



By Carolyn Raffensperger

Dam Nation: The End Of An Economic Era?

More than 500 dams have been removed over the last few decades, mostly in the Midwest, restoring rivers to free-flowing condition, and dozens more come out every year. Although there are environment benefits — assuming that environmental liabilities, such as contaminated sediments, are properly handled — most of these removals are for economic reasons and have little opposition. As a result, the trend could spread around the country.

Dams can benefit society, providing irrigation, hydropower, and improved navigation. But they are highly destructive to the riverine environment. They cut off the circulation of fresh water. Fish can't move upstream and nutrients, oxygen, and sediments can't move downstream. In addition, artificial lakes formed by dams can easily become overly rich in nutrients, causing algal blooms and fish die-offs.

However, such environmental harms have little to do with whether dams are built or removed. Rather, the presence or absence of dams has been dictated by transportation and energy law. Environmental conservation related to dams has been a weak subsidiary of the latter, which emerged as a body of law only after the oil shortages of the 1970s.

Regulation of dams to facilitate transportation dates back at least to the Magna Carta, which prohibited the obstruction of navigable rivers. The 1824 case of *Gibbons v. Ogden* grants the U.S. federal government power to regulate navigable waters under the Commerce Clause. The govern-

ment used this authority, particularly in the 1880s and 1890s, to regulate unauthorized physical obstructions such as dams.

Use of rivers for logging added another dimension. By the 1800s the upper Midwest was the logging capital of the United States. Timber was being harvested along rivers such as the Menominee and the Chippewa and then floated on the waterways to mills. Most logging companies used the rivers for power to saw up the logs and then used the streams to ship the finished lumber to market in Chicago.

Dams used to divert rivers to water-powered sawmills damaged the rivers, as did dams placed to deepen the rivers. The rise of the railroad in the late 1800s gave rise to even greater devastation — not to rivers but to the forests that surrounded them. Railroads meant that the timber industry could continue logging through the icebound winter. In addition, hardwoods such as maple and oak, which couldn't float like pine, could now be commercially harvested. By the 1880s the forests of the Midwest were on the verge of collapse.

Enter hydroelectric power, which caused dams to be erected in other regions of the United States. The first central station hydroelectric plant in the world was built at Appleton, Wisconsin, in 1882, just as the Midwest logging industry was at its zenith. 50 years later there were 1,400 hydroelectric generating plants in the United States, most located in the Southeast and Northwest. The Hoovers and Grand Coulees and the Colorado and Columbia get the most attention because of the size of the dams and rivers, and thus the damage, but the environmental harm caused by the hundreds of small dams is far more widespread.

A new hydroelectric boom occurred a century after the first, in response to the energy shortages of the 1970s. President Carter's National Energy Act emphasized conservation and new energy sources. This well-intentioned law created some unfortunate programs. For example, the Public Utilities Regulatory Policy Act, one of five pieces of the NEA package, established a new national policy objective: "The expeditious development of

hydroelectric potential at existing small dams."

Since then, there have been several legal challenges over the conflicting goals of navigation and hydropower, although the conflict has diminished now that the rivers suitable for large-scale federal hydroelectric projects have already been developed. Similarly, since most small rivers that can be exploited for hydroelectric power are already licensed, the role of the Bureau of Reclamation and the Army Corps of Engineers will shift to maintaining existing dams, improving efficiency, and minimizing environmental effects. Most environmental groups have not agitated for removal of the hydroelectric operating dams in the Midwest, but for more environmentally sound management.

Most of the dams that could profitably be built have already been built. What no one foresaw was that dams would start to be taken down. Hundreds of dams have been removed in the United States over the past 30 years, largely through the efforts of environmental groups like American Rivers and the River Alliance of Wisconsin.

Why? Because dams have a relatively short life expectancy — in most cases about 50 years, even for those made of concrete. When dams rupture unexpectedly, they pose obvious downstream hazards. Accordingly, removing dams as a safety measure has turned out to be remarkably easy.

Almost every state has a dam safety program which operates in conjunction with the Army Corps of Engineers under the National Dam Inspection Act. A University of Wisconsin study done some years ago demonstrated that removing a dam cost about \$200,000 but repairing one cost about \$1,000,000. The old dams now being removed are mostly small ones, and electricity supplies have not been significantly affected — a win-win for energy and the environment. We can only hope that when the large dams start to crumble, we will have balanced our energy needs and sources and thus can remove them too with little opposition but much environmental benefit.

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