

Dominion
Roanoke Rapids/Gaston Hydropower Project
FERC No. 2009
**Diadromous Fish Restoration Technical Advisory Committee and FL1 Cooperative
Management Team Meeting**
July 24, 2007

Present: Jim Thornton (Dominion), Bob Graham (Dominion), Julie Harris (NCSU), Joe Hightower (USGS), Tom Gunter (Aquatic Biological Monitoring Services, LLC) Sara Winslow (NCDMF), Bennett Wynne (NCWRC), Kirk Rundall (NCWRC), Jeremey McCargo (NCWRC), Mark Cantrell (USFWS), and John Ellis (USFWS via phone).

The meeting began with introductions and a review of the draft agenda. No changes were made to the agenda. Bob Graham told everyone he had received messages from Wilson Laney, Bud LaRoche and Pres Brownell that they would be unable to participate.

1. Review of 4/03/07 FL1CMT and DFRTAC meeting minutes

Bob scrolled through the minutes and reviewed the action items. All had been completed. Mark Cantrell requested more information related to Dr. Levy's proposal to develop a genetic marker for *Anguillacola crassus* because it could complement some work he is doing. **Action Item:** Bob is to send Mark the proposal from Dr. Levy (*done 7/26/07*).

2. 2007 American eel studies
a. Bypass trapping

Bob reviewed results of American eel trapping in the bypass as of 7/11/07. Sampling has gone as planned with the ten "standard" traps being run biweekly from January through February, and weekly sampling resuming in March. From January through May the four "experimental" traps designed to assess the efficiency of 1" and 2" substrates produced by Milieu, Inc. were run continuously, except for a brief icing period during February.

As of 7/11/07 a total of 15,361 American eels had been collected with the standard traps. The majority of the eels were collected from late April through early July, with a peak catch of 4,291 eels occurring on 5/28/07. As in previous years, almost all of the eels were in the 110-160 mm TL size range, and very few (5) recaptures occurred. Bob presented plots of the 2007 catches in comparison with 2005 and 2006 catches. Sampling in 2007 will continue through the remainder of the year as planned.

b. Tailrace trap modification plan

The paired experimental traps were located near two of the most consistently productive standard traps, Trap 3 and Trap 9. The 1" substrate was made of a closed-cell foam (Traps 3F and 9F), and the 2" substrate of PVC plastic (Traps 3P and 9P). From the initiation of the study in December 2006 through the end of the study on June 8, a total of 2,351 eels were collected in the experimental traps. The catches for the 1" foam traps were remarkably similar (3F=1,185 eels, and 9F=1,156 eels), as were the 2" PVC traps (3P=2 eels, 9P=8 eels). As discussed in previous email correspondence, the 1" foam substrate will be used as a replacement substrate material for the tailrace eel trap because of its superior performance in the bypass. There was some discussion about the Fishpass substrate produced in France. Bob indicated that cost of purchasing the Fishpass substrate for the tailrace trap would be comparable to that of the Milieu substrate, but a combination of the testing done in the bypass with the Milieu substrates and inability to find similar comparisons with the Fishpass material lead him to prefer the Milieu substrate as the replacement substrate of choice for the tailrace eel trap.

Joe Hightower passed around a new book he had obtained dealing with eel passage in the United Kingdom (Solomon, D.J. and M. H Beach, 2004. Fish Pass Design for Eel and Elver (*Anguilla anguilla*). R&D Technical Report W2-070/TR1, Environmental Agency, Almondsbury, Bristol, UK). It contained a good number of illustrations that help envision how different substrates/designs/etc. can be employed. **Action item:** Bob to obtain reference from Joe. **Action item:** Bob is to check on timetable for bypass sampling, and Roanoke Rapids eelway design and construction. (*done – Article FS2, S. 3.0. Bypass sampling continues through Year 4 (2008), when Dominion to work with agencies to design an eelway for Roanoke Rapids Dam. Eelway is to be put into operation in Year 5 (2009), unless agencies see need to accelerate the program in Years 2 (2006) and 3 (2007). The bypass sampling may be repeated as bypass flows increase per Article FL1 (Management of the Bypass Reach).*)

c. *A. crassus*

There were no known new developments regarding the use of eels for bait in the upper drainage. Kirk indicated he had contacted the Lake Gaston striper club but had not received a response yet. Mark suggested some web fishing forums may be good places to obtain information on the prevalence of using eels for bait. **Action Item:** Kirk, Bud and Bob to follow up on use of eels for bait. All agreed that if bait dealers could be found, the next step would be to purchase some of the eels and examine them for *A. crassus*, as was planned.

There was a question about any new collections of eels from upstream of Roanoke Rapids Dam. Bob did not have any, but intends to electrofish the flats in upper Lake Gaston where trotliners have reported catches of eels, the cove the eels Chad Coley obtained came from, and near Kerr Dam.

d. Coded wire tags

Bob informed the group that Dominion had purchased a Mark IV CWT injector, tags and a shed to house the equipment separate from the powerhouse. Chad Coley and he had received instruction in its use from a Northwest Marine Technology representative, and Chad had also received instruction from WRC at the Marion facility. Bob intends to conduct two CWT studies this year. The first would be a tag retention study, and involve tagging 30-50 eels and holding them for several weeks to assess mortality and tag retention. The second would be to tag several hundred individuals and release them in a tributary to the Roanoke River downstream of Roanoke Rapids Dam. A crew from Dominion would then return to the stream after some period to try to recapture tagged eels. Mark suggested it would be good to have information on the presence or absence of eels in the stream selected for study, and provided some leads to related information (Bryn Tracey w/DEQ and Wayne Starnes noted). The group agreed that would be valuable. **Action Item:** Bob is to develop a study proposal in August and send it to the group for review.

3. 2007 Bypass diadromous fish studies

Tom Gunter provided an overview of the work his firm had done during 2007. Tom followed, with some modifications, the protocols developed by the DFRTAC that were based on Julie Harris' work during 2005 and 2006 (Harris, J. E., and J. E. Hightower. 2007. Relative abundance of migratory fishes within a restored braided-channel habitat below the Roanoke Rapids Dam. Final Report to Dominion. North Carolina Fish and Wildlife Research Unit, NC State University, Raleigh.). Tom used a 12-foot Zodiac as an electrofishing boat for adult sampling (2-3 runs per station), and 15-minute bongo net tows for ichthyoplankton. Stations in the lower, middle and upper bypass were sampled from early March through May. Only a few electrofishing samples were collected in the middle of the bypass due to poor road conditions, but all of the scheduled ichthyoplankton samples were obtained.

Electrofishing resulted in most of the anadromous fish being collected from the lower station. Adult blueback herring and alewife were collected here, Blueback were most abundant in early March and April, when water temperatures approached 15 C. At the middle station, the few samples that were obtained only documented one American eel. However, Tom noted there was an abundance of quality-sized largemouth bass and redear sunfish at this station. At the upper station, 1 adult alewife (250 mm TL) was collected, along with lots of small blueback herring presumed to be lake washovers, and a number of striped bass that may also have been lake washovers. Tom noted one gravid female striped bass collected was 875 mm TL.

Tom reported that John Olney's technicians have processed most of the IP samples from the lower station, and will be processing the remainder in the near future. Incomplete results from the lower station resulted in 50 live and 10 dead eggs being found, and 1 hickory shad larvae. The majority of the blueback herring eggs were collected in late March. Sara Winslow questioned some of the egg identifications based on time of collection, and it was agreed it would be best to lump alewife and blueback eggs into one "river herring" group due to difficulties with identification. It was noteworthy that most of the eggs were collected during the 500-675 cfs flow period, although Joe noted that the high flow period was chosen to coincide

with likely peak abundances of anadromous fish. Sara also noted that the commercial catch of hickory shad had been greatly reduced the last two years.

The group discussed how March had been a variable month in terms of river flow, and April in terms of water temperature. There was also some discussion about the suitability of the middle station as a good index of anadromous fish penetration into the bypass, because the lower end of the station lacks a channel of appreciable depth for fish passage, while a deeper channel exists farther to the south. **Action item:** Bob and Tom are to review the bypass aerial video and examine the middle study area. Tom indicated that depending on what the video shows, it may be useful to move the ichthyoplankton station in 2008. Tom will provide the DFRTAC with a draft report for review later this year after the ichthyoplankton results are in.

Lunch

4. 2007 American shad studies a. Electrofishing surveys

Bob described the weekly electrofishing surveys conducted by Dominion, in the vicinity of the Route 48 bridge. During 2007 680 American shad were collected, 379 of which were used for Julie Harris' acoustic telemetry study. These fish were collected from 4/5/07 through 5/8/07. Beginning on 5/15/07, all American shad collected received individually numbered Floy tags and were released after processing, which followed the protocol of past years. Catch rates were generally lower in 2007 than in 2005 and 2006, which may have been related to the extra electrofishing effort expended to capture fish for the acoustic study, and on 5/15/07 for the tag and recapture study. 2007 also differed in that the female/male sex ratio never exceeded about 0.5, which also may have been affected by the extra electrofishing effort. There was a distinct change in reproductive condition of female American shad in late May when water temperatures reached about 24 C, from green to ripe or spent. It appeared that spawning may have occurred during a relatively brief period in early June in 2007.

The group also spend considerable time reviewing plots of water temperature and dissolved oxygen recorded in the American shad haul tanks at 15-minute intervals with a Hydrolab instrument. Data were presented for seven of the eight weeks fish were collected for Julie's work, and indicated that while the haul tank water temperature remained nearly constant over the 6-12 hour collection and transport periods, DO was highly variable. Dominion had attempted to maintain DO at slightly supersaturated levels, but some very high (20-30 mg/l) oxygen concentrations were recorded during some hauls. The accuracy of the Hydrolab sonde and the handheld YSI model 55 instruments under supersaturated conditions was questioned. **Action item:** Bob is to check on effect of supersaturation in 3% saline water on instrument accuracy.

Collection and transport mortality varied from 0 to 24%. There appeared to be a negative correlation between water temperature and mortality, as would be expected. Given the fish were collected at ambient water temperatures of 20 C in some instances and held in the tank for over 6 hours, the group felt the mortality rate was within acceptable levels. Bob indicated he and Chad intended to continue to work on improving survival and haul tank DO stability. Tom suggested

cutting back on the oxygen when beginning transport, as the sloshing action during transport likely contributed to the high DO levels observed. **Action item:** Bob and Julie are to check on the transport distances to the Gaston and Kerr release sites. **Action item:** Julie is to send Bob any readings from the handheld YSI unit she has.

b. Tag and recapture study

A total of 12 recaptures occurred over the six week period following the initial tagging of American shad. Ten were recaptured during suveys conducted by Dominion, and two of these fish were recaptured the same day they were tagged. Two were recaptured by WRC during suveys conducted the last two weeks of May. The response of American shad to handling, which frequently results in fallback behavior, and the potential effects on the assumption of trying to develop a population estimate based on electrofishing was discussed at length. This was seen as a potentially greater problem than the population being open to immigration and emigration. Bob indicated he had forwarded the data to Terry Mills and Erich Brandstetter of Harza for comment, but had yet to receive any response.

c. Hydroacoustic population estimate

Joe reported that Kevin Magowan had completed processing the 2006 data files. This year Kevin again set his split-beam transducer up at the site near Williamston he used last year, and used a combination of electrofishing and drift gill netting to assess the composition of fish passing the transducer from March 6 to May 25, 2007. Unfortunately, only 14 American shad were collected in the gill net, and none were collected by electrofishing, which is the standardized collection technique Joe and Kevin had hoped to use for extrapolating the acoustic data. Joe presented data related to abundance of American shad in relation to abundance of striped bass from collections conducted by NCSU over the past few years, and will be looking at similar DMF fisheries independent data beginning in 1991 to see if it provides any insights into American shad/striped bass dynamics.

d. Acoustic telemetry study

At the beginning of her presentation, Julie noted that an overall objective of the study was to see if American shad make use of habitat upstream of Kerr if they have access to it. In lieu of Bob trying to summarize Julie's very informative presentation of her preliminary analysis, he attached it to the cover email to the DFRTAC. It had previously been sent to several members of the DFRTAC and subsequently forwarded to other agency biologists, so Bob hopes this meets with the DFRTAC's approval.

Of particular interest to the DFRTAC was 1) a high percentage of the fish introduced to Lake Gaston were later recorded downstream of the Lake Gaston Dam, 2) there was evidence that at least some of these fish survived the passage through the turbines, 3) a number of fish introduced to Lake Gaston passed the uppermost receiver in Lake Gaston, indicating they headed towards Kerr Dam, 4) a high percentage of the fish introduced to Kerr Reservoir were repeatedly

recorded from the mid-reaches of the lake, 5) one fish passed the mouth of the Dan River, 6) two fish passed the mouth of the Staunton (Roanoke) River, 7) the fish that passed the mouth of the Staunton River did not reach the next upstream receiver, 8) abundance of American shad eggs in plankton tows downstream of Roanoke Rapids Dam was greatest in early June, and 9) no American shad eggs were collected from the Staunton River.

Action item: Julie and the group discussed several recommendations for potential changes for 2008, and after giving them more thought Julie will provide those recommendations for DFRTAC review.

7. 2007 Bypass mussel survey

Rob Nichols conducted the survey in July, and will be providing a report of his findings later this fall.

8. Action Items and next meeting

Although not discussed, the next meeting is likely to be during the fall or early winter of 2007.