

Frequently Asked Questions About Dams and Dam Removal on the Fox River

Management decisions about dams on the Fox River (or any river) are affected by an array of biological, chemical, physical, and socioeconomic issues that need to be considered. Typically these issues vary with each dam, so that decisions need to be made on a case-by-case basis. Following are answers to some common questions about dams:

Q Who owns the land that is exposed when the river becomes narrower?

A Understanding of the land ownership varies and there is not a simple or standard answer as to who owns the new property if the “normal” width of the river changes.

Q Will there be development on the newly exposed riverbank?

A There are numerous federal, state, and local regulations that limit development on floodways (the new riverbank area would be designated a floodway or floodplain.) The State of Illinois has very stringent laws regarding construction (ie development) in the floodway. It is unlikely that any residential, commercial, or other inhabited structure could ever be built in the exposed river channel. The State also regulates any recreational facilities built in floodway; namely walking paths, ball fields, pavilions, etc.

Q Will dam removal cause more flooding?

A With the exception of the McHenry dam, which controls flow out of the Chain O’Lakes, dams on the Fox River are run-of-the-river dams that have little effect on the amount of water that flows down the river. So not, dam removal will not *cause* more flooding. Dam removal *could* increase the storage volume of the river as well as create new wetland areas adjacent to the river. This increased storage volume and the wetlands would provide additional buffer to help minimize effects of any future flooding. Any future flooding would be due largely to any new development upstream from the point in question that creates additional impervious surfaces (roofs, pavement, etc.) that allow more runoff.

Q Will dam removal lower the level of water in the river?

A Water trapped upstream of a dam creates an impoundment or pool. The depth, width, and length of an impoundment depend on the height of the dam, the shape of the riverbed, and the amount of water flowing down the river at a given time. If a dam is removed, the depth of water in the impoundment will decrease.

Q Will the river dry up if the dams are removed?

A With the exception of the McHenry dam, which controls flow out of the Chain O’Lakes, dams on the Fox River are run-of-the-river dams that have no effect on the amount of water that flows down the river. Factors that determine the amount of water flowing down the lower Fox River include the amount of water released from the Chain O’Lakes, the amount of water discharged by wastewater treatment plants that discharge to the river (also known as point sources), diffuse surface water runoff from lands and cities adjacent to the river (also known as non-point sources), groundwater, and the amount of water flowing from tributaries (e.g. Nippersink Creek) into the Fox River.

Q What are the costs of the different options of dam repair or full dam removal?

A Illinois has little experience with dam removal, so specific, local data are hard to find. River Alliance of Wisconsin and Trout Unlimited reviewed data from more than 80 dam management projects in Wisconsin and reported that:

Costs varied widely among the projects.

Dam repair costs were often underestimated. They cite two cases where the estimated repair costs were \$197,000 and \$200,000, and the actual costs were \$778,000 and \$350,000, respectively.

Dam removal costs were often overestimated. They cite two cases where the estimated removal costs were \$1.1 million and \$60,000, and the actual costs were \$170,000 and \$30,000, respectively.

Unfortunately, their report does not include a summary of all the costs and it is not clear if the cases they cited were typical or if the costs included time donated from volunteers.

Selecting the dam repair option guarantees that there will be additional maintenance costs in the future. In contrast, dam removal is a one-time cost, but this option can include substantial additional costs associated with riverbank restoration or sediment removal.

There are other costs that should be included in a total cost assessment. For example, dam restoration probably increases opportunities for certain kinds of water sports such as power boats and jet skis, while dam removal probably increases opportunities for sport fishing and non-powered water craft such as kayaks and canoes. Property values could increase or decrease with either option, depending on individual tastes. There are other, hard-to-quantify costs, such as those associated with water quality, taste and odor problems, the capacity of the river to assimilate water from point and non-point sources, and the capacity of the river to assimilate pollutants in the water from point and non-point discharges, all factors which dam removal can improve for a stretch of river.

Q Whether the dam is removed or replaced, who pays for it?

A In general, the owner of the dam is responsible for the safety of the dam, and therefore responsible for management of the dam. Grants are often available for dam removals, but there is not typically funding available for remained or replacement of dams. Therefore, replacement/repair costs would be born by the owner of record. In many cases, the state (IDNR) will provide some funding for dam removals. Many, but not all, of the dams on the Fox River are owned by the Illinois Department of Natural Resources.

Q If the dam is removed, what about odors from exposed sediment?

A Particles move downstream in a river through a series of steps. Particles fall and collect on the bottom until the water velocity gets high enough to resuspend the particles and carry them further downstream. At normal flow conditions the water velocity drops when the river gets deeper and wider; that is why sediment tends to collect in impoundments upstream from dams where the pool is deep, wide and slow-flowing. This sediment, which typically includes substantial organic matter, can stimulate the growth of bacteria that remove most of the oxygen from the water. This lack of oxygen makes the impoundment a hostile environment for fish and other creatures we associate with a healthy river. Bacteria that grow in the sediment in the absence of oxygen produce certain chemicals (volatile acids) that have unpleasant odors. Usually these chemicals are released from the sediment and washed downstream so that small amounts are released to the air over a long distance. (They may, however, contribute to the odors that can be detected downstream of a dam during a warm, summer day.) If those same organic-rich sediments were exposed to the air via a dam removal, some odors would be generated until oxygen permeated the sediment and inhibited the growth of the anaerobic bacteria. In other cases of dam removals within the Fox River watershed, those exposed sediments became quickly vegetated, thus stabilizing and oxygenating the sediment. Whether or not those odors were a nuisance would depend on the temperature, the wind conditions, and the relative sensitivity of anyone exposed.

Q If river water quality has improved so much over the past 30 years, why do we need to do more?

- A** Water quality has improved over the past 30 years due to the passage of the Clean Water Act. It regulated “point source” pollution and required that those entities (manufacturers, sewage treatment plants, etc.) get permits and adhere to certain clean water standards.

Now, the primary sources of pollution to the river are “non-point source,” meaning they do not come from one point. It is stormwater runoff from parking lots and streets, phosphorus rich runoff from fertilized lawns, and agricultural runoff. This is much more difficult to control and will INCREASE as development increases in the Fox River Watershed.

Population projections suggest that parts of the watershed will experience more than a 30% increase in population by 2020. Some of these people will rely on the Fox River for drinking water and nearly all of these people will discharge their treated wastewater to the Fox River. We need a Fox River that can function as a healthy ecosystem AND better assimilate the affects of this additional development.

Q Isn't the real water quality problem the sewage discharge to the river, not dams?

- A** Discharge from wastewater treatment plants to the Fox River is regulated by the Illinois Environmental Protection Agency through a permit program. Over the past 30 years, this program has been largely responsible for significant improvements in water quality in the Fox River. Presently, some people think those regulations are not strict enough, while others think the most serious problems are caused by stormwater runoff. Even if funding were available to address both of these issues over a reasonable time frame, some of the problems associated with dams would linger. For example, dams would still trap sediment, restrict fish passage, lead to higher water temperatures, and interfere with canoes and kayaks.

Citizens should be aware that there is a permit process for any new discharge points. This includes a public comment/review period and information about it can be obtained from the IEPA and local officials.

Q Doesn't the flow of water over the dam improve water quality by adding more oxygen to the water?

- A** Warm, nutrient-rich waters in the impoundment upstream from a dam provide a good environment for algae. These conditions, coupled with a continuous supply of algae from the Chain O'Lakes, often lead to very high concentrations of algae in the Fox River during summer months. Algae use sunlight to produce oxygen through photosynthesis. In fact, they can produce so much that dissolved oxygen concentrations more than two times the expected level have been measured. Much of this excess oxygen leaves the water as it flows over the dam.

In the absence of sunlight, these same high concentrations of algae consume oxygen through respiration. As a result, in the middle of the night the dissolved oxygen concentrations in the impoundments can drop below the established water quality standard. When this water that has very low levels of dissolved oxygen flows over the dam, there is some reaeration and part of the missing oxygen is replenished.

Unfortunately, these kinds of daily cycles in the concentration of dissolved oxygen can be stressful to many aquatic organisms and are NOT characteristic of a healthy river or stream ecosystem.

Q Why is FREP becoming involved with dam removal issues?

A The Fox River Ecosystem Partnership (FREP) is a voluntary, nonprofit organization of stakeholders within the Fox River Watershed. We include individuals, landowners, businesses, municipalities, agencies and organizations. Many of our members are directly involved in issues that affect the health of the watershed: water quality, stormwater management, land use, habitat, agriculture and recreation.

FREP members and associates worked together to create ***the Integrated Management Plan for the Fox River Watershed in Illinois***. This 38-page plan includes 37 recommendations to help fulfill the vision to: “**balance all the uses and demands on our natural resources while preserving and enhancing a healthy environment.**” Implementation of this Plan requires cooperation, coordination and dialogue between all of the stakeholders on the Watershed. Issues are studied by a number of committees.

In regard to dams, the following statement was developed by FREP members after careful review of the issues.

FREP Statement Regarding Dams

It is said that there are enough dams in the U.S. for one to have been built every day since the nation began in 1776. Dams generally were built to store and provide water for mechanical power generation, industrial cooling, hydroelectric power generation, agricultural irrigation, human consumption, and impoundment-based recreation. They also have been used for flood control and maintaining channel depths for barge transportation.

Although beneficial for various uses, dams also have negative impacts that may include increased risk of drowning; degraded aquatic habitat, water quality, and fish communities; blocked fish spawning migrations; and impaired flowing-water recreation (canoeing and kayaking). In many places around the country, dams are being removed or modified rather than repaired or reconstructed in an effort to restore naturally flowing river systems.

The Fox River Ecosystem Partnership (FREP) has identified in its Integrated Management Plan for the Fox River In Illinois (1999) dam removal or modification as an important watershed-based approach to enhance and restore aquatic habitat and fisheries in the Fox River basin. Studies evaluating the effects of dams on various ecological parameters in the Fox River, including water quality, and fish and invertebrate populations, and fisheries habitat suggest that dams are having substantial negative impacts on the ecology of the watershed.

Fox River Ecosystem Partnership is fully aware that many factors need to be considered when addressing any dam removal or modification alternatives. However, from a strict ecological standpoint, we believe that dam removal is the soundest alternative.

The answers to these FAQs were prepared by members of the Fox River Ecosystem Partnership (FREP). They work in fields related to watershed conservation and continuously study these issues. FREP welcomes the suggestion of additional questions that can be researched and added to this collection. To suggest a question, please email info@foxriverecosystem.org

More information about dams and restoration of the Fox River can be found at:

foxriverecosystem.org/dams.htm

foxriverstudygroup.org