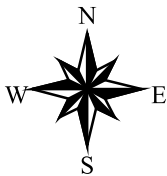
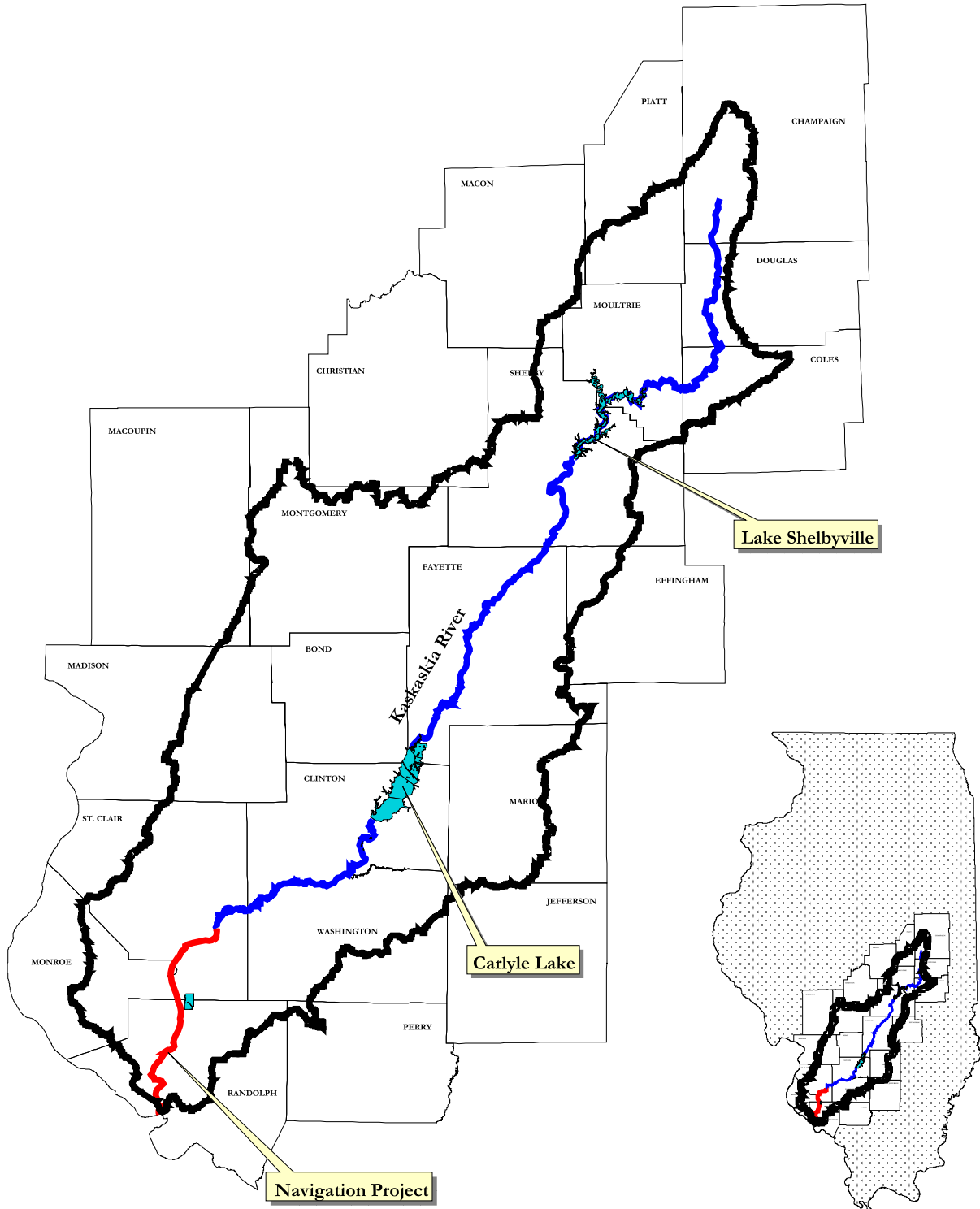


Kaskaskia River Watershed



An Ecosystem Approach to Issues & Opportunities

Kaskaskia River Watershed



The Kaskaskia River Watershed Basin, at 3,677,785 acres, represents 10.2% of the surface area of Illinois.

Map by the Southwestern Illinois GIS Resource Center

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EXECUTIVE SUMMARY

The Kaskaskia River Watershed covers in excess of 10% of the entire area within the State of Illinois and has a direct impact on all, or parts of 22 counties, ranging from Champaign County, in East-Central Illinois to Randolph County, in Southwestern Illinois. Due to its overall size and its importance to residents within the region, it is imperative that we gain a better understanding of the history of the watershed, its present condition and develop and implement future plans to maintain its vitality. In doing so, we will be better prepared to manage the river in a sustainable manner that will promote, but not abuse, the natural resources, and also encourage additional recreational opportunities, new economic development and sound agricultural practices.

The river was once a free flowing, meandering waterway through all of its 292 miles. Prior to settlers coming into the region in the early 1700's, the Mississippian Society (700 – 1400 AD) had settled in many satellite camps throughout the lower reaches of the Kaskaskia River. The area therefore remains extremely rich in archeological resources. Settlers utilized the river for transportation, and as agricultural efforts were implemented, the vast tallgrass prairies, wetlands and bottomland forests that once dominated the region, began to become fragmented.

The introduction of railroads, automobiles and mechanized agricultural equipment in the 20th century accelerated the reduction of these ecosystems. In the 1960's, two main stream, flood-control reservoirs, Lake Shelbyville and Carlyle Lake were constructed by the US Army Corps of Engineers to reduce flooding on the lower sections of the Kaskaskia River, as well as the lower Mississippi River. This agency also implemented a Navigation Project on the lower reaches of the river (36 miles) to encourage the distribution, via barge, of coal, grain, steel and other commodity items.

These activities have significantly altered the quantity and quality of the natural resources that remain within the watershed. The following examples indicate how our highest quality habitat has been hardest hit:

- *Only 1,300 acres of high quality forest (five separate types) remain within the watershed. This is only .11% of the area that was forested at settlement.*
- *Only one acre of high-quality savanna remains in the watershed.*
- *Only 11 acres of high-quality prairie remain in the watershed, .0005% of the original expanse.*
- *Less than 700 acres of wetlands are in high-quality condition, .1% of total wetland acreage.*
- *Less than 1% of the watershed's stream segments are listed as Biologically Significant Streams.*
- *Of the 41 native mussel species found in the region, only 14 have been collected alive in the last 20 years.*
- *Nearly three-dozen species of birds once known in the region are either locally extinct or are only rarely present during breeding season.*

Agricultural activities are significant within the watershed and are far and away the leading source of income for residents within the many rural communities found here. The northern sections of the watershed focus on row-crop production, while the southern reaches contain a mixture of livestock and row-crop production. The inclusion of buffer programs, the Conservation Reserve Program, the Wetlands Reserve Program and no-till incentives in past Farm Bills have assisted in reducing the amounts of nutrients, pesticides and sediments reaching the river throughout the watershed, however this effort should not be reduced until all 8,680 miles of streams are buffered, and all highly-erodible land is planted in perennial cover.

As conservation programs are developed, it is important to understand the following:

- *There is a strong feeling of stewardship among stakeholders within the watershed, and these same stakeholders place a high value on private property rights.*
- *Programs must be voluntary, and incentive-based to be successful.*
- *Agricultural activities are the driving force behind the economy within the region, and it is important that prime farmland is protected to provide for future generations.*
- *The term “wetlands”, as used in this document, is a broad term describing a wide variety of types. Currently, programs by agencies use varying and different definitions related to wetlands and are not consistent between the various agencies.*

Recreational activities within the watershed are extremely popular and are a very important economic benefit to the region, especially around the three USACE projects, Lake Shelbyville, Carlyle Lake and the Navigation Project. Fishing, including tournaments, sailing, hunting, camping, beaches and day-use areas and wildlife viewing are all popular and growing activities.

In addition to recreation, the Navigation Project also boasts of a thriving barge transportation system, which allows for the affordable shipment of grains from approximately 2,500 farms within the region. Fertilizer is brought into the region to support these farms, and a significant steel industry has been developed, processing over \$150,000,000 worth of steel annually. Approximately 200 people are employed in jobs directly related to this commercial navigation project.

Many other water uses, including public water supplies, coal-fired power plants and ethanol facilities have a stake in the future of the Kaskaskia River. The allocation of water rights to these entities, while ensuring enough water to maintain the Navigation Project, and to protect the natural resources, that ultimately support the recreational industry, will be an extremely difficult task.

Sedimentation is a major issue throughout the watershed, and is documented in the vast majority of studies that were collected and utilized in the creation of this report. The sedimentation may be a result of bank-cutting, agricultural runoff or headcutting. An example of the severity of the situation is found in the Navigation Project, from Fayetteville to New Athens. A total of 4.27 cubic million yards of sediment has been deposited within this 6-mile stretch of river between 1972 and 1999.

In many years, such as 2002, the issue of too much water is a more significant issue than too little water. Intense spring rains stressed the two flood-control reservoirs, Lake Shelbyville and Carlyle Lake, forcing the closure of campgrounds and access sites. As release rates from the reservoirs were increased to accommodate the recreation industry, lands below the dams were further inundated with water, forcing a delay in agricultural activities. While the reservoirs worked to the best of their ability, and at least a portion of the recreational and agricultural seasons were saved, it is clear that an updated management plan, including additional flood easements and new high-water recreational facilities will be needed to protect these interests in the future.

To assist in the future direction of the watershed, the Kaskaskia Watershed Association has been created. This group is a mixture of business persons, agency personnel and other interested parties that have come together to address issues in a holistic manner. The Kaskaskia River has tremendous opportunity for restoration, and with assistance from both state and federal programs, this restoration effort will contain elements to promote recreational, business and agricultural opportunities.

INTRODUCTION

This report is an attempt to begin a coordinated restoration process, based on sound ecosystem principles, for the Kaskaskia River Watershed, in Central and Southwestern Illinois. The phrase “ecosystem principles” includes such concepts as sustainability, diversity, health, variety, connectivity as well as the ability of an ecosystem to thrive and reproduce. The report will also focus on other factors that have a direct influence on the watershed, including recreation, agriculture and business and industry.

Recommendations will be made on each of these subjects in an effort to promote the sustainability of the ecosystem, as well as to strengthen the economic base and the quality of life of residents within the region.

The Kaskaskia River Watershed is an excellent candidate for restoration efforts, as it possesses sufficient diversity for a widespread approach to the broad-based issues of ecosystems, but at the same time is small enough not to be overwhelming. Recognizing this, local stakeholders are coming together on a watershed basis. Partnerships have been assembled with the State of Illinois and the federal government. A private land trust has been created. Much work, in individual portions of the watershed, has already been accomplished. It is time to move forward with a major initiative to create the structure, plans, and funding that will address the watershed as a whole, rather than as individual components.

The Kaskaskia Watershed Association (KWA) was created to represent the entire watershed while recognizing the uniqueness within each reach of the river. The river and its associated watershed have been divided into four reaches: Upper Kaskaskia Reach, Carlyle Reach, Kaskaskia/Shoal Reach and the Lower Kaskaskia Reach. The KWA has been created with equal representation from all reaches.

The findings in this report focus on proposed recommendations with responsible agencies and potential sponsors. Funding is the key to success and our goal is to have the federal and state governments provide the funds through the Water Resources Development Act and budget appropriations for the Departments of Agriculture and the Environmental Protection Agency, as well as the IDNR C2000 Ecosystem Partnership Program. The U.S. Army Corps of Engineers already has a large presence in the watershed with the Navigation Project, Carlyle Lake and Lake Shelbyville.

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GLOSSARY OF ACRONYMS

ADA	Americans with Disabilities Act
C2000	IDNR Conservation 2000 Program
cfs	cubic feet per second
CLA	Carlyle Lake Association
CPP	Conservation Practices Program
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
DCCA	Illinois Department of Commerce and Community Affairs
EQIP	Environmental Quality Incentive Program
FEMA	Federal Emergency Management Agency
IBI	Index for Biotic Integrity
IDNR	Illinois Department of Natural Resources
IDOA	Illinois Department of Agriculture
IDOT	Illinois Department of Transportation
IDPH	Illinois Department of Public Health
IEPA	Illinois Environmental Protection Agency
IHPA	Illinois Historic Preservation Agency
INAI	Illinois Natural Areas Inventory
KRFWA	Kaskaskia River Fish and Wildlife Area
KWA	Kaskaskia Watershed Association
LKSI	Lower Kaskaskia Stakeholders, Inc.
LWCF	Land & Water Conservation Fund
mgd	million gallons per day
NPDES	National Permit Discharge Elimination System
NRCS	Natural Resources Conservation Service
NVGD	National Vertical Geodetic Datum
OKAW	Original Kaskaskia Area Wilderness
ORBC	Okaw River Basin Coalition
OLT	Open Lands Trust
SWI RC&D	Southwestern Illinois RC&D, Inc.
SWCD	Soil & Water Conservation District Offices
“T”	Tolerable Soil Loss Limit
USACE	US Army Corps of Engineers
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
USF&WS	United States Fish & Wildlife Service
WHIP	Wildlife Habitat Incentive Program
WRDA	Water Resources Development Act
WRP	Wetlands Reserve Program

DESCRIPTION AND EARLY HISTORY

The Kaskaskia River has been an important and prominent natural feature in Central and Southwestern Illinois throughout recorded history. It is the second largest river system within Illinois, rising along farm ditches in Champaign County and flowing in a southwesterly direction for approximately 292 miles, where it unites with the Mississippi River, in Randolph County. The Kaskaskia River Watershed covers all, or parts, of twenty-two counties and encompasses an area of 5,746 square miles (3,677,787 acres) or 10.2% of the entire state. There are 8,680 miles of tributary streams, including the main river channel, (33% of the state stream-miles), and 843 lakes or ponds covering 79,037 acres. Two large reservoirs, Carlyle Lake and Lake Shelbyville, add another 37,000+ acres of surface water. The elevation at the Kaskaskia River headwaters is 740 feet NVGD and drops to 368 feet NVGD at the Kaskaskia Lock and Dam near the confluence with the Mississippi River.

The watershed has many ecologically rich resources. The largest bottomland, hardwood forest within Illinois, at 43,000 acres, is located along the Kaskaskia River between Carlyle Lake and Fayetteville. One tract within this forest is the single largest contiguous tract in Illinois (7,300 acres) and is approximately two miles wide at certain points. In addition, the vast majority of the state's high quality southern flatwoods forest occurs within this corridor.

Forest cover within the watershed is significant (9% of land area), particularly along the streams. Good wetland resources exist (4.5% of land area), particularly along the streams, where clay soils drain poorly and flooding makes development improbable. As the climatic differences from the headwaters to the mouth are substantial, there also exists a great variance in the native flora and fauna found within the watershed.



The Kaskaskia River bottomland hardwood forest is one of the most significant forests of this type in the entire Midwest.

PAST

To understand the concern for the Kaskaskia River, we must look not only to the last 200 years of impact since settlement but also to the geologic forces that provided the landform for our ecosystem. Virtually all of the surface features in the Kaskaskia River Watershed were formed by glaciers of the last two glacial epochs. The terminal glacier of the Wisconsin era, our most recent glacial period (20,000 years ago), only affected areas as far south as the Shelbyville moraine, near Lake Shelbyville. The Illinois era, some 100,000 years prior, etched the landscape on the lower sections in the watershed. As this section has been exposed to erosion for a much longer period of time, the area is primarily flat, with a widespread system of rills, creeks and streams.

Wind blown loess was deposited on the surface and is quite deep along the Mississippi River bluffline but decreases rapidly as you travel east. The karst region of the watershed was formed in creviced limestone created by water dissolving the limestone and creating underground conduits.

In the 18th century, the Illinois landscape was a diverse mixture of forest, savanna and barrens, prairie, wetland, and aquatic ecosystems. The variations in landforms created by the glaciers created a diversity of native communities within the watershed resulting in a significant diversity among the flora and fauna found there.

Early in the history of Illinois, rivers were the primary mode of transportation. French settlers built the first villages along riverbanks at Kaskaskia, Fort de Chartres, and Cahokia. The first state capitol was in the village of Kaskaskia, which was located at the confluence of the Kaskaskia and Mississippi Rivers. Vandalia, the second capitol, was also located on the Kaskaskia River; however, it was located further upriver, closer to the state's then center of population.

English, French and German settlement of Illinois drastically altered the landscape as communities spread out. Early homesteads were along streams, and gradually extended into the forested uplands. Prairie sods were difficult to plow and therefore were the last landform to be settled. Also, prairies were generally located away from the convenience of stream transportation. With the advent of the railroad, the prairies and sparsely populated central portions of Illinois were opened up for settlement and transportation.

Most new settlers were farmers through necessity, and it is agricultural developments that have produced some of the most significant modifications to the hydrology and habitat of this river basin. Starting in the 1800's, forests were cut down for building materials and for agricultural production; prairies were plowed under and swamps and wetlands were drained. Roads were built, and eventually railroads were installed to connect to the major cities. Later, dams, reservoirs and a navigation channel were constructed, forever altering the hydrology of the river.

The settlers created farms to sustain themselves, and in doing so, the resulting loss of the original tallgrass prairie is estimated at 99.9%, with just a few minor pockets of viable prairie remaining. Forest cover has been reduced, and forest fragmentation has reduced

the nesting success for many species of neo-tropical migrant songbirds. The removal of vegetative cover along streambanks has led to an increased rate of streambank erosion concerns throughout the watershed. Wetland loss is also extremely high, resulting in increased flooding. Fish nurseries have been lost with the channelization of the river and with the loss of riverine wetlands. Two mainstream dams have created significant habitat fragmentation for fish and macroinvertebrates, both in the river proper and in tributary streams and reservoirs. This has led to the loss of a number of fish species from portions of the river.

History has also shown a number of exotic and invasive species entering the watershed. The most damaging plants include reed canarygrass, musk thistle, bush and Japanese honeysuckle, garlic mustard, multiflora rose, giant reed, Johnson grass and autumn olive. The most serious animal pests include the house sparrow, starling and several species of Asian carp.

PRESENT

Land Use

At the present time, agriculture is the predominant land use within the Kaskaskia River Basin. Currently, 82% of the land is used for agricultural purposes, while the state average is 78%. Of that 82%, most is cropland, (63%), with other significant land utilized as grassland, (19%). Since 1978, the number of farms has decreased by 25% and the acreage tilled has decreased by only 6%. Cash income for the region in the early 1990s averaged \$404 million or about 7% of the state total of \$5.9 billion. Corn and soybeans are important to the region, but producers also grow 25% of the entire state's crop of wheat. Livestock production, including dairy, swine, poultry and beef cattle is a significant industry, especially in Clinton, Randolph and Washington Counties. Soil loss is high from these combined agricultural efforts, however the farms meeting "T" (Tolerable Soil Loss Limit, as defined by NRCS) numbered 74% in 1997.



Buffer programs would help ease sedimentation entering the watershed from agricultural practices.

The population of the Kaskaskia River Watershed in 2000 was 553,328. Urban land use in 1990 was only 3% of the land while the statewide average was 6%. There are approximately 100 small villages and cities. The largest city is Belleville, with a population of 42,785, located along Richland Creek, a tributary to the Kaskaskia River in St. Clair County. Madison and St. Clair Counties have the largest concentrations of urban populations of the Kaskaskia River Watershed.

Urban sprawl around Fairview Heights, O'Fallon, Edwardsville, Collinsville, and Belleville is of significant concern. In a recent public input process conducted by Southwestern Illinois RC&D, Inc., respondents from the seven counties that it serves indicated that the number one concern for the region was urban sprawl. This concern was raised in even the most rural counties of Bond, Clinton, Randolph and Washington. The development of Mid-America Airport, (Mascoutah, St. Clair County), will encourage additional sprawl into the watershed over the next several decades. In addition, MetroLink has recently been expanded into St. Clair County and will probably further encourage growth in the corridor. Plans are also being finalized for the creation of an additional bridge spanning the Mississippi River near downtown St. Louis. Sprawl has also had a significant impact on Monroe County, which is now listed as the fastest growing county in the state, by percentage.



Grain handling facilities at Evansville, Illinois. The region ships \$45 million in grain products annually.

Water Resource Development

The Kaskaskia River, as it remains today, contains one of Illinois' premier riparian corridors and two of Illinois' premier fishing and boating lakes. Recreation has always been a valued activity along the river, but in the last fifty years, it has become a major economic benefit throughout the watershed. The large, flat-water reservoirs, Carlyle Lake and Lake Shelbyville provide many water-related activities such as boating, fishing and sailing, as well as many non-water based activities, including hunting, camping, picnicking, hiking, biking and nature observation.

Lake Shelbyville is a multi-purpose project, with more than 11,000 acres of water surface and 172 miles of forested shoreline, located in Shelby and Moultrie counties in Central Illinois. Construction began on the \$56 million dam in 1963 and was completed when the gates were closed in August 1970. The project's purposes as authorized by the Flood Control Act of 1958 are flood damage reduction, recreation, fish and wildlife conservation, water supply, and navigation. These provide balanced management of the lake and its resources.

Lake Shelbyville and Carlyle Lake combined have prevented approximately \$616 billion in flood damages since their completion. By preventing downstream flood damages, USACE facilities are often impacted by high water. When water is extremely high, boaters and swimmers have limited access to the water. This has had a great impact on the economy of the surrounding communities and is reflected in the sharp drop in visitation during high water years. Severe shoreline erosion, which has impacted recreation facilities, has also resulted from this high water.

The balance between recreation and flood damage reduction has been challenging at best in the past few years. Six of the ten highest lake levels have occurred since 1990. High water in 1990, 1995, and 1996 occurred during peak summer recreation season. In 1996, after two consecutive years of near record high water, concerned local citizens formed the Lake Shelbyville Development Association. Their primary focus was access to the lake during high water. The result of their efforts was the construction of five high water boat ramps around the lake. Since their construction, the ramps have proven their value during two high water events, most recently in 2002 when Lake Shelbyville reached elevation 618.01 NVGD, its second highest level ever.

The Shelbyville Lake provides three marinas, two State parks, six USACE campgrounds, three USACE day use areas, six beaches, a Visitor's Center, and a multitude of other outdoor recreational facilities. Maintaining the highly used, ageing recreation facilities with the fiscal resources provided presents daily challenges to the staff.

Although not the largest of the USACE St. Louis District's lake projects, Lake Shelbyville offers more recreational facilities, has higher camping visitation, and consistently collects more in user fees. The lake usually ranks in the top 5% of projects throughout the USACE in user fees collected. An average of 2.7 million visitors come to Lake Shelbyville annually, drawing tourists from throughout central Illinois, including

Springfield, Decatur and Champaign-Urbana, as well as Chicago and other portions of northern Illinois.

Carlyle Lake, at 26,000 surface acres, is the largest man-made reservoir in Illinois, and an equally popular outdoor recreation facility. It has eighty-five miles of shoreline and two state-managed outdoor recreational sites, including South Shore and Eldon Hazlet State Park, which is located on the west side of Carlyle Lake and is the largest campground in the State of Illinois. The federal government, through the US Army Corps of Engineers, provides the lake and three marinas, five campgrounds as well as four beaches a Visitor's Center and other outdoor recreation facilities.

There are over thirty species of fish in Carlyle Lake, and fishing is a very popular recreational activity. The lake is also known as one of the premier sailing lakes in the Midwest. Attendance at Carlyle Lake typically exceeds 2.8 million visitors annually, and its proximity to the St. Louis Metropolitan region makes it the number one day use facility in the state. Aside from water-based activities, the area also attracts golfers, bird-watchers and has recently constructed a Convention Center. It is estimated that each facility, Carlyle Lake and Lake Shelbyville, contributes in excess of \$35 million to their respective area's economy each year.

The USACE and IDNR work together to manage the 9,500-acre Wildlife Management Area in the northern section of Carlyle Lake. The area is divided by the following management zones, Westside Management Area, Eastside Management Area, Flooded Dead Timber Area and the Open Water Area. This diverse habitat includes 2,000 acres of woodlands, 5,800 acres of open water and wetlands, 200 acres of grassland, and 1,500 acres of cropland and native moist soil managed for wildlife food and cover.



Day use facilities at Lake Shelbyville. An average of 2.7 million visitors visit the lake's facilities annually.

Prior to the impoundment of Carlyle Lake and Lake Shelbyville, cultural resource surveys were conducted by Southern Illinois University at Carbondale and the University of Illinois at Urbana respectively. These surveys identified 84 sites at Carlyle and 62 sites at Shelbyville. All, or a portion of, 13 sites were excavated. Since that time additional surveys on the uplands have identified an additional 170 sites at Carlyle and 61 additional sites at Shelbyville. In addition, the Carlyle Lake project contains the General Dean Bridge, and the Lake Shelbyville project contains the Lithia Springs Chautauqua, both of which are listed as historic sites.

Clearly, both the Carlyle Lake and Lake Shelbyville projects are rich in historic properties and cultural heritage. To manage the cultural properties and ensure proper compliance, Historic Properties Management Plans were developed for both Carlyle Lake and Lake Shelbyville. The plans set forth a systematic method for further investigation of known sites and procedures to follow prior to future development of an area.

The Navigation Project, on the lower reach of the Kaskaskia River, was built to increase the efficiencies in hauling coal and grain via barge. During construction of this project, approximately 14 miles (26 river bends) were sliced off of the river, forming a straighter, more navigable channel. The USACE is now charged with maintaining this 36-mile channel, at a minimum width of 225 feet, and a minimum depth of nine feet.

In 1996, Congress, through the Water Resource Development Act (Section 321 WRDA 96), added fish and wildlife and habitat restoration purposes to the authorized Navigation Project (Authorized by Section 101 of the River and Harbor Act of 1962). This authorization addresses fish and wildlife and habitat restoration on the Navigation Project. The IDNR managed Kaskaskia River State Fish and Wildlife Area is one of the largest state-owned and managed sites in Illinois. Located 35 miles southeast of St. Louis, Missouri, the area comprises more than 20,000 acres of land and water and extends along the Kaskaskia River Navigation Project in St. Clair, Monroe, and Randolph counties. IDOT acquired the lands along the river and IDNR manages it for fish, wildlife and other recreational activities.



Holiday weekend at the Kaskaskia River Lock and Dam near the confluence of the Mississippi River.

Due to the proximity of the lower Kaskaskia River basin to the St. Louis Metropolitan area, there has always been a significant demand on the area for outdoor recreational use. Fishing, hunting, and camping were high participation activities in the lower basin even before construction of the Navigation Project. Due to the project's recreational importance, in December 2000, the addition of Recreation as an authorized purpose for the Navigation Project was mandated by WRDA 2000.

The Kaskaskia River Navigation System currently has in excess of 200 people working in jobs directly related to commercial navigation. In 2001, \$45 million of grain was exported from the Kaskaskia River. This grain originated from approximately 2,500 family farms located in the basin. The river system also handled \$2 million worth of in-bound fertilizer to support agricultural operations. Steel processing operations at the Kaskaskia Regional Port District industrial park is processing \$150 million worth of steel annually. Processing operations add \$14 million in value to the steel handled. Since the lock and dam project opened in 1976 in excess of 50 million tons of commodities have been shipped through the facilities.

Other recreational sites are located within the Kaskaskia River Watershed, including Baldwin Lake, Peabody-River King State Fish and Wildlife Area, Ramsey Lake State Park, Hidden Springs State Forest, and the Coffeen Lake State Fish and Wildlife Area. The Kaskaskia Biological Station, managed by the IDNR Natural History Survey with support from the University of Illinois, acts as the state's primary research station for reservoir fisheries management and is located in Sullivan, Illinois.

The Kaskaskia River area also contains eight dedicated Nature Preserves, 63 Illinois Natural Areas Inventory (INAI) sites and eight registered Land & Water Reserves. Many private lands are also used extensively for hunting and other outdoor recreation. Indeed, there are extensive forests and wetlands along this riparian corridor that are used for outdoors experiences both on private and public lands. The main river itself is used for boating, fishing, and nature observation. Recreation is the second major category of economic income, following agriculture, for the basin.

Despite the development, settlement, use, and impacts previously described, the Kaskaskia River Watershed remains rich ecologically. Of the 59 mammal species found in Illinois, 83% reside within the watershed. For reptiles, 60% of the species are represented in the basin. Vascular plants total about 1,100 species in the basin, or 40% of those in Illinois. Of the 300 bird species found in Illinois, 287, or an amazing 96% are found here (includes migrants). There are 112 species of fish, 42 species of mussels, 27 species of crustaceans, and 19 amphibians.

State threatened and endangered species include: 12 plants, 29 birds (includes migrants), 2 mammals, 2 reptiles, 5 fish, 8 mussels and one crustacean. Although plant and animal diversity is currently quite high, the existing forest, wetland and prairies are under great stress and ecological functions are impaired. More species are in danger of becoming threatened or endangered in the future.

One species of reptile in particular, the eastern massasaugas, Sistrurus catenatus catenatus, was once known to inhabit a minimum of 18 counties in Illinois. Findings now indicate that the Carlyle Lake population is the only known viable population in the state of Illinois, and one of the few remaining in the Midwest. Efforts to protect habitat for this species of rattlesnake must be carefully balanced with the growing need for recreational activities on federal, state and private land surrounding Carlyle Lake.

Removal of wetlands in the 19th century certainly impacted the habitat, but most importantly it took away the natural buffering of the water cycle. Flooding has been a constant result ever since. Concern with flooding was the motivation in the 1930's to build levees, and also planted the seeds for large dam construction for flood control. The reservoirs at Shelbyville and Carlyle were built in the 1960s with the primary target to address flooding. In the meantime, agricultural practices have changed now to include more and more ground that was once forested and used during flood cycles. The result is that during high water events, many acres of this converted land continues to be flooded.

One of the purposes of Lake Shelbyville and Carlyle Lake is to lessen flooding on the downstream sections of the Kaskaskia and the Mississippi Rivers. Both lakes average over \$30 million in prevented damages annually. During flood damage reduction operations, both lakes' recreational facilities are impacted affecting the region's tourism industry. Outflow releases to lower the pool after the storm event often impact recreational use, cropland, and bottomland timber below the dams.

In Spring 2002, as a result of heavy rains during late April and May, Carlyle Lake and Lake Shelbyville stored floodwaters that protected large areas downstream of the project, including the Mississippi River below Chester, Illinois. The flow at Venedy Station was reduced from 100,000 cubic feet per second to 50,000 cubic feet per second. Carlyle Lake combined with Lake Shelbyville stored over 876,000 acre-feet of water during this flood event. An acre-foot of water is a volume of water 1 foot deep over an acre of land. The Carlyle Lake and Lake Shelbyville projects worked as designed and helped prevent a much larger flood on the lower Kaskaskia River and also the lower Mississippi River. The reservoirs in the St. Louis District (Mark Twain Lake, Carlyle Lake and Lake Shelbyville) prevented a flood larger than the one experienced at Cape Girardeau in 1993. Millions of dollars of damages were prevented.

Carlyle Lake reached a record pool elevation of 459.83 feet NVGD on May 18, 2002, encompassing 52,000 acres of surface water, more than double the size of its summer pool. This flood event significantly impacted Carlyle Lake recreational areas, wildlife management areas, outflow releases, and downstream agricultural, timber, and recreational land. Similarly, Lake Shelbyville reached an elevation of 618.01 feet NVGD also significantly impacting recreational areas and wildlife management areas. To lower the pool at both lakes after the event, outflow releases impacted downstream agriculture, timber, and recreation use.



Spring 2002 flooding at Carlyle Lake. The lake reached a record elevation of 459.83 feet NVGD.

The Kaskaskia Watershed Association and interest groups worked with the USACE to quickly lower both lakes allowing for some upstream and downstream benefits this summer. However, at both lakes, recreation and downstream areas will be impacted over the summer as the water from the flood damage reduction operations is released. Without the tremendous work of the watershed organizations and stakeholders, the entire recreation and crop seasons could have been lost in 2002.

The region's recreation and tourism industry at both lakes is impacted at pool levels above 450 NVGD at Carlyle Lake and 610 NVGD at Lake Shelbyville. Releases above 4000 cfs at Carlyle and 1800 cfs at Lake Shelbyville cause water to be out of the banks impacting agriculture, recreation, and timber. To help reduce impacts during flood damage reduction operations additional high water facilities at the lakes along with incentives to encourage downstream and upstream landowners to enroll in a conservation program are needed.

Point source pollution from sewage treatment facilities, although not as significant now as in the past, has added to this mix of concerns. Non-point source of pollution from agricultural row crops and livestock operations add to the sediment load of both the river and lakes. Streambank collapse and bank erosion are an issue throughout the river and lakes, with the possible exception of the navigation channel. However, the resulting sedimentation accumulates within the navigation channel, requiring costly periodic dredging. During flooding events the sedimentation also accumulates within the remnant oxbows, adjacent to the navigation channel, and are slowly choking out important fish nurseries. Sedimentation is the number one concern raised by all areas of the watershed and is documented in the vast majority of plans and reports provided.

Use of water within the Kaskaskia River will become a greater issue in the future. As the population expands within the region there will be a greater need for a clean source of public drinking water. Recent legislative changes in the use of Illinois coal have placed

an immediate interest in developing coal-fired power plants within the watershed, and the expanded use of ethanol nationwide makes this region a natural choice for the location of an ethanol facility. These uses, in conjunction with maintaining a navigational channel, as well as to provide recreational activities throughout the watershed will stress the amount of water available for environmental purposes. It is therefore very important that all interests unite to formulate an action plan that will be responsible to all uses within the basin.

Water Use Demand on the Kaskaskia River

	Lake Shelbyville	Carlyle Lake	Combined	Balance
Projected Availability	17.0 mgd	24.5 mgd	41.5 mgd	
Existing Use	8.5 mgd	.2 mgd	8.7 mgd	32.8 mgd
Current Requests - Annual Average Use			36.7 mgd	(3.9 mgd)
Current Requests - Peak Use			89.8 mgd	(57.0 mgd)

Figures as of July 2002; IDNR Office of Water Resources

FUTURE

The Kaskaskia River Watershed is uniquely positioned for restoration. The natural features of forest and wetlands that remain offer an opportunity to restore natural functions of the riverine and riparian habitat. Many large areas of bottomland forests have not been developed because they are wet and difficult to modify. In fact, five of the state’s 40 large forest blocks (over 500 acres) occur in the Kaskaskia River Watershed.

Quality wetlands still exist in the watershed today. Changes in recent years to the federal farm subsidy programs have limited the loss of these wetlands. These remaining wetlands can be a starting point for the redevelopment of this ecosystem, an opportunity that is not available in many other watersheds in Illinois.

There have been some positive developments in recent years that provide a better outlook. Agricultural practices, promoted in the Farm Bill, to prevent soil erosion are rapidly gaining acceptance. The treatment of urban sewage pollution has significantly improved the quality of water. The development of recreational businesses has created an important, sustainable source of income based off of the natural resources found throughout the watershed. Restoration efforts, including many funded through the IDNR C2000 Ecosystem Partnership program, CRP and WRP are taking marginal ground out of production and recreating fish and wildlife habitat. In addition, many landowners within the watershed, particularly from Carlyle Lake to Fayetteville, have united to promote conservation protection on private land in cooperation with state and federal agencies.

There is a diversity of interests, stakeholders, and partners within the watershed that are dedicated to improving the natural resources, the economy, and the quality of life for all residents within the region. Issues do exist and must be addressed, but the residents of the watershed are looking to a healthy natural resource, positive economic benefits, and better

quality of life. There is agreement that the watershed is important and that a better, healthier, and more prosperous resource will be good for all.

The Kaskaskia Watershed Association (KWA) was created to represent the entire watershed while recognizing the uniqueness and diversity within the river. They started meeting together in 1996 and incorporated and received their not-for-profit status in 2002, with equal representation from each group. Their goal is to develop, enhance and protect the ecological and socio ecological values of the natural resources within the Kaskaskia River Watershed. Eight different coalition groups have met for 25+ years and continue to meet within the watershed, investing their own resources to address watershed concerns, issues and opportunities.

In combining the groups to form the KWA in a not-for-profit status from the headwaters of the Kaskaskia River at Champaign to the confluence of the Mississippi River the stakeholders realize the watershed is very diverse but their issues are the same: communication, erosion, siltation, recreation, fish and wildlife, flood damage reduction, water supply, industrial, navigation, economic development and eco-systems. Working together the coalition will be able to combine resources of people, past investments and existing economics and programs to further their goals and objectives in enhancing and preserving the watershed.

Reach I - Champaign to Lake Shelbyville Dam

- Lake Shelbyville Development Association (LSDA)
- Upper Kaskaskia C2000 Ecosystem Partnership

Reach II - Lake Shelbyville Dam to Carlyle Lake Dam

- Carlyle Lake Association (CLA)
- Mid Kaskaskia Coalition
- Carlyle Lake Watershed C2000 Ecosystem Partnership

Reach III - Carlyle Lake Dam to Fayetteville

- OKAW River Basin Coalition (ORBC)
- Original Kaskaskia Area Wilderness, Inc. (OKAW)
- Kaskaskia River/Shoal Creek C2000 Ecosystem Partnership

Reach IV - Fayetteville to Confluence of Mississippi River

- Lower Kaskaskia Stakeholders, Inc. (LKSI)
- Lower Kaskaskia/Silver Creek Ecosystem C-2000 Partnership
- Sinkhole Plain C2000 Ecosystem Partnership

The existing base of natural resources in the Kaskaskia River Watershed is under pressure, but with proper planning and implementation, a restoration and protection project can yield good results with minimal public costs. The studies listed in the attached bibliography indicate a long interest in providing information about the Kaskaskia River. The following federal and state agencies, in collaboration with local interests, have worked together to develop local initiatives that will lead future protection and restoration efforts within this watershed:

- Federal Agencies:
 - US Army Corps of Engineers
 - USDA Natural Resources Conservation Service
 - USDA Rural Development
 - US Department of Transportation
 - US Environmental Protection Agency
 - US Fish & Wildlife Service

- State Agencies:
 - Illinois Department of Agriculture
 - Illinois Department of Commerce and Community Affairs
 - Illinois Department of Natural Resources
 - Illinois Department of Public Health
 - Illinois Department of Transportation
 - Illinois Environmental Protection Agency
 - Kaskaskia Biological Station (IDNR, University of Illinois)

- Illinois Department of Natural Resources C2000 Ecosystem Partnerships:
 - Carlyle Lake Watershed Ecosystem Partnership
 - Kaskaskia River/Shoal Creek Ecosystem Partnership
 - Lower Kaskaskia River/Silver Creek Ecosystem Partnership
 - Sinkhole Plain Ecosystem Partnership
 - Upper Kaskaskia River Ecosystem Partnership

- Regional / Local Interests:
 - Carlyle Lake Association
 - Isaac Walton League
 - Kaskaskia Watershed Association
 - Kaskia-Kaw Rivers Conservancy
 - Lake Shelbyville Development Association
 - Lincoln Heritage RC&D
 - Local & Regional Governments
 - Lower Kaskaskia Stakeholders, Inc.
 - Mid-Kaskaskia Coalition
 - Okaw River Basin Coalition
 - Original Kaskaskia Area Wilderness
 - Shelby County Community Services
 - Soil & Water Conservation District Offices
 - Southwestern Illinois RC&D, Inc.

The Kaskaskia River Watershed stakeholders are ready to move forward with planning, restoration, protection, improvement, and development efforts. They are committed to a holistic approach based upon the broad concerns within the watershed. Funding to pay for these projects will have to come from local sources with assistance from state and federal agencies/legislators.

Primary authority for projects and appropriations for the US Army Corps of Engineers components will be sought from the next federal Water Resources Development Act (WRDA) in 2002. Projects for the Department of Agriculture, US Fish and Wildlife and the USEPA will be sought through the appropriate legislative tool. Funding from the State of Illinois will be requested through the necessary appropriation bills for IDNR, IEPA, IDPH, as well as individual legislators. Local requests will be as needed with the county, township, city, or village processes. Private grants will also be pursued in hopes of leveraging as much effort as possible.

The following recommendations will guide the planning and implementation of a comprehensive ecosystem restoration:

All recommendations are based on the following assumptions:

- The Kaskaskia River and surrounding land is a valuable resource.
- Survival and public health depend upon healthy ecosystems.
- Residents of the watershed want a healthy and better life.
- Natural resources have intrinsic value.
- Stewardship of natural resources is an important responsibility.
- Education is an essential tool.
- Individuals are important and community is more important.
- There is the collective will to address the issues.
- There is an economic value to the river and surrounding lands.

All recommendations must meet the following criteria:

- Efforts must be based on planning and an approach that includes local citizens and all levels of government.
- Recognition of private property rights and the public interest should strive for a balance.
- Actions must be based upon good science and economic data.
- Primary action should be focused on the protection, restoration and enhancement of the high quality resources that are at risk and that have the greatest potential for recovery.
- Programs should be voluntary and incentive-based.
- Actions should be consistent with ecosystem based management strategies.

Success of these recommendations will be measured by:

- Enhanced biodiversity, including increased species richness, and the abundance and distribution of desirable plant and animal species and natural communities.
- Restoration of tributaries, the main river, stream banks, and remnant oxbows.
- Attainment of water quality standards.
- Improvement in the Index for Biotic Integrity (IBI).
- Reduction of river water level deviation from natural hydrograph, within the constraints of the water management plan.

- Reduction of peak flows.
- Increased economic development related to the river and natural resource jobs.
- Measurable reduction in amount of sediment entering the river.
- Increased recreational opportunities within the watershed.

Stakeholders and interested parties, working together, can make these written recommendations become a reality through local involvement, political contacts, education, and dedication to a better life.



Grain, fertilizer, steel, and other commodities are shipped through the lock and dam project.

Recommendations for this report have been developed as broad, encompassing statements (goals) that, if coupled with specific projects (objectives), will allow for successfully completing the mission, which is to restore the watershed in a manner that benefits both wildlife as well as the residents within the region.

The recommendations have been developed into seven categories, including:

- Business, Industry and Agriculture
- Habitat
- Human Resources
- Hydrology
- Recreation
- Research and Monitoring
- Water Quality

To assist KWA, as well as other interested parties in utilizing this report, a Work Plan has also been developed to act as a supplement to this document. The Work Plan contains specific projects and or components of projects that will address the various recommendations that are included within the report. It should be understood that the Work Plan is only a partial listing of proposed projects within the region, and that KWA should update it on a regular basis, preferably annually.

BUSINESS, INDUSTRY AND AGRICULTURE RECOMMENDATIONS

Issues primarily focused upon business, industry, and agriculture are listed here.

Recommendations:

- 1. ASSIST THE PRIVATE SECTOR IN DEVELOPING BUSINESS OPPORTUNITIES FOCUSED ON AGRI-TOURISM, ECO-TOURISM AND/OR RECREATION.***
 - Support tours focused upon bird watching, fishing, hiking, biking, hunting and camping.
 - Support “service work projects” for restoration objectives.
 - Support community riverfront development efforts throughout the watershed.

- 2. STUDY STRATEGIC BUSINESS OPPORTUNITIES ALONG THE RIVER. OPPORTUNITIES MAY INCLUDE:***
 - Restore the navigation channel to Fayetteville for a new grain facility.
 - Add new, or value-added businesses that will increase tonnage, and/or the value of products shipped through the navigation project.
 - Increase businesses that serve the recreation and tourism business, including lodging (motels, bed and breakfast, campgrounds), meals and entertainment.
 - Support sustainable and smart economic development and the diversification of economic opportunities.
 - Support the development of an ethanol facility within the watershed.
 - Support and enhance markets for locally produced goods.
 - Support the Amateur Trapshooters Association facilities in Randolph County.

- 3. INVOLVE STAKEHOLDERS, LANDOWNERS, BUSINESS, INDUSTRY, AND AGRICULTURE SECTORS IN PLANNING FOR NATURAL RESOURCE USE, INCLUDING WATER USAGE.***

- 4. IMPLEMENT A PLAN TO UPDATE AND RESTORE THE EXISTING INFRASTRUCTURE AT CARLYLE LAKE, LAKE SHELBYVILLE AND THE NAVIGATION PROJECTS.***

- 5. DEVELOP A STUDY OF RESIDENTIAL DEVELOPMENT AROUND LAKE SHELBYVILLE AND CARLYLE LAKE FOR THE IMPACT UPON NATURAL RESOURCES AND HUMAN RESOURCES, INCLUDING ROADS, SEWERS, SCHOOLS, ZONING, URBANIZATION, STORMWATER, AND POLLUTION FOR POINT OR NON-POINT SOURCES.***
 - Examine existing data gaps and expand to fill in where necessary.

HABITAT RECOMMENDATIONS

Habitat programs will focus on the native environment of a plant or animal, the kind of place where it is natural for the life and growth of an organism. Important concepts include sustainability, diversity, health, variety, connectivity as well as the ability to thrive and reproduce. Recommendations will focus on the naturally existing communities of the watershed.

Recommendations:

- 6. *DOUBLE THE NUMBER OF ACRES OF WETLANDS, FROM 4.5% TO 9% (160,000 ACRES) IN THE NEXT TEN YEARS. MANAGERS SHALL WORK TO RESTORE A FULL RANGE OF WETLAND TYPES.***
 - Establish wetlands to absorb non-point pollution from agriculture and urban development activities.
 - Work with the Partners in Flight Program, US Fish & Wildlife Service – Partners for Fish and Wildlife Program and the North American Waterfowl Management Plan to ensure adequate habitat for migratory birds utilizing this flyway.

- 7. *WORK WITH THE VARIOUS AGENCIES THAT OVERSEE THE IMPLEMENTATION OF WETLAND REGULATIONS IN AN EFFORT TO DEVELOP A MORE UNIFORM APPROACH TO CLASSIFICATION OF WETLAND TYPES THAT WILL BE MORE READILY UNDERSTOOD.***
 - A comprehensive training (advanced training) program needs to be developed for natural resource Technicians/Managers to allow them to identify various wetland types.
 - Wetland educational programs need to be developed for the public.
 - Wetland redevelopment must be limited in areas of prime farmland, and should be concentrated in areas that transition into aquatic habitat, that act as buffers, as well as those areas that can absorb stormwater and minimize the effects of flooding.

- 8. *MAINTAIN EXISTING FOREST CORRIDORS AND SIGNIFICANT FOREST BLOCKS THAT ARE BEING THREATENED BY URBAN SPRAWL, AGRICULTURE AND GENERAL LAND CONVERSION.***
 - Promote silviculture practices that maintain at least 20% of corridor in mature forest condition.
 - Secure the designation of Forest Legacy Program to be available in the Kaskaskia River Watershed.
 - Double the number of acres of southern flatwoods forest from 450 to 900 in the next ten years, and look for preservation opportunities, especially in Clinton, St. Clair and Washington Counties.



- 9. RESTORE FORESTED RIPARIAN CORRIDORS ALONG ALL OF THE 8,680 MILES OF STREAMS.**
- Protect appropriate remaining areas through state and federal conservation programs and conservation easements.
- 10. REDUCE THE FRAGMENTATION OCCURRING WITHIN THE STATE'S LARGEST BOTTOMLAND HARDWOOD FOREST, BETWEEN CARLYLE LAKE AND FAYETTEVILLE, WITH SPECIAL CONSIDERATION GIVEN TO DEVELOPING ADDITIONAL, LARGE CONTIGUOUS FORESTED TRACTS, AS DEFINED BY THE STATE OF ILLINOIS.**
- Connect existing nature preserves or natural areas, if possible, to reconnect significant habitat patches.
- 11. PROTECTION OF KARST AREAS THROUGH THE REFORESTATION OF SINKHOLES AND THE CREATION OF BUFFER STRIPS AROUND SINKHOLES.**
- Promote education and outreach plan to inform public of karst issues.
- 12. IMPROVE AQUATIC HABITAT THROUGHOUT THE WATERSHED:**
- Reduction in the amount of nutrients and sedimentation entering waterways from agricultural and development efforts through the development of comprehensive conservation plans.
 - Restoration of historic water regime, to link backwater and oxbow habitat to serve as fish nurseries.
 - Acquire, through willing sellers, the purchase of supplemental flowage and flood easements to provide for additional wetland and wildlife habitat.
 - Maintain or restore 19.1 miles of remnant channels and oxbow meanders in navigation project.

- Construct low riffles and pools as possible, especially in tributaries.
- Develop plan to remove streams from 303 (d) list.
- Reduction or elimination of exotic fish, such as silver/fathead carp, by encouragement of commercial harvest of underutilized species.
- Improve fisheries at reservoirs.
- Restoration and enhancement of oxbow and floodplain lakes.
- Determine impact of navigation dm as an impediment to habitat connectivity (fish passage).

13. PROTECT AND ENHANCE EXISTING SAVANNAS AND PRAIRIES AS LISTED ON THE NATURAL RESOURCE INVENTORY, AND DEVELOP A PROGRAM THAT WILL CREATE NEW SITES WHERE POSSIBLE.

- Increase grassland habitat to stabilize the loss of grassland wildlife in the basin.
- Create 1,000 acres of savannas.

14. CREATE A SPECIAL PROGRAM AND POSITION, WITH ADEQUATE RESOURCES, FOCUSED STRICTLY ON THREATENED AND ENDANGERED SPECIES AND THE REMOVAL OF EXOTICS.

- Develop a preservation/restoration plan for each species on the state and federal list.
- Develop an outreach/educational/informational plan to share with the public on E/T.
- Develop a strategy to control exotics in the watershed.

PUT MAP HERE

HUMAN RESOURCES RECOMMENDATIONS

Human resources concerns include prehistoric, historic, present and future human impacts and needs.

Recommendations:

- 15. DEVELOP A PROGRAM ON URBAN SPRAWL AND URBAN STORMWATER IN ORDER TO DEFINE IT, EXPLAIN IT, AND TO DISCUSS THE IMPACT UPON NATURAL RESOURCES, INCLUDING ASSISTANCE WITH PLANNING AND ZONING.**
- 16. DEVELOP A WEB-BASED FEDERAL AND STATE WATERSHED CLEARINGHOUSE TO IMPROVE TRACKING PROGRAMS FOR ALL PERMITS.**
- 17. CREATE A STUDY TO SUMMARIZE CONFLICTS OF LAW AND USAGE REGARDING WATER ALLOCATION WITHIN THE KASKASKIA RIVER WATERSHED.**
 - Re-codification where necessary to provide clarification that will reduce future conflicts.
- 18. DEVELOP, SUPPORT AND/OR COORDINATE WITH PRIVATE/PUBLIC LAND TRUSTS IN MATTERS OF COMMON INTEREST SUCH AS CONSERVATION EASEMENTS, OWNERSHIP, MANAGEMENT, ETC.**
- 19. SUPPORT A LOCAL COORDINATOR OFFICE, POSSIBLY THROUGH KASKASKIA WATERSHED ASSOCIATION, AS A CENTRAL COORDINATING BODY COMPLETE WITH A PHYSICAL OFFICE, A COORDINATOR, EDUCATIONAL FUNCTION, LIBRARY, AND MEETING ROOMS.**
 - Support a stable source of funding for a local grassroots agency and partner rather than an extension of state or federal agencies.
 - Promote watershed thinking and activities through outreach and informational programs.
 - Coordinate public participation in agency activities.
 - Develop special educational programs and materials on appropriate issues such as the massasauga.
 - Develop programs to discuss alternatives such as preservation, restoration and development.
 - Serve as Watershed Clearinghouse
- 20. ESTABLISH A CONFLICT RESOLUTION PROCESS FOR THE WATERSHED.**

- 21. DEVELOP FUNDING SUPPORT FOR ALL NATURAL RESOURCE MANAGEMENT THAT WILL PROVIDE ADEQUATE LEVELS OF STABLE INCOME TO ACCOMPLISH THE NEEDS.**
- Investigate feasibility of 1/10 cent sales tax to support natural resources.
 - Investigate fee charges for services to regulated and non-regulated public.
 - Work with legislators to secure a permanent source of funding for the C2000 program.
- 22. EFFECTIVE AND EFFICIENT FACILITIES TO DELIVER PUBLIC SERVICES.**
- Implement facilities plan at Lake Shelbyville
 - Create/establish RC&D Areas throughout the entire watershed.
 - Expand/improve visitor's center facilities on state and federal land.
 - Create a joint venture for an interpretative facility within the watershed.
- 23. PROTECTION AND MANAGEMENT OF ARCHEOLOGICAL RESOURCES.**
- Update and continue to implement Historic Properties Management Plans at both Carlyle Lake and Lake Shelbyville.
 - Develop Historic Properties Management Plan for the Kaskaskia River Navigation Project.

HYDROLOGY RECOMMENDATIONS

Hydrology focuses on water and its impacts. Primarily this includes the physical properties of occurrence, distribution, and circulation. Quantity of water within a certain time period is a factor that is especially important.

Recommendations:

- 24. INITIATE A COMPREHENSIVE STUDY OF WATER USE, WHICH INCLUDES RECREATION, NAVIGATION, FLOOD CONTROL, INDUSTRIAL PROCESSES, PUBLIC WATER SUPPLY AND HABITAT, AND PREPARE ALTERNATIVES FOR CONFLICTING USES.**
- 25. CREATE A FLOOD REDUCTION PROGRAM THAT WILL HAVE LITTLE OR NO DAMAGE TO INFRASTRUCTURE AND CAPITAL DEVELOPMENTS.**
 - Design conservation easement, CREP programs, flood and/or flowage easement program, to include all lands within the 100-year floodplain.
 - Develop a demonstration ecosystem plan to determine the necessary balance of natural resource management.
- 26. STABILIZE BANK AND SHORELINES ALONG BOTH THE RIVER AND LAKES.**
 - Identify and evaluate the critical areas of stream bank erosion and channel incision along the river and tributaries. Design and install appropriate measures.
 - Implement shoreline erosion measures on sites defined as critical at Lake Shelbyville and Carlyle Lake.
 - Develop a system wide erosion/sedimentation analysis and plan to reduce silt by measurable, and observable, amounts within ten years.
 - Conduct a major soils analysis based on ecosystem principles and planned use to determine appropriateness.
 - Establish special programs as needed on a regional or watershed basis to reduce soil loss through special incentives.
- 27. ELIMINATE THE CHANNEL AND "HEADCUTTING" PROBLEMS THAT ARE OCCURRING BETWEEN FAYETTEVILLE AND ROUTE 177, AND REPAIR THE EXISTING DAMAGE ON THE MAIN RIVER AND TRIBUTARIES.**
 - Develop a publicly acceptable program of alternatives including no action. This should be complete with public hearings, cost analyses, cost/benefit evaluation, and engineering plans that are juried by the profession.
 - Develop an analysis of the impact of proposed remedies to the design deficiency on recreation.
 - Develop an ecosystem analysis of the proposed remedies to the design deficiency.

- 28. STUDY HYDROLOGIC METHODS OF RESTORING WATER FLOW THROUGH OXBOWS, WHILE REDUCING SEDIMENT DEPOSITS, ALONG THE NAVIGATION CHANNEL, AND DEVELOP AN IMPLEMENTATION SCHEDULE.**
- Continue to search for useful ways to recycle dredge spoils
 - Develop program to improve silt management and enhance wildlife and fisheries habitat.
 - USACE to develop a micro-model of potential solutions.
- 29. CREATE A SUBTERRANEAN WATERSHED MAP FOR THE KARST REGION, WITH CRITICAL HABITATS CORRELATED TO SURFACE ACTIVITIES.**
- 30. MODIFY HYDROLOGY TO RESTORE NATURAL WATERSHED HYDROLOGIC FUNCTIONS, WITHIN THE CONSTRAINTS OF THE WATER MANAGEMENT PLANS.**

RECREATION RECOMMENDATIONS

Recreational issues are based upon maintaining or restoring a sustainable natural resource base that can be used and enjoyed by people while at the same time having a sensitivity to the economic impact of people utilizing the resources and contributing to the local economy of rural communities.

Recommendations:

- 31. DEVELOP A COMPREHENSIVE RECREATIONAL NEEDS ASSESSMENT TO DETERMINE SUPPLY AND DEMAND, AND THE RELATED ECONOMIC IMPACT. THIS ASSESSMENT SHOULD BE BROKEN OUT INTO THE FOUR SEPARATE REACHES WITHIN THE WATERSHED.***
 - Develop beaches along the river in the Lower Reach

- 32. DEVELOP, RESTORE, AND/OR IMPLEMENT LOW-WATER, NORMAL AND HIGH-WATER INFRASTRUCTURE FACILITIES AT CARLYLE LAKE AND LAKE SHELBYVILLE, INCLUDING BOAT RAMPS, CAMPING SITES, RECREATIONAL SITES, AND SERVICE BUILDINGS.***

- 33. ENCOURAGE THE EXPANSION OF OPPORTUNITIES FOR PUBLIC ACCESS FOR RECREATIONAL OPPORTUNITIES ON BOTH PUBLIC AND PRIVATE LAND.***
 - Review the potential of a voluntary, fee-based program that will increase public access on private property throughout the watershed.

- 34. SECURE THE DESIGNATION OF A FEDERAL LAKES RECREATION DEMONSTRATION LABORATORY, ALONG WITH PERMANENT FUNDING.***

- 35. IMPROVE THE FISHERIES AT CARLYLE LAKE AND LAKE SHELBYVILLE.***
 - Develop plan to harvest “underutilized” species (non-sport) as a commercial program.
 - Review the impact of tournaments on these fisheries.
 - Involve fisheries management issues in water management decisions.
 - Develop stable funding source for fisheries management.
 - Support IDNR revised fisheries technical assistance program to both lakes.
 - Better connectivity with floodplain pools, and establishment of water releases from reservoirs that better approximate the natural hydrological cycle.
 - **Public access at fish hatchery at Carlyle Lake.**
 - Improved integrated management strategies for waterfowl management to serve as fish nursery areas in spring.

36. EXPAND NATURAL RESOURCE RECREATIONAL OPPORTUNITIES AT BOTH CORPS PROJECTS AND STATE FACILITIES.

- Develop greenway and trail projects for bikes and horseback riding.
- Expand hunting areas.
- Develop wildlife viewing areas.

37. ENSURE THAT ALL AREAS, EVENTS AND PROGRAM ACTIVITIES, WHERE POSSIBLE, ARE BARRIER FREE AND COMPLY WITH ADA STANDARDS.

38. DEVELOP A STUDY FOR RESIDENTIAL PROPERTY ALONG THE RIVER IN A MANNER THAT WILL NOT DESTROY THE ENVIRONMENT, BUT YET ALLOW PROPERTY OWNERS ACCESS TO THE RIVER.



RESEARCH AND MONITORING RECOMMENDATIONS

Research and monitoring are needed to determine the effectiveness of restoration projects, to address information needs and to suggest appropriate management strategies.

Recommendations:

39. *ESTABLISH A DATA COLLECTION PROGRAM FOR WATERSHED ANALYSIS.*

- Long term monitoring.
- Comprehensive data targets.
- Comprehensive system evaluation and trends analysis.
- Set up process to inventory, map, protect, identify, and prioritize ecological problems.
- Utilize GIS technology.

40. *EXPAND THE WATER-MONITORING PROGRAM, INCLUDING QUALITY AND QUANTITY, IN THE WATERSHED TO ESTABLISH BASELINE DATA FOR THE WATERSHED.*

- Amphibians
- Plants
- Fisheries, including adult and juvenile fish, and mussels
- Invertebrates & Macroinvertebrates
- Mollusks
- Nutrients
- Quality & Quantity
- Regulated items
- Silt and sediment

41. *DEVELOP A COMPREHENSIVE BOTANICAL SURVEY, OF KEY NATURAL RESOURCE SITES, THROUGHOUT THE WATERSHED, INCLUDING:*

- Bottomland hardwood forest
- Karst
- Prairie
- Savanna
- Southern flatwoods

42. *DEVELOP A SCIENTIFIC ASSESSMENT OF THE PUBLIC WATER SUPPLY IN THE KASKASKIA RIVER WATERSHED.*

43. *DEVELOP A COMPREHENSIVE DATA COLLECTION PROGRAM FOR ALL AQUATIC SPECIES (AMPHIBIANS, REPTILES, MOLLUSK, INVERTEBRATES, FISH AND PLANTS) IN ORDER TO PROVIDE SCIENTIFIC DATA FOR PROPER MANAGEMENT DECISIONS.*

WATER QUALITY RECOMMENDATIONS

Water quality concerns focus on the need to maintain clean and healthy water. Anything present in water that reduces the natural cleanliness, impairs the safe use, or destroys the natural ecosystem function of water is included.

Recommendations:

- 44. REDUCE SILT, SEDIMENTATION, NUTRIENTS, AND TOXICS IN WATER BY A MEASURABLE AND OBSERVABLE AMOUNT IN TEN YEARS.***
 - Increase the use of buffers and grassed waterways throughout the watershed.
 - Establish programs to, eliminate within 10 years, the impairment of use on the 65 stretches of river and tributaries on EPA's 303 (d) list.

- 45. STUDY THE CUMULATIVE IMPACT OF POINT AND NON-POINT SOURCES OF POLLUTION ON STREAM QUALITY.***

- 46. ASSIST PUBLIC WATER SUPPLY AGENCIES TO ACQUIRE A GREATER INFLUENCE ON THE USES OF SURFACE WATER WITHIN THEIR WATERSHED, IN COORDINATION WITH OTHER AGENCIES.***
 - Assist public water supply agencies to implement upland watershed land treatment programs to reduce sediment delivery.
 - Develop special program within karst lands to protect groundwater.
 - Raise awareness and target additional funds for the program to seal abandoned wells.

- 47. ENFORCE AND FUND THE NPDES PROGRAM ON POINT AND NON-POINT SOURCES OF POLLUTION.***
 - Eliminate sewage violations from all sources.
 - Implement the Phase II, non-point stormwater management programs in urban areas.
 - Establish stable funding for water quality/stormwater management on the state and local level.

- 48. CONTINUE AND ENHANCE THE LAKES MANAGEMENT PROGRAM OF IEPA.***
 - Assist in removal of exotic plants from Illinois lakes.
 - Assist in removal of silt and sedimentation.
 - Assist in developing lake management programs.
 - Assist in addressing point and non-point sources of pollution.

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