

Dominion Energy, American Eel Working Group

16 December 2019

Location: Roanoke Rapids Power Station and/or

Conference Call: 1-866-740-1260 x 2917101

Scheduled Time 16 December 1000-1500

In-Person Attendees: Bob Graham (Dominion Energy, almost retired), Jeremy McCargo (NCWRC-Inland Fisheries), Peter Sturke (Dominion Energy), Wilson Laney (NCSU, Department of Applied Ecology; also USFWS, retired), Corey Chamberlain (Dominion Energy), Paul Vidonic (Dominion Energy), Fritz Rohde (NMFS Habitat Conservation), Twyla Cheatwood (NMFS Habitat Conservation), Dan Michaelson (Virginia Department of Game and Inland Fisheries, VDGIF), Kirk Rundle (NCWRC-Inland Fisheries), Taylor Allen (Dominion Energy), and Scott Smith (VDGIF).

Telephone Attendees: Kevin Mack (NOAA Fisheries), Justin Krebs (AKRF), and Doug Newcomb (USFWS, Ecological Services, Raleigh, NC).

10:13: Peter convened the meeting and introduced those on the telephone. He provided a sign-up sheet.

Corey and Peter indicated that the company is currently replacing the transformers on the dam, so there is a predicted outage of 160 days, through the spring. Some of us had noticed all of the workers and traffic on the dam and had asked what was going on.

Agenda Items

• Safety

Peter went over the safety issues. Watch out for trip hazards. He covered where coffee and restrooms were located. There were no other safety issues.

• Introductions and scribe

Peter noted that Wilson had volunteered to take notes electronically. Peter asked everyone to do introductions and everyone did so.

Peter reviewed the agenda. He noted that there has been some debate by the retirees present regarding whether a post-lunch nap was needed (joke). Peter noted that we would cover all the upstream items prior to lunch. We will have Abner's catered food for lunch. We will cover the downstream items after lunch.

Peter asked that any issues for Justin should be addressed before lunch, since he has to leave after lunch. Fritz suggested that we just cover Justin's presentation before lunch then, if his schedule is limited. Wilson noted that he would update everyone on the winter Striped Bass tagging, since he knows a lot of the members are interested in possibly participating.

We agreed to reverse the order of the agenda for Justin's benefit, so all the post-lunch agenda, was moved to before lunch.

- **Downstream Passage at Roanoke Rapids**

Peter updated us on downstream passage at Roanoke Rapids. AKRF has been working on that aspect. Peter noted that determining the biological triggers of when the eels leave, is a key information need, in case fish friendly turbines aren't a viable option. Peter noted that once we know the biological information, they will know how to make adjustments at Roanoke Rapids Dam (RRD) in order to safely pass silver eels.

- **Part I: Eel Population Study**

Pete noted that Justin and colleagues had done the population estimation for American Eels in Roanoke Rapids Reservoir (RRR). There are two benchmark survival studies on American Eels that provided some background. Peter noted that they sent the study to FERC in early October. That was not a license requirement. They split the reservoir into three strata, and sampled using eel pots, to get a better handle on the American Eel population in the lake. The two-year study will validate Justin et al.'s study and estimates. The lake is a mixture of habitats, and sometimes hard to navigate. The other part is determining eel behavior, determining when they move out of the system.

- **AKRF Study Year 1 Progress Update**

The eel pot survey began this year. They have deployed 116 eel pots in the reservoir, thus far. They have captured eels at two locations to date. They used peeler crabs for bait in October; and dead crabs in November and December. They caught nothing in Nov/Dec. The two eels caught were both in pots pulled by Bob Graham. Peter noted that one thing that came up in October, was to record whether the pots were catching other fish as well. The habitat types are mixed. Peter noted that they have not gotten too deeply yet into analyzing the data. Other fish species captured were Snail Bullhead, Bluegill, Warmouth, Channel Catfish, Yellow Perch, Bluespotted Sunfish, and unidentified minnows. Fritz noted that it may not be temperature, as the factor for why no eels but other non target fish were captured in Nov/Dec, since it has remained relatively warm.

We noted that plenty of eels have been moved upstream over the dam, so it is puzzling why so few have been caught in the survey. The two captured were both larger eels. Both were tagged, one with a PIT and the other with an acoustic tag and PIT.

Justin noted that perhaps the eels are not in the habitats being fished. There is an area dominated by SAV (Hydrilla), which is not being fished. Also, pots have been placed in Johnson Pond, only recently.

Pete noted that they had been negotiating access with the pond owner, so last week, they put in six pots and caught no eels. We noted that the temperature has been plenty high, so perhaps it is a bait issue. They are going to test Atlantic Menhaden, dead crab, dog food, and hot dogs.

Bob noted that dead crabs should still be available from Chesapeake Bay. He noted that they had in the past purchased Blue Crabs fresh and alive, and then froze them. They caught eels in the past, above Lynchburg, using the fresh frozen Blue Crabs.

Jeremy asked if Todd Mathes (NCDMF) ever told us what the commercial eel fishermen were using in NC. We weren't sure.

Dan asked if any electrofishing had been done. Peter noted that they did electrofish in Johnson Pond and got about 44 eels per hour. They did even better later, so there are a lot of eels in Johnson Pond. They didn't try electrofishing in the reservoir. Bob noted that they just hadn't tried electrofishing in the deeper parts.

Dan noted that they had used electrofishing in the river in VA, when he was a graduate student under Dr. Paul Angermeier (USGS Cooperative Fish and Wildlife Research Unit, Virginia Tech).

Scott noted that electrofishing gets weird in the winter.

Jeremy asked about another site which might be productive, Vulture.

Peter and Corey, and Jeremy, discussed some potential sampling in the upper end of the reservoir. Bob noted that there is access via some of the areas around Clements Island. Corey suggested perhaps they could schedule a high-water day and get better access. Suggested means of access included Tom's Daredevil boat, or an airboat. Jeremy noted that duck hunters do use the area so they must be getting there somehow. Scott wondered about kayaks. Pete noted that they could possibly set some pots using waders.

Justin noted that continuing the survey for a year was good, to see if spring and summer would yield more eels.

Pete noted that he hoped this week would yield more insight on the bait. Pete later followed up with the bait test via email and the second bait test in Johnson Pond did not produce any eels. Water temperatures were 10C. He noted in the email that they will continue the eel pots monthly before changing procedures due to any environmental variable.

- **Eel Movement Study**

They have 5 Vemco VR2Tx receivers out right now, in Johnson Pond, Body of Deep Creek, Mouth of Deep Creek, RRL West 2, and RRL West 1. They have done range testing already on all but one (RRW1). They got pretty good detection on most of the receivers. Peter noted the likelihood of detection in the various parts of the array.

Jeremy asked if the ones in the river were ever range-tested. Peter didn't think so. Jeremy thought that there may have been some limited testing, but no formal spatial analysis. Peter suggested that some testing from a canoe might be useful. He asked what sort of tags were being used. Fritz indicated that there was no tagging currently ongoing.

Corey asked if the receivers downstream are being maintained. Jeremy indicated as far as he knows they are still being maintained. We will discuss a potential sturgeon-tagging project tomorrow. As far as we know, the downstream receivers are being maintained. Peter indicated that he would be willing to do some range-testing in the spring.

Fritz said that we should ask Holly tomorrow about the receivers.

Justin indicated that the receivers are in a restricted area of the river, so the detection probably should be high. But Bob and Jeremy noted that there are lots of boulders and other obstructions, which could affect detectability.

Fritz noted that some tagged fish have evaded receivers on their downstream trip.

Jeremy noted that detection at more than one receiver would be an indication that eels were still alive.

Peter reviewed the eel size distribution in Johnson Pond, and noted that the largest eel in Johnson Pond was 505 mm. Bob asked if we know, based on Jesse Fischer's work, any idea of gender. The growth rate is very variable, as are the ages.

Justin stated the age for 500-550, based on Jesse's work, is 5-8 years.

Pete noted that they had tagged 13 eels in October. Another 20 were tagged with PIT tags. Those with acoustic tags also received a PIT tag. Matt Fisher taught everyone (Taylor, and Peter, et al.) how to tag the eels and suture them. Peter noted that he had tagged the first one. After Taylor jumped in, he tagged the rest of them. All the eels were held overnight, and no tags were shed, nor did any eels die.

Peter reviewed the graph which shows the different tag types used for the different sizes of eels. All the eels were released in Johnson Pond. Only one from the lake went into the pond.

The eels were released October 17. The receivers were checked in December. Two eels were detected having moved from Johnson Pond, into Deep Creek, in the creek body, and then at the mouth. The receivers were downloaded on December 4.

Fritz asked if they were silver eels. Bob indicated that none of them were definitely silver. Peter noted that some of them had bigger eyes. Clearly, they were moving downstream. The movement did occur during the approach of a new moon.

Scott asked about any heavy rainfall events.

Peter didn't remember. Justin had not looked either. Peter noted that they did get some heavy rains when they were setting the pots. The V7s are short-lived tags (~12 months). Corey noted that they should look to see what the temperature has been doing as well.

Fritz noted that they should download the receivers downstream of the dam, as well.

Peter noted that the graph also shows day versus night detections.

Fritz asked what the time span is between detections. Peter indicated that he would have to check on that distance.

Jeremy noted that some could have been missed. Peter agreed.

Peter noted that is the most exciting information from December.

Justin noted that one eel had 146 detections. The other one had ten. About half of the 146 detections came from Deep Creek, of which 109 were at Deep Creek two.

Peter noted that all of the eels put out in Johnson Pond were detected on the receiver in the pond. "Carlos" was 340 mm, and "Sarah" was 356. Both hung around in Johnson Pond for multiple days, before they left.

Bob noted that tagged eels could have moved upstream as well.

Paul asked if detections happen, if eels are preyed upon. We thought yes.

Wilson noted that we should note the recent study in Fisheries, which documented Double-Crested Cormorants eating tagged trout, and discussed how to recover the tags from bird-nesting, or roosting sites.

Jeremy asked about the detections of Carlos. Peter showed the details for both of the detected tagged eels.

Scott asked if the assumption is that they are outmigrating. Jeremy noted that they are definitely leaving Deep Creek, but we don't know where they are going. Peter noted that they will download the downstream receivers in the spring.

Jeremy asked if the other detections are all in Johnson Pond. Yes, they were. Peter indicated all of the eels have been detected on the one receiver in Johnson Pond. Peter noted that for the ones that left, they can calculate the transit time. Scott asked what the distance is between the stations. Justin indicate it is at least five miles.

Fritz noted that one had made it very quickly, in minutes, from Deep Creek body to the creek mouth.

Peter noted that the AKRF crew will be looking at precipitation, temperature, discharge, and other factors. Jeremy noted it was interesting that the two eels that left were the smaller eels.

Dan asked about the departure route. Bob noted that the dam is broken up, so it isn't hard for the eels to get out.

Jeremy asked if the flow ceases in the summer, from the pond.

Bob indicated that there was a drought in 2002. Scott noted that there was a drought in 2012 as well.

Jeremy verified that most of the time, there is a water connection between the downstream creek and the pond. Bob noted that the stream is really flashy.

Peter showed us a photo of the flow coming out of the pond. He noted that it appears very eel accessible. Bob noted obviously it is accessible.

Peter noted that hopefully there will be more detections to come.

Peter reviewed the secondary eel bait test. They will be deploying and range testing four more receivers. They will deploy the last two V9 receivers if possible. They will acquire tags and plan to electrofish and tag in August/September. The update report is due to FERC June 30, 2020.

- **Upcoming Schedules**

Fritz asked about the tag deployment and more electrofishing. That will all be done in Johnson Pond.

Peter noted that they hoped they could have a collection day, and a tagging day, so others can come to participate.

The annual report will go to FERC at the end of June each year, to provide report on Part I, which is the eel behavior and population study. Part II is the fish-friendly turbine section.

Justin indicated that Peter had done a good job covering everything. He had measured and indicated that Deep Creek is about 9-10 miles long.

Twyla asked if the habitat range for pot sampling could be added in 2020. Justin thought that it can be added.

Dan asked if the Hydrilla dies back. Kirk indicated that it does die back to some extent. Peter indicated that the pot lines do accumulate Hydrilla.

Corey asked if the eels may use the floating Hydrilla mats to travel downstream.

We weren't sure. Wilson noted his personal observations of glass eels using SAV accumulations to ascend and travel over a water control structure.

Bob and Kirk noted that they will use Hydrilla beds as habitat.

Corey noted that the dam is down all winter long, so everything is going over the dam, via the gates.

Peter noted it is pretty unlikely that any detections could be caught on the tailrace receiver considering the outage and flow operations during the outmigration season..

• **Part II: Fish Friendly Turbine Feasibility**

Fish Friendly Turbine Feasibility

Peter gave us an update on the progress of this part of the study. Peter noted that based on the eels that have been captured to date, if we used 600 mm, the desktop estimated survival goes up to about 84%. Peter noted that smaller eels obviously survive better. Knowing how large the eels are, will enable us to get a better estimate.

Fritz noted that the eels in the southern part of the range seem to mature faster, at smaller sizes. Peter noted that might have something to do with the distance they need to travel back to the spawning grounds.

Scott noted that they have seen some bigger ones in the mountains, in the James River Basin.

Bob noted that at the end of this study, when we have a lot more eel lengths, and a better idea of at which lengths they migrate, we may be able to determine a better percentage of survival and refine the mortality estimate.

Peter agreed that if we can provide a more discrete size range, they can give us a better survival estimate. Peter noted that we had originally thought the eels may be moving at 400, but if "Carlos" and "Sarah" are moving at a smaller size. Bob noted as we get more eel lengths, we can better estimate.

Kirk asked about the lengths, versus gate passage.

Bob asked about the timing of lower gate openings and how that might relate to survival. He thought that Alden had looked at all of that in making their estimate.

Peter explained how they had done the estimates.

Bob wondered if they had made use of all the data.

Scott noted that on the James, eels have been there a long time, and it is uncommon to see any over about 700-750 mm. Most of them are in the 500/550-700 mm range.

Corey asked if there are any eel length data for American Eels in the NC sounds. Wilson noted that if there are such data, NCDMF will have them, probably from their fishery independent sampling.

We briefly discussed the American Eel Farm operations. Wilson had heard a rumor that it was up for sale. Jeremy indicated that the operation has been successful in acquiring yellow eels from commercial fishermen and raising them for market. The facility has a permit for up to 200 pounds of glass eels per year.

Pete showed the table of project survival by fish length.

Jeremy noted that the difference in survival based on the gate opening, was only six percent. So, the size of the eel plays a larger role in survival.

Paul asked if there is a target. Peter indicated that the overall rate is 95 percent. Peter noted that perhaps one unit could be operated at night, wide open, to increase survival. Corey thought that might be possible, depending on what the operations issues are in the future.

Peter noted that Alden has gotten some funding to do a study on the zig-zag technology. He showed us a figure of the device which is designed to get eels past dams. They got funding from USDOE for a study, and they want to use RRD as a "large facility." Peter noted that they should have a draft this week, to review before it is sent to USDOE.

Bob noted that any results would not be directly applicable to RRD.

Peter noted that it seems like a literal "pipe dream."

Fritz noted that this is an expansion of an Alex Haro design. Bob confirmed that was the case.

Peter explained how the device works. Eels will swim into the holes in the zig-zag portion of the device, to find a velocity shelter. They would then traverse upward into a collection facility. In theory, it doesn't need a lot of infrastructure to work.

Twyla had asked for clarification.

Peter noted that it would take a lot of testing, and also would take a lot for construction considering that this technology would need to be paired with a bar rack to meet the 95% survival threshold.

Corey noted that with the Hydrilla movement in RRD, trying to keep such devices functional would be a challenge, if not nearly impossible.

Peter showed the assumptions from the study, for this device.

Dan noted that the 84% survival estimate is for what is present now. The fish-friendly turbines would boost survival to 97%. However, the cost was substantial. Peter noted that at night, RRD just needs one turbine running. Corey noted that the turbines have already been replaced once in the lifetime of this dam. Peter noted that they are on schedule for replacement, likely sometime in the next 20 years or so. Jeremy noted that all it would take is for one of the existing ones to go bad. Corey and Bob noted that they would have to look at the engineering.

Peter noted that some technical folks in Dominion are excited about the prospect of being the first facility to substitute a fish-friendly turbine however the details need to be examined.

Pete asked if there was anything else on downstream passage.

- **Other Member updates/Housekeeping**

- **Members**

Peter asked about new or continuous or continuing members. Wilson noted that he had never been voted upon. Bob noted that technically he isn't supposed to work for the company, for a year. Pete notes that he has this question out to Dominion HR to ensure it's above board. He noted that he isn't working for the company, he would be working for the DFRTAC. Nick Walker of George Mason University also would like to be included. Everyone was in favor of keeping both Bob and Wilson. The vote was unanimous.

Peter noted that Nick has asked to be a member of the group. He is a contributing author on "Global exploitation of freshwater eels (genus *Anguilla*): fisheries, stock status and illegal trade. Peter noted that Willy Bokelar also is associated with Nick's Eel Town.

We had some further discussion of Willy Bokelar's social media posts and his concerns regarding American Eel mortality at RRD, which are totally unsubstantiated.

Wilson asked about criteria for membership.

Jeremy noted that he would have concerns about bringing in as members, those who may not have a direct interest in the ongoing work at the dam.

Dan asked if Tom Gunter is a member. No, he is not.

Bob and Wilson suggested that Dominion ask Nick to submit a statement to us, that would say 1) how he would benefit from being a member, and 2) how his expertise could benefit the DFRTAC. That was acceptable to the DFRTAC.

Jeremy noted that the license agreement requires a vote to bring on any new members. We had a lengthy discussion of whether Nick would be representing George Mason University, or Eel Town. There are implications of which organization he represents.

Justin had also talked to Nick at a meeting. His perception is that Nick is just trying to get engaged. He had done a presentation at a meeting Justin attended, and discussed his work on spatial ecology.

Peter pulled up the text from the license regarding DFRTAC membership. Bob asked Peter to go to Article 401 of the FERC Order. They will track it down and send it out to everyone. Peter had looked at it just last week. Bob noted that it specifies who is there, and how to add members.

Bob verified that he and Wilson were approved for membership.

- **Upcoming meetings and coordination**

Peter noted that the NC and VA meetings are coming up. Both chapters are meeting February 4-6, NC in New Bern, and VA in Lexington. The Tidewater AFS meeting in 12-14 March in Hampton, VA. The national AFS meeting is August 30-September 3 in Columbus, OH.

The EPRI American Eel Interest Group and Sturgeon Interest Group meetings may be hosted at Roanoke Rapids in 2020.

Wilson clarified that the EPRI meetings MAY be hosted. Fritz asked who else was a member of the group. Peter named them.

12:06 pm

Jeremy noted that the community college has good meeting space.

Justin and Doug both had to leave the call. Peter indicated that he will send the data on the depths at eel pot locations to Doug for use in the American Eel habitat modeling. Peter noted that they took DO measurements as well from surface.

- **Scheduling and studies going forward:**

- o **2020 Gaston Eel Trap Construction/Commissioning**

- o **Initiate upstream distribution studies and effectiveness studies**

Wilson briefed the group on his engagement in the SE Region NMFS CVA, and on engagement in the NC SAC work to develop nutrient criteria for Albemarle Sound. Fritz is also on the latter committee.

Fritz noted that there is now an artificial crab bait which has been developed and is in use.

Peter noted that Kevin was the only one left on the telephone and asked him to dial back in after lunch.

- **LUNCH (provided by Dominion, catered by Abner)**

Reconvene: 1:00 pm

Kevin was the only party participating on the telephone, after lunch.

- **Eel Passage Update**

- **Rapids**

In 2019, the RRD traps captured 37,728 eels. The individual traps numbers were North, 12,405; South 25,135; and Tailrace 188. Peter noted that the N and S eelways tend to flip.

Scott asked what the numbers look like, during dry versus wet years, or years when they get a fall run.

Corey noted that last year, the hurricanes came through, in 2018. Scott noted that early 2019 was dry early on, but then wet in the spring.

Twyla noted that she and Kevin have some interest in looking at the American Eel correlations. Kevin noted that the biggest piece of data they are missing, is the flow data. If they can get the flow data

through the facilities, or through the eelways themselves, they can look at flow correlations, through the traps, or down the river.

Corey noted that the flow data are readily available. The temperature data he is sure also exists.

Peter indicated that the temperature data is available from the trap.

Bob noted that the temperature data are from the lake, at the dam.

Wilson noted that there are multiple USGS continuous water quality monitoring data gages downstream of the dam, which provide DO, temperature and salinity data. Those should be available from the USGS web site. Kevin and Twyla thank the group for the tip.

Peter noted that there were only 26 mortalities this year, due to a lack of water in the tailrace trap.

- Gaston

For Gaston this year, 1,140 eels were CWT tagged and released to the Lake Gaston Recreational Area.

Bob noted that the high catch at RRD this year, correlated with Gaston. He wondered if the eels passed at RRD, just went straight up to Gaston. Bob wondered if the same environmental cues were acting on the eels in both the river and RRR, or just the eels moved upstream. There was some discussion of dry, versus wet years and how that might come into play.

Peter noted that was another possible correlation for Twyla and Kevin to examine.

Scott noted that it almost looks like a temperature response. Wilson and Bob noted that early on, it appeared that there was some correlation between peak numbers and a 15-degree threshold. Peter indicated that he can take another look at the temperature.

Peter showed us the Gaston trap catches, by month. The peak was April through June. Numbers are low in August through December. Peter noted that the plans were sent to FERC December 5, for the Gaston facility. Their design folks are coordinating construction and getting everything together. The North Gaston trap will require more and will take until May 30th. The remainder will be done by October 1. Engineering design for the road took more time than they thought it would have taken. The South Gaston Eelway operational upgrades will be completed by March 1 and Dominion plans to operate it until June 30th. This should capture the first big run of eels at Gaston. After June 30th, the south eelway will enter an outage to complete the construction and facilities.

Jeremy thought we had decided to change the direction of the South Eelway.

Peter indicated that we had not, that instead we had decided to fill in the interstitial spaces under the trap with concrete. They will need an outage from July 1 for a while, for three months actually, in order to get the ramp done.

The North Eelway should be done by October 1. Peter noted that they will try to work faster, but you never know.

Corey asked if they could push the South Gaston outage until later in the year. Peter noted that could be possible, if the eel catches were still going strong. Paul noted that they want everything operational by October.

Peter noted that passage will not be established, until the eelways are fully functional. These were more monitoring traps, which are being converted into passage traps. Peter wanted to know if this schedule was okay for everyone.

Fritz noted that as long as the schedule was adhered to, that would be okay with NMFS.

Bob noted that the company will have to set up contract and schedules, so that limits their flexibility.

Fritz asked if the same company was doing both eelways. Yes, they are. Fritz thought that they could switch from one to another in order to keep things moving.

Peter explained how they arrived at the schedule to provide passage for the peak period. In theory, 84 percent of the eels moving upstream should be captured.

Dan noted that April-May work should minimize impacts from water.

Jeremy thought the schedule was good.

Peter noted that Dan Gardner is the Project Manager. He noted that the concrete work should be straightforward, but that is time that the eelway can't be operating.

Peter noted that we could discuss it again in the spring.

The NCWRC, and NMFS, were both okay with the schedule. Peter will call USFWS and make sure that they are good with the schedule. Peter noted that they may be able to do some other onsite work prior to the July 1 date.

Peter was pleased that the agencies were supportive of that schedule.

Peter noted that the Upstream Effectiveness studies and Lake Gaston Distribution Studies will not begin until after October 1, 2020. Study designs will be drafted and circulated in early 2020 for AEWG input.

- Future of Stocking Locations

Dominion will apply to NCWRC for a stocking permit. For the Roanoke Rapids Eelways, they will continue stocking 50:50 at Deep Creek, and Fifth Street. He noted that the eels are getting upstream to Johnson Pond. We are sort of encouraging them to move upstream to Johnson Pond by going up Deep Creek.

Wilson asked about trying to sample some of the beaver ponds upstream of Johnson Pond. Peter indicated that they can explore that possibility.

As far as the Gaston Eelways go, they propose to do CWT and release at the Gaston Recreation Area until the end of effectiveness studies (2020-2021).

Fritz asked if this meant not using any of the tributary streams.

Peter indicated that was correct. Many of those streams are pretty short. Kirk noted that Dominion had done a lot of ground-truthing last year. Peter concurred and noted that they had checked out a number of the tributaries. They investigated Lee Creek, and Summit Creek. Peter noted that he hopes to take what we learned from Deep Creek, to Gaston, in terms of sampling for distribution. For now, not splitting them up makes sense.

Wilson asked if Jesse Fischer was seeing a difference in growth rates, between American Eels captured in the reservoir, versus those from Deep Creek and/or Johnson Pond. Peter wasn't sure there was any difference, or if Jesse has looked at that parameter. Wilson wondered if there was anything to be gained from stocking in the tributaries, versus the open reservoir. Ultimately, the eels will go where they are motivated to go, by whatever factors that inspire them to move. And, the numbers being moved above Gaston are pretty low in comparison to what is being moved into RRR.

Peter projected a map of Gaston and reviewed the tributaries which they had surveyed.

Dan noted that until larger numbers show up, he doesn't see anything wrong with putting them all in one location. Peter noted that they will be doing some sampling in Summit. Peter doesn't think they would be attracted by to the dam.

Wilson noted that in theory, if a lot of the eels went back through the dam, some of them should be recaptured in the traps. Fritz noted, also in theory, if that happened, we should consider moving the stocking location.

When viewing the cumulative map, Fritz noted that Jeremy's predictive curve didn't do too well this year. Jeremy noted that there were a lot of mitigating factors this year.

Jeremy noted that we are not seeing tens of thousands of eels, in Deep Creek, or Johnson Pond, despite having put 1.1 million eels there. Jeremy noted that the basin is huge, and the lack of eels there is somewhat puzzling.

Wilson noted that the company by moving eels is restoring an ecosystem function. Some of them are going to die and or be eaten.

Jeremy agreed that was the case.

Scott suggested that it might be useful to catch some larger American Eels downstream, and put some transmitters in them, to see what they do when they are released in Gaston.

Bob noted that they have shocked some larger eels down there.

Wilson clarified what Scott was thinking. The idea is to put some larger ones which may be closer to outmigrating, further upstream, and see what behavior they exhibit.

Bob was supportive of seeing what eels would do if they were put in Johnson Pond.

Corey asked if there was any benefit to tagging a certain number of eels to put into RRR.

Peter noted that the recapture rate for the CWT-tagged eels to date has been very low.

Corey asked how many tagged eels were put into Johnson Pond. There were 20 with just PIT tags, and 13 with acoustic transmitters.

Jeremy noted that the transmitted eels can yield an estimate of the emigration rate. He noted that the population could be larger there, and we just aren't capturing a lot of them. Jeremy noted that you can verify that American Eels are there, based on the transmitters, so if you don't recapture many PIT-tagged eels, that would suggest that the population there is very large.

Peter noted that the more eels you stock, the more you potentially affect the growth rate. We all agreed that there is some carrying capacity which possibility has been, or would be, exceeded. Peter noted that might be an issue about which we can ask Doug.

Wilson noted that he and Doug were just planning to derive literature values for American Eel densities and use an average as reflective of a normal American Eel density.

We discussed stocking locations, and the fact that for a while, stocking was done at the NC 158 bridge location, instead of NC 903. There are some other potential stocking sites. There may be some other access points, to which Dominion could probably secure access.

Peter noted that we could open up more habitat, by shifting the stocking location.

Twyla asked how much American Eel habitat is in the reservoir watershed.

Wilson and Bob et al. explained the work that Doug is doing to estimate the amount of American Eel habitat in RRR. He should be nearing completion of that work, so if Twyla wants to request it, it might be forthcoming faster.

Twyla asked about the stocking locations in Roanoke Rapids Lake. We decided to keep 50 percent at the 5th Street location. Fritz noted that we kept the location in the middle of Deep Creek, to not mess up our design, but he would be okay with moving them downstream to the private boat ramp.

Bob noted when Gaston is generating, it pushes water into Deep Creek, and when RR is generating, it pulls water out of the creek, so the eels get a mixed message.

Bob noted that we have caught eels at both sides of Gaston Dam. Most eels caught at Gaston are caught in the south trap, and we have been releasing all the eels on the south shore. Perhaps the prey base is lower on the other side of the reservoir.

Fritz noted if the estimate from Johnson Pond is low, then we can continue stocking in Deep Creek. Otherwise if it is high, then perhaps we should move them.

Twyla suggested that we may want to consider how long the eels are staying in one area, and then perhaps change the location, to avoid overstocking in one area. She noted that we don't presently have those data, but we may in the future.

Peter noted Andy Dollof had done a residency study in the Shenandoah, and larger eels had stayed in the same area but that study was completed in a more headwater stream than in a lake environment.

Fritz noted that in a small reservoir, the number of stocking sites are limited.

Twyla asked what the options are.

Wilson noted that they could be moved further up the reservoir or stocked on the opposite shore. But, as Bob noted, there are no other streams over there. Peter noted that the ride to 5th Street is shorter. There is a stream on the opposite shore, which has a pond that feeds into it.

Wilson and Twyla noted it would be interesting to know if there are eels in any of the ponds on the opposite shore. Corey agreed. He noted that there is a lot of agriculture around that portion of the

landscape. Peter noted that it would be likely that any eels there would have come from the 5th Street stocking.

Jeremy noted that we could move them closer to Gaston, and that would improve his model.

Peter noted that we wouldn't want to do that.

Corey asked about moving them to the mouth of Deep Creek, which would increase the eels' options. Peter noted that in that case, they may not use some of the available habitat. Corey noted that the path to the other side of the reservoir is shallow.

Peter noted that one reason we used Deep Creek is to see if they would use that habitat.

Taylor noted that Deep Creek is currently our only source of eels for further studies.

Twyla asked if the creeks on the other side of the reservoir have been sampled, or if the ponds there have been sampled.

Bob said they have not sampled on the other side of NC46. All of those creeks were really small, just trickles. They did find some species of fish, like Bluegills, in them.

Jeremy indicated if that we could probably get permission to shock for eels, at least once. Jeremy thought that the standpipe release was probably pretty typically, which probably isn't that good for eel access.

Peter noted that some of the streams could be sampled.

Peter asked if we should just maintain status quo, until we have more information. No one objected.

Wilson verified that some electrofishing would be possible in those opposite shore tributaries, just to see if there are any American Eels there. Bob thought that it might be possible to check out the standpipes in the ponds. We all agreed that eels have an amazing ability to get into places where we would not expect to see them be present. Dan noted that with the rainfall we had this year, some of the dams may have been overtopped.

So, an **action item will be for Dominion to try to do some sampling**. We should also gain more insight from the continued eel-potting.

Jeremy noted his agreement that all of those streams are small, flashy, first-order streams.

The conclusion was to maintain the present strategy until we know more.

Jeremy noted that "eel cove" was a possibility referencing the shallow Submerged Aquatic Vegetated area north of the mainstem lake. Paul noted that it will be interested to see what, if anything, we gain from pot sampling in that area.

- Upstream Eel Passage at Gaston
- Status and schedule
- Study Discussions

- O&M Manual

Kleinschmidt is drawing up an operations manual for both facilities, Roanoke Rapids, and Gaston, to explain how to use the facilities.

Bob asked about any improvements. He asked, given Tom's issues with the siphon, should we begin some discussion of some repairs and some maintenance. Peter indicated that they will be doing some of this work. The North Eelway loses the siphon at times. This does not happen when you operate the North Spillway. It is a hassle to refill the siphon pipe. The operators are giving them a heads up to try to avoid this situation.

Paul asked about moving the siphon intakes. He suggested that is the root cause, so why not fix that. Peter wasn't sure that was the issue.

2:11 pm: Peter noted that was all that he had for today, with respect to American Eels. He did say that the strainer buckets for the generators, were full of Corbicula, and they found one American Eel there as well. This was water withdrawn from the reservoir. They froze and kept the eel.

Corey noted that there is a debris screen on the intakes, but not a fine screen. Corey wasn't sure why an eel of that size was up against the dam. It could be since the station wasn't generating for a while. Paul noted that the eel could have been dead.

Kirk asked what is going through now. Corey checked and found they are discharging 8,000 cfs this week.

Scott noted, given all of the gulls hanging around, there must be some fish going through the dam.

Peter reviewed the main take-away messages from our meeting. He reviewed the action items. They will add sampling of the streams on the other side of the lake. They will send out a pot sampling schedule, if anyone wants to come and participate.

o Spring meeting:

☑ March availability?

Fritz asked if we are going to have a March meeting. Peter thought we can get away with an AEWG call in the spring. Fritz noted that his March is very busy, with multiple meetings. NMFS is sponsoring a sturgeon workshop, which will be held in Myrtle Beach.

Peter indicated that they will keep those meetings in mind.

Peter will send a Doodle poll out to everyone.

Wilson provided an update to everyone on the Cooperative Winter Tagging Cruise which will be upcoming in 2020, in January and February.

Peter updated those who will not be here tomorrow on the agenda. The VCU researchers will be applying for permits to work on Atlantic Sturgeon. Various researchers will hopefully be starting work in various NC rivers.

Jeremy noted that they put in a proposal for the Roanoke, Chowan and other NC rivers. Fred Scharf, Matt Balazik will be doing the work. NCWRC is the Section 6 agency and is hoping to operate as a pass-through. Fred will contract out to Jason Kahn, and Matt Balazik.

Fritz noted that the US Navy is also a sponsor for the sturgeon workshop to be held at Myrtle Beach, the last week in March.

We briefly discussed Matt Balazik as a potential DFRTAC member.

The meeting adjourned at 2:30 pm.