North Dakota Use of the Missouri River

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Followers of these Missouri River articles are aware that the mighty Missouri River, the longest in the nation at more than 2,300 river miles, is a natural resource shared by a large part of our country.

Starting as a mere trickle in west-central Montana, it flows through and drains over 529,000 square miles of land in parts of 10 states and two Canadian provinces. All told, the Missouri River system provides drainage on more than one-fourth of all agricultural lands in the United States.

By the time it empties into the Mississippi River near St Louis, Missouri, the "Mighty Missouri" is of formidable size, providing a contribution to that river of an average of more than 60,000 cubic feet of water per second (cfs). It is such a valuable and visible resource that four state capitals are found along its banks: Helena, Mont., Bismarck, N.D., Pierre, S.D. and Jefferson City, Mo.

North Dakota, with most of the drainage into the river from dry lands of the central and west, contributes roughly 10 percent into the system.

In the drought of the 1930s, the Missouri River was the only river system in the Great Plains states that did not go dry. At the height of the drought, the river still flowed past Bismarck at near 17,000 cfs, a flow that guaranteed water for users during this period.

The river enters the state near Williston at an average annual flow rate of approximately 13,000 cfs and enters South Dakota south of Bismarck at an average annual flow rate of nearly 20,000 cfs. That equates to approximately 7,000 cfs of North Dakota water flowing in the river. As a measure of volume, that is approximately 5 million acre-feet of water per year.

A river of that abundance and reliability begs to be recognized and put to a beneficial use. Since statehood, North Dakota has understood that value and created programs, projects and policies for use of the river by our state.

Those who attended the 2021 North Dakota Water Users convention this past December may remember that North Dakota State Engineer John Paczkowski gave a presentation on the state's usage of the Missouri River. His presentation revealed facts that bear repeating and are shown in Figure 1.

Who holds North Dakota usage permits, and who uses that water? Figures 2 and 3 are again from the state engineer's presentation and provide some insight.

Figure 2 shows that most of the permit allocation is for the category entitled "multiple use." Those include permit allocations for the Garrison Diversion Conservancy District, the North Dakota Department of Water Resources (DWR), the Northwest Area Water Supply Project and the Red River Valley Water Supply Project. Those four permits collectively account for more than 84% of all the permitted Missouri River water in the state. Municipal, industrial and irrigation use all follow as other major users of the system.

- There Are **248** Appropriators Using Missouri River Flows In North Dakota
- **3,724,165** Acre-Feet Approved For Annual Consumptive Use
- In 2020, Reported Use Was **124,716** Acre-Feet
- This Means Reported Annual Use Constitutes **3.4%** Of The Total Consumptive Volume Allocated Annually

Figure 1. Missouri River use in North Dakota.
Source: ND Department of Water Resources (DWR)

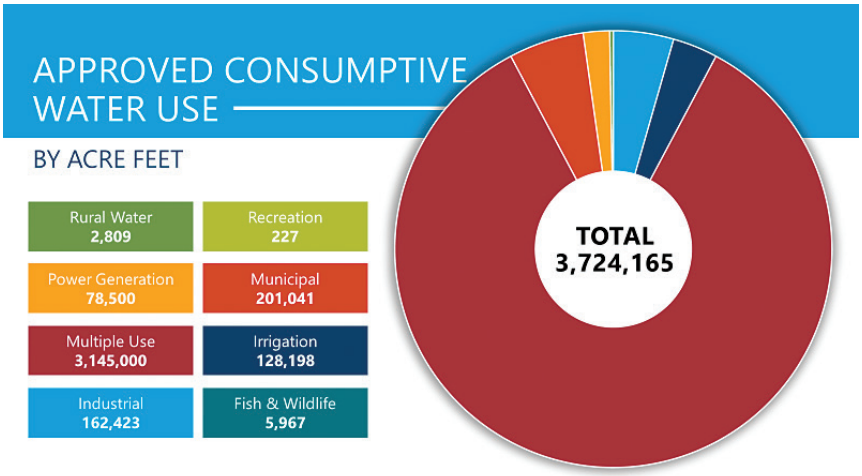

Figure 2. Approved consumptive use of Missouri River water in ND. Source: DWR

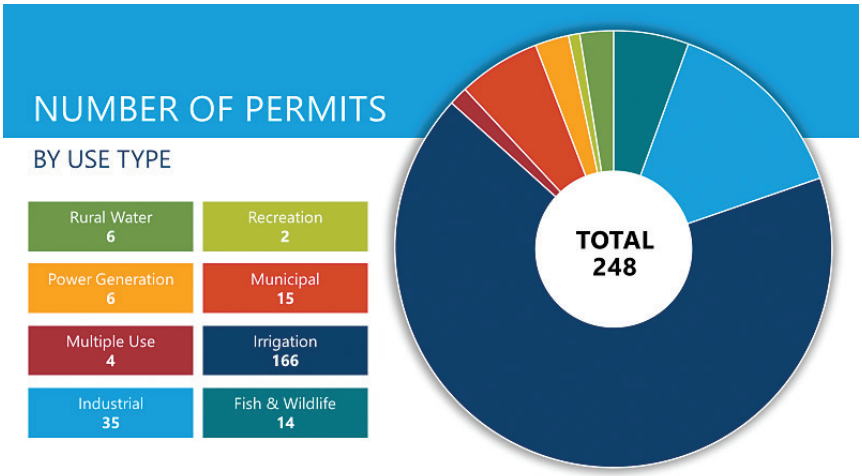

Figure 3. ND Missouri River water use permits by type. Source: DWR

Figure 3 shows that the number of permits is spread in a different fashion than water allocation. Most Missouri River water permits go to irrigation interests, with industrial and municipal users falling far behind. This follows a pattern across the West; large projects demand significant amounts of water, but irrigation holds most permits.

Relative to this discussion of water use from the river, the DWR undertook an analysis this year of who is using the water from the Missouri River (North Dakota and other states) and more importantly, how water is being used in North Dakota. The results are found in Figure 4.

Comparisons and analysis are difficult between the states because each state allocates and accounts for their permitting in slightly different fashions. For example, note the large permitted amount from the state of Montana (132 million acre-feet). No other state approaches that number. That is due mostly to the way Montana tracks allocations for hydropower generation and what it calls "in-stream flow" allocation for the benefit of fish, wildlife and recreation.

To date, North Dakota has used only a small portion of its permitted water allocation, a pattern seen in other states in the system.

North Dakota, using approximately 1.68% of its permitted volume, appears to be the most successful of the up stream states in fully utilizing the water permitted.

Future articles on this issue will further discuss the use of the Missouri River, and as important, the potential uses of the river by North Dakota and other states. The potential impacts of such current, future and potential uses will be a topic for discussion that all users of the river system should be aware of, and which North Dakota will need to recognize to protect its abilities to permit and use the system.

STATE	AVERAGE ANNUAL CONTRIBUTION	TOTAL PERMITTED	TOTAL CONSUMPTIVE USE	% USED vs. INPUT
	Acre ft per year	Acre ft per year	Acre ft per year	
MONTANA	17,600,000	132,000,000		
NORTH DAKOTA	7,000,000		117,570	1.68%
SOUTH DAKOTA	11,300,000	2,200,000	72,007	0.64%
NEBRASKA	21,800,000	4,400,000	74,800	0.34%
IOWA	Included with Nebraska input			
KANSAS	13,400,000	460,587	160,587	1.20%
MISSOURI	Included with Kansas input		466,065	3.48%

Figure 4. Consumptive use of the Missouri River by state. Total permitted and consumptive use data was provided by the DWR.