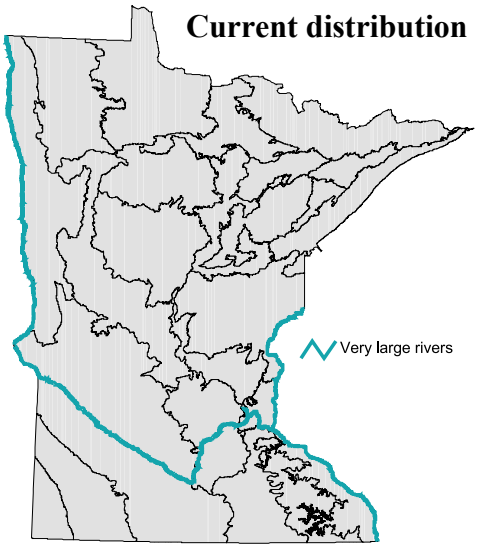
River-Very Large

Ecological Systems	Native Plant Community Types (NPC)	NPC Codes
Not defined	Aquatic systems are not classified in the native plant communities system.	None

MN DNR

Mississippi River – Anoka Sand Plains Subsection



Source: MN DNR 24k Streams 1990

General Description

Very large river systems are a unique river category that includes only the largest rivers in Minnesota. These are the Red River, the Minnesota River, the Lower St. Croix River, and the Mississippi River south of St. Anthony Falls. These river systems share several features that make them unique. They are of the highest orders (stream orders 7–10), meaning they are the terminus for several smaller streams, and can be quite wide and carry large volumes of water. Typically, current velocities in these rivers are slower than in their smaller counterparts, leading to the formation of meanders and oxbows, numerous islands, and significant backwater systems. These rivers periodically experience significant flooding events that maintain these channel characteristics. River portions that widen into large lakes, such as Lake Pepin or Lake St. Croix, are also part of the very large river system.

Very large rivers also share the five characteristics of hydrology, geomorphology, water quality, connectivity, and biology detailed in the Rivers overview section. Very large rivers tend to have a complex geomorphology and hydrology. Water quality issues are common in these rivers as their large watersheds provide many possible pollutant inputs. The usefulness as navigation channels has led to the development of numerous dam structures impacting connectivity. These very large rivers are also the most biologically diverse river systems in Minnesota.

Examples of Important Features for Species in Greatest Conservation Need

The backwater areas of these rivers are a biological "factory," providing important spawning areas for several species of fish, and are important refuge habitat for many other animal species, such as the **eastern massasauga** and **prothonotary warbler**. Connectivity of these rivers is also an important feature and historically influenced the distribution of fish populations and likely other taxa as well. St. Anthony Falls forms a natural barrier between the upper and lower Mississippi River in Minnesota for fish species, such as **yellow bass, pirate perch, pugnose minnow,** and **warmouth,** that occur only downstream of the falls.

Twenty-two of Minnesota's 48 native **freshwater mussel species** historically occurred in these very large river systems. Many of these mussel species are presently restricted to the lower St. Croix River and the Mississippi River below St. Anthony Falls, where water quality, flow regimes, and/or substrates such as boulders or gravel beds are present in sufficient quality and quantity to allow for their persistence.

Many of the important habitat features of these systems, such as connectivity, limited sediment in the substrates, and high water quality, are continually jeopardized by multiple human activities. Construction of dams has restricted movement of species, such as the **skipjack herring,** that otherwise would migrate significant distances. This restriction in motility of host fish has consequently restricted the distribution of freshwater mussels that rely on fish for completion of their life cycles. Dams and hydropower plants have also changed natural water flows, causing sedimentation in some areas and dewatering in others, and preventing seasonal flooding, which maintains the health of backwater areas. Since these rivers are the termini of many smaller-order streams, they can receive heavy amounts of sediments, nutrients, and pollutants from upland activities. This problem is most pronounced in the agricultural areas through which the Minnesota and Red Rivers flow. Many species in greatest conservation need have been extirpated from these two rivers, while relatively stable populations still occur in the St. Croix and Mississippi Rivers.

Management Options to Support Species in Greatest Conservation Need

- Support the removal of dams where appropriate to restore movement corridors.
- Advocate for maintenance of natural flow regimes.
- Provide technical assistance and incentives to support best management practices and the maintenance of native vegetation in riparian areas.