

FACT SHEET

WAUBONSIE CREEK WATERSHED ILLINOIS RIVER ECOSYSTEM RESTORATION

MARCH 2002

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Waubonsie Creek Watershed Illinois River Ecosystem Restoration

1. STUDY AUTHORITY. This site-specific evaluation is being conducted as a component of the Illinois River Ecosystem Restoration Study, which is a General Investigation study authorized by Section 216 of the Flood Control Act of 1970 with supplemental authority from Section 519 (Illinois River Basin Restoration) of the Water Resources Development Act of 2000. The study was initiated pursuant to the provision of funds in the Energy and Water Development Appropriations Act, 1998. The Feasibility Study was initiated in October 2000, with completion scheduled for December 2003.

2. STUDY PURPOSE. As stated in the Illinois River Ecosystem Restoration Project Study Plan, a number of site-specific evaluations will be conducted during the feasibility study. The site-specific evaluations will focus on developing detailed restoration alternatives for potential implementation at specific sites. A Restoration Needs Assessment (RNA) will be conducted to develop a comprehensive, basin-wide assessment of historic ecological change, existing conditions, predicted future conditions, and desired future conditions. If greater system needs are identified during the RNA, a larger list of potential improvements will be prepared and recommended for authorization. The main purpose of the document is to guide selection of the site-specific projects.

This document will: (1) provide a general description of the existing and anticipated future conditions of the Waubonsie Creek watershed, (2) identify problems, opportunities, and goals and objectives for restoration, (3) identify potential alternatives to address the problems in the creek and its basin, and (4) select a critical (pilot) project from the basin. Following the selection of the critical project, a Project Management Plan will be developed to identify the scope, schedule, and cost of the feasibility level investigation.

3. LOCATION OF STUDY AREA/CONGRESSIONAL DISTRICT.

Waubonsie Creek is located in northeastern Illinois. The basin has a total area of approximately 29.6 square miles (18,950 acres) and includes the southern corner of Kane and Du Page Counties and the northern corner of Kendall and Will Counties. The watershed drains portions of the municipalities of Naperville, eastern Aurora, Montgomery, and Oswego. Several tributaries enter Waubonsie Creek, which flows into the Fox River at the village of Oswego (Figure 1).

The Waubonsie Creek Watershed is located in the 14th Congressional District (J. Dennis Hastert - R) and the 13th Congressional District (Judy Biggert - R).

4. DISCUSSION OF PRIOR STUDIES, REPORTS AND EXISTING WATER PROJECTS.

a. Prior Studies and Reports. A number of documents prepared by local watershed planning groups and their consultants were reviewed:

(1) *Waubonsie Creek Watershed Plan and Technical Appendix*, 1999, Waubonsie Creek Resource Planning Committee and Waubonsie Creek Technical Advisory Committee. The watershed plan is the result of a locally led planning process guided by the Natural Resources Conservation Service (NRCS). The watershed plan describes the resources and history of the watershed. The plan identifies flooding and the environment as the important resource concerns in the watershed. Identification of funding sources to address these concerns was also an issue. The plan describes each resource concern and provides recommendations. The Technical Appendix has detailed information about the watershed resource inventory.

(2) Waubonsie Creek Biological Survey. 1997. S. Pescitelli and B. Rung. The Illinois DNR conducted the survey in 1997 to assess the fish, macroinvertebrates, and habitat in Waubonsie Creek.

b. Existing Water Projects in the Basin. Several ongoing actions call for a collaborative effort between local, state, and federal agencies to address water and related land resources within the watershed. Significant actions include:

(1) Existing Corps of Engineers Activities in the Watershed.

There are no existing Corps projects in the watershed.

(2) Partnerships and Ongoing Water Resource Projects and Programs.

Waubonsie Creek Resource Planning Committee and Waubonsie Creek Technical Advisory Committee. These committees were formed to develop a watershed plan in response to extreme flooding during July 1996. The Planning Committee members are watershed residents and stakeholders, staff and representatives of affected communities, and representatives of affected counties, townships and park districts. The Technical Advisory Committee membership consists of specialists from local engineering consulting firms and state and federal agencies. The Natural Resources Conservation Service guided these committees at the outset. The committees developed a watershed management plan that is to be implemented by an implementation committee. POCs: Planning Committee, William Dunn; Technical Advisory Committee, Peter Wallers.

Oswegoland Park District. The Oswegoland Park District provides park and recreation services for an area that includes the lower portion of the Waubonsie Creek Watershed. The Oswegoland Park District owns a portion of the riparian corridor along Waubonsie Creek and operates a number of parks along the creek. POC: Grant Casleton, Oswegoland Park District.

Fox Valley Park District. The Fox Valley Park District provides park and recreation services for an area that includes the upper portion of the Waubonsie Creek Watershed. The Fox Valley Park District owns a portion of the riparian corridor including Waubonsie Lake and Spring Lake.

Stonegate Dam Modification. A project was conducted in 1999 to modify the lowermost dam on Waubonsie Creek to allow fish passage. This dam failed during the 1996 flood. The dam was partially removed and boulder riffles were installed. This project was funded by the NRCS Emergency Watershed Protection Program and the ILDNR Conservation 2000 Program. POC: Grant Casleton, Oswegoland Park District.

Conservation 2000. Ecosystem Project grants are a major component of the Illinois Department of Natural Resources Conservation 2000 (C2000) Program. C2000 grants have funded a number of projects within the Waubonsie Creek Watershed, including the Stonegate Dam modification.

5. PLAN FORMULATION. The Rock Island District staff have conducted a number of site visits to the Waubonsie Creek Watershed to meet with local representatives, identify problems and needs, and evaluate potential actions to be addressed in the study.

a. Identified Problems.

(1) Existing Conditions. Waubonsie Creek is located in northeastern Illinois. The main channel is 10.8 miles long. The basin has a total area of approximately 29.6 square miles (18,950 acres) and includes the portions of Kane, Du Page, Kendall and Will Counties (Figure 1). The watershed drains portions of the municipalities of Naperville, eastern Aurora, Montgomery, and Oswego. Waubonsie Creek flows into the Fox River at the village of Oswego. Waubonsie Creek originates in Naperville, north of the Fox Valley Shopping Mall.

Geomorphology. The area is characterized by low, broad moraines, sloping morainal ridges, and broad, flat or nearly level outwash plains and prominent kames. The relief in general is nearly level to gently sloping, but more sloping and steeper areas occur along Waubonsie Creek, especially near the confluence with the Fox River.

Soils. Most of the soils in the Waubonsie Creek Watershed are dark-colored soils that formed under native tall grass prairie. Drummer soils, which are most extensive, are poorly drained and occur on broad flats, drainageways, and depressional areas. Drummer soils are considered hydric soils. Other dark-colored soils include the Barrington, Brenton, and Mundelein soils. Dresden, Fox, and Waupecan soils are common in the southern part of the watershed adjacent to Waubonsie Creek. These soils formed in a thin layer of silty material and underlying outwash deposits of sand and gravel. Muskego and Houghton mucks occur in depressional areas or along the creek and are unstable and have low strength. Sawmill soils are common in the floodplain of Waubonsie Creek and have a water table near the surface for much of the year.

Land Use. The Waubonsie Creek Watershed is experiencing rapid residential and commercial development. According to the 1996 Illinois DNR Critical Trends Assessment Land Cover Data (collected 1991-1995), 49% of the watershed is cropland, 24% of the watershed is urban or rural grassland, and 20% of the watershed is urban and built-up land. The percentage of urban and built-up land has increased since the mid 1990's.

Land Cover for Waubonsie Creek Watershed*

Land Cover	Acres	Percentage of Watershed
Urban and Built-Up	3,791	20%
Cropland	9,292	49%
Grassland	4,547	24%
Woodland	462	2%
Open Water	219	1%
Wetland	508	3%

*Illinois DNR Critical Trends Assessment Land Cover Data, 1996

The upper portion of the watershed has experienced more development and land use changes to residential, commercial, and light industry. The middle portion includes a mix of residential, commercial, and agricultural uses. The lower portion of the watershed is primarily cropland with the exception of the village of Oswego at the confluence with the Fox River. The Waubonsie Creek in Oswego is low-density residential development with a riparian setback owned by Oswegoland Park District. Many agricultural fields along Waubonsie Creek in the northern part of Oswego are being converted to residential or commercial use.

Dams. There are five dams on the lower portion of Waubonsie Creek. They are: Lower Stonegate Dam, Upper Stonegate Dam, Lower Pfund Dam, Upper Fund Dam, and Fox

Bend Golf Course Dam. The dams inhibit fish movement from the Fox River to spawning habitat in Waubonsie Creek. The Lower Stonegate Dam and Lower Pfund Dam failed in the flood of 1996. The Lower Stonegate Dam was modified in 1999 to allow fish movement upstream to the Upper Stonegate Dam.

Streams. The upper reach has little instream cover, poorly developed stream riffles, and few meanders. The lower reach has high sinuosity and deep, well-developed pools with stable riffles; however, five dams prevent access and recolonization of this area.

The average slope of Waubonsie Creek is 0.159% (Figure 2). A 1-mile section of middle Waubonsie Creek is very flat (<.03%) where it flows through the old Waubonsie Swamp. Increased stream power and flood frequency and volume have widened the channel in the middle reach.

Substrate. Substrate in the upper reach is consolidated, consisting of particles too small to resist high flows. Following is a breakdown of stream substrate at two sites in the upper reach:

Sand	50%
Gravel	25%
Silt	24%
Cobble	1%

Sand	40%
Gravel	20%
Silt	20%
Cobble	15%
Boulders	5%

The middle reach transitions from a silty mud bottom in the upper middle to a sand and gravel bed in the lower middle reach. In the lower reach, the stream substrate is bedrock slabs, boulders, cobble, gravel, and minimal sand or silt.

Habitat. Waubonsie Creek is a highly valued aquatic resource according to the Biological Stream Characterization (Figure 3). The habitat quality of the lower reach of Waubonsie Creek is excellent, but habitat quality decreases upstream. The lower reach has an Index of Biotic Integrity (IBI) of 151 (excellent); the middle reach has an IBI of 83 (fair); and the upper reach has an IBI of 55-88 (poor to fair).

Instream cover in the upper reach is sparse and does not provide adequate flow refugia during high flows. Riffles are poorly developed in the channelized reaches with only one stable riffle. Few meanders are found in the upper reach. In the middle reach, riffles are poorly developed and there are very few channel meanders present, except near Route 34. The lower reach has high sinuosity and deep, well-developed pools with stable riffles. The lower reach has pools with some woody debris. As stated previously, dams in the lower reach prevent access and recolonization of Waubonsie Creek. The 1996 flood resulted in channelization of nearly 700 feet of the stream near the confluence with the Fox River.

Lakes. The upper reach of Waubonsie Creek has three large stormwater detention lakes: Spring Lake, Willow Lake, and Waubonsie Lake. All three lakes are listed as impaired waters by the State of Illinois in accordance with Section 303(d) of the Clean Water Act. Impaired waters are those not meeting water quality standards.

Bank Stability. Bank erosion in the upper reach is moderate. Some reaches have undercut banks that have not yet collapsed. Much of the erosion in the upper reach is lake shoreline erosion. There are some undercut banks in the middle reach near Route 34. Only minimal vegetation exists on the channel side slopes in the middle reach. Areas of severe streambank erosion occur north of the Oswego Police Department upstream to Chesterfield Park. The lower reach has gradually sloping banks with minimal erosion. The stream channel is stable due to underlying bedrock.

Flooding. The Waubonsie Creek watershed has experienced an increase in residential flood damages. The Parkview Estates/Marviray Manor subdivision in the city of Montgomery was constructed within the 100-year floodplain and has experienced flooding in 1972, 1983, and 1996. A berm was constructed after 1972, but it did not prevent flood damages in 1983 and 1996. The Heritage subdivision in Oswego is also susceptible to flooding. To address the flooding concerns, the Waubonsie Creek Resource Planning Committee recommends improved stormwater management, installation of gaging stations, updating the hydraulic and hydrology study, updating the floodplain mapping, and buyouts of frequently flooded properties. Following the 1996 flooding, the Federal Emergency Management Agency (FEMA) initiated buyout offers to homeowners in the Parkview Estates and Marviray subdivisions. A number of these homes were purchased by FEMA and demolished.

(2) Expected Future Conditions. Urbanization of the Waubonsie Creek Watershed is expected to continue. The high level of current and planned development will further exacerbate flooding problems. Continued loss of open space and the increase of impervious areas will intensify stormwater runoff. The modified hydrology also impacts the fish and invertebrates in the creek. Hydrologic alterations affect the structure of habitat within the creek, as well as the plants in and adjacent to the creek. Many riparian wetlands will be lost as residential and commercial development continues along the Waubonsie Creek corridor. New developments are required to have properly engineered drainage system and detention ponds. These structures will reduce the impact of added stormwater from development, but will not compensate for lost habitat.

It is anticipated that the dams on Waubonsie Creek will be evaluated for removal or construction of fish passage structures.

(3) Planning Objectives and Constraints. The principal focus of this study is to identify opportunities to restore degraded ecosystem structure and function, including the ecosystem's hydrology, plant, fish, and wildlife communities. Restoration of aquatic habitats in the Illinois River and its tributary streams is important in: (1) maintaining distribution and abundance of vertebrates and invertebrates, (2) maintaining spatial structure of habitat, and (3) maintaining interspersed and connectivity.

The Waubonsie Creek Watershed Plan identifies the following desired future conditions for the environmental resources of the watershed:

- Protect and improve fish and riparian habitat
- Stabilize streambanks and shoreline to protect water quality
- Adopt greenway plans in all areas anticipating future development
- Restore native vegetation in floodway and wetlands

Goals and objectives for environmental restoration in the Waubonsie Creek Watershed were developed using the above desired future conditions and input from local natural resources professionals.

Planning Objectives:

- Restore fish passage at dams
- Increase quantity and diversity of instream habitat
- Create fish refuges

Planning Constraints:

- Urbanizing nature of watershed
- Altered flow regime
- Willing participation of landowners

(4) Problems and Opportunities. Potential opportunities are listed below that could be addressed by the Corps of Engineers or in collaboration with the non-federal sponsors and other federal and local agencies. The following restoration measures would address the problems and objectives described above:

- Improve instream habitat
- Restore floodplain wetlands
- Restore or establish riparian corridors
- Restore fish passage

b. Alternative Plans. Restoration of the Waubonsie Creek Watershed must be a collaborative effort among a variety of local, state, and federal stakeholders who are concerned about or charged with the protection and restoration of Waubonsie Creek Watershed. Potential alternatives to be developed in the feasibility phase include, but are not limited to, the following:

- Remove dams
- Modify dams
- Construct rock ramp fishway
- Construct fish ladder
- Meander channelized stream segments
- Install riffle-pool structures
- Install lunger hides
- Restore or create pools
- Create off-channel wetlands
- Allow river access to its floodplain
- Restore native vegetation
- Stabilize streambanks

c. Preliminary Evaluation of Alternatives. Site-specific projects that have already been identified by previous planning efforts are described below. Alternatives were evaluated based on anticipated benefits and costs, anticipated feasibility, and level of detail of existing site-specific plans. An evaluation of how each project could move to implementation is also included.

(1) *Fish Passage on Lower Waubonsie Creek.* Modify or remove Upper Stonegate, Lower Pfund, Upper Pfund, and Fox Golf Course Dams to improve fish passage. Modification will likely involve installation of riffle ramps. Coordinated modification of all the dams on the lower Waubonsie Creek would allow fish in the Fox River to access spawning and nursery habitat in Waubonsie Creek. Target species include the shorthead redhorse. The Oswegoland Park District owns all dams on the lower Waubonsie Creek except for the Upper Pfund Dam. Oswegoland Park District supports modification of these dams to allow fish passage.

(2) *Oswegoland Stream Restoration.* Restore stream and riparian habitat in northern Oswego by meandering channelized segments of Waubonsie Creek, increasing instream habitat diversity, and creating off-channel wetlands. The project would improve the quality and diversity of instream and riparian habitat in Waubonsie Creek and provide spawning and refuge habitat for fishes. The Oswegoland Park District owns the stream corridor in the northern subdivisions of Oswego. The Oswegoland Park District supports restoration of the stream corridor to improve aquatic and wetland habitat.

(3) Waubonsie Swamp. Restore floodplain wetland in conjunction with future regional stormwater detention at the Old Waubonsie Swamp, north of Oswego. Commercial development is planned for the perimeter of the property.

(4) Parkview Estates Wetland Restoration. Meander interior ditch and restore floodplain wetlands in a stormwater detention facility adjacent to Parkview Estates subdivision. This project would restore floodplain wetlands and meander and create instream habitat in the ditch that runs through the stormwater detention facility. Restoring a connection with Waubonsie Creek will also be evaluated. The village of Montgomery owns the site.

(5) Fox Valley Stream Restoration. Construct pools and riffles or installation of other instream habitat to improve the quality and diversity of instream and riparian habitat in Waubonsie Creek and provide spawning habitat for fishes. The Fox Valley Park District owns the stream corridor downstream of Lake Waubonsie and supports stream restoration in this area.

(6) Waubonsie Lake Restoration. Reduce lakeshore erosion in Waubonsie Lake by introducing emergent aquatic plants. Waubonsie Lake is an on-stream stormwater detention lake managed by the Fox Valley Park District.

(7) Spring Lake Restoration. Reduce lakeshore erosion in Spring Lake by introducing emergent aquatic plants. Spring Lake is an on-stream stormwater detention lake managed by the Fox Valley Park District.

c. Recommendation on Critical Restoration Areas. Based on preliminary evaluations, the following projects were selected for further feasibility level evaluation: (1) fish passage, (2) Oswegoland stream restoration, (3) Parkview Estates wetland restoration, (4) Fox Valley stream restoration, and (5) Waubonsie Lake restoration. Reasons for selections include the critical need for fish passage and quality stream habitat, public ownership of lands, and local support. Further formulation and evaluation of alternatives will take place in the next phase. The next phase will be initiated by development of a Project Management Plan, which will outline the scope, schedule, and cost of the feasibility level investigation.

9. ESTIMATED MILESTONES. The following is a draft schedule subject to revision during the development of the detailed Project Management Plan:

Complete Project Management Plan	March 2002
Initiate Feasibility Level Study	October 2001
Formulate Alternatives	January 2002
Evaluate Alternatives	March 2002
Complete Feasibility Level Analysis and Draft NEPA Documentation (Environmental Analysis)	September 2002

11. RECOMMENDATIONS. Recommend that the Corps, the ILDNR, and other state and federal agencies initiate development of the Project Management Plan and feasibility level study for the Waubonsie Creek site-specific projects.

12. VIEWS OF OTHER RESOURCE AGENCIES. This fact sheet was developed in partnership with the Corps of Engineers, the Illinois Department of Natural Resources, and the USDA Natural Resources Conservation Service. Meetings also have been held with the Waubonsie Creek Technical Advisory Committee.

13. PROJECT AREA MAP. The project area map is included as Figure 1.

Waubonsie Creek Watershed Landcover Map

1 0 1 2 Miles



US Army Corps of Engineers
Rock Island District



Kane Co.

Kendall Co.

Du Page Co.

Will Co.

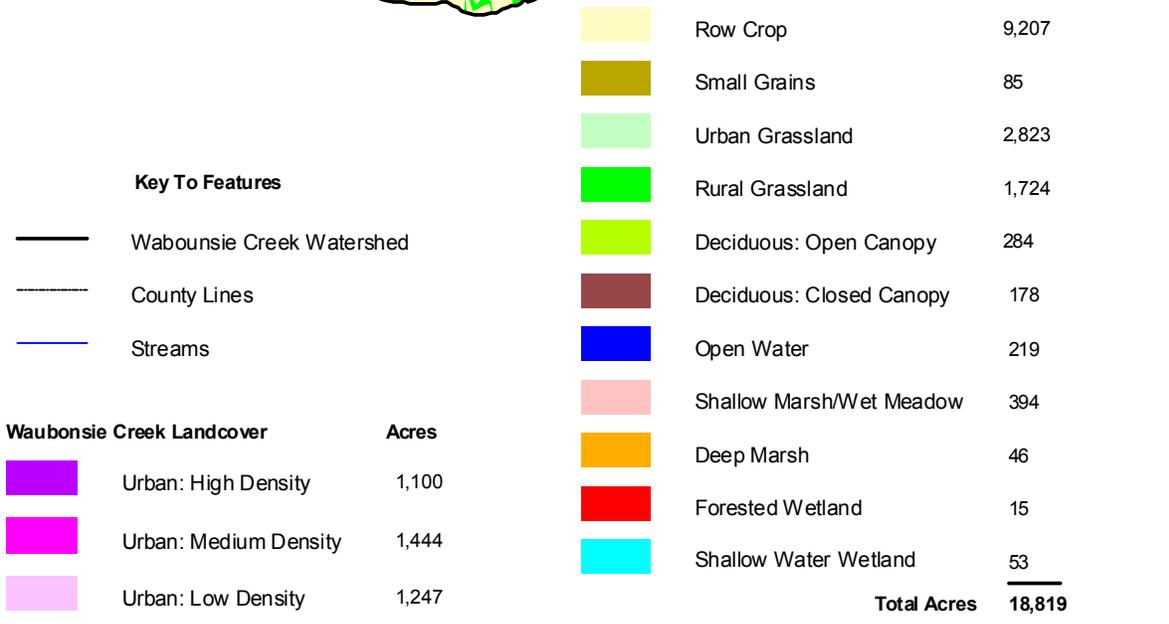
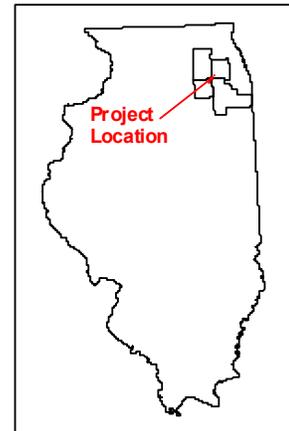


Figure 1. Land cover in the Waubonsie Creek watershed (IDNR 1996)

Elevation Profile of Waubonsie Creek

Average % slope of selected segment: 0.159

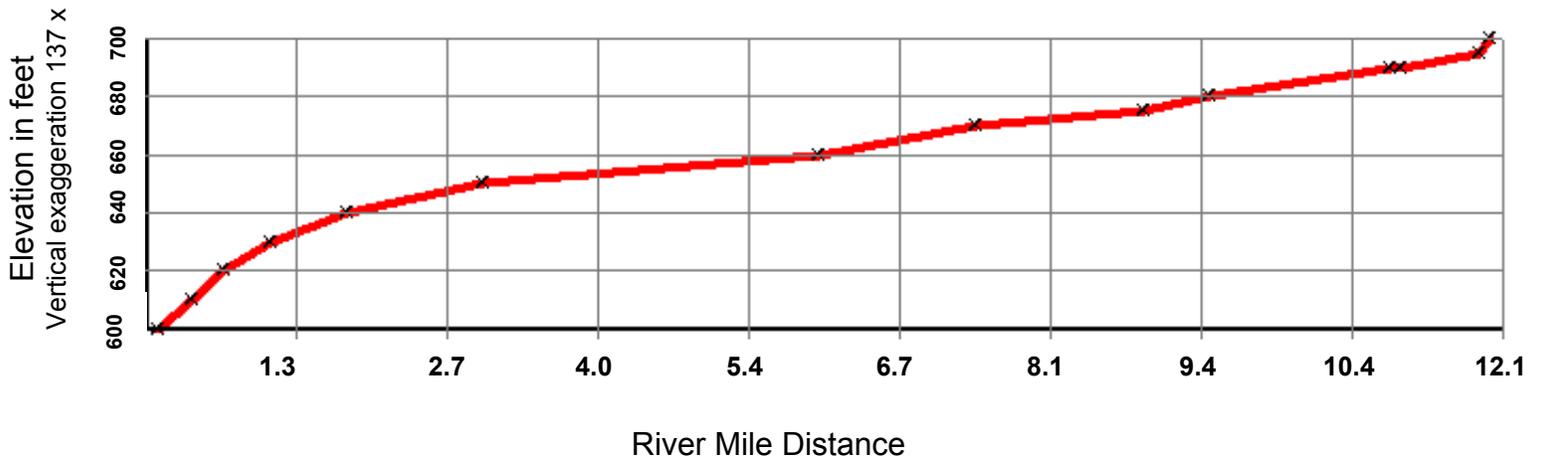
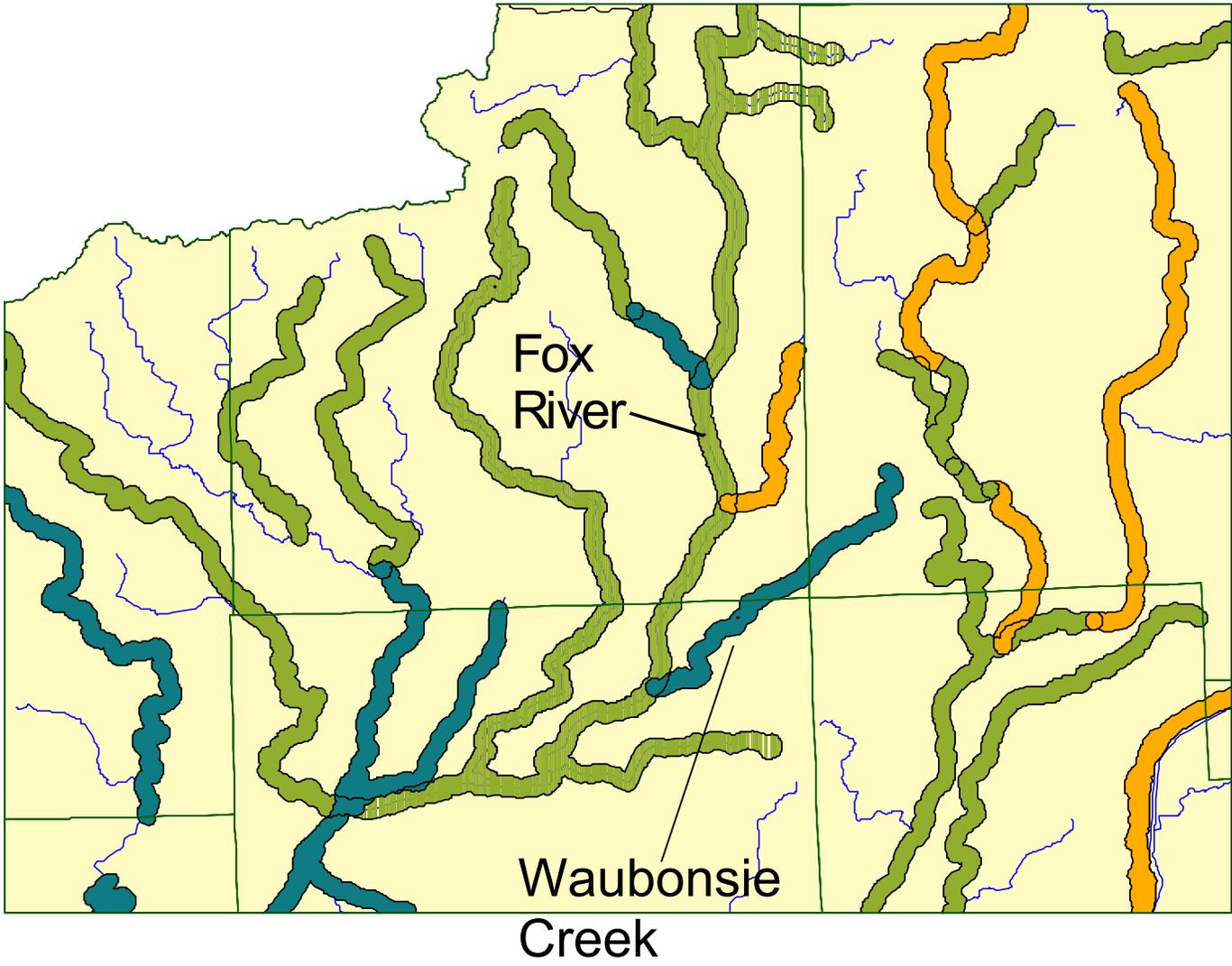


Figure 2. Bed elevation profile of Waubonsie Creek

Waubonsie Creek Biological Stream Characterization



Biological Stream Characterization

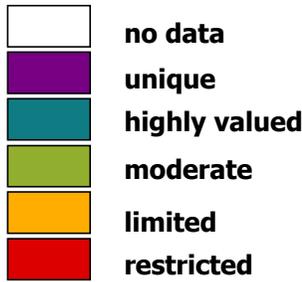


Figure 3. Waubonsie Creek Biological Stream Characterization