

Missouri WATER In High Demand

by John Drew and Karen Rouse

“Water is the scarcest and most important resource in the western United States.”

– Bob Stallman, president of the American Farm Bureau Federation

Stallman captured the Western view on water at a congressional hearing entitled, “Water: Is it the Oil of the 21st Century?” Missouri, in competition for water, finds itself at a strategic crossroads where east meets west.

For several decades the Missouri Department of Natural Resources has been at the heart of the battle over water in the Missouri River. There are 10 states and 28 Indian tribes in the Missouri River basin; the states and tribes are sovereign entities, with competing interests in the water. The state of Missouri, located along its southern reach, is the last to use water from the Missouri River before it enters the Mississippi River at a point not far upstream from St. Louis.

According to the U.S. Geological Survey, Missouri River Basin users already consume an estimated 28 percent of the total water available. As demands for water increase and more projects are developed, the competi-

tion for Missouri River water will intensify. “The Department of Natural Resources is responsible for protecting not only the state’s water quality, but also water quantity,” said Mike Wells, deputy department director and chief of Water Resources. “As demand escalates and the supply diminishes, we need to ensure that future generations have adequate access to the river’s resources.”

In the first half of the 20th century, tremendous floods wreaked havoc on farms and cities along the Missouri River, taking a heavy toll on human lives and personal property. Congress responded by passing the 1944 Flood Control Act whereby five mainstem dams would be constructed to curtail flooding along the Missouri River. Although Fort Peck Dam in Montana was already built by this time, it would be included with the other five dams to form the Missouri River Mainstem Reservoir System. The system is operated by the U.S. Army Corps of Engineers (Corps) and has

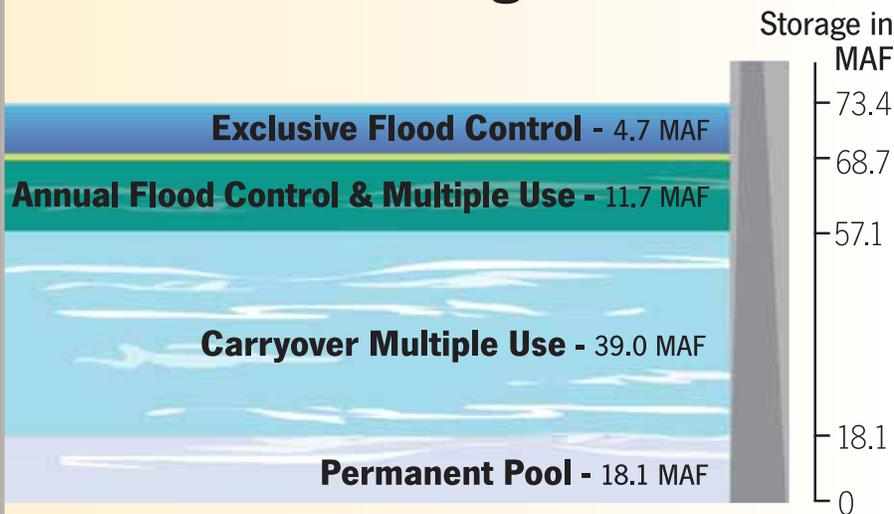
two primary purposes set by Congress: flood control and navigation. Secondary authorized purposes include water supply, power generation, fish and wildlife protection, irrigation and recreation.

The Missouri River reservoirs constitute the largest reservoir system in North America. At the normal water level they store approximately 55 times the amount of water that is stored in the Harry S Truman Reservoir, the largest reservoir in Missouri.

The reservoir system is primarily fed by snowpack from the Rocky Mountains, and snows that fall on the northern Great Plains.

Like a bank account, the reservoirs are used to store water in times of excess to reduce flooding and to release water in times of shortage. In an average year, the water stored in the spring provides ample water for all uses, without drawing water from the reservoirs’ “account.” In high-runoff years like 1995 and 1997, excess water had to be released for much of the year to

Missouri River Main Stem Storage Allocations



MAF = one million acre-feet

Note: 73.4 MAF of water spread out over the entire state of Missouri would be more than seven inches deep.

Source: U.S. Army Corps of Engineers

ally kept empty so that it will be available to store water from extremely high runoff events and major floods. In normal runoff years, the annual flood control and multiple-use pool is filled, then later emptied in an annual cycle that meets all of the river system's purposes. In a prolonged drought, the huge carryover multiple-use pool is tapped to provide water.

Even after the drought in the upper basin, which has lasted six years, the carryover multiple-use pool is still roughly half full. The permanent pool's primary purposes are to provide storage for accumulation of sediment, a minimum level for generation of hydropower, and reservoir recreation. The reservoirs have been designed and operated so that during a repeat of the worst drought on record, the 12-year drought of the 1930s, the water level would not drop as far as the permanent pool. However, if it does, the Corps can release water from this pool. Coordinating releases from a multi-reservoir system is a complex task.

This complexity requires the Corps to operate the system according to a set of rules specified in the Master Water Control Manual, or master manual. One type of rule commonly cited is called a drought conservation measure. The Corps checks the amount of water stored in the system on specific dates to determine how much water will be released. As

The Missouri River system has the largest storage capacity of any in the United States, totaling 73.4 million acre-feet. To put these mammoth reservoirs in perspective, the Missouri River is 552 miles long in Missouri, extending from Atchison County to St. Charles County. In this stretch of river, the floodplain is estimated to be approximately one million acres. The water would have to be 73.4 feet deep in this floodplain to equal the amount of water that could be stored in the system.

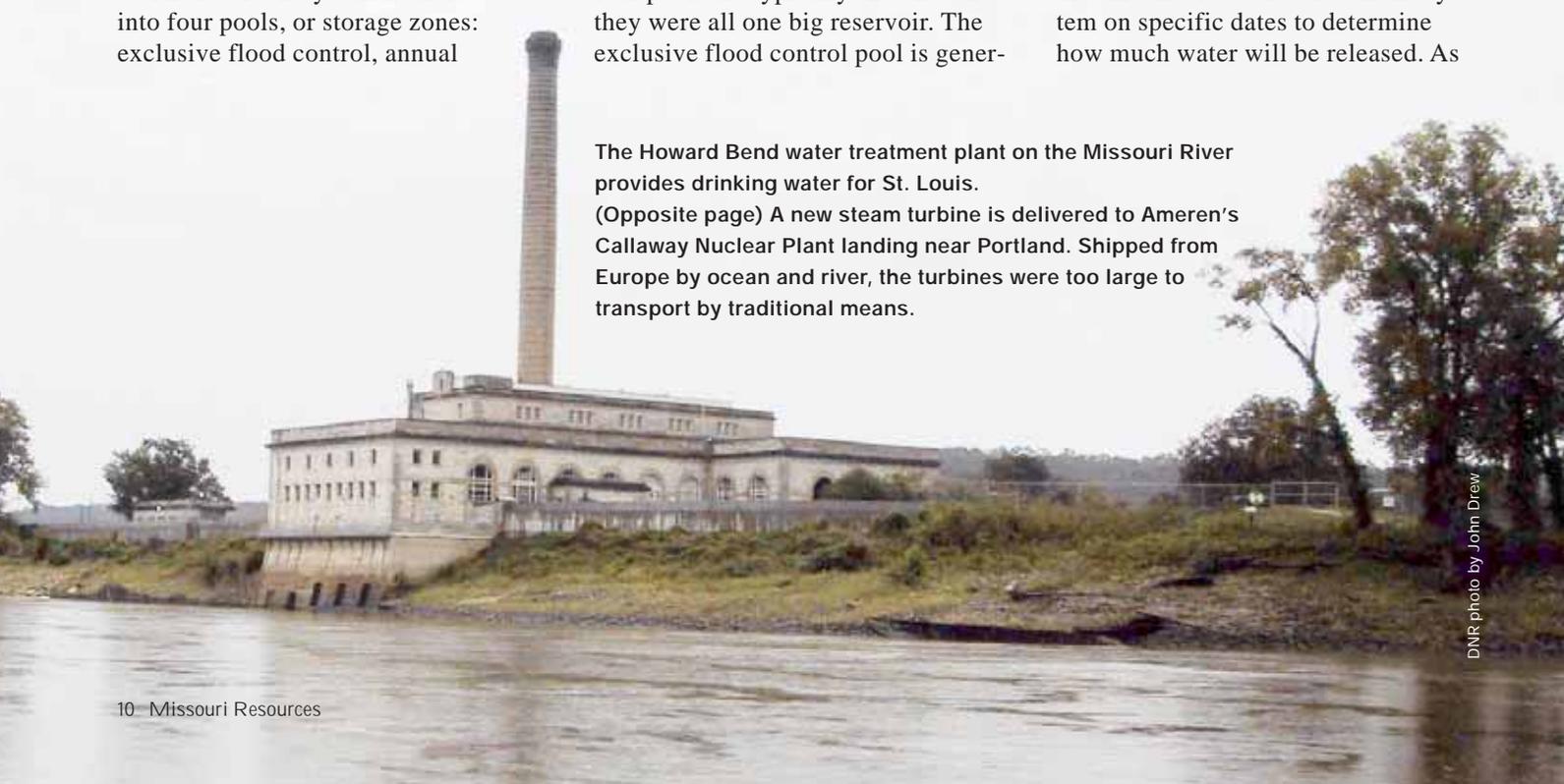
ensure adequate reservoir storage room for the following year's snowmelt runoff. During periods of drought, water is withdrawn from storage.

The reservoir system is divided into four pools, or storage zones: exclusive flood control, annual

flood control and multiple use, carryover multiple use, and permanent. Since the six reservoirs are operated collectively, storage volumes in the four pools are typically shown as if they were all one big reservoir. The exclusive flood control pool is gener-

The Howard Bend water treatment plant on the Missouri River provides drinking water for St. Louis.

(Opposite page) A new steam turbine is delivered to Ameren's Callaway Nuclear Plant landing near Portland. Shipped from Europe by ocean and river, the turbines were too large to transport by traditional means.



DNR photo by John Drew

the volume of stored water decreases, the Corps progressively decreases water released from the system.

The general idea is that as the system storage lowers, less water will be released, thereby conserving more water in the reservoirs. This decrease in releases negatively impacts navigation, water supplies on the river, hydropower generated from the reservoir releases, and other electrical power sources.

The Corps revised the master manual in March 2004, after 15 years of contentious, heated debate among states along the river. The

A Word About Endangered Species

Readers that are familiar with some of the conflicts over management of the Missouri River likely noticed that endangered species were not discussed in this article. While endangered species is an extremely important topic and river flow is part of that debate, it is a different issue than the dispute over water between the states.

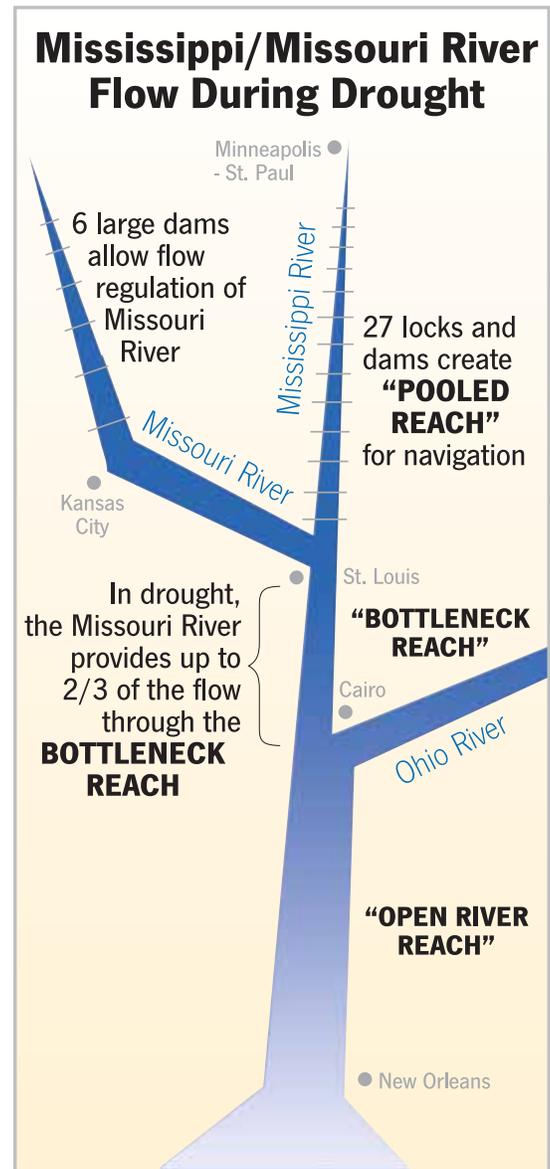
Holding more water in the reservoirs for stocked non-native fish in the Dakotas and Montana, and water diversion projects should not be confused with measures that help the endangered species. The Missouri Department of Natural Resources takes very seriously its responsibility to represent Missouri's best long-term interests, both environmental and economic, and will continue work with parties whose genuine goals include improvement of habitat for endangered species.

master manual revision began because political pressure was applied to the Corps by the upstream states where the reservoirs are located. The upper basin states wanted the rules changed to retain more water in the reservoirs for their use during extended droughts.

According to Wells, upstream states say Missouri is not willing to compromise and support a new plan.

"A compromise means give and take on both sides," Wells said. "The new plans were not a compromise. They all shifted water from Missouri to upstream states. We were unwilling to support a plan that was not in Missouri's best interests," he added.

Although the final plan did not shift as much water to upstream states as they negotiated for; there was enough water shifted to significantly impact downstream use. The new criteria had an immediate effect, as the new manual required that reservoir releases be scaled back faster in order to keep more water in the reservoirs for upstream use.



In 2004, the first year of the new master manual, the navigation season ended 47 days early. This cut 30 days from what would have been allowed under the old master manual. In a year with a record harvest of corn and soybeans, the shorter season prevented Missouri's farmers from moving grain to markets on the Missouri River. In 2005, the navigation season was cut short by 48 days in the fall.

Cutbacks in flow support to Missouri River navigation reverberate all the way to the Mississippi River. Above St. Louis, the Mississippi has a series of locks and dams that help maintain the depth of the water. Waterborne transportation can continue to move even when there are low flows. Problems arise on the stretch of river between St. Louis and the confluence with the Ohio River, known as the "bottleneck reach." Since this reach is free-flowing river, the water transportation industries rely on the Missouri River to supply up to two-thirds of the flow during times of drought.

Low water in this reach can act as a bottleneck, shutting down the entire inland waterway system. Missouri River flow can be the difference be-

tween keeping the Mississippi River open to traffic or shutting it down. The repercussions of these shutdowns not only create a hardship on Missouri's economy, but usually generate a national impact as well.

In addition to hampering commodity movements on the inland waterway system, low water on the Mississippi River impacts the Port of St. Louis, the third-largest inland port in the country.

Missourians benefit from a variety of other uses of their namesake river. Almost one-fourth of the total length of the river flows through our state. The Missouri's floodplain is fertile cropland and habitat for a multitude of fish and wildlife species. The river is a destination for people seeking various forms of pleasure, be it taking in a vista from a bluff top, bicycling in Katy Trail State Park or a number of other recreational pursuits.



Photo by Robert T. Miller

More than one-half of Missouri's citizens get their drinking water from the Missouri River or its alluvium (the underground aquifer that is tied to the Missouri River). Numerous power plants also use the Missouri River as a source of cooling water. Thus, flows lower than those required for navigation can adversely impact both navigation and the state's water and power supplies.

"Water in the Missouri River is essential



DNR map by Karen Rouse and Belinda Hughes

to the operation of our power plants, providing a source of cooling water,” said John C. Pozzo, an environmental safety and health engineer with Ameren. “This summer (2005), it was also essential to a plant upgrade at Callaway (Nuclear Power Plant). Because of their size and weight, the Missouri River was the only way that we could transport the new steam generators to the plant site,” Pozzo added.

Sometimes, litigation has been required to protect Missouri’s interests in water. In 1988, Missouri filed a lawsuit to stop the upstream diversion of water out of the Missouri River basin. In the ETSI Pipeline Project v. State of Missouri, the U.S. Supreme Court stopped the transfer of water from the basin. This project

(Opposite page) Two of Ameren’s steam generators travel up the Mississippi River. (Clockwise from below right) At Chamois, a coal-fired power plant uses water from the Missouri River to help generate electricity.

June 2005 flooding submerged the river road below Katy Trail State Park just upstream from Easley. The trail itself was unaffected.

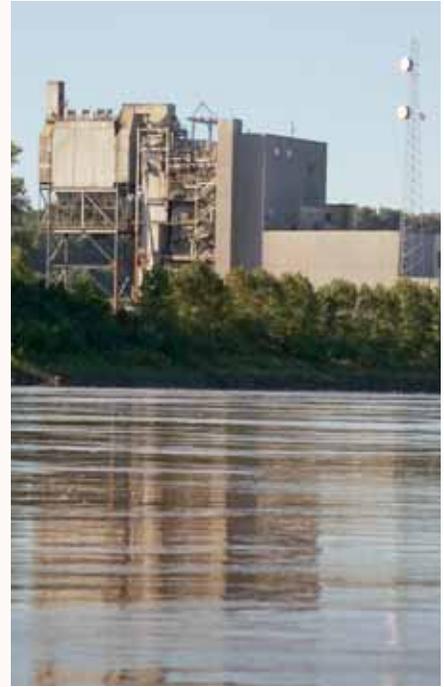
David Miller, of Cortland, N.Y., paddled the entire Missouri River from Three Forks, Mont. to St. Louis. Miller is the author of *The Complete Paddler*, which details the journey and shows others how to do it.



DNR photo by Bryan Hopkins



DNR photo by Scott Myers



DNR photo by Scott Myers

would have piped water westward from South Dakota as part of a coal slurry pipeline.

Due to ongoing drought, several upstream states filed suit in 2002 in an attempt to withhold reservoir releases to protect their economic interests in the Missouri River. Missouri became involved in these lawsuits, seeking to protect the state’s interests. In an August 2005 ruling, the Eighth Circuit Court of Appeals denied the upstream states their motion and reaffirmed flood control and navigation as the dominant functions of the system. The court added that reservoir recreation was not included as a dominant function. It went on to say that any change in the priorities of the system was to be decided by Congress and not through litigation.

An ongoing and well-publicized project that seeks to decrease the amount of water in the Missouri River system is the Garrison Diversion in North Dakota. This project would transfer a substantial amount of water

out of the Missouri River basin to the Red River basin, which flows into Hudson Bay in Canada. Although many of the pieces are in place, North Dakota still faces some hurdles in completing this water diversion.

Many interests compete for water in the Missouri River. Although we have reached many milestones, unresolved issues remain, such as upstream water diversions, tribal water rights, implementation of the new master manual and others.

With Missouri’s magnificent lakes and rivers, it is easy for Missourians to take water for granted. However, water is an extremely valuable resource and key to our state’s prosperity. The Missouri Department of Natural Resources will continue to fight for water in the Missouri River so that future generations of Missourians can depend on it. ☀️

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