

Locks and Dams on the Mississippi River

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Upper Mississippi River (UMR) Background

The **Army Corps of Engineers** is assigned the responsibility of managing the Mississippi River.

The **River and Harbor Act of 1930** provided for the construction of locks and dams as a way to maintain the creation of a nine foot deep river channel. In 1965, a series of 29 locks and dams was completed.

The UMR system is used for **drinking water, irrigation, manufacturing processes, power generation, recreation, and navigation**. Navigation infrastructure supports the transport of 100 million tons of cargo per year.



Water Resources Development Act

The **Water Resources Development Act** is brought up biennially in the United States Congress. In the WRDA of 1986 Congress recognized the Upper Mississippi River System as a significant ecosystem and commercial navigation system. It authorized the construction of a second lock at locks and dam 26, Mississippi River, Alton, Illinois and Missouri and a recreational projects program. The Dam Safety Act of 1986 redefined the word “dam” and authorized the establishment of a **National Dam Safety Review Board** to review and monitor state implementation. The most recent Water Resources Development Act is that of 2007. After a 12-year, \$70 million study, the Corps of Engineers **recommended increasing** the size of seven locks from 600 feet to 1,200 feet (Locks 20, 21, 22, 24, and 25 on the Upper Mississippi River and at LaGrange Lock and Peoria Lock on the Illinois Waterway). In the project, **over 300 miles of the Illinois Waterway** would be improved, mooring facilities would be constructed at Locks 12, 14, 18, 20, and 24, and LaGrange Lock, switchboats would be provided at Locks 20-25, and an Asian carp barrier would be constructed.



Mississippi River Environmental Pool Plans

This Corps of Engineers project was prepared at the request of the River Resources Forum. The planning area starts at Upper St Anthony Falls in Minneapolis and continues south to Lock and Dam 10 in Iowa. River management to improve navigation has altered river habitat. The locks and dams hold back water, raising water levels for sections of the river during periods of low flow. Changes caused by the dams contribute to the **reduction of productivity and biological diversity** in the Upper Mississippi River through several processes and conditions:

- Erosion of islands, excessive sedimentation of side channels and backwater lakes, reduced flow/current diversity, excessive current scour, wave action, and re-suspension of sediments; loss/reduced sand bar and mudflat habitats, stabilized long term water levels, degraded natural function of tributary streams and deltas, changes in the connectivity of aquatic habitats, loss of isolated wetlands, reduced floodplain forest and terrestrial vegetation diversity, and social issues.

The **Environmental Pool Plans** will reestablish desired habitat structure and function. The locks and dams will be left in place. Goals for the St Paul district’s jurisdiction of the Mississippi River include:

- Improving water quality, reducing erosion, sediment and nutrient impacts; returning of natural floodplain to enable more habitat diversity, emulating seasonal flood pulse and periodic low flow conditions, restoring backwater/main channel, managing sediment transport, deposition, and side channels; managing dredging and channel maintenance, severing pathways for exotic species, and providing opportunities for native fish passage at the dams.

Pool 1, stretching from Lock and Dam 1 (Ford Dam) through the Twin Cities, is the closest to Macalester and St. Thomas and most pertinent to our local habitat.

Rehabilitation of Locks and Dams

Of the 257 locks still in use in the United States, 50% are functionally obsolete, and this figure is expected to increase to 80% by 2020. **Reconstruction is estimated to cost approximately \$125 billion.** Should the investment be made?

Yes, because:

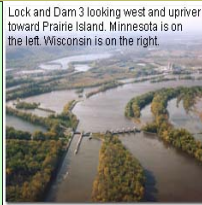
- For many Minnesota corn and soybean growers, the Mississippi River is a vital transportation corridor, providing **cheap, efficient bulk transportation for commodities** over long distances. Use of the waterways decreases traffic congestion on highways, and it is better for the environment.
- Besides commercial navigation, locks and dams can also provide **flood protection, municipal water supply, agricultural irrigation, recreation, regional development, and hydropower**. Reconstruction of the dams could increase the amount of renewable energy available.

No, because:

- Locks and dams **disrupt the chemical, physical, and biological processes of river ecosystems**.
- Fish and wildlife migration is disturbed
- Local communities may be displaced
- It may affect the dissolved oxygen and temperature of the river.**
- It can cause instability of the hillsides which increases **erosion**.
- Construction and maintenance **costs billions of dollars**
- It slows the natural velocity** and sediment that would otherwise flow downstream is trapped.

Recommendations

Policies made at a national level influence what happens on a smaller scale, therefore local governments are to a certain extent dependent on federal and state policies and resources. If the locks and dams rehabilitation plans are put into practice, the US federal government should **amend the Inland Waterways Trust Fund Act of 1978** to allow funds to be collected. Repair should start where needed most, e.g. where the locks and dams are oldest or most used. This would require a **priority list, and cost-benefit analyses**.



Lock and Dam 3 looking west and upriver toward Prairie Island. Minnesota is on the left, Wisconsin is on the right.

- Sources
- <http://www.mvp.usace.army.mil/rff/eppfinal.pdf>
 - <http://www.mvp.usace.army.mil/navigation/default.asp?pageid=1265&subpageid=397>
 - <http://www.mvp.usace.army.mil/navigation/default.asp?pageid=1239>
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