The Nature of Wetland Restoration: The LaGrange Wetland Mitigation Bank Site, Brown County, IL

Thomas C. Brooks
Bureau of Design and Environment
Illinois Department of Transportation
2300 South Dirksen Parkway
Springfield, IL 62764
Email: brookstc@dot.il.gov

ABSTRACT

The 1645-acre bank site at the confluence of the La Moine and Illinois Rivers was acquired by the Illinois Department of Transportation (IDOT) February 2001. The site was acquired to provide wetland compensation for future unavoidable impacts tied to Federal Aid Project 310 (US Rt. 67) in Morgan, Cass, Schuyler and McDonough Counties. Approximately 32 acres of unavoidable wetland impacts will be replaced with 140 acres of compensatory wetlands. The La Grange site will be developed as a wetland mitigation bank. At the bank, wetlands will be restored in advance of permitted impacts. After the wetlands are certified by the Mitigation Bank Review Team, the certified wetlands or credit areas may be drawn from the bank to compensate for unavoidable wetland impacts that may occur within the bank's service area. The bank sponsor or IDOT proposes to restore approximately 490 acres of forested wetlands and 790 acres of emergent/scrub-shrub wetlands. The IDOT proposes to generate approximately 1000 wetland credits at the La Grange wetland mitigation bank site (bank site). After all credit areas are certified, the IDOT will seek to transfer the bank site to another state or federal agency for long-term management.

WETLAND MITIGATION BANK SITE

The La Grange site in Brown County, IL will become a wetland mitigation bank site. Wetlands will be restored, enhanced and preserved at this site to compensate for impacts from construction of highway projects. This work will be accomplished in advance of the actual permitted impacts and this way there is no temporal loss of wetland functions. At the bank site, small impacts from individual projects will be consolidated to form one large contiguous ecosystem. Large ecosystems tend to be more biologically diverse and are easier to manage than small isolated project-specific wetland compensation sites. With mitigation provided up-front, the permitting process with regulatory agencies should be much smoother. And smoother permitting helps ensure that projects make it to the letting on time.

One IDOT project with wetland impacts to be compensated at the bank site is the 61.6 mile upgrade from two to four lanes of US Rt. 67 between Jacksonville and Macomb, IL. Wetland impacts from this project total 32 acres and required compensation totals 140 acres. About 11.02 acres of the impacts from this project will occur at the crossing of the Illinois River near Beardstown, IL. The forested wetlands at this location are dominated by silver maple (Acer saccharinum) and are of low floristic quality. Most impacts from IDOT projects are to wetlands similar to those at the Illinois River near Beardstown, IL.

NO NET LOSS OF WETLANDS

We mitigate impacts to wetlands because of the functions they provide, such as wildlife habitat and floodwater storage. Realizing these important functions, policies and regulations have been passed to protect wetlands. Included in the IDOT's mission statement is the phrase "demonstrate respect for the environment." This means that the IDOT will endeavor to mitigate impacts to our environment, including wetlands. To mitigate is to sequentially avoid, minimize and compensate wetland impacts. Our nation's goal is for no net loss of wetlands. If an acre of wetland is lost, we should replace it. Section 404 of the Clean Water Act, Presidential Executive Order 11990, and the Illinois Interagency Wetland Policy act of 1989 all stress the avoidance, minimization and compensation of wetland impacts.

ON THE FLOODPLAIN OF THE ILLINOIS RIVER

The bank site is located on the floodplain of the La Moine and Illinois Rivers at the northeast corner of Brown County (Figure 1). Most of the site is level with slopes of 0 to 2 percent. It is approximately five miles south of Beardstown or about ten miles north of Meredosia, IL. A township road forms a portion of the west boundary of the site and this road is marked on the Illinois highway map. The site is 1645 acres in size. Currently, the bank site is not open to the public.

Figure 1. Map of the bank site and vicinity.

ESTABLISHING THE BANK SITE

Site Selection and Assessment

Two guidelines are used by the IDOT when selecting wetland compensation or wetland mitigation bank sites. First, restore rather than create wetlands because restorations are met with success more frequently and are easier to do than are wetland creations. Second, when seeking to restore wetlands, select sites with a majority of drained hydric (or poorly drained) soils. Areas of drained hydric soils once supported wetlands, but since they are drained or converted wetland hydrology and hydrophytic vegetation are no longer present (Admiraal et.al. 1997). Drainage tiles, ditches and pumps are used to drain areas of hydric soils. In addition, structures such as

levees modify the natural drainage of hydric soils by eliminating the hydrologic input from flooding. The La Grange site was selected as a potential wetland mitigation bank site because it contains a majority of drained hydric soils. Almost 94 percent of the soils of the site are described as poorly drained (Berning 1980). From air photos, topographic maps and on-site inspections, one can see that the site hydrology has been modified. In 2001, site hydrology was controlled by 5 miles of levees, 9 miles of ditches, and estimated minimum of 15 miles of drain tile, a 36-inch gravity drain pipe with a screw gate, and periodic use of a 12,000 gallon-per-minute diesel-powered pump. The drainage or conversion of wetlands was documented by the Natural Resources Conservation Service (2001) after they certified the wetlands within the bank site. Approximately 846 acres (51 percent) of the site consisted of prior converted wetlands. About 351 acres of the site was considered farmed wetland and the remainder of the site was either upland (47 acres), wetland (282 acres) or open water (119 acres) (Figure 2). With 846 acres of prior converted wetlands, 351 acres of farmed wetlands and reversible hydrologyic modifications, the suitability of the La Grange site for wetland restoration and the potential for generating wetland banking credits is very high.

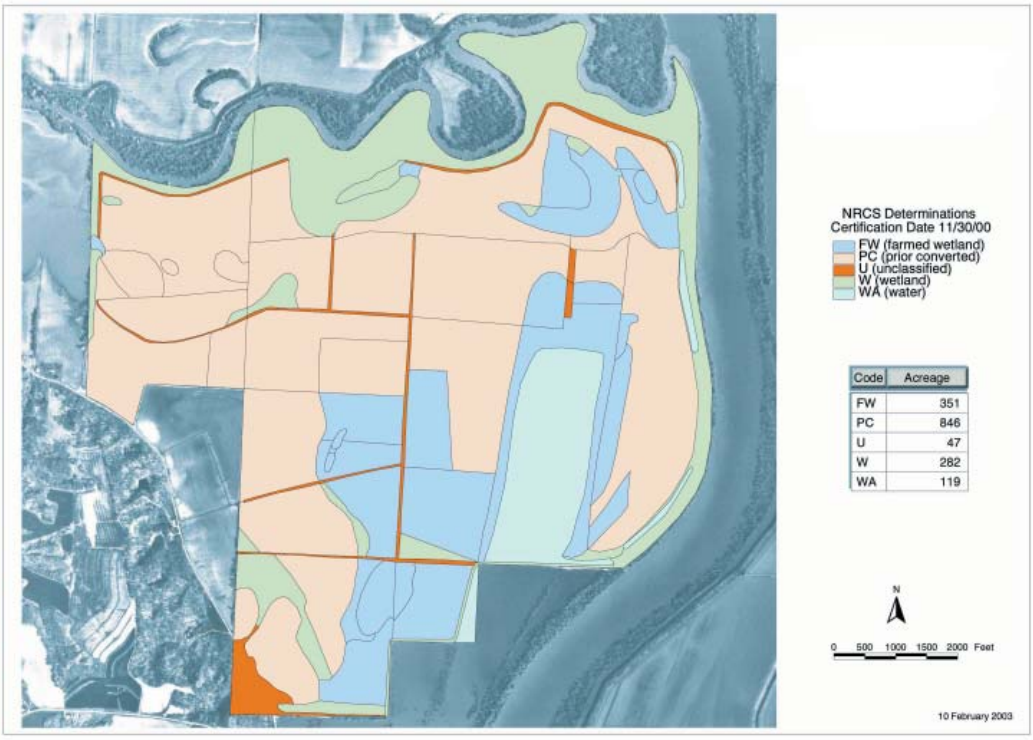

Figure 2. Natural Resources Conservation Service map of wetlands.

Instrument

A wetland mitigation bank site instrument was prepared (IDOT 2004) in accordance with the Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (Federal Register 1995). The instrument documents agency concurrence on the objectives and administration of the bank.

Site Plan

Included in the instrument is a site plan and specifications for restoration of wetlands (Figure 3). Our goal in developing the site plan was to successfully restore wetlands on all prior converted wetlands, enhance farmed wetlands and preserve existing wetlands. In reaching this goal, our objectives were to minimize the use of water control structures and dependence on a high level of vegetation management. This goal is in line with guidance provided by the regulatory and resource agencies charged with protecting wetlands (National Research Council 2001). The plan re-connects the bank site with the Illinois and La Moine Rivers and calls for considerable natural regeneration of the vegetation. If completely successful, approximately 1,024 wetland credits

would be generated at the bank site.
The vision for the bank site is that of a dynamic complex of floodplain communities shaped by natural processes. New landforms such as oxbow lakes may emerge, but certainly the dominant theme is floodplain forest similar to that described by White (1978) for natural wet floodplain forest in Illinois. "Flooding in the community is so frequent or prolonged that the diversity of trees is lowered. The understory and often the overstory are open. Nettles and vines are often prominent. Characteristic plants include silver maple (Acer saccharinum), cottonwood (Populus deltoides), sycamore (Platanus occidentalis), red maple (Acer rubrum), river birch (Betula nigra), black willow (Salix nigra), and box elder (Acer negundo)." Many impacts to wetlands from IDOT projects are to floodplain forest not unlike that described by White.
Approximately 490 acres of forested wetland are planned for restoration. Of that acreage, 346 acres will be planted and 144 acres will revert to forested wetlands through natural regeneration. Approximately 790 acres of mixed marsh and wet shrubland are also planned for restoration and the vegetation of these communities will also revert back through natural processes.
In the forested wetlands, 70 trees will be planted per acre and the following species will be planted: bitternut hickory (Carya cordiformis), pecan (C. illinoensis), swamp white oak (Quercus bicolor), and pin oak (Q. palustris). Trees will be three- to five-gallon containerized size. Areas slated for planting are on the higher ground within the site.

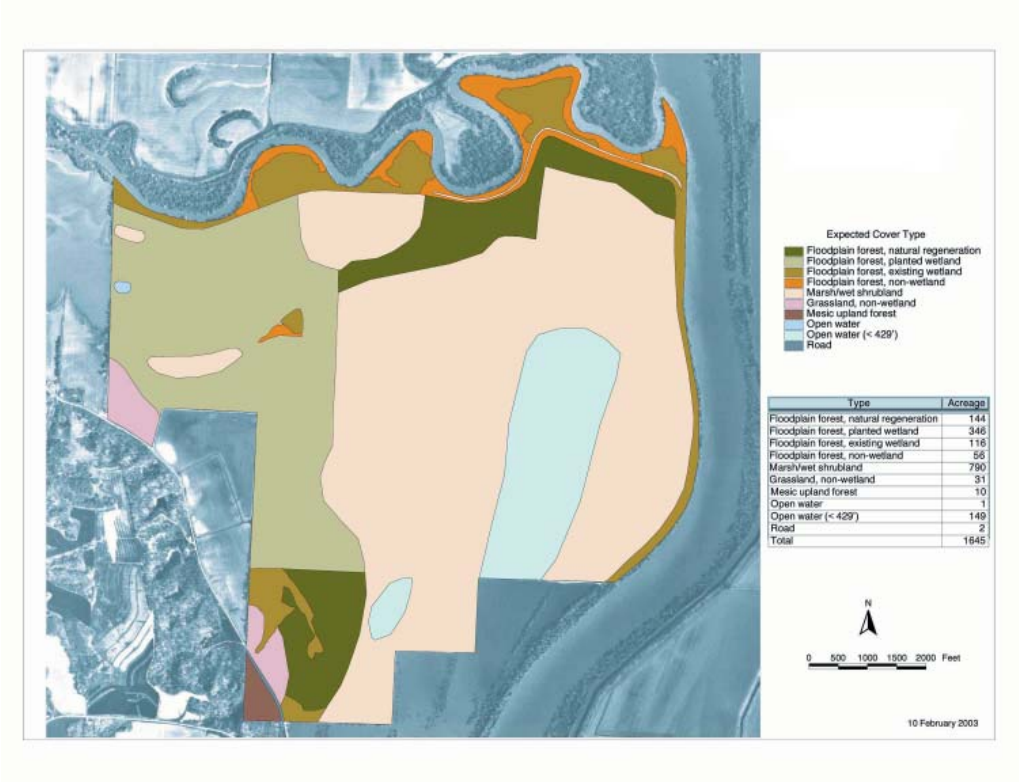

Figure 3. Site plan for establishment of the La Grange wetland mitigation bank site.

Performance Standards

Two performance standards have been established to judge success of the planned wetlands and credit availability at the bank site.
First, each planned wetland area should become a jurisdictional one as defined by current Federal standards. Each area must have hydric soils, wetland hydrology and a predominance hydrophytic vegetation.
Second, each planned wetland should meet standards for planted species survival and floristic composition. At least 80 percent of the planted trees should be established and living five years after planting. At least 90 percent of the plant species present should be non-weedy, native, perennial and annual species. At least 75 percent of the vegetative cover present should be native, perennial and annual species. None of the dominant plant spe-

cies may be non-native or weedy species, such as cattails, sandbar willow, reed canary grass, giant ragweed, or giant reed.

Areas that attain the above performance standards are eligible for certification. Certified areas or credit areas can then be used to compensate for wetland losses within the bank site service area.

Monitoring Plan

The vegetation and hydrology of all planned wetlands or credit areas are monitored in order to determine attainment or non-attainment of the specified performance standards. Ground water is monitored by way of a network of soil-zone monitoring wells scattered throughout the site. Staff gauges and sonic transducers measure surface water elevations of open water. Water levels are measured twice each month during the growing season (mid-April through mid-October) and once every other month during the non-growing season. Stage information on the Illinois River is available on-line and is collected by the Corps of Engineers at the New La Grange lock and dam approximately two river miles south of the bank site.

Vegetation will be monitored or sampled using a system of line transects and quadrats. Transects will be laid out at 160 foot intervals and along each, also at 160-foot intervals, 33-foot square quadrats will be established and within each, planted tree survivorship will be quantitatively sampled. In the marsh-wet shrublands, two 20-foot square quadrats will be established at each 160-foot point along the transect and within each the percentage cover of native and non-native species will be determined.

Contingency Plan

Monitoring results will point to the need to remedy or correct non-attainment of performance standards or to put into action a contingency plan. Given the plan to open the site to the Illinois and La Moine Rivers and allow for a large area of natural regeneration, it is difficult to predict with a high degree of confidence what hydrology and vegetation will return to the bank site. If, for example, reed canary grass (Phalaris arundinacea) becomes invasive, vegetation control such are prescribed burns may have to be used in order to meet performance standards. Or, if flooding is too frequent or too deep, the site plan may have to be modified: water control structures may have to be used to control on-site flooding.

Implementation

For purposes of implementing the site plan, the 1645-acre bank site is divided into 15 fields—following the same divisions used by the United States Department of Agriculture-Farm Service Agency. The work is broken down into 9 phases to be implemented over a span of 14 years. In each work phase, work items such as tree planting, post-construction monitoring or request for certification of credits are specified in the instrument. The phased approach to implementation was chosen because it allows for modification of the plan to fit actual site conditions, if need be.

May 2002, the site was re-connected to the La Moine and Illinois Rivers. That month, the five-mile levee system that protected the site from flooding was breeched at two locations and since then the site has been open to flooding from both rivers.

Two contracts have been prepared by the IDOT and were let April 29, 2005 (contract no. 72939) and June 17, 2005 (contract no. 72967). The former was awarded on August 18, 2005. The first contract includes earthwork to re-establish wetlands, deactivation of field tile and drainage ditches, and construction of 2-miles of embankment for a proposed access road through the site. The second contract includes tree planting on 47 acres (fields 4 and 7) of the bank site.

Service Area

The service area of the bank site includes the following drainage basins: Illinois River Central, Mackinaw River, Sangamon River, Illinois River Lower, La Moine River, and Spoon River (Figure 4). The basins and their boundaries come from the Implementation Procedures for the Interagency Wetlands Policy Act (17 ILL. Adm. Code Part 1090). Unavoidable wetland losses from IDOT projects within the service area are eligible for compensation at the bank site.

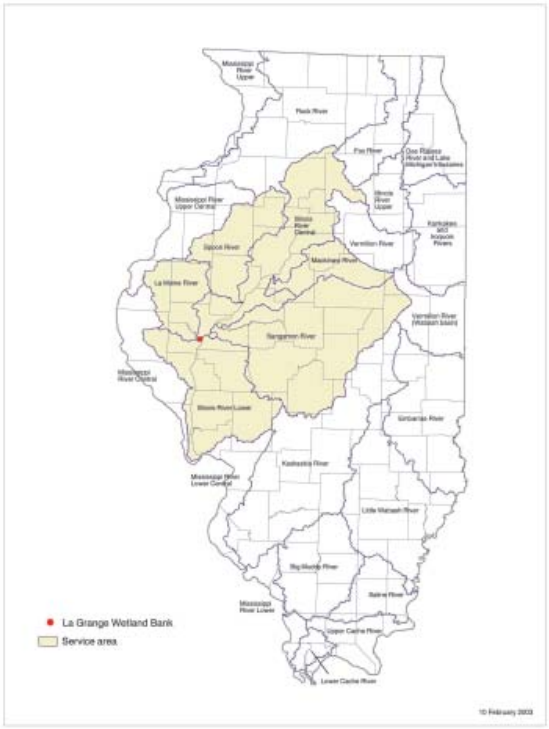

Figure 4. Map of the bank site service area.

BANK SITE PLAYERS

The U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service (USFWS), U.S. Corps of Engineers (Rock Island (Chair) and St. Louis districts) and the Illinois Department of Natural Resources (IDNR) are represented on the La Grange wetland Mitigation Bank Review Team (MBRT). Each agency on the MBRT is signatory to the instrument and oversees establishment, use and operation of the bank site.
The wetland banking instrument and site plan were crafted by specialists at the Illinois Natural History Survey Wetlands Group, Illinois State Geological Survey (ISGS) Wetlands Geology Section and the IDOT Bureau of Design and Environment. The final document was prepared by the ISGS. The last player involved in establishment of the bank site has not yet been identified and this entity will be responsible for long-term management after all credit areas are certified or used. Very likely, it will be either the IDNR or the USFWS.

AN EXEMPLARY ECOSYSTEM INITIATIVE

Last year, the La Grange wetland mitigation bank site was one of seven Exemplary Ecosystem Initiatives identified by the Federal Highway Administration (FHWA). Seven criteria were used to evaluate each ecosystem ini-

tiative. Following their evaluation, this is what the FHWA (2004) had to say, “The IDOT’s restoration work and commitment to long-term management will benefit all or part of 39 Illinois counties. What’s more, the site’s prime location at the confluence of the Illinois and LaMoine Rivers will enable IDOT to enhance its involvement in ongoing efforts to restore the Illinois River system--efforts involving IDOT, The Nature Conservancy, Wetlands Initiative, U.S. Fish & Wildlife Service, and numerous private individuals and clubs.”

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