



Multi-LCC Mississippi River Basin / Gulf Hypoxia Initiative
High Impact Conservation Practices – Fact Sheets

Suite #3 – Upper Floodplain Hydrologic Restoration

Updated 12 February 2016 (draft for review)

WHAT IS HYDROLOGIC RESTORATION?

Hydrologic restoration is the process of reconnecting leveed channels to floodplain backwaters, forming a more natural hydrography that has multiple benefits including habitat rehabilitation. Often this reconnection is achieved by retrofitting the levee systems with gauged culverts. However, there are multiple ways to achieve hydrologic restoration. A second, more passive approach is to allow broken levees to remain unrepaired and connected to the river. An example of this approach is on the Maquoketa River (Iowa) near the confluence with the Upper Mississippi River near Green Island, IA, where an unrepairable levee break has offered an opportunity to study the hydrological, biological, and physical effects of this more natural form of restoration.



WHY HYDROLOGIC RESTORATION?

River-floodplain connectivity is a proven mechanism by which water quality, biodiversity, and flood dampening are enhanced. These ecosystem services are highly desirable but difficult to achieve due to current river management strategies. A side effect of the restoration process is that the more natural water systems are able to transport and process (denitrify) large amounts of nutrients and other contaminants (e.g. nitrate). Studies suggest that NO_3 uptake was significant but uptake length increased linearly with the N-load while uptake velocity decreased. In other words, the more nutrients in the system the longer those nutrients remain in the waterway and the slower those nutrients are processed and removed from the system.

WILDLIFE BENEFITS

Connecting these semi-isolated backwater lakes and streams to leveed channels can help restore habitat by providing better oxygen and water temperatures for over-wintering game fish, as well as critical nursery habitat for large river fish such as paddlefish. In addition, the reconnection of these isolated portions of the floodplain and their subsequent conversion to a more natural hydrologic regime creates the possibility of improved habitat for a variety of waterfowl, shorebirds and other wetland birds, especially those species that require shallow water or mudflat conditions during migration.

INSTALLATION & COSTS

There are many ways to pursue hydrologic restoration, but often there are not any upfront costs associated with re Connectivity (i.e., levee removal). Costs may occur, however, if the decision not to repair publicly-maintained levees results in the inundation of privately owned lands. Compensation of affected private landowners may then be required to retain the floodplain water quality and wildlife habitat benefits that such re Connectivity brings. An example is the USDA's Floodplain Easement Program (FPE), which targets flood damaged lands for permanent conservation easements. However, to allow for levee breaches to be left open, large acreages are often required to be under easement or public ownership, which increases costs substantially.

MONITORING

Joint Ventures for birds? (*TBA*)

LIMITATIONS/CONSIDERATIONS

One consideration is the fact that hydrologic restoration is often not an intentional process. Thus it can be difficult to control and even predict the effects of re Connectivity. Even where the process is intentional, there can be unintentional negative impacts, such as increased sediment loads and deposition into oxbows and backwater wetlands, thereby eliminating important fish and wildlife habitat, and even drainage of off-channel features due to the deepening of the channel through prior channelization and dredging. In addition, as mentioned above, re Connectivity and restoration may be not be feasible in some areas where active agricultural production is occurring due to the inevitable inundation of floodplain lands that is inherent to such restoration efforts. The exception to this challenge is if landowners are willing to participate in easement programs such as USDA's Agricultural Conservation Easement Program (ACEP).

RESEARCH, PROGRAMS, AND MORE INFORMATION

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OPPORTUNITY AREAS

TBA

SOURCES

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