately, what happens is, we write the management document, take it out for public comment. I bring it back to the Management Board and present to them all the input that occurred through this whole process and they weigh all of this information and make those final management decisions through the Robert's Rules of Order that I talked about before.

After those decisions are made, then the states go and implement the management measures that come out of these final decisions by the board. The commission as the compact decides on the management and the individual states are required to go and implement them.

The last sort of bringing it full circle is a check of compliance with the management measures that have been decided and implemented in the states. You will see me bring this up later, but ultimately I go through a process that checks whether the states actually did what they were required to do. There is accountability in this.

That is a quick overview of our commission. I will now go into the fishery.

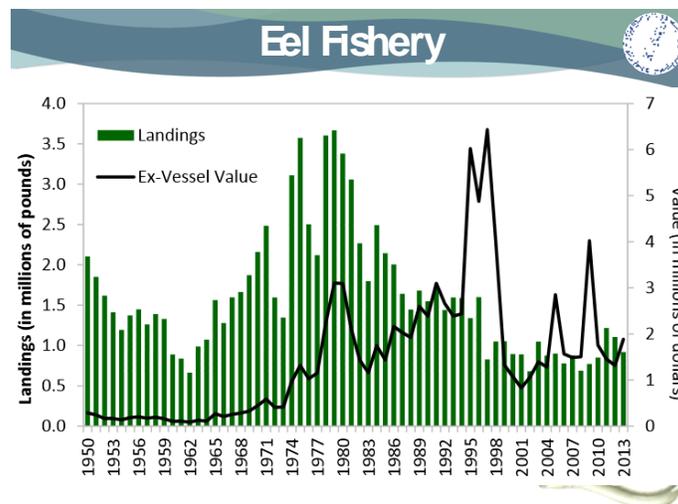


Figure 4. Comparison of Eel landings and value.<sup>60</sup>

<sup>60</sup> Stock Assessment Overview: American Eel, ATLANTIC STATES MARINE FISHERY COMMISSION, [http://www.asmfc.org/uploads/file/AmericanEelStockAssessmentOverview\\_May2012.pdf](http://www.asmfc.org/uploads/file/AmericanEelStockAssessmentOverview_May2012.pdf).

We have heard a lot about [Figure 4] so I will not spend a ton of time. Ultimately this is landings on this primary axis and value in millions of dollars secondary axis. The green bars are the landings and the black line is excess of value. We have seen this trend described, precipitous decline in landings. The value in millions of dollars fluctuates. This is obviously not incorporating the very valuable glass eel fishery which I will talk about in later slides. Just a note to Matt [Gollock], I tried to pull CPUE (Catch Per Unit Effect) data for this, but we only have effort data on trips that have caught eels so we do not have it for the negative trips which bias that CPUE number, so ultimately the technical committee do not feel confident in those CPUE's . . . .

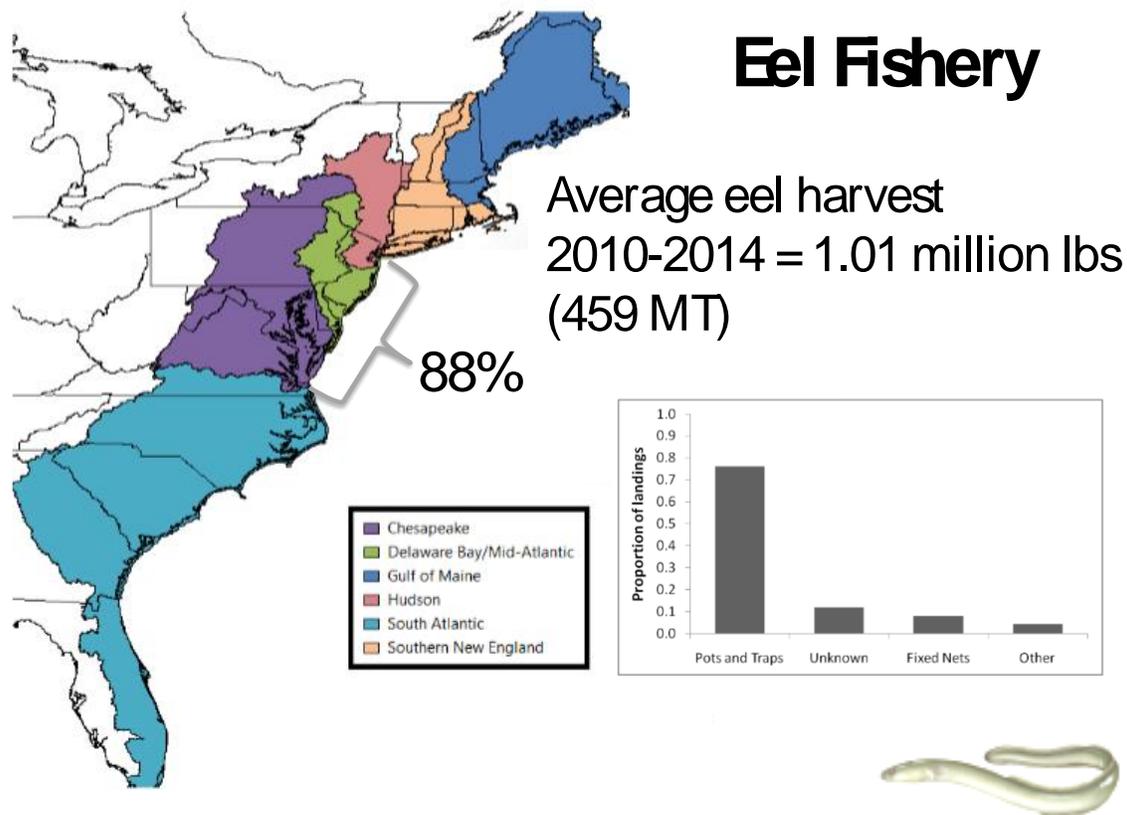


Figure 5. Eel Fishery by Region.<sup>61</sup>

A little bit of a mixed bag [in Figure 5]. We have got the geography of Maine through Florida just split into regions essentially and just describing the harvest of the eel fishery. This is actually yellow eel harvest from 2010 through 2014 is about a million pounds or 459 metric tons. That average harvest is concentrated in this mid-Atlantic Chesapeake Bay region. So the states of New Jersey, Delaware, Maryland, and Virginia make up 88% of this average harvest over that time frame. This fishery is predominantly upon trap fisheries with some fixed nets as well as Mitch [Feigenbaum] described yesterday.

<sup>61</sup> *Id.*

## Glass Eel Fishery



Year	Maine		South Carolina	
	Landings	Value	Landings*	Value
2007	3,713	\$1,287,485	No activity reported	
2008	6,951	\$1,486,355	No activity reported	
2009	5,119	\$519,559	No activity reported	
2010	3,158	\$584,850	<500	<\$100,000
2011	8,584	\$7,653,331	<500	<\$500,000
2012	20,764	\$38,760,490	<1,500	<\$2,500,000
2013	18,076	\$32,926,991	<2,500	<\$2,500,000
2014	9,690		<2,500	

- Only ME and SC have fisheries. SC data confidential

*Figure 6. Glass Eel Fishery comparison.*

We have a glass eel fishery but only in two states. Really Maine is the largest glass eel fishery that we have. Gail [Wippelhauser] spent a lot of time yesterday walking everybody through the history of that fishery. I focused on the more recent years. Ultimately, landings have fluctuated. This has been referred to the gold rush. You can see the value here just increasing incredibly. South Carolina does have a very small glass eel fishery. This fishery in terms of number of participants, there is about nine hundred in the last couple of years. This one only has ten, so only ten participants in South Carolina. Really well restricted which I will get into in a minute here. The gears for the glass eel fishery are dip and fyke nets.

Let's talk a little bit about stock status as that is basically the precursor for recent management that we have gone through. As we all know – really challenging species to assess scientifically. I give a ton of credit to our Technical Committee. They worked really hard on this. This predates me on eels. In 2012, we conducted a stock assessment through the technical committee process. Ultimately, this was a ton of work that was done by this group. They looked at the information they used was trend analysis for fishery independent survey data and they did some modeling as well. As part of our management program, we implemented the requirement to do basically young of year and some yellow eel fishery independent surveys. So when it came down to assessing the resource we had quite a bit of survey data to go on. I believe the technical committee reviewed 19 young of year surveys went into this stock assessment and 15 yellow eel surveys went into it as well. There was quite some criteria that they evaluated. Those were not the only surveys available but they went through a number of surveys and basically established a criteria and what made the cut were the 19 and 15 that I told you.

## 2012 Stock Assessment

- Composite Relative Index of Abundance for Yellow Eels

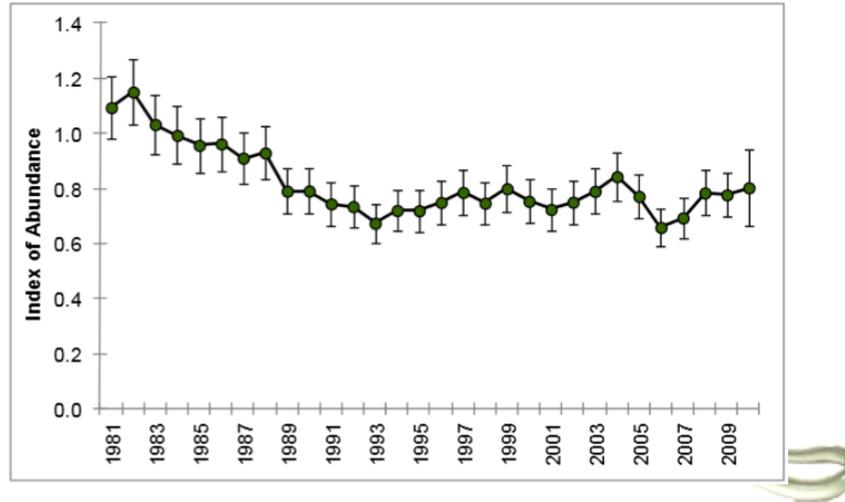


Figure 7. Yellow Eel Assessment.<sup>62</sup>

[Figure 7] is a composite relative index of abundance composite from the yellow eels since 1981. The trend is in place which we have seen similar to the landing – sort of a decreasing in trend in those survey indices. I will not go into all the individual indices that got reviewed but that information is in the stock assessment. If you are really curious, check it out.

## 2012 Stock Assessment

- Depletion Based Stock Reduction Analysis

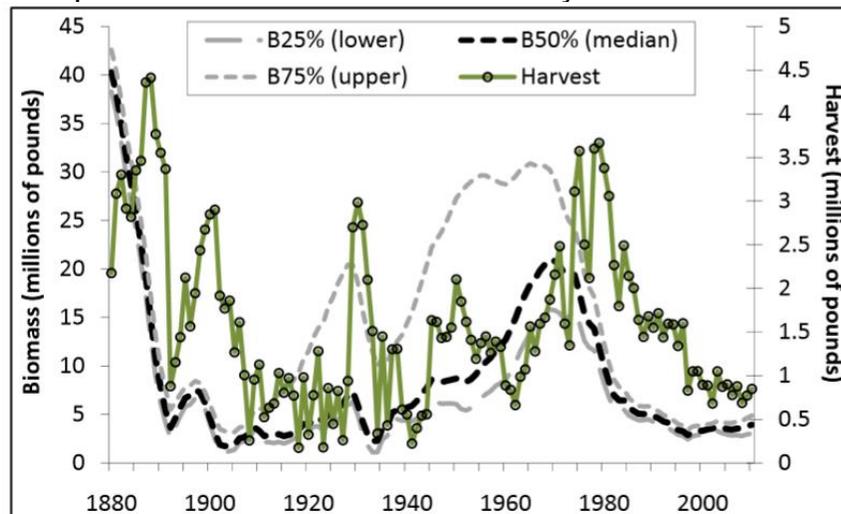


Figure 8. Biomass Assessment.<sup>63</sup>

<sup>62</sup> *Id.*

<sup>63</sup> *Id.*

The Technical Committee also did a depletion based stock reduction analysis which uses catch to estimate basically biomass and potentially maximum sustainable eel in theory. Just to orient you to this figure, we have biomass in millions of pounds (the gradient lines). Then harvest in millions of pounds is this green line. Basically, the modeling process uses an integration of this data to estimate what the biomass is. Once again we can see this precipitous decline of biomass that corresponds with the decline in harvest. This is, I think, nothing new. We have seen this multiple times during this weekend. What ended up happening from that, so based on that trend analysis and the modeling that occurred, the American eel stock status was determined depleted by the technical committee. That assessment passed peer review. Ultimately, the recommendation that came out of it was: let's reduce fishing mortality on all life stages. The tricky part was through the stock assessment process we have heard that ideally the status reference points that allow some understanding where your biomass is relative to a target or your fishing mortality rate relative to a target so you can use that information to drive the management and sort of quantify exactly what needs to be done, but there wasn't that that came out of this. But with this depleted stock status the board obviously was concerned and so they initiated management to respond to it.

This is where I am going to now move into sort of the management of the resource. I am going to focus on this by life stage because I think it is the easiest to follow. As Gail [Wippelhauser] pointed out yesterday, prior to our fishery management plan on American eel, which was implemented in 2000, the states did have management measures for their eel fisheries. So they were managing this prior to the commission establishing a Fishery Management Plan for this species. Ultimately, what ended up happening in the first plan was a call for the states to just keep the management measures that they were using in place when we implemented that fishery management plan. Basically, keep the management measures that you have in place – that started in 2000. There was an addendum in 2006. The way the process works is that we have the fisheries management plan and they we can make changes to it through the addendum process. That is that public input and everything that I walked you through earlier in the talk. Addendum I ultimately improved monitoring of the species so it required better monitoring in the fishery so that we could get better information on how much is being caught throughout the management unit. Addendum II was just recommendations for enhancing fish passage. Ultimately . . . a lot of the talks . . . John [Dettmers] highlighted a lot of these things. Looking at ways to improve fish passage as we know the barriers in terms of habitat fragmentation is a significant stressor on the resource. That was Addendum III.

I am now going to focus on the recent management, which was the management that came from that depleted stock assessment. Like I said, I will do this by life stage. The glass eel fishery, regulations . . . . Ultimately, all the states must implement a YOY survey. Like I said, that came from the original FMP. Only the glass eel fisheries are allowed in Maine and South Carolina. Remember, when the FMP first went into place all the states had to keep using what they were currently implementing and so that essentially meant that only Maine and South Carolina had glass eel fisheries at that time.

This is now moving into sort of more recent management action, you will see that the dates here are associated with the management act. There is a maximum of 25 pigmented eels per one pound of glass eel. So the glass eel fishery has to use this one-eighth inch mesh to grade the eel. What ended up happening here was the development of pigmented eel fisheries that started as glass eel fisheries then started increasing in harvest over this pigmented stage. So because there was no quota in at this point, there was concern that this would increase the harvest when we are trying to

decrease mortality on all life stages, so they put it in this tolerance basically of pigmented eels which eliminated targeting of the pigment stage. So that was basically an input control.

Here come the quotas. In 2014, Maine self-imposed a voluntary quota of eleven and a half thousand pounds. Basically, this is where the glass eel fishery got incredibly popular. Maine sort of saw this coming. We were developing management. Ultimately, after that voluntary quota, we implemented a glass quota on Maine which is about nine and a half thousand pounds and that quota comes with accountability payback. So if the glass eel fishery exceeds that poundage they have to pay it back the following year pound for pound.

To do all of this, there was a requirement to have daily trip level reporting. To do that, Maine implemented this swipe card program, which has actually gained a lot of interest. It has been described as sort of a debit card system. I want to highlight one further extension than what has already been discussed. Ultimately, a harvester catches eels, he has a swipe card, he goes to a dealer, the dealer has a swipe card reader, the harvester swipes the card, all this information on the harvester populates automatically through the swipe, the dealer inputs location, gear type used to harvest, and manually puts in pounds and value paid for those pounds, the swipe reader integrates with a software that reports the information to the data warehouse, and the dealers report that information daily – they are actually required to do it by 2:00 p.m. every day. If the dealer does not submit a report, the system does not allow the dealer to buy more eels from a harvester. They ultimately need to report daily before they can continue to buy. That includes negative reports. So if they did not buy any eels, they still need to report. Maine in recent years has added a dealer to dealer system as well. All of this was in response to a huge value increase within the fishery. There was a lot of poaching going on.

They developed this dealer to dealer system as well. It works essentially the same as the harvester to dealer. So they gave all the dealers swipe cards and in order for a dealer to sell to another dealer they have to swipe to that dealer. It populates dealer information. Basically that allows for traceability of glass eels from coming out of the water all the way to the export out of the state.

The results of this program – I do not get any of the credit for this, this is the state of Maine – are incredible. As Meredith mentioned at the beginning of our time here, there was, I believe, 200 citations in years prior to this. Enforcement citations after swipe card implementation dropped to 20. So, a really great job in enforcement of this swipe card program. Not only did it act as a monitoring tool, it also acted as a fishery management tool because they implemented individual fishing quotas for all of their harvesters. Basically, that allowed them to determine whether those harvesters harvested under their quota and that is where the payback comes in as well. So I took a few minutes to walk through that but I think there is a lot of interest in that program so thank you for bearing with me on that.

Maine was required to implement a lifecycle survey. You can imagine 15 states with two states roughly, but one state mainly having a \$40 million fishery. There was a lot of interest in all of the states to potentially add a glass eel fishery. One of the concessions for Maine for keeping this in good faith and not only sort of addressing these information gaps that we spent a lot of time talking about. They are working on a lifecycle survey. Gail [Wippelhauser] has done a ton of work designing that through the soundboard of the Technical Committee as a whole and they plan on starting to implement that in the 2016 fishing year.

The results of annual compliance review – remember that after the commission has all these management measures, then the states have to go and implement them and we have to make sure, my job is to insure compliance. So annual review for compliance, Maine and South Carolina

are adhering to all of the regulations. I am going to run through this really quickly. For the yellow eel regulations, this is both commercial and recreational, we had an increase in minimum size to nine inches. That was actually originally six inches across the range from when the states were managing by themselves. Addendum III increased to nine inches. This minimum mesh requirement, remember this is predominantly in eel pot fisheries, and the minimum mesh requirement was aimed at achieving that nine inch minimum size. We have also allowed for an escape panel for a few years until the industry can transition over to this to let those undersized eels go. We have a recreational bag limit which was originally 50 fish per bag, now it has been reduced to 25. The crew and captain for higher vessels is still allowed 50 fish. These are charter boats using eels; there was some leniency there for them. This is a coast wide harvest cap of about 907,500 pounds. This is a commercial quota on yellow eel fishery. That was instituted for the first time in the current year. This is a coast wide harvest cap so these are not individual quotas but ultimately this management document put in an allocation trigger. If this coast wide quota is depleted by 10% in any one year or exceeded in any two years, they don't have to be consecutive, then we are automatically going to trigger our state by state allocation and each state is going to get a yellow eel specific quota. That quota will have accountability so they will be required to pay back overages and it will allow for transfers. A note of where this came from this was the average harvest from 1998 to 2010. Remember all of these measures reducing mortality on all life stages.

Results of 2014: all the states were in compliance – one was not. The bottom line was we found Delaware out of compliance – they did not implement these management measures. Remember we have a process in place that requires states to adhere to our management plan. The Department of Commerce agreed that Delaware was out of compliance and there will be a moratorium enforced in Delaware state waters March 18, 2016, unless they come back into compliance. So, a good process in place. We have essentially closed the silver eel fishery through a seasonal closure. Except for baited pots, traps, and spears because as migrating silver eels they do not feed on the way out. So we have essentially closed except for this New York weir fishery which Mitch mentioned and we have limited them to nine permits that can be transferred. This is the only silver eel harvest still occurring. Remember that that yellow eel quota that I talked about – the silver eel harvest is accounted for in that as well, so that will be with the quotas as well. So all are in compliance for the silver eel fishery.

We have a couple other management programs in place. Improve reporting: we have sustainable fishery management plans that essentially allow some flexibility for states to demonstrate that they are not detrimental to the resource. If they can do that scientifically – remember that has to go through TC review – there is a little bit of flexibility within the plan. I can go into that in more detail if there are questions about it.

Future directions: I think this is what everybody is interested in. We are keeping track of the CITE's Appendix II listing which Fish and Wildlife is currently considering. We are monitoring the state compliance with the FMP so as I said there is that coast wide quota that might get triggered state by state. We will be monitoring that. Implementation and review of Maine's Life Cycle Survey, the first of its kind for the state. We will be working with the State of Maine to ensure that they are able to do that. This is what I wanted to leave everyone with: we have a five year trigger for our stock assessment. Because we did one in 2012, that triggers in 2017. One of the recommendations out of the stock assessment of many recommendations was to increase collaboration in the scientific assessments between countries, specifically the U.S. and Canada and the Great Lakes Region.

**MODERATED DISCUSSION AND QUESTION & ANSWER PERIOD****Matt Gollock:**<sup>64</sup>

This question is to Laura [Hussey-Bondt] and Mike [Waine] with regards to the management. Is there a drive to try to improve collection of data? Because I think that is an important element of fisheries management and understanding they tell a story, but the landing states may tell a different story.

**Laura Hussey-Bondt:**

Absolutely. There are a lot of gaps that I struggle with as a manager in terms of both scientific information and information more related to the fishery. The reality is that the eel fisheries in Canada were not an important fishery for a long time. Given conservation concerns now, the value of the elver fishery, it is becoming a higher profile fishery. But there just were not a lot of resources and time allocated to those fisheries. There is a lot of work to be done. I mentioned briefly yesterday that we are sort of in preparation right now for a new stock assessment and framework assessment for how we do stock assessments for eels in Maritimes region. It will be interesting to see what comes out of that. The whole idea – we talked about setting reference points and things for eels in Canada – is looking at trying to nail something down so we have something of a metric that can help us to tell how we are doing cause right now we are lacking a lot of those tools.

**Mike Waine:**

I was a little bit surprised to see that we did not have the effort for trips that did not actually catch eels. I am going to go back and look into that a little further. I wanted to sort of reiterate the swipe card program from the State of Maine which is only right now for the glass eel fishery. There is an incredible amount of interest in that monitoring tool. Actually we have a data partner that we work with that houses all our fishery independent data and they are working on a project to try to expand that swipe card model to the rest of the states not only for this fishery but for all fisheries. I think that, with technology coming online, it is so much easier for the input of this effort data. Starting a clock or stopping a clock, how many trips, traps or whatever the effort to metric is. That is a direction that we are moving and I do not know if there is interest in other countries.

**Matt Gollock:**

I think your point is very important. I do not think it is a problem with just eels in North America; it is a problem everywhere.

**Laura Hussey-Bondt:**

I should speak more directly to the effort side of things. I mentioned a little bit in my presentation that we have been taking steps to improve the recording and catch monitoring for

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<sup>64</sup> Chair of the IUCN Anguillid Eel Specialist Group, Zoological Society of London.

[eel] fisheries because in the past, although it was a license condition to report on the fishery, the compliance with that was pretty bad and nobody was chasing anybody down about it because [it was not a priority]. But, in recent years, we have implemented what we call a delinquent logs policy where it basically gives it a bit of teeth where if you have not fulfilled the reporting requirements from the previous season you cannot in fact get your license and conditions to fish the next season. So you have to have reported so we should for recent years have much better data on fishing levels, effort, and that sort of thing. Unfortunately, we do not have the details for going very far back but it is something that going forward we should have a better handle on.

**Steven Shepard:**<sup>65</sup>

I have a question about the regulation of the dams on boundary waters. Some fall under U.S. Federal law – the Federal Power Act. Some are split like Moses Saunders dam with jurisdiction in both countries. We have three on the St. Croix River that are older dams they do not fall under U.S. Federal law at all. So, as we are trying to get passage for eels, we are having to go in these early discussions with hat in hand and ask nicely. Perhaps David [VanderZwaag] can answer some of the statutes mentioned earlier on international laws that might apply in that type of situation.

**David VanderZwaag:**

[I did not cover the potential roles of the International Joint Commission and its International St. Croix River Watershed Board. Certainly the Board might be a further avenue for discussing American eel management issues.] Would Rachel have anything to add to that?

**Rachel White Sears:**

I am going to pass the potato, I do not have a lot of dams or Federal sort of energy.

**Jeff Thaler:**

If it is not under U.S. jurisdiction then I think you are subject to a . . .

**John Dettmers:**

It is a boundary water. Given that it is a boundary water I think the international joint commission makes a lot of sense because they deal with water supply issues and . . .

**Jeff Thaler:**

That may not be ideal but that may be the only resource.

**Steven Shepard:**

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<sup>65</sup> Fish and Wildlife Biologist, U.S. Fish & Wildlife Service.

Obviously they regulate flows, discharge water levels, aspects of operation of those dams...

**David VanderZwaag:**

[The potential role of the St. Croix Watershed Board in addressing American eel is certainly worthy of further research.]

**Mitch Feigenbaum:**<sup>66</sup>

. . . I did want to just highlight to the group, and I will follow up when we have our open discussion, one factual point that I think is quite important as we talk about CITES and Appendix II. Laura [Hussey-Bondt] pointed out that in Canada's glass eel fishing we have a very extensive daily monitoring program that basically requires every one of the nine license holders to hail in and hail out every . . . it is basically daily trip level reporting, so it is basically real time monitoring.

I am very proud of the swipe card system in Maine. I contributed to some degree in having that swipe card program implemented by convincing the State and the Governor to get behind it. But I do need to point out that it does not include, at this time, any daily reporting. A comment was made that there is a chain of custody being documented from the time of harvest until the time of shipment. That is not the case yet. The first swipe of the swipe card is when the fisherman shows up at the dealer's location, but that fisherman is allowed to hold those eels for a week, for two weeks, and it is not until that first swipe is made that the chain of custody has been made. We have raised this point to the State of Maine. The State of Maine has done an incredible job implementing the system. The feedback we have gotten is: in the hierarchy of priorities trying to close that gap is a lower priority but they will work on that for the future. The industry will try to hold their feet to the fire on that because it is important.

Finally, I would just point out, Matt [Gollock], in response to your question. Both the 2007 and the 2012 ASFMC stock assessments do include rather extensive CPUE data in the appendices but it was not included in the analysis or the final modeling for various reasons. But in the most recent assessment the feeling was that overall effort had reduced to such a low point that the CPUE's were actually looking very favorable and there was concern by the ASFMC technical committee that those favorable CPUE indexes might not present an accurate picture because with reduction of effort tends to increase efficiency. Less competition more skillful fishermen today into the industry when others leave.

Very final point: I do need to point out that depletion based stock assessment, stock analysis that Mike [Waine] referred to was used as the basis of the depletion finding. The use of that model was completely rejected by the peer review process. They agreed with the depletion finding, but they did not agree that that was an appropriate model. Although they were very complementary about the effort, they rejected its use. Also the stock assessment had said that overfishing was taking place and the peer reviewer rejected that finding. Although the peer review agreed that the stock depleted status, they did not find that overfishing is taking place. "Depleted" is a very technical term defined by the ASFMC and it literally says nothing more than the stocks are at low levels. ASFMC guidance defines depletion in that manner.

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<sup>66</sup> Director, American Eel Sustainability Association.

**Sara Rademaker:**<sup>67</sup>

I am currently working on growing eels in Maine. I just had a question for the fisheries manager. Given the range of the eel and the amount of habitat in the gulf coast is there any communication or data coming out of the southern states – communication with the southern states management?

**Steven Shepard:**

Do you mean the gulf coast fishery management council?

**Sara Rademaker:**

Yes.

**Steven Shepard:**

Some of our staff in Atlanta sit on that technical committee and have kept them up to date through the development of the listing process and query them for information. We got very little back from that the Gulf Coast Fishery does not actively manage eels so they have no plan. I do not think data are regularly collected except for if something comes in through by-catch of other fisheries or something of that nature. Very little information. We did ask specifically about the presence of *Anguillicoloides crassus* in those states and got mixed data back peer review, so probably not present in those states. That is about all that we do, that information is reflected in the biological report.

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<sup>67</sup> American Unagi, LLC.