Ecohydraulics and its Application to Ecosystem Restoration and Water Resource Infrastructure

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Across the United States, the U.S. Army Corps of Engineers operates and maintains 25,000 miles of navigable river miles, which includes 196 lock and dam sites originally constructed to facilitate commercial shipping on U.S. waterways. The majority of these lock and dams were built during the 1930s -1960s. As commercial shipping declined in the latter half of the 20th century, the frequency of lock operations on many rivers also declined. In many cases, the locks provide the only potential passage route for migratory fishes. Decreased lockages may constrain seasonal migrations and movements of fish reducing aquatic ecosystem connectivity. The USACE and its partners have been exploring how fish use low-use locks and what engineering or operational changes could improve ecosystem connectivity. An emerging workflow combining field telemetry, laboratory assessment, and computational modeling suggests characteristics of locks that promote passage. Given that many locks and dams won't be removed lock passage may be the best immediate option for improving ecosystem connectivity.

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