Moving toward Floodplain Restoration at Scale on the Illinois River and Upper Mississippi Basin: Valuing Ecosystem Services, Demonstrating Flood Reduction, and Policy Implications

Webinar for the Natural Floodplain Function Alliance
18 November 2013

Presenters:

K. Douglas Blodgett, Director of River Conservation, The Nature Conservancy in Illinois

Charles E. Theiling, Large River Ecologist, US Army Corps of Engineers Rock Island District
Two floodplain restoration sites of The Nature Conservancy during the Illinois River Flood of 2013

Part of a webinar for the Natural Floodplain Function Alliance
18 November 2013

by
K. Douglas Blodgett
Director of River Conservation
The Nature Conservancy in Illinois
Adapted from a figure by the Illinois Natural History Survey
HAVANA — The three dredges that are working on Thompson Lake are throwing up a new levee in ‘Dan Hole’s Field’...
Adapted from a figure by the Illinois Natural History Survey

Circa 1925
Some benefits of functional floodplain wetlands …

• Provide habitat for native plants and animals (aquatic and terrestrial, resident and migratory)

• Contribute to a more natural hydrology by storing storm water (moderates unnatural water level fluctuations, reduces flooding and associated damages, and provides base flow)

• Facilitate infiltration and groundwater recharge

• Store and process nutrients (e.g., nitrogen, phosphorous) and sediments

• Improve water quality

• Sequester carbon (helps reduce global climate change)

• Provide opportunities for recreation, education, and economic development
Restoration of functional floodplain is essential for restoring ecosystem health.


Emiquon National Wildlife Refuge

The Nature Conservancy
U.S. Fish and Wildlife Service

Key to ownership

The Nature Conservancy
U.S. Fish and Wildlife Service

Havana
More than 250 bird species observed to date with many relatively rare species …

including >90% of the wetland-associated T&E bird species
Public boating/fishing, waterfowl hunting, and education programs
Wetlands internationally important

Emiquon, Dixon among only 34 sites nationwide given designation

CONVENTION ON WETLANDS
CONVENTION SUR LES ZONES HUMIDES
CONVENCION SOBRE LOS HUMEDALES
(Ramsar, Iran, 1971)
1943 Flood of Record
451.5 ft msl

First predicted crest
447.0 ft msl

Max. predicted crest
453.4 ft msl

Actual crest
452.18 ft msl
The record flood of 2013

Water surface elevations of the **Illinois River** @Havana and **Emiquon**

Prior record floods of 1943 & 1985 (451.5ft)

- South Thompson levee overtop begins @451.3ft
- North Coal Creek levee overtop begins @451.0ft
- North Globe levee overtop begins @449.5ft
- New record of 452.18ft @3 PM 25 April
- South Thompson and north Coal Creek levee overtops end

Feet above mean sea level

14-Apr 16-Apr 18-Apr 20-Apr 22-Apr 24-Apr 26-Apr 28-Apr 30-Apr 2-May 4-May 6-May
Approximations (back of envelope by a biologist) for Thompson Drainage and Levee District

6+ days of inflow

Water surface elevation raised 0.87 ft

Water surface area increased 521 acres (14%)

Water volume increased 3500 acre-ft (24%)

= ~25 min. Illinois River flood flow

Potential to store 100,000 acre-ft

= ~12 hrs Illinois River flood flow
The Great Flood of 2013 at Spunky Bottoms
Effect of the Spunky Bottoms levee breach on the Illinois River

Rough approximations (by a biologist):

17 ft head
8 hrs to fill
22,500 acre-ft stored
   = 2 ½ hrs of IR flood flow
IR level dropped 0.3 ft
Effects down- and upriver
An Analysis on Managed Flood Storage Options for Selected Levees along the Lower Illinois River for Enhancing Flood Protection

Report No. 4: Flood Storage Reservoirs and Flooding on the Lower Illinois River

by

Abiola A. Akanbi, Yanqing Lian, and Ta Wei Soong

Prepared for the Office of Water Resources
Illinois Department of Natural Resources

June 1999

Utilizing 17.6% (25,800 acres) of the drainage and levee districts on the lower Illinois River for flood storage could protect 40.7% (59,845 acres) of the drainage districts from overtopping during a 100-year flood event.
## Effects on Illinois River Water Surface Elevation

<table>
<thead>
<tr>
<th>Situation</th>
<th>Spunky Bottoms</th>
<th>Emiquon</th>
<th>Potential</th>
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<tbody>
<tr>
<td>April 2013</td>
<td>April 2013</td>
<td>Potential</td>
<td></td>
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<tr>
<td>Levee failure</td>
<td>Overtopping</td>
<td>?</td>
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<tr>
<td>Duration (days)</td>
<td>0.3</td>
<td>6+</td>
<td>?</td>
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<tr>
<td>Stored (acre-ft)</td>
<td>22,500</td>
<td>3,500</td>
<td>100,000</td>
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<tr>
<td>IL River flow</td>
<td>2 ½</td>
<td>0.4</td>
<td>12</td>
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<tr>
<td>equivalent (hrs)</td>
<td></td>
<td></td>
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<tr>
<td>IR level drop (ft)</td>
<td>0.3 ft</td>
<td>?</td>
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Great Flood of 2013 on the Illinois River
Highest two dozen Illinois River floods at Havana by decade

Mean = 4.3 events/decade

Mean = 1 event/decade
Post-flood investigations
University of Illinois Springfield
Illinois Natural History Survey
The Nature Conservancy
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