



Freshwater Habitat and Fish Passage Action Team Meeting

Albemarle-Pamlico National Estuary Partnership

10:30pm - 3:00 pm

April 25, 2017

NC Wildlife Resource Commission Office Headquarters

Commission Meeting Room 5th Floor

NCSU Centennial Campus

1751 Varsity Drive, Raleigh, NC 27606

Meeting Notes

*Notes recorded by Wilson Laney, Tim Ellis, Stacey Feken and Matt Butler

*Compilation and editing by Tim Ellis

APNEP Staff Present: Dean Carpenter, Coley Cordeiro, Bill Crowell, Tim Ellis, Stacey Feken, and Jimmy Johnson.

Team Members Present: Matt Butler (Sound Rivers, Action Team Lead), Amin Davis (NCDWR, WRD Grant Program, attended via WebEx), Chris Elkins (NCCCA), Casey Knight (NCDMF), Wilson Laney (USFWS; APNEP STAC liaison), Jeremy McCargo (NCWRC), Cam Mcnutt (NCDWR), Peter Raabe (American Rivers), Roger Rulifson (ECU), Shane Staples (NCDWM), Fred Tarver (NCDWR), Frank Yelverton (USACOE-retired, Cape Fear River Watch), Simeon Yurek (USGS-Wetlands and Aquatic Center, SALCC).

Coley convened the meeting at 10:35. She noted that everyone should sign the sign-in sheet, and turned the meeting over to Matt Butler.

Team member introductions and new members: Matt Butler

Matt welcomed everyone to the meeting. He noted that we have had three people, Amin Davis, Simeon Yurek, and Cam Mcnutt, who have joined the team since the last meeting. He asked everyone to do introductions. Everyone did so.

Dean Carpenter explained his role with the Monitoring and Assessment teams, one of which is Aquatic Fauna, for which he and Wilson have the lead. That team will be kicking off again in June. He explained that "action" teams, like this one, work on action and mitigation items, while the MAT's design monitoring and assessing plans. He described the role of this MAT group is to develop metrics for tracking and monitoring the status of aquatic fauna.

Matt asked if there was anyone on the telephone. Amin Davis was on the telephone. Amin noted he is with NCDWR and with the grants division.

Revisit possible team action items identified during last meeting: Team Members

***Develop a comprehensive map of ditched and drained areas, identify priority areas**

Cam Mcnutt- update on information from Nat. Wetlands Inventory and CarWA (USGS Topography Digitization)

Cam displayed map USGS data extracted from late 90s topo maps to mid-2000s. Cam noted that the data underlying the map projected on the board are over 40 years old. The red areas are the areas that have been ditched and drained. (Number code 30 previous set). Cam noted that the mapping was done inconsistently. Cam noted that there are some white areas on the map, that didn't make it into the electronic format. The areas were mapped; they just didn't transfer. There are plenty of ditch networks there, which just don't show. You can get a pretty good idea of "modified" areas but how many were natural previously, is hard to tell (i.e., how many are natural streams and how many were created to drain farmland). We also don't have imagery on any of the military installations, so we can't tell what is going on within them. The stream imagery was explained. Unsure if these data are usable for data analysis. Cam noted that some of the drainage areas designed for stormwater management are concrete-lined ditches. Cam noted that ditched areas are bad habitat and managed differently (i.e., not a natural system and with limited aquatic life). Cam noted that he wasn't sure what the priority areas are, but he could possibly point us to some areas.

Coley asked if anyone knows of any other mapping going on.

Wilson suggested that we should talk to USGS, although he was sure that Cam and Fred talk to them.

Cam noted that he is on the stream mapping advisory committee for the state and USGS is involved. Ongoing efforts to remap the western part of the state using consistent mapping. NCDOT headwater streams spatial datasets (some do a good job) fall apart in urban areas and areas east of I-95. They may use some high-resolution LIDAR data as well. We may have a better product once those data are analyzed. Another issue is how to tell where the natural stream channels were. Some you can see from aerial imagery. Cam noted that one retired USGS staffer told him that in the Coastal Plain, they put streams in, if there wasn't one within a mile. Cam recommends using the most current aerial imagery (4-year cycle), instead of field investigations, for small-scale needs (e.g., implementation) but not at the large-scale analyses we are needing.

Wilson noted that Doug Newcomb on the USFWS ES staff may be able to shed some insight as well. Wilson noted that Doug is working a lot with the LIDAR data. Cam was aware of Doug's work. Wilson noted also that there is work going on within the Mattamuskeet watershed. He is involved along with Doug, Katy (?), and WRC staff, trying to prepare a plan eligible for funding. The WRC has funded research looking at nutrient inputs in the watershed, specifically

from waterfowl impoundments. Cam is tied in to that as well and hopes mapping is part of the Mattamuskeet restoration process.

Cam shared what the team he and others are on, are doing. He noted that DWR has to respond to ditch networks and canals associated with closed shellfish harvest areas, and having accurate maps and flow direction would be very helpful when restoring those areas as well.

Coley noted that Ecological Flows group will be meeting in a few weeks and can bring up this topic as well.

Coley noted that Simeon is with USGS.

Wilson asked if APNEP is going to make a map?

Fred asked, do we really want to provide passage into these drainage systems? Are these areas even suitable habitat?

Wilson concurred that was a great question, and noted recent discussions that he has had with Mike Wicker, about water quality conditions in these canals, and whether they are suitable for aquatic life. They had discussed management at Pocosin Lakes NWR and the potential for water control structures. Mike Wicker is interested in fish passage being built into that plan. Wilson noted that we need to sample these areas (e.g., pH) and get information on water quality, especially in summer, no canopy, low DO, low pH (e.g., not optimal for river herring).

Cam noted that they do have a lot of data, on benthic invertebrates, fish, and water quality, for some of these systems. He noted that they tend to be much faster than normal in terms of delivery (i.e., these ditched networks are bypassing slow-moving water bodies and turning them into rapid draining areas). They also have data on the water quality. Cam can look at seeing where they have experienced exceedances (e.g., model vs. what landcover suggests would be there).

Fred noted that they treated a lot of ditches in the Scuppernong drainage, for Alligatorweed. He suggests looking at pesticides.

Cam thinks the online data list areas with no impairments for herbicides/pesticides in canals/ditches but the data are just hard to get to.

Simeon asked if there is a way to get a sense of how well these systems are still flowing.

Cam stated you must look at the energy. He was talking to the NRCS folks about managing these areas. The NRCS folks put basin lines on the maps, for HUCs, to give an idea of where they were flowing. Cam noted that there are outfalls depicted on the maps.

Wilson asked, what do we mean, when we say “priority areas.” Priority for restoration?

Casey thought that we meant “priority” for additional information.

Wilson suggested that we recommend: 1) developing a comprehensive map of ditched and drained areas; and 2) identify areas that we feel were priority for further investigation, or restoration; and 3) identify criteria which would preclude us providing fish passage to any areas with suboptimal habitat quality.

Coley said she would pose these recommendations to the Decision Support Tools Action Team as well to see what other information may be available. Coley also noted that we had two people join us since we were discussing this topic and asked them to introduce themselves.

Frank Yelverton, Executive Director of Cape Fear River Partnership, and Jeremy McCargo, Diadromous Fish Research Coordinator for the NC Wildlife Resources Commission, both did so.

Jeremy noted that he was late due to the Corps Water Management call. The Corps is going to go to 35,000 cfs on the Roanoke, and they will go to 6,000 cfs, on the Neuse.

Jeremy stated, in response to Wilson’s question about sampling, that he doubted that WRC had done much sampling in ditch systems. The aquatic diversity groups do some salamander, crayfish, non-game species sampling...could look at those data if we want to. No sportfish sampling except in the Mattamuskeet canals. Jeremy noted that the question comes down to what habitat quality is like in ditch systems...need to evaluate.

***Map inland freshwater habitat**

Fritz Rhode - updated on the integrated freshwater habitat protection strategy

Coley noted that Fritz was going to provide an update on the integrated freshwater habitat protection strategy, but he was unable to be with us today. She asked who knew anything about inland freshwater habitat maps.

Wilson noted that the USFWS has produced the National Wetland Inventory maps. Simeon and Casey thought that those maps were current up to about 2010 or 2011.

Cam noted that all benthic sites (303d monitoring) have habitat data associated with them. Small streams criteria were finished a few years ago.

Casey said DMF has habitat types for joint and coastal waters in Albemarle and Pamlico Sounds.

Coley asked Jeremy if there was a need for freshwater habitat mapping.

Jeremy noted that NCWRC has discussed mapping anadromous fish spawning habitat, but they haven’t pursued any of those thoughts yet. They haven’t included any concept for mapping small streams. Jeremy asked if we were talking about just mapping the streams, or mapping

habitat types. He suggested it would depend on how far the team wants to go but confirmed that there is a need for anadromous mapping to identify spawning habitat in all NC waters.

Coley suggested that the CHPP might have a need for further mapping.

Wilson suggested that “inland freshwater habitat” for APNEP should include everything up to the smallest headwater stream.

Cam advised that USGS has already mapped headwater streams. That modeling program tries to identify ephemeral stream intermittent points (west of I-95).

Coley noted that at the end of the day, we will have a discussion of what should be priority items. If this is chosen by the team as a priority, then we could hire a GIS technician to work with everyone to get the mapping done. The team itself won't have to do any of the work but agencies or their staff would hopefully do some of the work and assist the GIS technician.

Frank Yelverton noted that the CFRP has submitted a letter of interest to the NFWF for ground-truthing all the obstructions in the Cape Fear River watershed. If they get the funding, they will ground-truth some work that was already done by a former City of Wilmington employee who identified all the obstructions below Lock and Dam 2.

***Map anadromous fish spawning areas**

Casey Knight - update on comprehensive evaluation of suitable spawning areas

Casey noted that there are a lot of existing GIS data layers. She showed us two data layers which she had added to the Google drive. These are ranked, with alteration (ditched and drained) scores. She explained that the whole area is broken down into hexagons, which are then selected by a model. The other picture has culverts and dams in it. The culverts and dams were actually used in the models which depicted the probable spawning areas. The NCDMF is going through ground-truthing now. She explained the colors on the maps. She has all the same information for the Albemarle System as well. The maps she showed us were for the Pamlico-Tar system. She was looking at using these maps as prioritization tools (i.e., identify areas in need of restoration). Casey noted that the NCDMF GIS staff could possibly make this into an online map for which we would not need ARCGIS. She noted that APNEP would have to decide who would maintain such a system. Mike Griffin is the NCDMF GIS person (Mike is also on the APNEP Decision Support Tools Action Team). Casey noted that there are a ton of differing layers out there, and how you use them for decision-making must be decided.

Shane asked if there are points and designated AFSA areas. Shane noted that Holly White (NCDMF - Elizabeth City office) has been sampling some streams, which aren't designated, but have significant herring runs in them. Shane asked if some of the data could be used to assist us with expanding the designation. Shane noted that one of the areas was outside CAMA jurisdiction. We could notify Travis Wilson about this, for NCDOT purposes. Casey noted that NCDMF CPUE data could be used.

Shane noted NCDOT is replacing culverts and bridges in areas that are not under AFSA designation but having that designation gets better attention. Coley noted that Wilson would be covering the NCDOT guidelines.

Wilson noted that he would just share the guidelines. The guidelines are 20 years old.

Jeremy suggested that it would be good to add the CPUE data, to the maps.

Wilson agreed. He noted that Holly White had provided him with data on the pH associated with the capture of gravid fish. He noted that there was proposed legislation to give Sea Grant \$100K to work with NCDMF on a new river herring stock assessment. Wilson also noted that the ASMFC is already doing a stock assessment update. Wilson didn't know the status of the proposed NC legislation.

Peter looked up the bill online and updated us on the present status. The Sea Grant provision has been dropped. The current version requires NCDMF to do an update.

Roger asked if NCWRC or NCDMF have data on fish run size.

Jeremy says there are no run-size estimates for any streams. Only information available are the population estimates from assessment models. There are CPUE measures from electrofishing surveys that can give an idea of trends in relative abundance over time. NCDMF has independent gill net survey data, mostly in the Chowan, but they don't target river herring. Jeremy confirmed that it would be great to have run-size estimates but currently there is no way to obtain these data.

Wilson noted that he has been charged (by USFWS and the SALCC) with coming up with run targets, for Blueback Herring, American Shad, and American Eel, in all streams for the four South Atlantic states. He explained that this is challenging because we can't see fish as we can in clearer streams of New England, and he will have to work with Jeremy and others on that task. Wilson also noted that measures can be taken at any fish passage structure.

Roger noted that there are ways to count the fish. Harrison Lake National Fish Hatchery has a DIDSON-like camera for measurements on Herring Creek. VCU has nearby satellite monitoring capability (?). Roger noted that he has put in a proposal with NCSG to use eDNA as a tool to estimate run size. This would be done in parallel with abundance surveys. They would like to ground truth some of the GIS mapping layers. The proposal is to figure out how to do eDNA (i.e., use eDNA signal strength against known spawning run to estimate population size), with a long-term goal of going to all streams and sampling water for eDNA. The eDNA may be far more efficient than traditional surveys like electrofishing. Roger has sent a message to Jeremy asking for his input.

Wilson noted that he would like to see us ultimately produce a map, on a web site, which would show the active runs and the historic runs, and what their present status is. This can be done in conjunction with the APNEP Aquatic Fauna Monitoring and Assessment Team.

Casey noted that she didn't know what all the criteria are for establishing a new designation. Jeremy indicated that the criteria include running ripe adults, and larvae. Jeremy noted that they (WRC) have the capability of adding new areas to the list of AFSAs.

Shane noted that if there are new sampling data, he was wondering what the process is for designating new AFSAs.

Casey noted that in the climate that we were in under the last administration, they were told not to pursue any new designations. Casey noted that they need to check and see what the current conditions are. She will talk to Holly and get the data together.

Coley summarized: we need to review all areas that are designated and will work to add new data. She asked Casey if Mike Griffin could also work with us to put this online. Casey thought that he could do so.

Fred noted that there is an AOGL Committee which could possibly maintain a data layer. Cam noted that Mike Griffin is on that committee. Cam explained that the Department data will all be compiled in the NC One Map database. When you go there, you will be referred to the appropriate agency. Casey noted that database appears to be getting a lot better.

Wilson summarized: 1) update the anadromous maps with any new data; 2) get the maps put online so they are accessible.

Casey noted that we also need to see the attributes of the areas in order to use them as a criterion for prioritizing. Wilson suggested it would be interesting to overlay the ditched/drainage layer, over the active spawning areas, to see how they relate.

Casey noted that she has already done that. We should be able to see areas that are high-priority, where existing runs occur, and also areas which may merit restoration areas.

Tim asked about the SHAs and how those entered the modeling process. Casey explained. She noted that some of the Advisory Committees were very involved in developing ranking measures for altered areas. Tim clarified that he was seeking advice whether we should focus on the SHAs, versus the AFSAs. Casey noted that the SHAs really focused on the more pristine areas and creating habitat corridors. The AFSAs were more focused on functional areas. Casey suggested that if we want to look more at anadromous fish, then we should look at AFSAs. If we want to look at habitat, then we may want to look more at the SHAs.

Tim explained he was trying to explicitly define APNEP's role in linking to the work that NCDMF has already done.

Wilson wondered about finding some point, beyond which river herring don't go to spawn, but inland freshwater habitats become prevalent. This could be an APNEP focus and avoid duplication.

Casey noted that was a possibility.

Coley noted that corridors were a SALCC focus as well, and we can certainly bring them into the conversation.

Jeremy noted that there are plenty of designated AFSAs in Inland Waters, and NCWRC has the statutory authority to designate such areas within their jurisdiction. So, the map also needs to be updated to add those NCWRC-designated areas.

Casey agreed that these areas need to be added.

Jeremy noted that a lot of the AFSAs around Mattamuskeet are spawning areas.

Tim noted that there was a NCWRC representative (Chad Thomas) who assisted in informing the SHAs. Tim again noted that we need to decide where APNEP can contribute.

Coley asked Jeremy who the NCWRC GIS POC would be. Jeremy stated there isn't one in the fish division. He can check to see. Everyone does sort of their own thing. They do submit data to NC One, but that is mostly terrestrial data (i.e., wildlife and game lands, not fish). He doesn't know who it would be.

Wilson asked Jeremy if Cindy Carr might be a good contact person to ask about NCWRC GIS work.

Jeremy noted that she would possibly be. He noted that two DSTs will be coming out from the Wildlife Action Plan work this spring.

Coley noted that APNEP is interested in meeting the needs of the environmental community. She noted that we would have a working lunch today and she hoped that we would collaborate with each other. She wasn't sure the weather was good for eating on the balcony today. They are giving us time to collaborate with each other during lunch.

12:00 noon: The team broke for lunch.

12:36 p.m.: Coley reconvened the meeting and went over a few housekeeping items. She noted that there is a complete roster of team members, on the Google Drive. She noted that she is posting all the information which any team member shares, on the drive as well. She explained that she can also use Google Drive to edit documents simultaneously. The links are also attached to the meeting agendas, or you can send an e-mail to her or Matt, to request the link.

Bill Crowell asked if anyone doesn't have an Outlook, or Microsoft account, in case we switch to another application (SharePoint) in the future. Roger didn't have one.

Coley noted that both meeting agendas are on the site as well. Meeting minutes are also on the site. Fred suggested that Coley may want to organize the materials into folders. Coley noted that we can refer to the minutes if we have questions about what has transpired in the past. She asked for any more questions about the Google Drive. There were none.

***Create a list of dams that need passage**

*Coley Cordeiro - update on prioritized list of areas for passage and dam removal (Assess dam removal list and develop criteria for passage) *NC ACT List of Dams added to FHFP Google Drive*

Coley noted that the next item today is to discuss a list of dams that need passage. This action item fell to her. She explored whether existing lists were already available, and whether any prioritization had been done. She noted that she had asked Peter to address this topic.

Peter noted that there is an existing list (created by American Rivers). He noted that the list was a "pre-daughter" list (he uses his daughter's age as a landmark) created sometime around 2012. He explained that the list was initially for NC, but now has been expanded to the entire SE through SARP. Kat Hoenke (intern at Duke) developed the ArcGIS prioritization tool which was used to make the list. Peter explained how the tool can be used. He used the list on the screen to explain how different factors can be used to prioritize stream barriers across the SE. You can for example use safety issues (e.g., where people have died), and/or fish passage issues, to form a list. There are about 6,300 barriers for NC in the list right now, excluding farm ponds. They have avoided adding those for now. Some of these are water supply dams, such as Falls Reservoir. It is in there because it is a barrier that is present. The list has a recon tab that discusses feasibility of barrier removal. It is both a list, and a freely-available tool, which can be shared. Peter will send a link around.

Frank asked how complete it is, does it have 90 percent of the dams?

Peter indicated that he believes that they are at the upper limit of the number. Frank asked if they have been ground-truthed. Some of them have, and that is indicated in the list. Peter noted that any new ones are added. The layer is for fish passage barriers, so may include some culverts, Casey indicated. If the culvert is NOT a barrier, it may not be on the list. Peter noted that not all the culverts are on the list.

Cam asked what data layer was used for the barriers? Peter wasn't sure. Kat is really the brain trust behind the tool.

Peter noted that if you don't have ArcGIS, you can have access to the map, through the USFWS ArcGIS online. You must get a password from USFWS and then you can access it.

Cam noted that you can extract the dams from the USGS dataset as well.

Wilson noted that Doug Newcomb had at one time procured the NC Dam Safety database and added it to the national database.

Peter noted they had tried to combine as many databases as possible. So, it should be pretty complete.

Bill Crowell noted that Emergency Management mapping and DWR stream mapping had produced a data layer to include every culvert and every impoundment.

Cam noted that they are developing secondary products from that data layer. Cam noted that their stream-mapping unit also includes culverts.

Coley noted that the NC Aquatic Connectivity Team agenda is also included in the Google Drive.

Peter noted that they are also doing training, in Fayetteville, on May 22-23, at the Botanical Gardens. The training is free, and you must stay overnight. Let Peter know if you are interested.

Update on status of Milburnie Dam

Coley noted that Fritz was supposed to update us on Milburnie, but Peter will do it since Fritz is not here. Peter noted that Restoration Systems is looking to remove the dam in 2018. The final approval has come from the Corps of Engineers, but the IRT and NCDEQ Mitigation Services has had a lot of input. Peter gave us some of the details regarding how Restoration Systems had to develop a plan for maintaining some existing wetlands which had developed after Milburnie Dam was put in place. Specifically, a nearby neighborhood had rights to drain stormwater into a wetland pond created by the dam and so the city of Raleigh had to permit a berm to maintain this wetland. The guess is that it will be next fall, before the dam comes out.

Matt Butler and Wilson Laney - update on recent meeting with Rocky Mount Mills

Coley noted that some of us met last week with Rocky Mount Mills last week. She asked Matt Butler to give a report.

Matt noted that he, Wilson, and Peter met with Capital Broadcasting last week. Peter had asked about dam removal, but the owners want to refurbish the turbines and produce hydropower. The owners are doing a mini-version of the American Tobacco project in Durham. Matt noted that after meeting with them, and knowing that removal is not an option, it appears that a rock weir would be a possibility, and it would be used for educational purposes. Matt noted that Wilson can speak to the possibility of getting some design and cost estimates. Capital Broadcasting is open to fish passage and can provide some funding. Matt invited discussion on the topic by asking the group if this is something they would like to pursue.

Frank asked how high the dam is. Matt indicated it was about 40 feet, but it is 15-20 feet at the point where any rock weir would be constructed. Some material is there already and could possibly be used for part of the weir.

Matt noted that Coley, Tim, and Bill had been present on the site visit as well.

Wilson gave a summary of what has been discussed to date (informal discussions on this since 2008). USFWS engineers had been to the site and recommended passage but both engineers have since retired. He read Evan's "do's and don'ts" to the group, which included keeping this discussion quiet until Capital Broadcasting decides they are fully committed, do not touch gates or tail race, make it visually attractive, and put structure on the mill side of the dam so that visitors can see it from the island. Wilson noted that we know American eels are passing the structure because we've seen them upstream in the reservoir but we don't know what percentage are passing. We should also discuss the potential for passing American shad.

Wilson noted that the next step is to bring fishway engineers to the site for conceptual design. He recommended we form a subgroup to identify what species, and how many, we would target for passage, and present that information to the engineers. The subgroup would require the involvement of WRC, DMF, USFWS, and NMFS. Wilson also noted that we need to have some relative abundance sampling procedures in play. Someone noted that we can get American shad relative abundance from spawning surveys (50 shad/acre, the Dick St. Pierre USFWS formula could be used to come up with estimate number for a passage target).

Wilson noted that one possible complicating factor, is if when they begin generating, they would come under FERC jurisdiction. If so, then federal dollars would not be available for fish passage. We had some further discussion about whether they would, or wouldn't.

Tim noted that we also need to keep in mind the issue of flow. We need an assessment of flow regime downstream of the reservoir (is it sufficient for passage?) and if the site does start generating power again, how will that impact flows and passage potential? Tim also noted that Capital Broadcasting said that the dam has structural issues that need to be repaired.

Fred mentioned that if there were no substantial repairs or replacement since 1936, then they wouldn't fall under FERC.

Peter reported that the site's architect said it would cost at least \$1M to repair the dam and rebuild the flood gates. Peter elaborated that the site is currently under contract with Duke Energy to sell back to the grid and they have had to pay a fee to Duke while the generators are not operating. Tim thought that Evan had said that they didn't want to sell power back to the grid. They stated that they couldn't imagine the site without the generators being operational (cultural aspect). Matt thought that they did want to sell to the grid. Others confirmed that a FERC license would require them to sell power back to the grid.

Matt suggested that we try to get clarification on that point.

Casey noted that we need to determine whether they will fall under FERC.

Wilson noted that he can pursue engineering assistance, without knowing whether there will be a FERC-license or not. He said even if the dam comes under FERC, doing a conceptual design would help APNEP action item and FERC Section 18 permit requirements in either situation.

Peter asked some key, troublemaking questions. First is whether they were recently under FERC or not. We explained how they may not be under FERC. Matt replied that his understanding was that they turned the generators on long enough to test them and see if they worked or not. Bill searched online and found no FERC license or expiration date.

Peter's second question was if the dam does fall under FERC then should dam removal (instead of power generation) still be on the table.

Matt noted that fish passage at Rocky Mount Mills will make accessible another 4 miles of upstream habitat (mainstem) and two other tributaries before reaching the Tar River Reservoir.

Roger asked what the purpose of the two reservoirs/dams is.

Matt explained. The City of Rocky Mount's reservoir is for water supply. The Rocky Mount Mills Dam is just a historic structure. Roger asked about other uses upstream and how they may relate.

There are homes upstream as well, so waterfront residents. The dam between the City's and this one is breeched. Matt noted that one could be on a list for removal.

The breeched one is on the list for potential removal. Peter noted that one is entitled the "above Rocky Mount" dam. We looked at it on the list.

Jeremy noted that the Tar River Reservoir is the City of Rocky Mount's dam. It doesn't impound much water. It is not really evident on Google Earth. Roger asked if there is any boat use of the reservoir. Jeremy didn't think that there was much recreational use.

Tim asked Peter if AR had approached the owners of the dam in between. Peter didn't think so, although they may have visited it. They decided that they need to deal with the Rocky Mount Mills Dam first.

The breeched one is also apparently known as the Abernathy Dam.

Fred asked if there are any fish in the Tar River Reservoir that run upstream. Jeremy didn't think so.

We discussed where we are on this one. Wilson suggested that American eel would be the most likely target. Fred revisited Tim's earlier comment about flow requirements. Wilson asked Frank to comment. Frank noted that for Lock and Dam No. 1, flow wasn't an issue. It could be an issue here, if there isn't sufficient flow.

Frank asked how wide the dam is. It is 600 feet. We discussed possibilities in terms of construction of a rock weir. Frank noted that there are a lot of options.

Bill pulled up the file of photos which had been taken during our site visit. We discussed various design considerations for a rock weir. Peter noted that they are planning a concrete pad across the top of the dam, so some construction could be done at the same time. He speculated that they may generate continuously.

Frank noted that where the flow is discharged, would determine where the fish go. The owners likely may want to pass most of the flow through the hydropower facility. If so, then where is the attraction flow on the other side so that fish aren't lost to the hydro flow? Certainly, you can design something, and it could be relatively inexpensive.

We had some further discussion of where the fish go, and at what flows they use which channel. Jeremy indicated that Kirk may have some data which would provide us some insight into where the fish go. Kirk only samples there when flows are high enough to navigate a boat. Jeremy noted that he has recently sampled there with Kirk and there were lots of Gizzard Shad in the tail race.

Coley projected a photo of the system at high flows. It was noted that a lot of sediment is behind the dam. Bill noted that they said they were going to have to do some dredging.

Wilson noted that from his perspective, the site is unique in terms of its educational potential. Bill agreed. Fred asked if they have a timeline for refurbishing the hydropower. Peter thought that all of it was supposed to be done by 2018, which seemed pretty optimistic to him and Wilson. Capital Broadcasting may be taking advantage of a tax credit to refurbish old mills on the historic register.

We looked at the breached dam as well as the Tar River Reservoir upstream.

Peter noted that he had spent a lot of time looking at dams on Google Earth.

Coley summarized the action items: 1) we need to get further clarification from Evan regarding their hydropower plans; 2) Wilson will explore moving ahead with a request for design assistance.

***Assess existing research related to dam removal**

*Frank Yelverton - Cape Fear River Plan - *Added to FHFP Google Drive*

1:45 p.m.: Frank summarized the Cape Fear River Basin Plan prepared by the Cape Fear River Partnership. This was a 2011 NOAA partnership opportunity entirely in one state. The plan is 80 pages and includes 17 action items. He noted that the plan includes a lot of potential measures, including access for migratory fish, protection habitat, improving water quality, repair wetlands, and changing flows from Jordan Reservoir. The Corps is working with TNC for the Sustainable Rivers Project; now have a focus on river management, which could include the Cape Fear. A major emphasis was also on ecotourism. Recently, they are trying to scale the plan down to implementation with USFWS funding. The USFWS will present a draft plan at the annual partnership meeting on May 24th in Fayetteville, focusing on access to spawning grounds, habitat, etc. (low-hanging fruit). Peter, Jeremy, and Mike Wicker (USFWS) are involved.

That is the general gist of what is going on. Frank noted that he could spend a lot more time talking about it, but the short-term issue is a focus on getting it narrowed down to a list of things that can be done.

Frank asked Peter if he wanted to add anything. He did not.

Frank noted that American Shad are passing well at Lock and Dam No. 1. About ninety percent of shad spawning is now below Lock and Dam No. 2. The Corps is looking for funding with partners to see about tweaking Lock and Dam No. 1 to improve passage for striped bass, which is currently low.

Chris specified that the funding came from CRFL and not the MFC. Frank replied that it did and that he must have misspoke earlier.

Coley asked if the Cape Fear River Watch was working on any other initiative, not related to fisheries. They are also working on the design team for fish passage at Locks and Dams No. 2 and 3. They are looking at all the alternatives, including removal. Bladen County got funding from several different sources. The Engineering Firm of Moffat and Nichol got the contract. Luther Aadland is also involved. The timeline is 12-18 months, then all that is needed is funding. The biggest issue related to fish passage, is water supply. There are water supply intakes about each L&D. Number 3 is the biggest issue, since it provides water to the City of Fayetteville, and Fort Bragg. For Lock and Dam No. 1, the cheapest alternative was to put a rock weir on the dam. Frank noted that he is confident they will come up with a good fish passage alternative.

Wilson clarified the difference between the Cape Fear River Watch, and the Cape Fear River Partnership. Frank is the executive director of the CFRW and Dawn York is the director of the Partnership. Wilson noted that there are two different organizations.

Chris noted that Frank has been a great supporter of providing fish passage at the Locks and Dams. Chris noted that the CCA membership really supports the work that Frank has done.

Frank noted that he would like to see Lock and Dams No. 2 and 3 be taken out, if we can deal successfully with the water supply.

Tim asked what the cost was for Lock and Dam No. 1. It was around \$14M. Frank noted that the biggest cost was filling the scour hole below the dam. One of the Corps engineers had recommended filling the hole with junked cars, but Frank wasn't sure he was serious. An additional \$2M was required to shore up the lock walls. There has been

Frank noted that Lock and Dam No. 3 was constructed differently from Lock and Dams Nos. 2 and 3, so it has no scour hole. Lock and Dam No. 2 has a much deeper hole, so would be more expensive. The slope of the rock weir also would need to be a two percent slope, which would mean it is twice the length.

Tim asked if there are any projected costs for Lock and Dam No. 2. Frank stated no, the design must be developed first. Frank noted that one alternative would be to put a rock rapid upstream of the dam, then take the dam out, but that would preclude navigation. The project is authorized by Congress, for navigation, so Congress would have to deauthorize the project. Wilson asked about a bill in the NC Legislature, which transferred the facilities to the state. Frank noted that bill was passed ten years ago, but it has a lot of qualifying provisions. Frank noted that there hasn't been any commercial navigation on the river in 10-15 years or more. Modern-day barges are all too large to fit through the lock chambers.

Wilson Laney - report on DOT guidelines for culvert removal

Wilson shared the November 21, 2016 guidelines provided to him by the USFWS NCDOT liaison, Gary Jordan. Wilson noted that he was unsure what/if any agencies were invited to help with design criteria. Wilson suggested that the team read over the guidelines, then have a discussion at our next meeting regarding whether we believe they adequately address fish passage, and if so, whether it would be worth our while to pursue asking NCDOT to make them policy. The team thought that was a good way to proceed.

Jeremy McCargo - report on Wildlife Action Plan relevant issues and prioritization schedule

Jeremy noted that there is nothing in the WAP which makes recommendations for specific dam removals or passage. However, it does outline species that would benefit from passage by covering aquatic connectivity issues within each basin. He noted that there are a couple of tools coming online this spring, which will be useful to the group to identify priority areas for land purchase and conservation, and to assess potential threats. He noted that we can ask Cindy Carr to come and talk to us about the tools.

*Wilson Laney - share SAFMC council policy on beach dredging - *Added to FHFP Google Drive*

Wilson stated that he was unsure how we discussed beach dredging at the last meeting but he guessed that it could affect fish passage through the surf zone. He noted that the policy is on the Google Drive and is self-explanatory. He explained the SAFMC and the Advisory Panel and what it does. He noted that the policy was developed by the Council's Habitat Protection and Ecosystem Based Management Advisory Panel (Wilson is co-chair of this panel) and updated in March 2015. Wilson noted that the ASMFC also has a Habitat Management Series document on beach fill projects, and the SAFMC has other policies that this team may be interested in such as flows.

Roger noted that the latest issue of Sierra magazine has a great article on the Rogue River in Oregon where three dams were removed and how fast the salmon and habitat quality returned. Peter has worked with Bob Hunter who led efforts in that dam removal project.

***Funding opportunities**

Amin Davis and/or Fred Tarver - Water Resources Development Grant Program

Amin and Fred addresses this topic. Amin noted that NCDWR has Water Resources Development Grants. There is a 50 percent cost-share, in which units of local government throughout the state (counties and municipalities) and some eligible state agencies (e.g., NCWRC, State Parks, and NC Forest Service) can participate. They fund three primary projects: water management (stormwater BMPs, living shorelines), water-based recreation (greenways, fishing docks and piers), and stream restoration (dam and aquatic barrier removal projects). Amin indicated they just reviewed the fall cycle projects yesterday, and are currently in the spring cycle (ends June 30th). They would like to see more projects from the Piedmont and eastern portion of NC, because the western part of the state has dominated for the last year or so. Amin noted that Coley has a list of the projects. He asked if there were any questions.

Roger asked if the 50 percent match must be real dollars, or can it include in-kind services.

Amin indicated that it can be in-kind, and can also include engineering and design work for dam removal projects. State universities are also eligible for applying for this funding.

Coley projected the map of 2016 projects, which were clearly more in the western part of NC.

Amin indicated that anyone needing more information can contact him.

Coley noted that more information is present on the Google Drive.

Simeon asked Amin to talk some more about the two coastal projects.

Amin noted that they funded the wetland treehouse project in Bertie County, which was two elevated camping platforms along the Cashie River. The other one is a living shoreline project for the Town of Swansboro.

Wilson asked how much funding was available in the program, each year. For the last two years, it has been about \$1M each year. Historically it was higher. Fred noted that the legislature has been doing line items in recent years, and the two Locks and Dams are included this year.

Amin noted that larger projects, including line item projects, are dealt with by Darren England (NCDWR).

General discussion and ideas: Team Members

Coley asked for any other ideas from the team.

Peter noted that in looking at culvert policy and guidelines, they (American Rivers) have worked a lot with New England agencies, which he can provide for future discussion (e.g., culvert design/removal...least likely to become barriers to fish passage). Wilson noted that he and Jimmy Johnson had visited some of those projects during one of the ASMFC Habitat Committee meetings.

Wilson asked about getting an update from Fred on the status of Ecological Flows in NC. Coley noted that the Ecological Flows Action Team will be meeting in two weeks, so that report will certainly come back to the this team.

Coley noted that we have two new team members and asked us to review the strategies from the CCMP, which are assigned to this team. She wanted to remind us of these, before we discuss priorities. Coley reviewed them using the webinar screen. She asked for any questions regarding these strategies. She noted that some of the conversations we have had today, were more directed. Some of these topics came from our last meeting. There were no other questions.

Prioritize action items: Team Members

Discussion by the group

Note: CCMP Actions and associated activities (blue/green) are summarized below following the order of the agenda only (i.e., no implied prioritization)

CCMP Action B2.4: Facilitate the development of policies to minimize dredge and fill activities in naturalized areas and sensitive habitats.

Develop a comprehensive map of ditched and drained areas; identify priority areas

Cam asked if we want ones identified by USGS as channel ditch.

Casey noted that these areas have already been separated out for SHA regions.

- 1) Identify areas that we feel were priority for further investigation, or restoration.
- 2) Identify criteria, which would preclude us providing fish passage to any areas with suboptimal habitat quality.

CCMP Action B2.1: Facilitate the development and implementation of an integrated freshwater habitat protection strategy.

CCMP Action B2.5: Facilitate protection of designated anadromous fish spawning areas and inland primary nursery areas from marina impacts.

Map inland freshwater habitat

Combine NWI mapping with existing USGS (working to remap streams) and DWR (using modeling for HW streams) efforts.

CCMP Action B2.1: Facilitate the development and implementation of an integrated freshwater habitat protection strategy.

CCMP Action B2.5: Facilitate protection of designated anadromous fish spawning areas and inland primary nursery areas from marina impacts.

Map anadromous fish spawning areas - suggested by team as high priority

- 1) Update the anadromous maps with any new data.
 - Casey will talk with DMF GIS staff regarding their availability to assist.
 - Including presence/absence information from survey data is easier than CPUE.
 - Are there any WRC data/layers?
- 2) Get the maps put online so they are accessible.
 - *AGOL repository for APNEP GIS maps (Cam suggests tagging layers as "APNEP")

CCMP Action C4.1: Install fish ladders on existing dams and other permanent barriers.

CCMP Action C4.2: Facilitate the removal of dams, culverts, and other in-stream barriers.

CCMP Action C4.4: Facilitate research to improve fish passage.

Create a list of dams that need passage

American Rivers has a comprehensive list of dams (discussed earlier).

- 1) We need to get further clarification from Evan (Rocky Mount Mills) regarding their hydropower plans.
- 2) Wilson will explore moving ahead with a request for design assistance (e.g., cost estimate) regarding fish passage project at Rocky Mount Mills.
- 3) Form a sub-committee to review Rocky Mount Mills issues (send inquiry to group to see who is interested).

4) Team to review culvert guidelines as homework and then develop suggestions for culvert removal at the next meeting (i.e., policy instead of guidance).

CCMP Action C4.3: Restore degraded anadromous fish spawning habitats.

[Assess existing research related to dam removal](#)

Ecological Flows report

- Coley noted that she will bring up the issue of mapping flows for closed shellfish harvest areas with the Ecological Flows team, which will be meeting. This issue can also be discussed with the Decision Support Tools team.
- Fred noted that there is a need for boots on the ground for the long term. Funding need for grad students and research agencies to collect the data we will be mapping. Cam also noted the possibility of leveraging citizen science.

CCMP Actions associated with these activities need to be established through further discussion

[Additional Topics and activities in preparation for next meeting](#)

1) River herring population estimates

- Update next meeting if Roger received SG funding and can discuss then if this group can support any of that work towards population estimates. Roger noted he would appreciate someone writing a letter of support. Casey suggested he contact Holly White (DMF).
- Chris expressed concern about not discussing other species and said the group should be discussing striped bass in the central management district. Wilson said that the USFWS use herring as surrogate species. Chris noted that he would love to have Ben Ricks (WRC) come and talk about this striped bass issue. Coley responded that we are not just considering river herring.

2) Homework review of beach dredging policy and discuss.

3) Review and discuss decision making tools released through Wildlife Action Plan.

4) Add link and information to Google drive on Water Resources Development grant.

Wilson asked Peter if American Rivers have any projects ripe enough for the group to support, endorse, or participate in? Peter replied that the hindrance to dam removal is having to hold the hands of project managers from start to finish. Could APNEP work with AR on dam removal training/workshops in the coastal plain?

Chris alerted the group to a funding opportunity through the CCA. They gave \$100K to Joel Fodrie (UNC-IMS) for oyster research and other stuff. If there is a project directed towards issues important to CCA members (e.g., striped bass issue) then get in touch with Chris. He noted that there could be more money. Coley said that we would share this opportunity with the other action teams as well and suggested that Dean share it with the STAC. Chris noted that the application is simple (i.e., only a few pages or less).

Summarize priorities and provide next steps: Matt Butler

Bill reemphasized that there are specific actions with regards to the implementation of the CCMP and these items discussed today are activities/steps to meet those actions. He would like APNEP staff to send out a survey to the group for prioritization of the CCMP actions themselves. A way to verify that the activities discussed today to do before the next meeting are aligned with CCMP action item priorities. *(NOTE: For clarity, CCMP Actions have been inserted above as headings for the associated activities specifically discussed during the meeting)*

Bill also reminded the group of APNEP's funding and provided an update regarding the EPA national budget situation.

~3:30PM: The meeting was adjourned.