

President Lee Meadows reported that the Clean Clear Water coalition sent an assessment today of approved legislation (an outgrowth of the “rain tax” repeal effort) that requires strict reporting of funding for remediation, with penalties up to \$10k / day if a jurisdiction doesn't meet the EPA requirements. The new law also allows Storm Water Fees to be applied to state & Federal properties (such as Ft Meade and the USNA). Chesapeake Bay Trust funds can be used as matching funds for local fees. This is a Major improvement over the original Storm Water Fee legislation.

Vice President John Wright reported that we planted over 90 trees last Saturday. About 90 volunteers included students, teachers, and SRA members and officers. Midshipmen and the Maryland Terrapin Club helped at Luce Creek. This was our first tree planting, and we hope to double or triple the number of trees next year.

John also announced the following upcoming SRA events: Our 5/21 meeting will be a presentation of Annapolis New Forestry Protection Ordinance Proposal Moderated by Kurt Riegel. The 6/16 meeting will be the Annual Membership Meeting including election of new Directors and a presentation of the State of Severn by Lee Meadows & Andrew Muller. On 6/20 we will have a tour of Belvoir Farms, a Revolutionary War plantation that once belonged to Francis Scott Key’s great-grandfather. The tour will include a State Champion Tree, the old slave quarters, and the garden..

John introduced our **Speaker**, John Seebach of American Rivers. Mr. Seebach is Vice President for River Basin Conservation, overseeing American Rivers’ conservation work in its 10 priority river basins around the country. He has a BA from Davidson College and an MA from the University of Kent. He chairs the Hydropower Reform Coalition and is a Director of the Low Impact Hydropower Institute.

**Overview of Presentation:** Conowingo Dam is neither the source of nor the cure for the water quality problems of the Chesapeake Bay, but Exelon still bears some responsibility for their dam’s impacts on water quality. The dam is the source of an unfortunate error in calculating what we need to do to fix those water quality problems, because it has hidden much of the sediment pollution.

**About American Rivers**

American Rivers is the Nation’s leading organization improving the environmental performance of hydropower dams. For nearly 30 years we have been using federal licensing regulations to improve dams, and we are the nation’s leading experts in dam removal. We have worked on scores of hydropower dam relicensings across the country, trained partner groups, and restored thousands of river miles with improvements to aquatic habitat, flows, fish passage, recreational releases, water quality, and other reasons why people care about rivers, and we founded the Hydropower Reform Coalition.

We try to remove dams that have outlived their usefulness, and try to improve the ones that are still serving a purpose for society. Conowingo falls in this latter category.

**The Susquehanna River** stretches 464 miles from Cooperstown, NY to Havre De Grace, MD. It Drains 27,000 square miles and provides half of the Bay’s freshwater, 41% of its nitrogen, 25% of its phosphorus and 27% of its sediment load. This translates to a net benefit to the Bay, but of course improvements are still needed.

**Exelon’s Conowingo Dam**, built in 1928, has a 14-mile long, 9000 acre reservoir. Conowingo’s license from the federal government just expired in the fall. Since federal licenses last for up to 50 years, this presents a very rare opportunity to address Conowingo dam’s environmental impacts. Removal is not feasible because it provides 574.5 MW of electricity, Drinking water for Baltimore, Cooling water for Peach Bottom nuclear station, Pumped hydro storage upstream, and the River crossing for U.S. Highway 1. Instead, we are focusing on improving (1) Fish passage for shad, eel, and herring, (2) Stream flows for riverine species (including endangered fish and turtles) downstream, and (3) Sediment and water quality downstream



**Conowingo Dam**



As presently operated, the Dam causes levels in the Susquehanna River to drop by up to nine feet in one hour, killing hundreds of thousands of fish, and decreases the available habitat for fish and other species by as much as 95 percent. A free run of the river would actually generate more power, but Exelon uses the dam to provide peaking power, running a full power when demand and utility rates are high, and at low power during periods of low demand (and low rates).

**Federal Oversight**

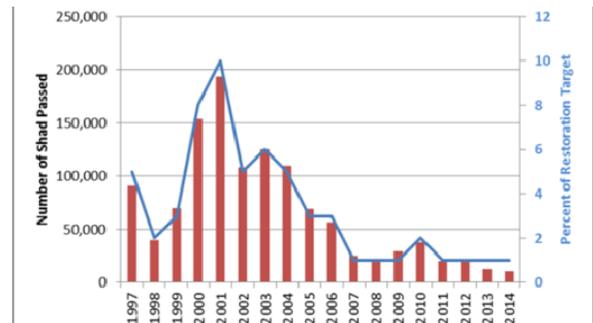
The Federal Energy Regulatory Commission (FERC) issues licenses to build and operate hydroelectric facilities. When your license expires, you keep operating under your old license until FERC issues a new license. FERC sets all of the operating conditions for the dam, and can require measures to protect, mitigate, and enhance other public values like fisheries, water quality, cultural resources, and recreation. FERC bases these conditions in part on recommendations from federal and state agencies, but FERC generally has the final say, except (a) Fisheries agencies (US Fish and Wildlife Service and National Marine Fisheries Service) can prescribe fish passage measures, and (b) State water quality agencies can condition the license to enforce compliance with state water quality standards. These are all called “mandatory conditions,” which means that FERC cannot reject or modify them, and they can be very powerful.

Conowingo's license was last issued in 1980 and expired 8/31/2014. Exelon filed a license application in 2012, and has been operating on an annual temporary license since the old one expired. There is no legal limit on the number of these annual renewals, but they still provide good negotiating leverage for environmental improvements.

**Conservation Priorities:**

Like most dams, Conowingo has two major environmental issues: flow (water releases from the dam) and connectivity (fish passage for shad, eel, and herring).

The **Fish passage** issue is fairly straightforward. A variety of state and federal agencies have developed recovery goals for those species, and Conowingo’s fish passage success rates are falling far short of those goals. The U.S. Fish and Wildlife Service has prescribed improved fish passage for Conowingo. Exelon wants less expensive measures.



The issue of **Flows and Aquatic Habitat** is more complex, and is what makes this this licensing is so interesting. While sediment control is one aspect of this issue, it is not the only consideration. Stream flows for riverine species (including endangered fish and turtles) downstream are a very important impact of hydropower dams.

Fully opening the Dam causes levels in the Susquehanna River to drop by up to nine feet in one hour, killing hundreds of thousands of fish, and decreasing the available habitat for fish and other species by as much as 95 percent.

Exelon manages flows to generate power when it’s most profitable. Changing operations to follow the river’s natural flow would actually generate more power and be substantially better for aquatic habitat. That would also be much less profitable for Exelon. We and others (primarily the Nature Conservancy, which has excellent staff working on all of these issues) have recommended flows that would split the difference. FERC and Exelon have ignored those recommendations.

**Sediment transport and water quality downstream:**

Sediment comes in all shapes and sizes. While fines such as clay and silt are considered a pollutant, coarse or “good” sediment (typically sand and gravel) is needed to restore aquatic habitat. Both are an issue at Conowingo. The river downstream of Conowingo, as with most dams, is starved of “good” sediment. In my view this is a missed opportunity; but FERC doesn’t really seem to want to address it and no other agency has the authority or interest to force them to care.

The big sediment issue at Conowingo is the fine sediments and the organic pollutants like Phosphorous and Nitrogen (commonly known as “nutrient pollution”) that bind to them, for which the EPA has finally established a TMDL or Total Maximum Daily Load for the Bay and its major tributaries such as the Susquehanna.

Most of this nutrient pollution comes from agricultural runoff, stormwater runoff, and inadequate sewage treatment. About 5.2 million tons of sediment – 53,000 railcars worth – flows into the Chesapeake Bay in an average year. Dams trap a lot of it, and Conowingo is one of the biggest dams in the watershed. Sediment is one of the main limits on the usable life of a dam. Over time, when a dam fills with sediment, it loses the ability to store water as designed. Once it’s there, sediment becomes something that has to be managed. And since much of it is polluted fines, the sediment management problem becomes a pollution management problem.

For more than 80 years, Conowingo trapped nearly 2 million tons of sediment each year. There is nearly 200 million tons of sediment built up behind Conowingo. That's 2 million railcars, enough to circle the world twice. Some of that is good (coarse) sediment, but most is bad (fine) sediment. Conowingo has been effectively reducing pollution inflow into the Bay for decades, and our strategy for dealing with the Bay's water quality impacts was built in part on the assumption that it would continue to do so. The Lower Susquehanna River Watershed Assessment, a study of Conowingo's sediment which was just completed by the US Army Corps of Engineers, US Geological Survey, the Maryland DNR and MDE and others, found that the reservoir is fast approaching a state of dynamic equilibrium – most of the silt deposited during normal flows is scoured out at each major storm event. As a result, the present TMDLs are too high. Even if we achieve all of the present planned reductions and there is only one winter scour event (Scenario 3 in Table 4-9) water quality will still be unacceptable in the Chester River and the Middle and Eastern Bay, from the Bay Bridge to the Patuxent River with the reservoir in its present state.



This is optimistic –once the reservoir reaches full dynamic equilibrium, the entire bay and all of its tributaries will often fall short of the stated water quality goals.

Question – why is the red zone so far south of Conowingo? Possibly because fines are the main problem and they go farther than coarse sediment. Not really sure this is the reason, but it makes sense.

The LSRWA also concluded that pollution from upstream, not behind the dam, is the real water quality culprit, and that dredging really only buys a little bit of time at a very high price. Managing sediment via large-scale dredging, bypassing, or operational changes at the dam is expensive relative to the benefits and won't offset the loss of Conowingo's long-term sediment trapping capacity in terms of the impact to the Bay's water quality. For example, dredging would cost \$48 million a year just to keep up with sediment coming into reservoir, and gets more expensive as time goes on.

The LSRWA was intended to “generate and evaluate strategies to manage sediment and associated nutrient load.” It concluded that most of the reservoir sediment management strategies weren't cost effective and that managing nutrients was smarter. But it didn't evaluate upstream sediment and nutrient management alternatives for comparison. Nonetheless, it seems logical that continually cleaning out the trap is more expensive than stopping the crud that is clogging it. Also, the Susquehanna provides half of the Bay's freshwater, but only 41% of its nitrogen, 25% of its phosphorus and 27% of its sediment load, and only 13% of that (according to the report) comes from Conowingo. The other rivers are worse.

We should have seen this coming. The 2000 Science and Technical Advisory Committee: knew that we'd see more nutrient loading and sediment loads, but didn't know how much, and also didn't know the effects of scour. The 2002 Sediment task force recommendations were to reduce sediment from upstream and explore reservoir management options. The LSRWA has now answered those questions and explored those options, so we can no longer use Conowingo as an excuse for inaction. Since we know now that the trapping capacity of the dam is negligible, a 2017 midpoint review will have to account for the lost trapping capacity. The nutrient and sediment loads from PA, MD, and NY will likely need to be reduced further to meet water quality standards. In other words, we're going to have to work harder to clean up the bay.

### **So how does this affect the FERC licensing?**

Conowingo did not cause the bay's water quality problems and it is not going to fix them. But Exelon still has responsibility for the dam's environmental impacts, including its impacts on water quality.

A big part of the logic behind the Bay's pollution diet is making sure that *everyone* pays their fair share. And Exelon does bear some responsibility. Their dam traps sediment and nutrients which get “scoured” out during a storm event. Exelon has responsibility to manage its reservoir to meet water quality standards downstream. Right now they're not, and they're about to get a 50-year license that allows them to keep reaping the benefit of the public waterway without paying their fair share to address the larger problem.

The good news is that by law, FERC can't issue a license for the Conowingo Dam until Maryland certifies that Exelon's operations of that dam will not violate water quality standards. And Maryland can place conditions on that certification that FERC **must** incorporate into Exelon's FERC license. Maryland is in a real position to hold Exelon accountable for its share of the problem. FERC cannot reject or modify any condition that Maryland places on Exelon's license, although Exelon can challenge those conditions in state court and ultimately have them reviewed at the U.S. Supreme Court.

Maryland has broad legal authority, but it has limits and is really untested in a situation like this. Maryland can address the dam's water quality impacts, but they can't force Exelon to manage their dam solely as a pollution control measure. Thus they can probably make Exelon deal with the water quality impacts related to sediment scoured out from behind the dam, but cannot make them deal with the sediment coming downstream. Asking Exelon to completely dredge out the reservoir back to 1996 levels or beyond as a condition of a new license is probably more than the law will allow.

Maryland doesn't yet have enough information to a link scour to water quality, which is why they threatened to deny Exelon's application for a water quality certification (now withdrawn) and asked Exelon to complete a study that will help them to draw this link so that they can develop appropriate conditions for Exelon's certification. Maryland hasn't ruled out dredging, but the Corps study determined that dredging wasn't the best way to deal with the issue. I don't know where Governor Hogan is on this. I know that his staff and DNR and MDE seem to have largely picked up where the previous administration left off. And while I don't agree with all of the Governor's rhetoric, I do think it's important that his administration is focused on the dam, because if we miss this opportunity, we won't get a second one.

### Conclusions

1. Conowingo Dam is not the source of the Bay's water quality problems. Rather, it's the source of an unfortunate error in calculating what we need to do to fix those problems. The TMDL is largely working, but is based in part on an assumption about Conowingo's trapping capacity that we now know to be incorrect. So cleaning up the bay will be a heavier lift than we previously thought. But it's still doable.
2. Conowingo dam won't solve the bay's water quality problems, but Exelon still bears some responsibility for their dam's impacts on water quality. MDE and DNR can impose mandatory operating restrictions to minimize those impacts.

### Questions

Earl Bradley – are there other dams on the Susquehanna further up? Yes, three. Holtwood, Safe Harbor, and York Haven are all more full than Conowingo, but smaller so they have less impact. The state of Pennsylvania gave Exelon a good deal on Muddy Water dam. Governor Hogan agrees they must pay their fair share to clean up the Bay.

Earl Badley – why did fish passage drop and what is to be done about it? US Fish & Wildlife is addressing this issue, and hasn't yet acted. They appear to be favoring requiring results, not prescribing methods. 5 years ago, PPL doubled the size of their turbines upstream, and were required to improved fish passage to get that license. We think a change in management led to the drop in fish passage at Conowingo. Fish passages are not effective because shad can't find them and avoid them because they are restrictive They need to be larger. Eel passage is also a concern. Upstream passage for eels is OK, but they move downstream on the bottom and get caught in turbines. Eels support mussels.

Ken Hatch – where does Conowingo's power go? Mostly to PA, into the Grid.

Gene Milgram opined that a limiting factor is the Nuclear Power plant's need for cooling water. The pump storage to a mountain reservoir is used to provide power when needed. They use more power than they generate, but are valuable to match the load. Unfortunately they negatively impact fish – they are sucked into the pumps.

Lee Meadows – is the Agriculture Department involved? Not yet.

If dam breaks, would the sediment flood down? Would the sediment hold back the water? Both would come down.

Tom Guay - what impact would dredging have? How long would it last? Dredging is not really a solution – its cost is usually underestimated, so if ACE says it's too expensive then we believe them. Dredging would only help reduce Phosphates on the sediment. It would buys some time and protection from storms.

Dick Spencer – The dam was built in 1925, and now stores effluent from upstream dredging for coal and other minerals. The old sediment may contain bad pollutants. True – the Bilodi Dam on the Patapsco River is now being removed and this is a problem.

Lee Meadows – Are microdams changing the future of hydroelectric power? Yes and no. Only 3% of dams include hydroelectric power, though people have recommended adding turbines to some agricultural water discharge dams. Most dams are small, but the 10 largest dams generate almost all the power. Ken Hatch noted that a textile mill in Ellicott City used river water to generate power at night when the plant was closed.

The SRA thanked Mr. Seebach for an excellent presentation. **Meeting was Adjourned** at 8:25 PM.