USA: Indiana: Maumee River Riparian Zone Restoration, Allen County

Overview

The Maumee River Riparian Zone Restoration is a reforestation effort on 75 acres of farm land with a goal of restoring riparian bottomland habitat. The restoration plan, developed by the state of Indiana Department of Environmental Management (IDEM) and Department of Natural Resources (IDNR), and the U.S. Fish and Wildlife Service (USFWS), provides compensation for natural resource injuries along the Maumee River resulting from hazardous substance releases from the Fort Wayne Reduction Site. The 35-acre Fort Wayne Reduction Site, a former municipal landfill and waste disposal facility located on the Maumee River east of the City of Fort Wayne, Indiana, was placed on the National Priorities List of hazardous waste sites in 1986. A settlement agreement with the responsible parties provided for the restoration of 75 acres of farm land located in the Maumee River floodplain to protect approximately one mile of riparian habitat along the river. The plan called for reforestation of bottomland/riparian habitat with native and naturally-occurring tree and shrub species that are tolerant of wet conditions.
After six growing seasons, the area averaged 83 percent total stem survival and had an average of nine different species present. The property was conveyed to a local parks department that has made improvements in public access and has planted additional tree seedlings on the property. The restored riparian habitat has provided a number of environmental benefits, including wildlife habitat, improved water quality, and streambank stabilization as well as recreational opportunities such as hiking, bird watching, and nature studies.

Quick Facts

Project Location:
Maumee Pathway, Fort Wayne, IN 46805, USA, 41.0796934604308, -85.09923860850711

Geographic Region:
North America

Country or Territory:
United States of America

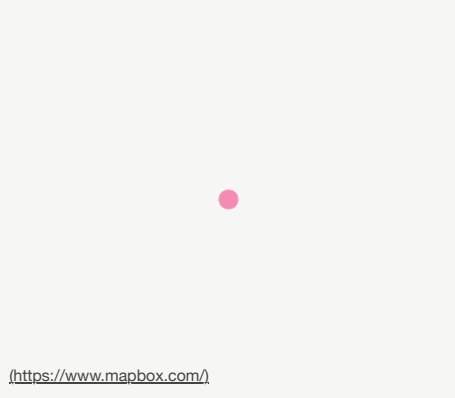
Biome:
Temperate Forest

Ecosystem:
Freshwater Rivers & Streams

Area being restored:
75 Acres

Organization Type:
Governmental Body

Location



TIMEFRAME

Project Stage:
Completed

Start Date:
2000-05-06

End Date:
2006-01-11

DEFINING THE PROBLEM

Primary Causes of Degradation

Agriculture & Livestock

Degradation Description

The land was cleared of native vegetation and has been row-cropped in a corn/soybean rotation for more than 50 years despite frequent damaging floods.

PLANNING AND DESIGN

Reference Ecosystem Description

Prior to clearing of the land for agricultural purposes riparian zones supported a mixture of water-tolerant bottomland hardwood trees and shrubs. These wooded riparian buffer zones protected streams by trapping sediment and pollutants, capturing flood debris, reducing bottomland erosion, improving water quality, enhancing fish and wildlife habitat, improving streambank stability, and helping to reduce streambank erosion. In addition, the riparian forest floor acted like a sponge absorbing both precipitation and runoff. This action helped to reduce flood peaks, recharge the water table, and maintain base flows by storing and slowly releasing excess water. Riparian buffer zones also provided areas for local wildlife to feed and nest.
Restoration of riparian hardwood forests should improve water quality and increase sediment deposition in the riparian zone, seedling survival, occurrence of native tree volunteers, and wildlife use.

Project Goals

The project was designed to provide compensation for natural resources injuries along the Maumee River that occurred due to the Fort Wayne Reduction Site. The restoration goal was to permanently retire farm land located in Maumee River floodplain while restoring structural and functional riparian habitat along the river. Specifically, a target of 50 percent seedling survival after five years, with a minimum of five native species represented in the surviving seedlings was selected. This bottomland/riparian reforestation project fits within the context of other basin restoration efforts outlined in the Maumee River Basin Commission Flood Mitigation Master Plan (CBBEL, 1995 and 2008).

Monitoring

The project does not have a monitoring plan.

Stakeholders

The Maumee River basin has a number of organizations (Maumee River Basin Commission, Indiana Natural Resource Commission, Save Maumee Grassroots Organization) working with citizens, government agencies, businesses and industries to restore the health of the basin's waterways to "fishable and swimmable" conditions. These groups had an interest in the restoration project because it contributed significantly to their ongoing conservation efforts in the watershed.

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the natural resource trustees (IDEM, IDNR, and USFWS) have the responsibility to restore, rehabilitate, replace, or acquire the equivalent of natural resources injured as a result of the hazardous substance release, and to manage injury-related settlement funds. The natural resource trustees developed the restoration plan with input from the general public and entered into a consent decree with SC Holdings Inc. and Participating Generators Group to resolve all natural resources damages claims arising out of or associated with the Fort Wayne Reduction Site.

PROJECT ACTIVITIES

Description of Project Activities:
(1) Research and Planning; Restoration alternatives were evaluated by federal and state resource trustees, experts from industry, and restoration scientists to determine the best options to compensate the public for ecological services impaired or lost by the release of hazardous substances. Restoration plans were reviewed by interested members of the public, and both on-site and off-site restoration options were considered. Decisions guiding restoration implementation and monitoring were developed as a part of a settlement agreement between resource managers and the involved parties. The final restoration plan developed by the natural resource trustees used a habitat equivalency analysis approach, similar to that described by Unsworth and Bishop (1994), and an off-site restoration option was selected. (2) Implementation; This bottomland hardwood reforestation project employed a scheme that resulted in the planting of approximately 25,400 trees, with a density of 540 trees per acre. The trees were planted every 9 feet within the rows and 9 feet between the rows. The planting density provided a seedling diversity that allowed both natural mortality and natural regeneration of hardwoods and encouraged the establishment of a diverse natural bottomland hardwood forest. Native water-tolerant trees and shrubs were used to restore the original habitat. A diverse selection of trees (bur oak, pin oak, swamp white oak, swamp chestnut oak, overcup oak, green ash, sycamore, river birch, shellbark hickory, buttonbush, silky dogwood, and red osier dogwood) were used to allow for micro-changes in topography, soils, and drainage patterns. All trees were obtained from reputable private nurseries or state nurseries located within the same geographic area (not more than 200 miles away) to prevent problems related to geographic adaptability. A minimum of eight species were planted. All nursery material was free of pests and disease. The project was maintained through herbicide applications to control competing weeds and grasses. A pre-emergent herbicide was applied in April 2000, prior to the initial planting and again in May 2002, to provide additional weed control and promote establishment of the tree seedlings and shrubs. The reforested bottomland habitat was to be monitored for a period of five years after completion of the initial planting. Site visits (two per year) were made between May and October. Special effort was taken to visit the site during flood events to document the impact on the project area. The monitoring plan incorporated the following components: 1. Three permanently marked 1-acre transect test plots were established within the reforested areas. Total percent stem and species survival rates were estimated in each. 2. Three permanent photographic stations were set at key vantage points within the reforested areas and provided visual documentation of site development. 3. Wildlife use was noted through informal surveys. 4. An annual report based upon the results for each year's monitoring was provided to the natural resource trustees. (3) Education and Outreach; The property was conveyed to the New Haven-Adams Township Parks Department for inclusion in their natural area/greenways program. There is a small parking area, and an additional 5,200 tree seedlings have been planted. A local Boy Scout troop is in the process of establishing nature trails throughout the area to encourage public access. (4) Results. 75 acres of bottomland have been retired from agricultural production and 47 acres of this bottomland have been planted with native hardwood trees and shrubs. After six growing seasons, the planted area has averaged 83 percent total stem survival and had an average of nine different species present. Volunteer tree species and planted seedlings are beginning to provide additional cover for wildlife, and water quality is benefiting from sediment deposition and nutrient removal from the water column.

PROJECT OUTCOMES

Ecological Outcomes Achieved

Eliminate existing threats to the ecosystem:
The high seedling survival rate and species diversity present in the planted area indicate that the resources and processes are in place to successfully restore the riparian forest ecosystem. Since the cessation of row cropping and the subsequent tree planting activities, the site has been undisturbed and natural vegetation is becoming established. The results of this project have exceeded the short-term goals with regard to seedling survival, acres reforested, and the addition of a wetland restoration.

Factors limiting recovery of the ecosystem:
Despite the occurrence of frequent flooding, seedling survival has exceeded expectations at the restoration site. Early in 2008, late winter flooding followed by extreme cold and ice formation caused damage to individual trees. Most trees successfully generated new growth from stem or roots and there was very little mortality, suggesting resiliency in the restored species.

Socio-Economic & Community Outcomes Achieved

Economic vitality and local livelihoods:
The establishment of a parking area and natural trails has increased access and provided recreational opportunities to the public. This restoration project fits well within the activities of the Maumee River RAP which prescribes watershed actions that will restore aquatic ecosystems and increase

KEY LESSONS LEARNED

Key Lessons Learned

Five years of annual monitoring following initial tree planting demonstrated that seedling survival exceeded project goals, and volunteer seedlings of native species (silver maple, red maple, slippery elm, box elder, white ash, green ash, sycamore and cottonwood) were observed in the monitoring plots. By conveying the property to a local parks department improvements in public access were made and long term management of the area will continue.

LONG-TERM MANAGEMENT

Long-Term Management

A deed restriction (in the form of a conservation easement) was imposed on the entire 75 acres. The deed restriction prohibits any future alteration of the property which would detract from its intended ecological function. The land use restriction does not, however, restrict the construction and maintenance of walking trails, observation platforms, or similar facilities created for public use. The property was conveyed to the New Haven-Adams Township Parks Department and is included in their natural area/greenways program.

FUNDING

Sources and Amounts of Funding

Fort Wayne Reduction Site Natural Resource Damage Assessment and Restoration

LEARN MORE

Other Resources

CBBEL (Christopher B. Burke Engineering, Ltd.). 1995 and 2008. Maumee River Basin Flood Control Master Plan Main Report. Maumee River Basin Commission, Room 640 City-County Building, Fort Wayne, IN. Project No. 93-64. http://ftp2.cbbel-in.com/mrbc/

Natural Concepts, LLP. 2000. Restoration Plan. Natural Resource Damage Assessment Settlement, Fort Wayne Reduction Site, Allen County, Indiana. Report to the SC Holding, Inc. and the Participating Generators Group, Southfield, Michigan. 18p.

Roell, M. J., 1994. Considerations for Recommending Streamside Protection Zones in Missouri. White Paper, Missouri Department of Conservation, Columbia, MO, 18 p.

Unsworth, R.E., and Bishop, R.C., 1994. Assessing Natural Resource Damages Using Environmental Annuities. Ecological Economics, 11 (1): 35-41.

Project Contact:

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Save Maumee Grassroots Organization

Maumee River Basin Commission
http://ftp2.cbbel-in.com/mrbc/about.html

Indiana Wetland Conservation Plan
http://www.in.gov/dnr/fishwild/3350.htm

Natural Resources Conservation Service Wetlands Reserve Program
http://www.nrcs.usda.gov/Programs/WRP/

New Haven-Adams Township Parks Department
http://www.newhavenin.org/department/?fDD=9-0

Joyce Foundation, Maumee River http://www.joycefdn.org/News/NewsDetails.aspx?NewsId=157

Watershed Poster
http://www.utoledo.edu/as/geography/pdfs/maumeewatershedposterr.pdf

EPA Superfund Fact Sheet
http://www.epa.gov/region5superfund/npl/indiana/IND980679542.htm

CONTACTS

Primary Contact

Organizational Contact

(http://ser.org)

(https://www.facebook.com/Society

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