

## MISSOURI RIVER

### What Is The Missouri R.?

The Missouri River, flowing through central South Dakota, is one of the longest rivers in the United States. This magnificent river, forced into its present course by the face of the Continental glacier (see Figure 2), is formed by the joining of the Gallatin, Madison, and Jefferson rivers, near Three Forks, Montana. The Missouri River flows generally south and east, entering into the Mississippi River near St. Louis, Missouri. The Missouri River basin, including over 95 major tributary rivers and streams, encompasses over 338.5 million acres. The terrain in the basin ranges from the eastern slope of the Rocky Mountains to the fertile soils of the central prairies.

The Missouri River, prior to its modification by man, was known for its shifting channels, high *turbidity*, and periodic floods. This river, commonly referred to as the "Big Muddy," served as a travel-way and thread of life for people and wildlife, alike. The floods that used to occur, often with destructive force, were viewed with awe and dismay by many white settlers. The floods actually served a very important function for the Missouri River valley *ecosystem*. Floods provided an important exchange of nutrients between the flood plain and the river. Additionally, periodic floods replenished backwaters and scoured, as well as built, sand bar habitat critical for many wildlife species.

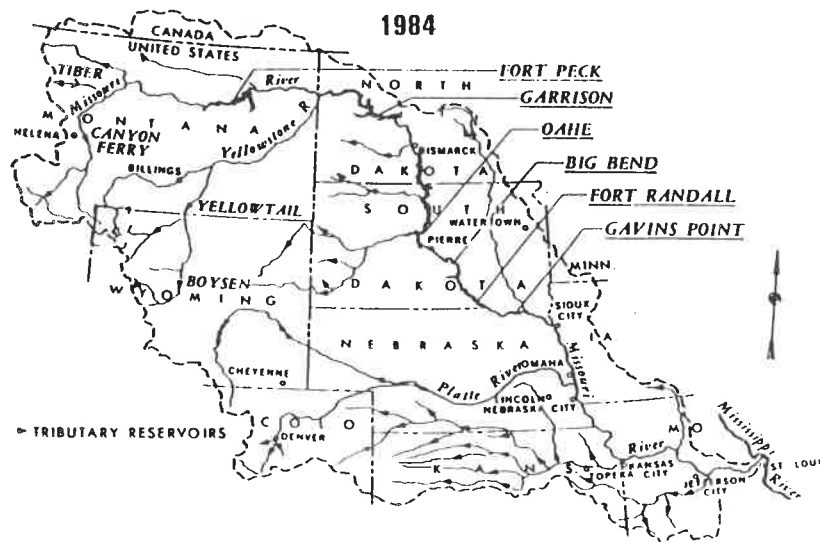


Figure 1: The Missouri River Basin Today

The Missouri River of today, now "tamed," is very different from the river prior to human influence. Today, the river is divided into approximately three equal parts: the lower one-third, below Sioux City, Iowa is *channelized*; one-third is *impounded* by six large dams; and one-third consists of *remnant* "free flowing" stretches of water. Only one percent of the river's entire length remains truly uncontrolled by humans.

In South Dakota, the Missouri River enters the state in the north-central region near Pollock and flows generally south. Near Pickstown, in south-central South Dakota, the river turns southeast, flowing in that direction and forming a common boundary with the state of Nebraska, until it leaves South Dakota at the southeast corner near Jefferson. As it flows through South Dakota, the Missouri River is fed by seven major tributary rivers and streams: the Grand, Moreau, Cheyenne, Bad, White, James, and Big Sioux rivers (See Figure 1).

## Status

In South Dakota, the Missouri is impounded by four large dams (Table 1). Oahe Dam, forming Lake Oahe near Pierre, is one of the largest rolled earthen dams in the world, and was completed in 1958. Big Bend Dam, finished in 1963 and forming Lake Sharpe near Ft. Thompson, was the last of the Missouri River impoundments to be finished. Ft. Randall Dam, impounding Lake Francis

Case near Pickstown, was the first dam completed (1952) on the Missouri River in South Dakota. Gavins Point Dam, finished in 1955, forms Lewis and Clark Lake near Yankton and is the smallest impoundment on the *mainstem* Missouri River. The reservoir system on the Missouri River was designed for multi-purpose use. Hydroelectric power, flood control, navigation, municipal water, irrigation, fish and wildlife habitat, and recreation are all authorized uses of the system.

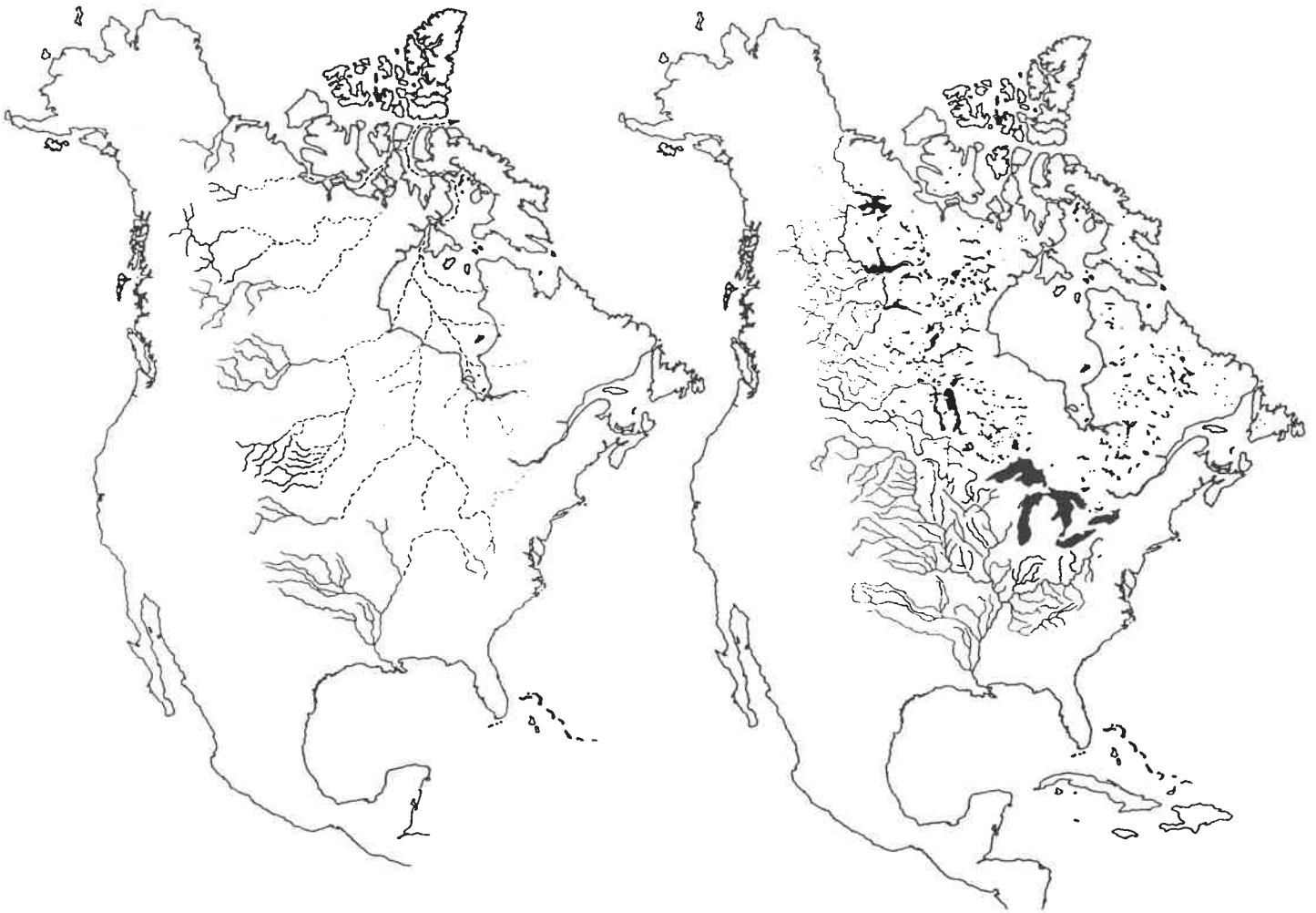
Two semi-natural segments of regulated free-flowing Missouri River remain in South Dakota. A 45-mile stretch below Ft. Randall Dam flows into Lewis and Clark Lake. The second section is a 58 mile stretch below Gavins Point Dam, flowing into the channelized portion of the Missouri River near Sioux City, Iowa. These river sections have received protection under the Wild and Scenic Rivers Act.

## Why is the River Important?

The Missouri River of the past was characterized by six associated habitat types, all extremely important for wildlife. Sand dune habitat is important for big-game animals, *terrestrial* birds, reptiles, and amphibians. Cattail marshes provided habitat for aquatic furbearers, waterfowl and other water and marsh birds. Cottonwood-willow habitat was used by big-game animals and upland game birds. Cottonwood-dogwood habitat was

**Table 1. Missouri River Dams and Reservoirs in South Dakota.**

Reservoir Name	length (miles)	area (acres)	max. depth (feet)
Oahe Dam/ Lake Oahe	231	359,000	231
Big Bend Dam Lake Sharpe	80	63,000	78
Fort Randall Dam Lake Francis Case	107	95,000	140
Gavins Point Dam Lewis & Clark Lake	25	29,000	45



**Figure 2A: Preglacial Drainage of N.Am.**  
Water once drained north to Hudson Bay

**2B: Present Drainage of Central N. Am.**  
Water now drains south to the Gulf.

seasonally important to big game and *terrestrial* birds. The most mature habitat (elm/oak) was also important to a variety of large and small animals and a host of various resident and migratory birds. The river itself formed a sixth habitat type, home to a large variety of fish and other aquatic life. The combination of these habitat types formed a complex that provided feeding, resting and breeding areas for nearly 160 species of wildlife and over 150 species of fish at one time.

While all six habitat types can still be found on portions of the Missouri River and its reservoirs in South Dakota, the quantity of each has been greatly reduced. Most of the extremely fertile, Missouri River bottomland habitats have

been flooded and replaced with a more lake-like environment. Wildlife and fish species that were dependent on the turbid free-flowing Missouri River and its associated habitats have been reduced in numbers and replaced by species that are adapted more to a clear lake-like environment. Fish species in particular have undergone a dramatic change. Thirty-three of the 156 native fish species in the Missouri River basin are now considered either rare, threatened, or endangered. Big river fish species such as sturgeon and paddlefish, once common in the Missouri River, have been greatly reduced in numbers, due to the loss of river habitat. However, species like walleye, white bass, and smallmouth bass, which do well in clearer lake habitat, have flourished in the present reser-

voir environment. Additionally, in large deep reservoirs such as Lake Oahe, habitat has now been formed that can sustain cold water fish species such as rainbow smelt and chinook salmon.

Water based and associated recreation, of which fishing is the major activity, has continued to increase and now exceeds 8 million visitor days annually on the four reservoirs in South Dakota. Boating, swimming, and camping are other common uses of the river and reservoirs.

## Regulations

The Missouri River and tributaries are generally managed/governed by State and Federal regulations. The United

States Army Corps of Engineers (U.S. COE) has general management authority over the river and dams controlling the water of the Missouri River. The wildlife and fisheries resources of the basin are, in most cases, managed by State, Federal and Tribal wildlife and fisheries agencies. Other agencies govern such things as water quality, diversion for irrigation, and construction activity.

In South Dakota, U.S. COE owns most of the lands adjoining the Missouri River. The S.D. Department of Game, Fish and Parks manages most of the fish and wildlife resources of the river and reservoir system, with assistance from the U.S. Fish and Wildlife Service.

## Glossary

**Channelize** - to force the natural meander of a river or stream into straight channel.

**Ecosystem** - a complex of plant and animal communities and their environments functioning as a unit in nature.

**Flood plain** - land along a river formed from soil deposited by floods.

**Impound** - to collect and hold water behind a dam.

**Mainstem** - the main course of a river or stream.

**Remnant** - small part or trace remaining.

**Terrestrial** - living on the land.

**Tributary** - a stream or river flowing into a larger stream or river.

**Turbid** - not clear but clouded with sediment.

## References

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## Resources for Teachers

River Called Missouri (video), 1981. Iowa Public Television, DesMoines, IA. Phone: 515-242-3100.

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