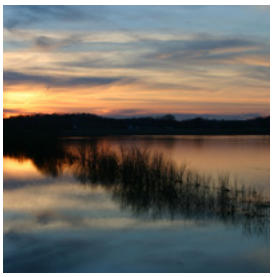
USA: Illinois: Emiquon Wetland Restoration Project



Overview

The Emiquon Wetland Restoration Project is a large-scale project that aims to restore approximately 7,100 acres of land owned by the Nature Conservancy. Once, this land was floodplain on the Illinois River, but in the early 20th Century, the land was drained and turned into farmland. The Nature Conservancy and its partners want to restore to the site into a functional flood plain and also return its ability to sustain native plant, fish, and wildlife species. Once completed, this project could positively impact the water quality in the Illinois River, increase tourism for the area, and restore the biological diversity of the Illinois River. Another purpose of this project is to provide educational and recreational opportunities to visitors of the Emiquon Preserve.

This project is science-based; scientists have been monitoring this site since before restoration began. The first phase of restoration was to stop pumping water off the site, allowing water to fill the land. In 2007, thousands of plants and seeds have been planted to help provide some biodiversity. Non-native fish have been removed and native fish have been introduced into these new waters. Eventually, the waters at Emiquon will be reunited with the Illinois

River, returning the natural flood cycle to the area. Based on the results of these early phases, scientists will produce recommendations for further restoration efforts.

Quick Facts

Project Location:
Emoquin Wetland, Illinois, 40.3241346, -90.09804299999996

Geographic Region:
North America

Country or Territory:
United States of America

Biome:
Freshwater

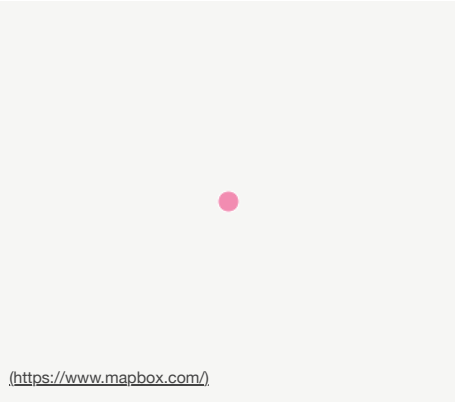
Ecosystem:
Freshwater Ponds & Lakes

Area being restored:
7,100 acres

Project Lead:
The Nature Conservancy

Organization Type:
NGO / Nonprofit Organization

Location



TIMEFRAME

Project Stage:
Implementation

Start Date:
2007-05-23

End Date:
2007-05-23

DEFINING THE PROBLEM

Primary Causes of Degradation

Agriculture & Livestock

Degradation Description

The Illinois River was channelized and dams were erected, to control its flood cycle. The native plants and animals were well-adapted to the seasonal flooding and many species could not persist without it, even without further land-use changes. Additionally, increasing urbanization has brought higher levels of pollution and invasive species to the Illinois River.

The Emiquon area used to be a highly productive wetland. But the land was converted into highly fertile farmland. Levees were erected and the water drained from the area by using pumps and ditches. This caused the loss of many plant and animal species (both commercial non-commercial) from the

PLANNING AND DESIGN

Reference Ecosystem Description

The Illinois River floodplain had a diversity of wetland habitats from shallow lakes to emergent vegetation. Prior to being levied and drained, this area was wet year-round. Seasonal flooding from the Illinois River provided nutrients for a tremendous biological diversity, including dozens of species of native plants, fish, and wildlife. The wetlands provided an important stopping point for migratory waterfowl. These wetlands also provided a natural filter to cleanse the water that flowed into the Illinois River, improving its water quality.

Historical paperwork indicates that the site was once home to many types of trees, such as black walnut, swamp white oak, and northern pecan. The site also contained mussels and commercial fisheries at one time.

Project Goals

Goals as set forth in Reuter et al. 2005.
1. Develop, test, and export successful techniques for restoring and sustaining the natural biological diversity of large floodplain river ecosystem;
2. Incorporate the principles of adaptive management as a necessary component of natural area management.;
3. Demonstrate the benefits of ecological restoration of critical habitats for threatened and endangered species;
4. Evaluate the potential for storing floodwaters and reducing unnatural water level fluctuations;
5. Promote the ecological and cultural importance of the Emiquon area by developing and implementing educational programs;
6. Demonstrate that natural area conservation efforts can be an important component of local and regional economic development strategies; and
7. Provide excellent recreational opportunities.

Monitoring

The project does not have a monitoring plan.

Stakeholders

The Nature Conservancy had purchased 7,100 acres of former wetlands with the intention of restoring the area.

On February 18, 2007, the Nature Conservancy officially partnered with the Natural Resources Conservation Service (NRCS), a division of the U.S. Department of Agriculture (USDA). By enrolling 6,285 of the 7,100 acres in the Wetlands Reserve Program (WRP) for a conservation easement for 30 years, allowing the Nature Conservancy to retire some of its debt. The WRP is a program that offers landowners a subsidy for wetlands they restore based on the agricultural value of the land.

Dickson Mounds Museum, located adjacent Emiquon plans to remodel its first floor to become the visitor center for Emiquon, allowing the Nature Conservancy to focus its funds on restoration.

The University of Illinois at Springfield is constructing a field station on site that will provide both lab and teaching space. Scientists will be able to gather scientific data and monitor the progress of restoration.

The local officials and citizens of Fulton County (which contains most of the land for the Emiquon Project). They will lose the tax revenue from farmland but may gain revenue from tourism.

Illinois Department of Natural Resources

PROJECT ACTIVITIES

Description of Project Activities:
- TNC purchased land and ceased agricultural activity on it. - A groundwater project used observation wells, gauges, and mapping of the water table to assess how deep the water would be and how long the area would remain flooded once the water was no longer pumped from the site. - Baseline studies of soil, plants, wildlife, were conducted. - For three years, scientists have been studying water quality and microbial counts in areas in and around Emiquon. - Then, they stopped pumping water, allowing areas that were once shallow lakes and wetlands to fill up. - A UIS student has conducted a seed bank study using soil from the Illinois River floodplain. - For Emiquon, they used the results found at Spunky Bottoms, a similar site along the Illinois River, to guide their restoration efforts. They knew from that site that the seed bank would supply native plants as soon as the water returned. They also knew that native wildlife would follow the plant life and establish on the site. - During 2007, 1,400 acres of Emiquon will be planted including: 180,000 trees (pecan, burr oak, swamp white oak and sycamore), 8,000 pounds of seed (6 types of grass and 59 forbs), 90,000 upland shrubs and trees. - Established trees will be fortified in a timber stand improvement project. - Non-native aquatic species will be removed and native fish species put into the system - The Emiquon Field Station will conduct scientific research and provide web-based results to the general public, making the science of the Emiquon Project more accessible to both scientists and laypeople - The University of Illinois, Springfield will use the Emiquon Field Station as an educational facility with courses that will involve intense field work at Emiquon. - A visitor center in conjunction with Dixon Mounds Museum is planned to provide educational opportunities to go alongside the recreational activities. - Monitoring of water quality (such as dissolved oxygen, temperature, and pH), plant, and animal life is ongoing throughout the phases of restoration. This monitoring will guide future restoration efforts

PROJECT OUTCOMES

Ecological Outcomes Achieved

Eliminate existing threats to the ecosystem:

- Water has been returned to the site because pumping has been stopped. The site has not yet been reconnected with the Illinois River. Since turning off pumps in April 2007, an estimated 700 acres have been inundated. Eventually the lakebeds may encompass 3,000 or more acres of this land. - The Illinois Department of Natural Resources has eradicated invasive aquatic species (including carp) in early 2007. - Local hatcheries supplied several species of native and sport fish. - By the end of 2007, hundreds of thousands of native seedlings and seeds will have been planted on site. - A bald eagle (Haliaeetus leucocephalus) hatched on site in 2006 - Dozens of Eastern Bluebirds (Sialia sialis) have bred on site due to the installation of nest boxes. - Based on results at nearby Spunky Bottoms, scientists expect native birds, mammal, reptiles, and amphibians to use the site once the wetland is established. - Scientific inquiry will continue based out of the Emiquon Field Station to monitor water quality, microbes, plants, and wildlife. - Research has been conducted on using the growth and reproduction of moist-soil plants as a metric for the level of success in recreating the natural flooding regimes of the Illinois River floodplain.

Factors limiting recovery of the ecosystem:

It will be difficult to restore connectivity from this site to the Illinois River, while excluding pollution and invasive species. Also, many Fulton County residents oppose returning this site into the wetland it once was so any planned restoration activities may be subject to public opposition and regulation from local, state, and federal authorities. The main concerns of the residents are the loss of farmland revenue and the possibility that the wetlands will increase the spread of disease by mosquitoes.

Socio-Economic & Community Outcomes Achieved

Economic vitality and local livelihoods:

This project may have economic benefits for Fulton County which would benefit from increased tourism and increased recreational industry to the area due to the Emiquon Project. This restored site will be a large tract Illinois River floodplain which will function as a storehouse for biological diversity and when finished, will restore ecosystem function. Better management of flood plains can reduce pollution and nutrient levels in oceans which, in turn, reduces the environmental and economic damage of urbanization and agriculture.

KEY LESSONS LEARNED

Key Lessons Learned

This project is still in its beginning phases. Preliminary data show that it has been successful so far.

LONG-TERM MANAGEMENT

Long-Term Management

This project seeks to restore the ecosystem function of part of the Illinois River floodplain. This program will be monitored by scientists using the Emiquon Field Station on site. Scientific research will guide future management and restoration activities.

Baseline soil and water quality were measured and baseline plant and animals surveys were conducted which gives a starting point to which all future measurements can be compared.

FUNDING

Sources and Amounts of Funding

millions USD – Approximately 18 Million used by TNC to purchase land

– $10.7 Million Provided by the USDA to TNC for conservation easements and restoration activities.

– $242,514.25 Illinois Department of Natural Resources (IDNR) Conservation 2000 (C2000) grants to help local communities protect and improve Illinois' environment.

– TNC is also actively seeking funds for restoration and for the addition of visitor resources such as restrooms, parking lots, observation decks, and educational signage.

– Volunteers will be used to plant seeds and seedlings.

– Scientists from the University of Illinois, Springfield will operate out of a field station on site

– YSI, Inc. has donated $20,000 worth of water monitoring equipment to the project

– The Nature Conservancy will continue to solicit donations from the public.

LEARN MORE

Other Resources

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The University of Illinois, Springfield Emiquon Field Station http://www.uis.edu/emiquon/about/index.html

Changwoo Ahn, David C. White, Richard E. Sparks (2004)
Moist-Soil Plants as Ecohydrologic Indicators for Recovering the Flood Pulse in the Illinois River. Restoration Ecology 12 (2), 207 – 213.
http://www.blackwell-synergy.com/links/doi/10.1111%2Fj.1061-2971.2004.00361.x

Leah Barth. 2006. Alterations to Soil Microbial Activity Following 80 Years of Agriculture at Emiquon. ASA-CSSA-SSSA International Meeting 2006
http://crops.confex.com/crops/2006am/techprogram/P27430.HTM

Borges, Ashlyn*,1, Johnson, Keith1, McConnaughay, Kelly1, Paul, Eldor2, Conant, Rich2, Morris, Sherri1, 1 Bradley University, Peoria, IL, USA2 Colorado State University, Fort Collins, CO, USA. 2005. Emiquon: Landscape scale differences in carbon and nitrogen dynamics following 80 years of agriculture. Poster Session 23: Soil Ecology. ESA 2005 Annual Meeting
http://abstracts.co.allenpress.com/pweb/esa2005/document/?ID=51497

Misganaw Demissie, Allen Wehrmann, Yanqing Lian, Geremew G. Amenu, Stephen Burch, and William Bogner. 2005. Hydrologic and Hydraulic Considerations for the Ecological Restoration of the Emiquon along the Illinois River. Conference Proceeding Paper for EWRI 2005: Impacts of Global Climate Change. (doi 10.1061/40792(173)586) http://pubs.asce.org/WWWdisplay.cgi?0522392

Michael R. Jeffords. 2005. Emiquon Corps of Discovery: Providing an Aesthetic Perspective of a Large-scale Wetland Restoration (Illinois). Ecological Restoration 23(3), September 2005 notes. http://ecologicalrestoration.info/233b.asp

Michael Reuter, Ken Lubinski, Paul West, Doug Blodgett, and Mary Khoury. 2005. The Nature Conservancy's approach to conserving and rehabilitating biological diversity in the Upper Mississippi River system. Archiv fuer Hydrobiologie Supplemental 155(1-4): 549-560
http://www.umesc.usgs.gov/documents/publications/2005/reuter_a_nature_conservancy.pdf

Zorica Nedovic-Budic, Raymond G. Kan, Douglas M. Jonston, Richard E. Sparks, and David C. White 2006. CommunityViz-Based Prototype Model for Assessing Development Impacts in a Naturalized Floodplain""EmiquonViz. Journal of Urban Planning and Development 132(4): 201-210.
http://scitation.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=JUPDDM000132000004000201000001&idtype=cvips&gifs=yes

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