

FACT SHEET

BLACKBERRY CREEK WATERSHED ILLINOIS RIVER ECOSYSTEM RESTORATION

MARCH 2002

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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 the selection of the site-specific projects.

This document will: (1) provide a general description of the existing and anticipated future conditions of the watershed, (2) identify problems, opportunities, and goals and objectives for restoration, (3) identify potential alternatives to address the problems in the 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.

The Blackberry Creek Watershed is a 73-square-mile watershed in northeast Illinois located in south-central Kane County and north-central Kendall County. Blackberry Creek is a 32-mile-long stream originating north of Elburn in central Kane County and draining to the Fox River near Yorkville in Kendall County. The Blackberry Creek Watershed includes incorporated areas of Elburn, Sugar Grove, North Aurora, Aurora, Montgomery and Yorkville, as well as unincorporated areas of Kane and Kendall Counties (see Figure 1).

The Blackberry Creek Watershed is located in the 14th Congressional District (Dennis Hastert - R).

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

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

(1) *Blackberry Creek Watershed Management Plan*, September 1999, Blackberry Creek Watershed Resource Planning Committee. Four goals were identified include: (1) reduce existing flooding problems, (2) improve water quality and stream and wetland resources, (3) avoid negative impacts of new development on flooding and watershed resources, and (4) establish a watershed framework for implementing the Blackberry Creek goals and objectives. The plan resulted in 40 restoration, prevention, and maintenance recommendations. The implementation committee is now working to implement the recommended actions.

(2) Blackberry Creek Dam Removal Feasibility Study. Consultants Engineering Enterprises and Natural Areas Ecosystem Management recently completed a feasibility study to assess the biological, hydrologic, and economic aspects of altering or removing the Blackberry Creek Dam. The recommended alternative, of five possible alternatives, was to completely remove the Blackberry Creek Dam, construct a new bridge, and fully restore the channel which would improve fish passage.

(3) Blackberry Creek Biological Survey Report. During 1997, biological surveys were conducted on Blackberry Creek. The survey was the result of a cooperative effort by the Illinois Department of Natural Resources (ILDNR), U.S. Environmental Protection Agency (USEPA), Natural Resources Conservation Service (NRCS), and volunteers. A total of 4,409 fish (representing 42 species), 671 macroinvertebrates (representing 22 taxa), and 66 mussels (representing 11 species) were collected.

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 Blackberry Creek Watershed.

Blackberry Creek Watershed General Investigations Study, Rock Island District, U.S. Army Corps of Engineers. This study was authorized in a resolution of the Committee on Transportation and Infrastructure, U.S. House of Representatives, adopted March 16, 2000. To date, no funds have been appropriated to initiate the reconnaissance study. POC: Jerry Skalak, U.S. Army Corps of Engineers, Rock Island, Illinois.

(2) Existing Federal Activities in the Blackberry Creek Watershed.

Blackberry Creek Modeling Study, U.S. Geological Survey. The Kane County Department of Environmental Management and the USGS have teamed to produce new floodplain maps of the Blackberry Creek Watershed using HSPF and HEC-RAS modeling tools. The 3-year study will likely lead to updated FEMA approved floodplain maps and will allow local decision makers (including the Blackberry Creek Watershed Resource Planning Committee) to set priorities for land acquisition, restoration, and maintenance activities. POC: Bob Holmes, USGS, Champaign, Illinois.

Blackberry Creek Watershed Erosion Analysis, USDA Natural Resources Conservation Service. Erosion analyses performed during development of the watershed plan found that erosion is significant (3.9 tons/acre/year). The majority of sediment is upland erosion rather than streambank erosion. Cropland slopes greater than 5% are producing 70% of the sediment. Most of the sediment delivered to the creek is accumulating in the creek. Twenty percent (20%) of the sediment entering the creek is being discharged to the Fox River.

Advanced Identification of Disposal Areas (ADID), U.S. Environmental Protection Agency. The USEPA is working with Kane County and other federal, state, and local agencies to identify and assess wetland and other aquatic resources in Kane County. The ADID program is designed to provide improved information and raise awareness of the locations, functions, and values of wetlands and other waters. The ADID will look at wetlands and streams to assess wildlife habitat and floristic diversity, and stream habitat quality. The study will also assess water quality/stormwater storage functions of wetlands. Wetlands and other waters, which are identified as high quality based on biological function and/or water quality functions, will be mapped and may be afforded an additional level of protection through local ordinances. POC: Sue Elston, USEPA.

Alternatives Futures Analysis, U.S. Environmental Protection Agency. The USEPA is working with the ILDNR on an alternatives futures analysis for the Blackberry Creek

Watershed. This project was initiated in 2000 and will focus on aquatic resource protection. The project will model several different landscape scenarios to assess impacts on water quality within the watershed. POCs: Sue Elston, USEPA and Bill White, ILDNR.

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

Blackberry Creek Watershed Resource Planning Committee. The Blackberry Creek Watershed Resource Planning Committee's mission is to develop and encourage the funding and implementation of a long-range plan among landowners, governmental entities, and other appropriate groups which will enhance, manage, and protect the human, ecological, and socioeconomic resources within the Blackberry Creek Watershed Area. Committee members represent private enterprises, private landowners, local municipalities, and county government. POC: Jim Michels, Chairman, Sugar Grove.

Implementation of the Blackberry Creek Watershed Management Plan. The Conservation Foundation is taking the lead for implementation of the Blackberry Creek Watershed Management Plan. The Kane County and Kendall County Soil and Water Conservation Districts are providing funding and office space for The Conservation Foundation employee in charge of implementation. POC: Ksenia Rudensiuk, The Conservation Foundation.

Blackberry Creek Futures Analysis Project. The USEPA, ILDNR, Conservation Foundation, Kane County Environmental Management Department, and other local stakeholders are working together to assess the biological, social, hydrologic, and economic impacts of future development and land uses on the aquatic resources in the Blackberry Creek Watershed. Teams will analyze the impacts of current development and land use patterns versus conservation design and land uses in order to assess how aquatic resources may be negatively or positively affected in the future. A parallel study, if funded, will assess the economic impact of such land uses and will provide municipalities model ordinance language to allow conservation design elements in the future.

Windstone Subdivision Lake Restoration. Windstone Subdivision, in the Blackberry Creek Watershed, will work to restore a residential detention facility into a naturalized lake with native wildlife habitat and plantings to improve water quality.

Kane County Forest Preserve Land Acquisition Program. Kane County's Forest Preserve District is working to acquire land in key areas of the county for the purposes of preserving open space, improving stormwater storage and quality, and connecting the county's greenways. A study was recently completed in the Lake Run subwatershed of the Blackberry Creek Watershed, with recommendations for purchase.

5. PLAN FORMULATION. Rock Island District staff conducted a site visit on April 30, 2001, to the Blackberry 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. Blackberry Creek is a tributary to the Fox River. It originates in central Kane County and flows south into Kendall County where it joins the Fox River near Yorkville, Illinois. The Blackberry Creek Watershed is 73 square miles and the creek itself is 32 miles in length. The four significant tributaries to Blackberry Creek include East Run, North Run, and two unnamed tributaries.

Geomorphology. The area is characterized by low, broad moraines, sloping morainal ridges, broad, flat or nearly level outwash plains, and prominent kames. The relief is predominantly nearly level to gently sloping, but steeper areas occur along Blackberry Creek and on moraines and kames.

Soils. Most of the soils in the watershed are dark-colored soils formed under native tall grass prairie. Drummer soils, which are most extensive, are poorly drained soils occurring on broad flats, drainageways, and depressional areas. Other dark-colored soils include Brenton, Elburn, Blackberry, and Clare soils. Lena muck and Houghton muck occur in depressional areas along the creek and are often saturated or ponded with water. Otter soils and Sawmill soils are common within the floodplain of Blackberry Creek. These are poorly drained soils formed in alluvium and subject to frequent flooding. Most areas of Drummer and other soils with a seasonal high water table have been artificially drained for agricultural purposes.

Land Use. The Blackberry Creek Watershed is mostly rural. Land use data for Kane County show that in 1990, 71% of land in the county was in agricultural use while only 16% was in urban use. The area is experiencing increased urbanization. Urban use is expected to increase to 27% of the watershed by 2005. The 1998 "T by 2000" transects indicate that 65% of the cropland in the watershed is under conventional tillage practices and no-till is practiced on only 12% of the cropland.

Streams. The upper section of Blackberry Creek is extensively channelized with a gravel and cobble streambed blanketed with a layer of silt and mud. The middle section is a low gradient stream with poorly defined stream valley and severe silt and mud deposition. The lower section is a middle-to-high gradient stream with well-defined valleys and clean gravel-cobble runs. The average slope of Blackberry Creek is 0.148%. Figure 2 shows the stream profile.

Habitat. The upper reach has little desirable fish habitat due to mud and silt deposits. The upper reach has an IBI (Index of Biotic Integrity) of 34 to 36 and is classified as a Class "C" stream (moderate aquatic resources) (Figure 3). The middle reach has good habitat value with beaver dams, submerged logs, undercut banks, and some high quality submergent and emergent vegetation. It has an IBI of 40 and is also classified as a Class "C" stream (moderate aquatic resources). The lower reach has good habitat with pools, boulders, undercut banks, submerged logs, and high habitat value vegetation. The lower reach has an IBI of 42 to 46 and is classified as a Class "B" stream (highly valued aquatic resource).

Riparian Corridor. The predominant land use along the upper reach is agriculture with an approximate 20-foot buffer of primarily reed canary grass along most of the reach. The predominant land use adjacent to the middle reach is residential and agricultural with a 30- to 40-foot buffer dominated by invasive, undesirable vegetation with little habitat or stream stabilization value. The lower reach has a wider riparian corridor, up to 300 feet in some locations. The habitat and bank stabilization value of the vegetation is generally low, but some sections have higher riparian value.

Lakes. There are several lakes within the Blackberry Creek Watershed, but the majority of them are stormwater detention basins. Two larger lakes are owned and managed by the Fox Valley Park District. Lake Gregory is a long, narrow 7-acre lake excavated within the Blackberry Creek floodplain which functions as a water feature and stormwater detention for a surrounding park. The average depth of Lake Gregory is 3 feet. Jericho Lake is a 22-acre former sand and gravel quarry within the floodplain. It has an average depth of 14 feet.

Dams. A 10-foot-high dam is located approximately 700 feet upstream of the confluence with the Fox River. The dam is an impediment to fish migration. The dam slows the rate of biological recovery of the creek after severe flood events or other events that significantly impact the fish and macroinvertebrate communities. The structural integrity of the dam is uncertain due to a scour hole immediately downstream of the dam.

Water Quality. The ILEPA reports that Blackberry Creek is fully supporting its designated uses (aquatic life and fish consumption) throughout. East Run and Lake Run tributaries also support swimming uses. The mussel diversity suggests relatively high water quality. There

are five small ILEPA permitted discharges in the watershed, all discharging to small ditches that drain to Blackberry Creek. The ILEPA has a fixed monitoring station on Blackberry Creek in Kendall County and collects water chemistry and physical conditions from this station. Both Jericho Lake and Lake Gregory were listed as impaired waters in 1998 under Section 303(d) of the Clean Water Act.

Wetlands. Based on the presence of hydric soils, up to 90% of the wetlands in the Blackberry Creek Watershed may have been lost. Many of the remaining wetlands are degraded. Approximately 20% of the wetlands investigated during development of the Blackberry Creek Watershed Management Plan were identified as being high quality based on biological conditions. Wetland degradation is expected to continue without water quality controls and protection of wetland buffers.

Flooding. Approximately two thousand (2,000) of the estimated 20,000 residents of the Blackberry Creek watershed live in flood-prone neighborhoods. Flood damages during the July 1996 flood event exceeded \$14 million and 235 homes experienced flooding. Some structures located outside of the regulatory floodplain have experienced flood damages. This may be due to changes in runoff patterns due to urbanization and/or inaccuracies in mapping of the regulatory floodplain. The floodplain delineated by the USGS modeling effort is likely to contain areas not currently within the FEMA floodplain boundaries. A flow split occurs in Aurora at an approximately 10-year event and a portion of the flow from Blackberry Creek water flows out the creek across land and directly into the Fox River.

(2) Expected Future Conditions. Urbanization of the Blackberry Creek Watershed is expected to continue. As the watershed is developed, open space and farmland will be converted to impervious and less pervious land uses, such as parking lots and turf grass. Additional wetland loss and degradation are expected to continue. With these land use changes, rainwater will be conveyed to the stream more quickly, thus increasing flood flows. Flooding and flood damages are expected to continue or worsen. Development of "flow destabilization" is possible. Flow destabilization is the condition when there are higher high flow events and lower low flow events. As future floodwaters wash fish and macroinvertebrates downstream, diversity in the stream will continue to decrease because fish and other organisms cannot move upstream past the dam near the confluence with the Fox River. Water quality is also expected to decline over time.

(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, to a less degraded condition.

The Blackberry Creek Watershed Management Plan identified the goals and objectives for the watershed. Many of the goals and objectives identified by the Blackberry Creek Watershed Resource Planning Committee fit within the scope of the Illinois River Ecosystem Restoration Study. Other goals and objectives fall outside of the scope of the Illinois River Ecosystem Restoration Study. Following are the goals identified in the management plan that could potentially be addressed through the Illinois River Ecosystem Restoration Study are included.

Blackberry Creek Goals and Objectives
Blackberry Creek Watershed Resource Planning Committee

Goal 1: Reduce Existing Flooding Problems

- Objective 3: Achieve flood control benefits through strategic acquisition and management of natural storage areas

Goal 2: Improve Water Quality and Stream and Wetland Restoration

- Objective 1: Restore aquatic and wildlife habitat through management and restoration of stream channels and corridors such that Blackberry Creek achieves a "B" rating under the ILDNR Biological Stream Characterization
- Objective 2: Improve water quality and aquatic habitat through management and restoration of wetlands and wetland buffers
- Objective 3: Address existing development with inadequate storm water controls to reduce urban runoff impacts
- Objective 4: Retrofit existing storm water facilities to improve water quality
- Objective 5: Reduce agricultural runoff impacts
- Objective 6: Reduce direct stream impacts due to agricultural and equestrian activities
- Objective 7: Target acquisition of high quality stream and wetland resources

Goal 3: Avoid Negative Impacts of New Development on Flooding and Watershed Resources

- Objective 2: Protect existing floodplain and depressional storage
- Objective 3: Protect stream and wetland resources from unnecessary modifications and mitigate all necessary modifications and impacts
- Objective 5: Minimize water quality and quantity impacts of new development utilizing natural drainage systems as well as structural measures

Goal 4: Establish a Watershed Framework for Implementing Blackberry Creek Goals and Objectives

Planning Objectives:

- Restore movement of fish and other aquatic organisms upstream of the dam on Blackberry Creek.
- Improve aquatic habitat through restoration of wetlands and wetland buffers.
- Improve aquatic habitat through restoration of riparian buffers.

Planning Constraints:

- Constraint #1 - General public education and awareness.
- Constraint #2 - Much of riparian corridor currently in private ownership.
- Constraint #3 - Coordination with local municipalities.

(4) Problems and Opportunities. Potential opportunities that could be addressed by the Corps of Engineers or in collaboration with the non-federal sponsors and other federal and local agencies are listed below:

- Improve in-stream habitat
- Restore stabilization, habitat, and filtration value of riparian buffers
- Provide fish passage at the dam on Blackberry Creek near Yorkville
- Restore existing wetlands and buffer from future impacts

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

- Increase plant diversity of existing riparian buffers
- Establish buffers around remaining wetlands
- Modify or remove dam on Blackberry Creek to provide fish passage
- Restore wetlands and/or install buffers around wetlands
- Re-meander stream segments

Detailed information on a full range of alternative plans has not been compiled at this time. In the future, the Blackberry Creek Watershed Resource Planning Committee should be contacted to develop a more complete list of potential alternative restoration plans.

c. Preliminary Evaluation of Alternatives. Site-specific projects that have been identified by previous watershed efforts are presented below. Alternatives were evaluated based on anticipated benefits and costs, anticipated feasibility, and level of detail of existing site-specific plans. Detailed information on restoration of fish passage at the dam on Blackberry Creek was available and has been summarized below.

(1) Restore Fish Passage at the Dam on Blackberry Creek. The dam on Blackberry Creek is a 90-foot-long limestone structure with a concrete cap and fixed crest weir. The weir elevation is roughly 582 feet MSL and approximately 10 feet above the downstream water surface. The dam is located 700 feet above the mouth of Blackberry Creek and blocks movement of fish and other aquatic fauna into Blackberry Creek. The dam slows the rate of biological recovery of Blackberry Creek after catastrophic events such as flooding that can cause significant loss of fish and macroinvertebrates.

The proposed project involves modifying the dam to allow upstream fish passage. Allowing fish passage past the dam would benefit fish communities and the overall river ecosystem. Upstream passage would allow fish access to an increased quantity of potentially suitable habitat types, including seasonal habitat for spawning, feeding, resting, and shelter. Providing passage at existing barriers would allow access to habitats that may serve as refuge during periods of high or low water, as well as during harsh overwinter and thermally stressful summer periods. Communities formerly isolated downstream, including fish from the Fox and the Illinois Rivers, would be connected to those upstream, potentially increasing community stability and resilience. In addition, organisms such as mussels, which use fish as a host for their parasitic larvae, may be able to recolonize upstream habitats.

Fish passage alternatives must consider the highway bridge immediately downstream of the dam. The dam is connected to the bridge abutments. Alternatives must also consider the Yorkville Bristol Sanitary District wastewater treatment plant located immediately downstream of the dam.

The Blackberry Creek Dam Removal Study (2001) evaluated the following options: (1) no action, (2) repair existing dam and highway bridge, (3) replace or repair bridge and repair and modify dam

to allow fish passage, (4) remove dam and replace highway bridge, and (5) re-route channel and replace bridge at a location west of its existing location. The study acquired topographic mapping, conducted soil borings, and conducted a preliminary hydraulic analysis of the proposed alternatives. Preliminary cost estimates were prepared. The preliminary estimates for the fish passage alternatives were \$841,800 for Alternative 2 to \$2,932,000 for Alternative 5.

While some preliminary work has been done, this project will require a significant amount of engineering work. The project would also require close coordination with the Kendall County Department of Highways and the Yorkville Bristol Sanitary District.

(2) Restore Wetlands. Wetlands would be restored within the watershed that were identified by the Blackberry Creek Watershed Resource Planning Committee. This would increase the quantity and quality of available wetland habitat.

(3) Meander or Remeander Channelized Portions of Blackberry Creek. Areas would be identified where meanders could be established in channelized portions of the stream. Stream meanders would increase the habitat diversity and stream length, thus providing additional aquatic habitat.

(4) Establish Stream and Wetland Buffers. Buffers could be established along stream corridors and around existing, restored, or established wetlands. Buffers could help filter water before it reaches the stream or wetland. Riparian buffers could provide travel corridors for birds and other wildlife. Wetland buffers could help protect the wetlands against invasion by non-native species.

d. Recommendation on Critical Restoration Areas. Based on preliminary evaluations, modification or removal of the dam on Blackberry Creek was selected for further feasibility level evaluation. This was selected as the initial project because the dam significantly limits the diversity of aquatic species in Blackberry Creek. Further formulation and evaluation of dam removal and fish passage alternatives will take place in the next phase. The next phase will be initiated by development of a Project Management Plan that 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	June 2002
Formulate Alternatives	August 2002
Evaluate Alternatives	December 2002
Complete Feasibility Level Analysis and Draft NEPA Documentation (Environmental Analysis)	August 2003

11. RECOMMENDATIONS. The Corps, the ILDNR, and other state and federal agencies should initiate development of the Project Management Plan and feasibility study for the dam removal or dam modification site-specific project.

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. The Corps met with representatives of the Blackberry Creek Watershed Resource Planning Committee.

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

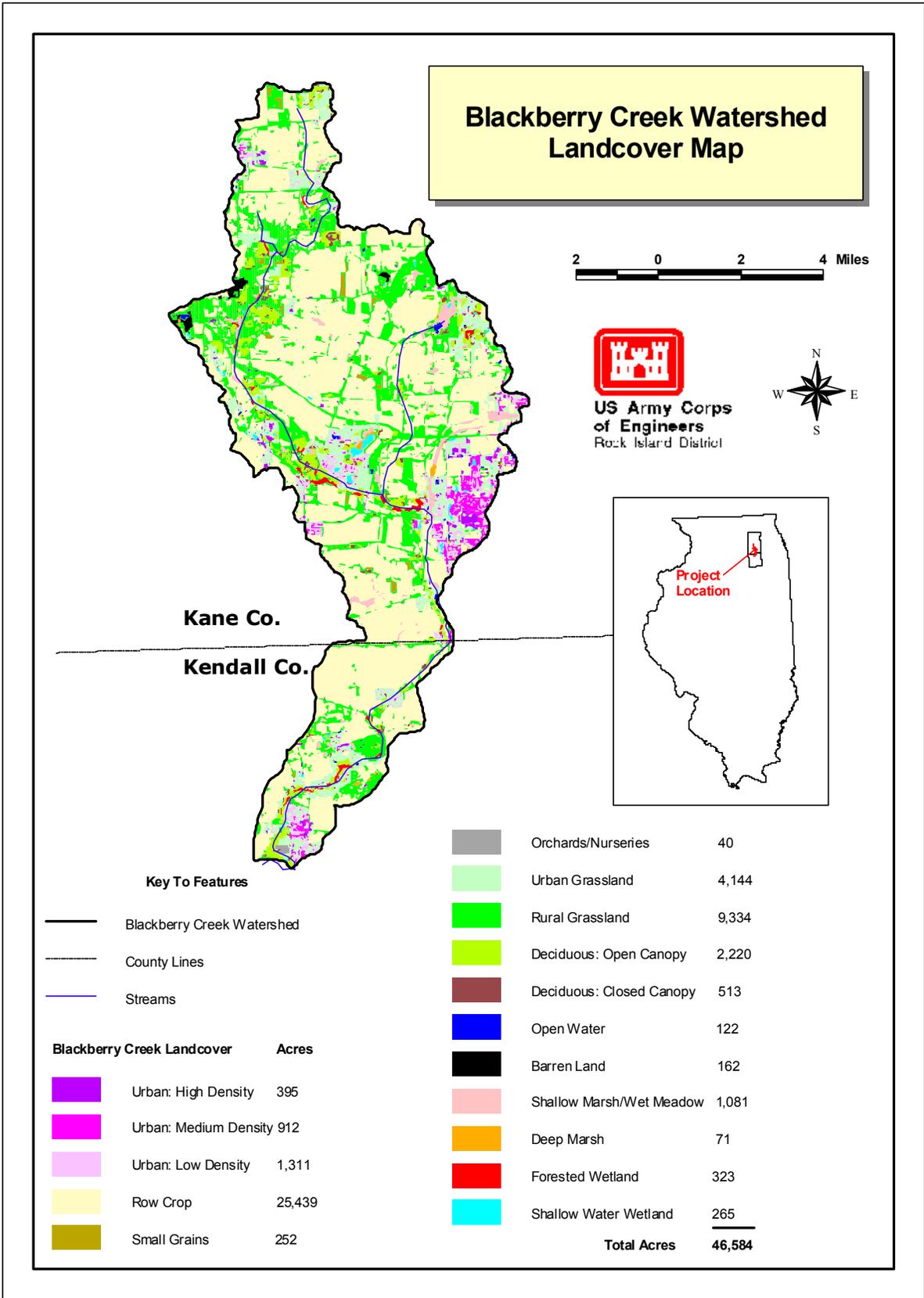


Figure 1. Blackberry Creek Basin and Land Cover Summary

Elevation Profile of Blackberry Creek

Average % slope of selected segment: 0.148

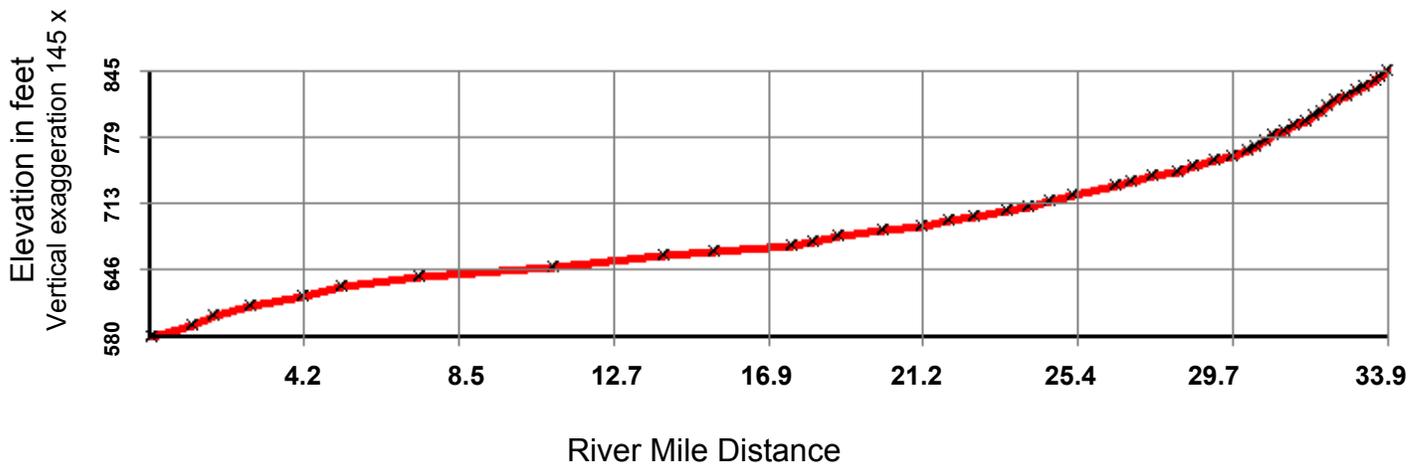


Figure 2. Elevation profile of the Blackberry Creek Basin

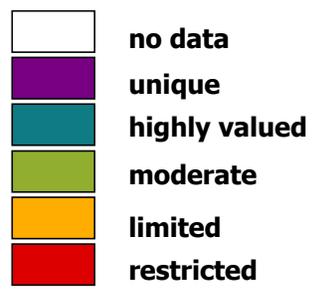
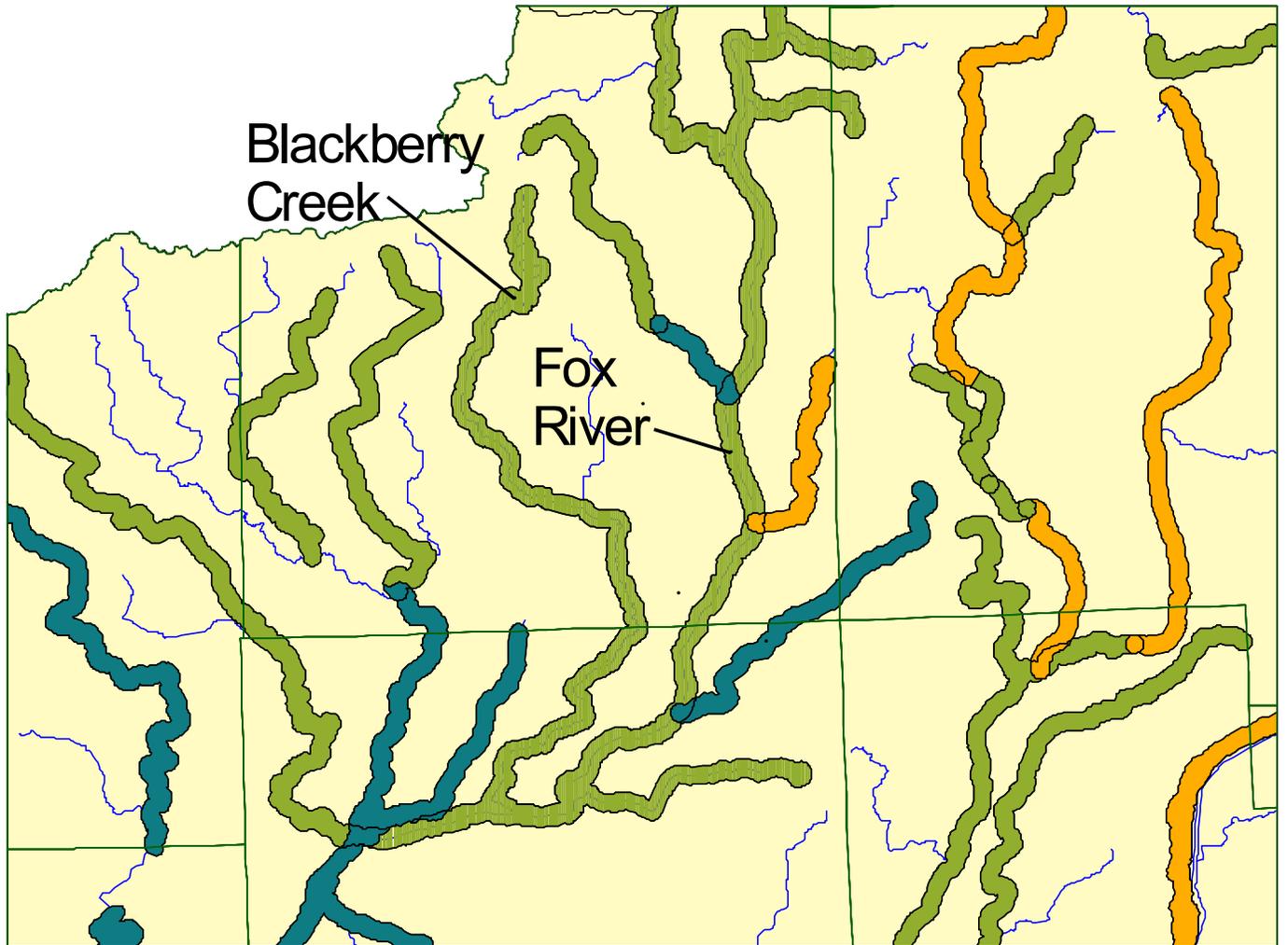


Figure 3. Biological Stream Characterization of streams in Kane and Kendall Counties.