

Just How “Green” is Hydropower?

April Hall

Program Director, Alabama Rivers Alliance

Before listing hydropower in the green energy column, it’s important to understand the long-term, detrimental impacts that both construction and operation of a hydropower dam can have on our environment.

There are a few known benefits to hydropower. Operations of the dam depend upon water, which is a renewable resource. However, there are more and more competing demands for our water resources.

The power generated at these dams does displace some of the coal-based energy otherwise produced. But in Alabama, hydropower generation accounts for less than ten percent of all the power generated in the state.



*Weiss Dam on the Coosa River
Photo by April Hall*

Dams in general can have numerous negative impacts to our riverine environments.

They greatly alter the flow in the river: minimizing base flows, denying flood events needed for ecological health and support of river structure, and reducing the natural variability of flows that are needed for a healthy river. The construction of dams is often referred to as “taming a river”, but it’s more like putting a river in a cage and restraining its natural, wild behavior.

Another major impact is the alteration of habitat for native species. Many riverine species that live in flowing water often can’t adapt to the deep, still waters of a reservoir. Species that don’t adapt will perish in a lake environment. Dams also fragment populations of fish that live in tributaries, as they cannot navigate the non-flowing water of a reservoir. Without the ability to move from one tributary to another, these populations become genetically isolated and unable to expand the gene pool for sustainability of their populations. The dam itself is a travel boundary, preventing movement of migratory species such as sturgeon, eel, and striped bass.

Other serious impacts from operations of dams include: downstream erosion due to high flows from turbines, release of carbon dioxide and methane from decaying organic material at the bottom of the reservoir, water loss due to evaporation, poor water quality both below the dam and in the reservoir, and sedimentation behind the dam and in the mouths of tributaries. For a fact sheet about impacts from dam, go to www.alabamarivers.org and click on River Resources on the left menu.

Hydropower dams differ from other dams in that the owners can chose to operate the facility to benefit the environment as much as possible. The turbines located at hydropower dams release water to generate power, and the operation of those turbines determines how much water is released into the river below the dam. These releases also affect water quality and erosion rates. Dam operators can also choose to release a continuous flow from the dam, to keep the river below it flowing at all times. In cases where no minimum flows are released, the dam acts like a spigot, with water being turned on and off at the whim of the operator.

Dams have caused much damage here in Alabama. The damming of the Coosa River led to the largest mass extinct event in recent history, destroying about 40 species of mussels and snails that lived in no other place on this planet. There are now only two free-flowing sections of the Coosa River that remain, and many federally protected aquatic species are hanging on for dear life in these river sections as well as portions of Coosa tributaries. On the Tallapoosa River, the massive daily river fluctuations have caused serious impacts to the ecosystem below Harris dam and have led to erosion and loss of property. For an illustration of how hydropower dams impact the environment and how existing dams can be operated to reduce environmental impacts, go to www.dameffects.org.

The Alabama Rivers Alliance has been involved in the relicensing of several dams across Alabama for almost ten years. Relicensing is a process through the Federal Energy Regulatory Commission that allows current hydropower dam operators to renew their existing licenses. This process can take five years or more but gives stakeholders a chance to review the operations of the dam and determine if operations can be improved to benefit the environment.

There are three major relicensing efforts currently underway. Alabama Power has submitted license applications for the dams it operates on the Coosa and Black Warrior Rivers. Alabama Power owns seven dams on the Coosa (Weiss, Neely Henry, Logan Martin, Mitchell, Lay, Jordan, and Bouldin), one on the Black Warrior (Smith) and operates turbines at the Corps of Engineers Bankhead dam on the Black Warrior). There is also a relicensing process just beginning for Alabama Power's Martin dam on the Tallapoosa River. You can find more information about these projects on the Alabama Power relicensing website www.alabamapower.com/hydro/home.asp.

Impacts from other types of dams, including those for water supply, can be just as damaging as those of hydropower dams. While viable sites for new major hydropower dams may be limited, there are numerous attempts around the state to construct large water supply dams. New non-hydropower dams must undergo a separate permitting process through the Corps of Engineers and the applicant must demonstrate a need for the project and detail the potential environmental impacts.

The Rivers Alliance will continue to participate in the relicensing processes and fight for better hydropower operations that will benefit the environment. We will continue to monitor new proposals for water supply dams and ensure that environmental regulations are followed. Your continued support helps us ensure that valuable environmental laws such as the Clean Water Act and the National Environmental Policy Act are upheld for both new and existing dams and that healthy flows are maintained to protect Alabama's water resources.