

Why GAO Did This Study

For more than 130 years the U.S. Army Corps of Engineers (Corps) has used dikes to “train” the Mississippi River channel and maintain adequate depth for navigation. The Corps relies heavily on these structures—including some with more recent designs—in the Middle Mississippi, between the confluences of the Missouri and Ohio Rivers. Over the past few decades, some researchers have raised concerns about the structures’ cumulative impacts on the environment and the height of floodwaters. For the Corps’ river training structures in the Middle Mississippi, GAO was asked to examine (1) key requirements and directives that govern their use, (2) how the Corps has addressed key environmental requirements, (3) the extent to which their hydrologic and environmental impacts are monitored, and (4) concerns that researchers have raised about hydrologic and environmental impacts and how the Corps has responded. GAO reviewed relevant laws, regulations, agency documents, and key studies, and interviewed Corps officials and other researchers and experts.

What GAO Recommends

GAO recommends that the Department of Defense direct the Corps to prepare an environmental assessment for river training structures in the Middle Mississippi, obtain required water quality permits for new structures, and conduct physical and/or numerical modeling to assess the cumulative impact of structures on flood heights. The department generally agreed with these recommendations.

MISSISSIPPI RIVER

Actions Are Needed to Help Resolve Environmental and Flooding Concerns about the Use of River Training Structures

What GAO Found

The Corps’ authority to use river training structures in the Mississippi River comes from several Rivers and Harbors Acts, which collectively require the Corps to maintain a 9-foot navigation channel in the river, and several Water Resources Development Acts, which also authorize projects in the Corps’ civil works program. In using these structures, the Corps must comply with federal environmental laws such as the National Environmental Policy Act (NEPA), the Clean Water Act (CWA), and the Fish and Wildlife Coordination Act, as well as applicable state requirements. The Corps also has its own guidance that district offices are to use when planning, designing, and building river training structures.

In using river training structures in the Middle Mississippi, the Corps has addressed some environmental requirements but not all. For example, the Corps has undertaken consultation with other agencies in accordance with the Fish and Wildlife Coordination Act. However, the Corps has not complied with certain requirements of NEPA or CWA. For example, in constructing new river training structures the Corps has continued to rely on an environmental impact statement prepared in 1976. Even though significant changes have occurred in the river and in the Corps’ design of its structures, it has not prepared the additional analyses required by NEPA to assess whether further environmental impact analysis is warranted. Similarly, the Corps has not obtained the appropriate CWA permits or state water quality certifications for river training structures as required.

The Corps routinely assesses some of the hydrologic impacts of its Middle Mississippi training structures but not the environmental impacts. For example, the Corps has performed physical and numerical modeling to assess the hydraulic impacts of proposed structures prior to construction, and it has routinely monitored the hydrologic impacts after construction through data collection and observation of the river’s surface elevation (known as river stage). The Corps has also analyzed the relationship between river stage and the volume and speed of river flow (known as discharge), looking for rising or falling trends that might indicate whether the structures are having a cumulative effect during floods. The Corps, however, does not routinely monitor the environmental impacts of its structures after construction, although it has conducted studies to monitor impacts on certain endangered species, such as the pallid sturgeon, and on fish and wildlife habitats.

Researchers have highlighted two key areas of concern with river training structures—degradation of river habitat and increased flooding. Although the Corps has attempted to address the habitat concerns, the agency and some researchers disagree over flooding concerns. In response to the habitat concerns, the Corps has modified some river training structures to increase flows between them, and has begun installing newer types of structures in select locations to promote aquatic habitat. Regarding flooding, the Corps disagrees with the concern that its structures have led to an increase in river stage during high flow events, and has undertaken various studies that support its position. Nevertheless, significant professional disagreement remains over this issue, which many experts believe could be resolved through additional physical and/or numerical modeling.