

**Roanoke Rapids/Gaston Hydropower Project
American Eel Working Group Meeting
11 April 2018**

Final Minutes

Participants: Pete Sturke (Dominion), Karen Canody (Dominion), Taylor Allen (Dominion) Corey Chamberlain (Dominion), Wilson Laney (USFWS), Jeremy McCargo (NCWRC), Fritz Rohde (NMFS), Scott Smith (VDGIF), Todd Mathes (NCDMF), Jesse Fischer (NCSU - Phone), Bob Graham (Dominion – phone),

Agenda Items

- Upstream Passage
 - Roanoke Rapids
 - Eelway tour
 - Deep Creek and Gaston Electrofishing
 - Harvest Limit 2018?
 - Gaston
 - Upstream Passage Alternatives Analysis
 - Consultant Kickoff date
 - Gaston Upstream
 - Tagging/marketing technique
 - Location for release
- Downstream Passage
 - Downstream tracking large American Eels using current VEMCO array – (NMFS – Fritz)
 - Downstream turbine and total project survival estimate in addition to passage technology feasibility specific to Roanoke Rapids Dam
 - Assumptions for consultants models
 - Range of Eel Lengths
 - Range of operations to include
 - Passage Season

Upstream Passage

Roanoke Rapids Eelways

The group present at Roanoke Rapids Powerhouse toured the tailrace eel trap, and the South and North Eelways. Six eels were captured in the South Eelway, and 25 in the North Eelway. We also toured the new American Eel workup shed which is under construction. The siphon on the North Eelway had ceased to function, just prior to the tour.

Peter convened the meeting in the Roanoke Rapids Power Station at 11:53 am. He asked everyone to do introductions, and everyone did so for the benefit of those attending by telephone.

11:56 am: Peter reviewed the agenda. He noted that Dr. Alex Haro was in the field this week, but for a future meeting, we hope that he will call in and discuss downstream passage with us during one of our meetings.

Deep Creek and Gaston Electrofishing

11:59 am: Peter noted that we had discussed conservation, as a priority over research this year. We did want to know how many Jesse might need this year to wrap up the eel research. Pete projected the capture numbers for the past Deep Creek Electrofishing Surveys. The numbers have been as high as 40

in one year (2016). Pete reviewed the numbers captured at Gaston Dam as well. The numbers have been generally increasing each year. Fritz asked what happens to the eels. A sample of them has been sacrificed for age/growth studies. Jesse indicated that those have been some of the biggest eels they see, so it has taken a few years to get enough larger eels to age. For this year he would like to have any eels over 300 mm. He noted that below 300 mm, you couldn't determine the sex. In addition, they would like to keep any captured silver eels. He thought that the first one caught, based on the length, would have been a male, but it was a female. Jesse clarified that when Peter referenced "Gaston electrofishing" he was talking about sampling below the dam. Peter clarified that was the case. Jesse indicated that since the numbers were usually fairly low, he would like to have them. He noted that they only have about 30 eels, over the 300 mm size. They have not seen very many big eels in the reservoirs.

We all were okay with taking all of the eels over 300, unless for some reason they become extremely abundant. Jesse felt that for sure next spring, we would probably not need any more in that size range. He hopes to be able to process all the samples this year and get them aged in time for the AFS Atlantic City meeting.

Peter asked if he was caught up with processing the eel samples from last year. Jesse has not had time to do so, but hopes to do so later this spring/summer once his teaching duties are over.

Wilson asked Peter to let us all know when they planned to sample, in case any of the agency staff wanted to help.

Jeremy noted that he had asked Kirk Rundle (NCWRC) to retain any eels he captured during the course of his sampling in the reservoirs.

Peter indicated that they plan to sample April 25-26, for Deep Creek and Gaston. They would prefer to do the daytime sampling first in Deep Creek, weather permitting, and then go get dinner and then do the nighttime sampling below Gaston Dam. They usually do the fall sampling in October. Since they captured the first silver eel in November, they will schedule the fall sampling later in the hope of capturing additional silver eels. Peter noted that they also would sample in July. Peter noted that there is no known outmigration time for the mid-Atlantic, and that is something on which we want to work. Pete reviewed the trapping results for Gaston Eel traps. The Gaston Eel traps had record captures in 2017.

FERC NOTE: AEWG agreed that Dominion Energy will retain American Eels over 300mm from the Deep Creek and Gaston Dam electrofishing efforts in 2018 for analysis by NCSU.

Gaston Upstream Passage Alternatives Analysis

Peter noted that they had gone through competitive bids, and selected Kleinschmidt for the work. The company will come down in early May, and tour the sites, so they can hopefully come up with the most creative solutions. Their proposal did have many cool ideas, with respect to substrate, and operational changes.

Fritz and Wilson noted that it would be good for the NMFS and USFWS fishway engineers to be engaged as well, in those meetings. That would expedite any later necessary reviews by the agencies.

Gaston Upstream Passage Discussion

Peter noted that they are beginning to get American Eels upstream at Gaston already this year. They have caught six. We need to determine how to mark/tag them. Peter noted that they are already set up for using CWTs, if everyone is good with that alternative. We can then discuss with Tom, what he can do. Peter asked if Jeremy's number (2,786 captured at the Gaston Traps) is correct, what proportion should we tag? Fritz favored tagging all of them initially, since the numbers are low.

Jesse indicated that with respect to the eels being captured in the Gaston traps, he is good with not getting any more out of the traps. They have a very good idea of what the sizes and ages are that are entering the traps. Very occasionally they capture a larger one, but Jesse doesn't need any more.

Peter clarified for Bob that we had switched to discussion of the eels caught in the Gaston traps. Jesse agreed that tagging all of them would in his opinion be essential, at least early on. Then we can set a limit. Fritz suggested that we use the old threshold that we used for Roanoke Rapids Dam, which he thought was 500. Scott asked about PIT tags, versus CWTs.

Peter noted that the PIT tags are a lot more expensive. The CWTs are less expensive as a whole given that Dominion Energy is already set up and has the equipment for CWTs over PIT tags. He also noted that the recapture rates on the Roanoke Rapids Lake tagged eels was very low and increasing the price per tag going into a larger reservoir (Lake Gaston) would represent a larger financial responsibility assuming the probabilities of recapture are lower in a larger body of water.

Wilson thought that perhaps the eels being captured at Gaston were on the edge of being too small for PIT tags.

Jesse suggested that we could probably tag them, using 8 mm PIT tags. He suggested that the average size at Gaston was around 200 mm. He has used PIT tags on smaller individuals of other species. Jesse thought PIT tags would be more feasible, but more expensive.

Wilson suggested that even a 200 mm American Eel, would have a rather small body cavity, and that is where Jesse indicated that he puts the tag. Wilson noted that would take up a rather large proportion of the body cavity.

Jesse noted that he felt that we did need to discuss the numbers needed, for the future.

Scott noted that there isn't much information out there, about where the eels moved into the reservoirs go. He suggested that radiotelemetry would be the best approach. At least you would be able to get some information that way. Todd noted that you could manually track them. Scott agreed that would be good at least for a short-term experiment.

Peter noted that in the PNNL study, they put 40 eels in Deep Creek, and most of them sat still for a long time, and two eventually moved to the upper most receiver location in Deep Creek.

Scott noted that the telemetry tags are much larger.

Corey noted that the lakes are different as well.

Jesse started to say something, but we lost him (12:21 pm).

12:21 pm: We apparently lost everyone who was on the telephone line. We took a break to eat lunch.

Some of us (Peter, Scott, and Wilson) kept on discussing possible mark-recapture strategies for the eels released in Gaston, above the dam.

Jesse rejoined us on the phone line.

Bob indicated that Dominion would take as an action item to explore the sizes of radio tags which possibly could be used on American Eels.

Peter noted that they will have to send their CWT machines back to Northwest Marine to get them refurbished. They will get Tom to tag all of the eels, once the machines are okay. They would tag and release them at the Day Use Area at Gaston, for the time being.

Peter noted that tracking them upstream in 2019 may yield more success. Alternatively, we could begin sampling in even years and start in 2020. The license does require them to monitor the eels released in Gaston. He noted that Tom plans to monitor Monday, Wednesday and Friday, then batch tag all the eels on Friday. Individual tagging would be really cumbersome. Batch tagging will at least give us the day they were released. The Day Use Area would be used as the release site, until further notice.

ACTION ITEM: Dominion to research size and range of tagging possibilities which could potentially be used on the Gaston Trapped American Eels (radio, acoustic, PIT, and CWT)

FERC NOTES: AEWG agreed to use Coded Wire Tags (CWTs) for tagging and transporting American Eels upstream of Gaston Dam utilizing the current operating Traps at the toe of the Gaston Dam. The AEWG also agreed to release the trapped American Eels at the Gaston Day Use area after tagging is completed.

Downstream Passage

Downstream passage study and/or funding opportunities – Fritz

Fritz noted that Pace Wilber had contacted him and indicated that he will provide funds for some downstream American Eel tracking, from their hydropower funds. Those funds should be available this summer. Fritz indicated if NMFS can purchase the tags, then we need to discuss who can do the work. He expressed the hope that Jesse could be involved in that project. He noted that he would need help in writing up a proposal for the NMFS funds.

Jesse asked how much funding we are discussing. Fritz said \$25,000-50,000. Jesse noted that if we have tags in fish, we can get other information like survival over the long run.

Bob Graham asked if Fritz was talking about hydroacoustic tags. He assumed he was. Bob noted that we could also use balloon tags and assess turbine mortality.

Fritz noted that we have to determine what Dominion is obligated to do. He had looked at the downstream passage, which is not specified in the license. Fritz wasn't sure if turbine mortality was required in the license.

Bob noted that the company is required to provide safe passage, which would appear to suggest that turbine passage should be evaluated. That is a relative term, defined by the percentage of eels that survive passage either through the turbines or the bypass.

Fritz noted that he favors the joint approach that we have been taking for the last nine years, as opposed to a myopic view. He can take the two proposals back to NMFS.

Jesse noted that we should be able, with acoustic tags, to get not only turbine survival, but also outmigration information.

Fritz noted that he has two sources of funding. They have given Alex Haro, and Joe Hightower, funds in the past. He noted that for hydropower funds, he is competing against two other regions.

Wilson suggested that we could possibly add to the existing amount of ACFCMA funding that was coming to the NC Cooperative Fish and Wildlife Research Unit (\$15,000 annually, which could possibly be increased to \$20-25,000), in the future, as long as those funds continue to come.

Jesse indicated he was glad Wilson suggested that first.

Fritz indicated that he would have to talk to Pace, about how they had transferred funding to Joe Hightower in the past.

Jesse indicated that he has pieces of a proposal already drafted, and thinks that we could put such a proposal together fairly quickly. Jesse indicated that he and Wilson could discuss what we can come up with there.

Peter indicated that VEMCO is going to charge \$365 per tag, regardless of the size. Fritz noted that there should be some quantity discount. There is a range-testing tag for \$394. The tag Peter was discussing has a two-year life. Peter noted that Dana Allen at VEMCO had looked at the Roanoke River and said it is narrow, so he felt that we should be able to use the smaller tag (lower powered) and still get good detection.

Fritz will talk to Pace tomorrow about all of this and get back to Jesse.

Jesse clarified that VEMCO had standardized the price per tag, since the larger ones are actually less expensive. It all comes out in the wash. Jesse noted that we would need to predict what we would catch in terms of different sized eels, in case we could use different sized batteries.

Peter indicated that for large female silver eels, they (VEMCO's customers) use V-13s. For the smaller (typically male) eels they use V-9s.

Jesse explained that 13 and 9 are the tag diameters. The length varies depending on the batteries. Jesse asked Peter to forward that information to him, so he and Wilson could work on the proposal with Fritz.

Peter indicated he would send that around.

Wilson and Todd noted that USGS is initiating collaboration with ASMFC to try to increase the amount of research on diadromous species. Todd and Wilson are reviewing some of the 25 proposals which USGS

submitted to ASMFC. A number of them deal with American Eels. They will keep the AEWG posted on which ones actually get funded.

Action Item: Dominion to send around tag information from VEMCO. Complete 16 April 2018.

Downstream turbine and total project survival estimate in addition to passage technology feasibility specific to Roanoke Rapids Dam

Peter noted that Dominion Energy is hiring a consultant to perform a desktop analysis of downstream turbine survival specific to Roanoke Rapids Power Station. The consultant will be looking into an estimated "total project survival" which will include the Bypass Reach. Additionally, the consultant will be completing a review of available technologies and their feasibility specifically at the Roanoke Rapids Power Station. Peter noted that a lot of their analyses are based on a Gomes and Larinier paper from 2008 from which the consultant has built upon and verified with field studies on the East Coast of the US. Normandeau has done some additional field studies in which the survival rates have been determined to be higher than expected from the desktop study.

Peter described the criteria they had provided for the study. Wilson and Scott noted that 1200 mm for the upper end, sounded rather large for the Roanoke system. Fritz noted that there are some silver eel data for SC, which he thinks we can get. Wilson noted that he had provided everyone with Ken Olivera's data table on lengths by latitude, a number of years ago.

Wilson and Bob suggested that we try to get a better idea of silver eel lengths, by looking at the literature and trying to bracket NC, by securing data from SC, and VA, MD and PA.

Scott noted that he thought that 800-900 might be toward the upper end of the size range Dominion may encounter.

Peter found Ken's table of silver eel lengths, and there were very few eels over 1,000 mm, even for locations north of NC. We decided that it would be most appropriate to use a 400-1,000 mm range.

Peter talked about the range of operations. The flows going through the turbines vary during the season. They need to look at flows less than 20,000, since they would likely be using lower flows during November-December. They would look at the turbines they are actually using.

With respect to the downstream passage season, there isn't one known or established for the Mid or South Atlantic like there is in the North East. Ken's table has months for outmigration. The further south you go (e.g. Altamaha), it could extend into March. So for now, they plan to go with October 1-January 31.

Peter asked about any details known about eels captured in the sound, but Todd indicated he doesn't hear about them.

Scott asked if they move through pretty fast, and that is what Todd and Wilson think.

Todd asked if Peter has the location of the NCDMF receivers. Peter didn't have it in a viewable format. Fritz has it and will pass that along to Peter. Peter indicated that they have the Tailrace and Bypass bracketed with receivers, and there are receivers spaced pretty well downstream.

Jeremy noted that they shouldn't have to change anything in the river. Jeremy noted that Mike Loeffler had gotten funds from NMFS, to upgrade the Albemarle Sound array by adding additional receivers.

Fritz noted that it had to be bracketed well on the way downstream. He noted that one acoustically-tagged shad was detected all the way upstream, but somehow missed receivers on the way downstream.

Scott asked if detection changes with flow. Yes, Jeremy and Fritz advised it can. Jeremy noted that it also depends on the ping rate of the tag. If they are swimming very fast, and the ping rate interval is long, then the fish could conceivably swim past the receivers without a detection being recorded.

Fritz noted that we have a good sequence of receivers below the dam down to Weldon. Todd noted that we could conceivably detect them as they were going out of Oregon Inlet.

Jeremy noted that they (NCWRC) may have some test tags as well, so Dominion wouldn't have to purchase them. Jesse noted that they have two of those at NCSU that they can loan for use as well. Pete noted that would be very good.

They can put them on buoys. Jeremy suggested that they could be tied to a drone.

All of us were pretty comfortable with the proposed outmigration season. We noted that we don't have much data for the mid-Atlantic.

Scott suggested that we might want to adjust the months, based on what they saw in the Shenandoah.

We discussed what temperature triggers the outmigration. Wilson and Bob thought it was around 15 degrees. Peter thought it was around 20. Fritz noted that one of the summer events was at a higher temperature. Ken didn't put outmigration temperatures in his table. Wilson suggested that we could look in the ASMFC 2009 diadromous fish habitat document for that information.

FERC Notes: AEWG agreed to use American Eel lengths of 400-1000mm in the downstream passage study to be completed by a Dominion Energy consultant in 2018. Additionally the AEWG agreed that the outmigration window to be used during the study October 1 – January 31 is adequate for the Roanoke Rapids Dam.

Additional Discussions

Peter noted that he had made all the DFRTAC participants logos the same size, on his last slide. Wilson noted that we will need all of the logos, for the AFS presentation on our process.

Peter indicated that covers everything we need to discuss, prior to the season. He reviewed: We will plan to harvest all eels over 300 mm, UNLESS we want to begin some acoustic tagging. Then we can hold them for tagging in the new Eel Shed.

Fritz suggested that is something that we can work out with Jesse.

Peter asked if the funding would only be for 2018.

Fritz noted in the past, it has carried over for several years. He can get the tags in one FY, and then put them out later. Fritz indicated they could contract through USGS more easily.

Peter will let us all know about the April event. That will make the handoff of eels easy, if Jesse can attend.

Dominion will move forward with getting the CWT machines refurbished. The release area will be the Day Use area. The eel length range will be 400-1000mm and the season will be October 1-January 31.

Peter has captured all of the action items. He asked if anyone had anything else.

Scott asked if you could capture enough adult eels, below the dam, and tag those, to get some idea of the timing of the outmigration. Wilson noted that is an excellent idea. Wilson, Bob and Peter noted that they had all missed netting very large eels downstream of the dam, during past backpack electrofishing events in the Bypass Reach, so we know that there are large eels present.

Everyone liked Scott's idea. Fritz suggested that we could do that work this year. Peter noted that we could put some of them in the Tailrace and others in the Bypass Reach. Once we have some idea about survival, then we could put some upstream.

Peter reviewed items in the "on-deck" circle. They are working on the Article 401 update. We do have to determine how to track eels in Lake Gaston.

Wilson wanted to confer on the abstracts submitted for the upcoming AFS meeting. Dominion had submitted three, and Jesse had submitted one. Wilson noted that he had contacted Dr. Sheila Eyler about getting the final American Eel Symposium agenda and abstracts, for a wider distribution, and she was supportive of the idea.

No one on the telephone had any additional items.

The meeting adjourned at 1:32 pm.

American Eel Working Group
 11 April 2018



Location Roanoke Rapids Power Station

Attendees

Name	Affiliation	Sign
Todd Mathes	NCDMF	<i>M. Mathes</i>
Jeremy McLargy	NEARC	<i>Jeremy McLargy</i>
Karen Canodey	Dominion Energy	<i>Karen Canodey</i>
Taylor Allen	Dominion Energy	<i>Taylor Allen</i>
Wilson Laney	USFWS	<i>Wilson Laney</i>
Fritz Rohde	NMFS	<i>Fritz Rohde</i>
Scott Smith	VDGIF	<i>Scott Smith</i>
PETE STURKE	DOMINION ENERGY	<i>Pete Sturke</i>
BOB GRAHAM	"	PHONE
JESSE FISCHER	NCSU	PHONE
Corey Chamberlain	Dom	<i>Corey Chamberlain</i>